TEACHER COGNITION OF THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING ENGLISH IN SECONDARY SCHOOLS IN NAIROBI COUNTY, KENYA

By

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DECLARATION

Declaration by Candidate

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ABSTRACT

The relevance of ICTs to English Language instruction stems from the fact that their use can enhance many aspects of education. ICT warrants teachers to adopt innovative classroom activities, thus enhancing the language learning process. ICTs continue to grow in importance and support teachers facilitate language instructions. The pedagogical skills are changing notably and there is increased demand for current set of innovations generating a knowledge gap between development of teachers' technological knowledge from the programmes language teacher training institutions provide. The purpose of this study was to evaluate teacher cognition of the incorporation of ICT in teaching English in secondary schools in Nairobi County. The objectives of the study were: examine technological knowledge of a teacher of English for ICT integration, establish technological content knowledge of a teacher of English for ICT integration, determine technological pedagogical knowledge of a teacher of English for ICT integration, and find out teachers' knowledge, beliefs and thinking towards incorporating ICT in teaching English. The study utilised mixed research approach which combined quantitative and qualitative techniques. The study was clamped on Pragmatist underpinned by two frameworks: Technological Pedagogical and Content Knowledge (TPACK) and Teacher Cognition. The study population constituted secondary school teachers of English in Nairobi County. The sample comprised 20 teachers of English selected by simple random sampling and purposive sampling techniques. Interview guides and questionnaires were used to collect data. The data collection instruments were piloted and scrutinised by supervisors assured reliability and a triangulation was enforced to warrant validity. The investigation utilised a descriptive statistics (SPSS) V.20 for windows to analyse quantitative data summarised and presented using tables and the qualitative data were evaluated using content analysis techniques and presented in narratives premised on key themes deduced from the analysis. The findings demonstrated that 75% of the surveyed teachers of English had limited TPACK necessary to integrate ICT into their instruction successfully. The required training by English educators to incorporate technology into their instruction or the resources necessary to execute this were insufficient in most of the schools studied. Sixty-eight per cent of English teachers in the study indicated positive views and attitudes concerning incorporating ICT into English language instruction. The study concluded that teachers' mindsets were a necessity for the achievement of integrating ICT in teaching English language, teachers of English required adequate technical and pedagogical content knowledge as well as basic ICT capabilities to integrate ICTs into teaching successfully, and that setting ICT capacities does not inevitably lead to improvements in classroom practices, despite the ambitions of nationwide educational authorities. The study therefore, recommended that teachers get continual professional growth by incorporating ICT into instruction, emphasising the significance of ongoing professional training in ICTs to improve English language instruction. In addition, the study encourages policymakers to contextualise instructional support in a holistic view of ICTs for instructions by developing an ICT strategy that includes vision-building professionals, an ICT-based English content, pedagogical skills, and ICT facilities be enhanced.

DEDICATION

This study is dedicated to my beloved wife, Gladys and my lovely children: Lauren Rita, Cheryl, and Isaac, for their inspiration, understanding, patience, and love. This study is also dedicated to my late parents: Capis and Prisca Ogallo, in loving memory for their tremendous love and influence and who gave me a language, and in memory of the late Dr Shem Sao Onjiko, with admiration and appreciation for his influence, friendship, mentorship, and inspiration towards this goal.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACOT	**:**	Apple Classrooms of tomorrow
ALM	**:**	Audiolingual Method
CBAM	**:**	Concerns-Based Adoption Model
CALL	**:**	Computer Assisted Language Learning
CBC	**:**	Competency-Based Curriculum
CK	**:**	Content Knowledge
CFA	**:**	Confirmatory Factor Analysis
CLT	**:**	Communicative Language Teaching
CMS	**:**	Course Management System
DEST	**:**	Department of Education Science and Technology
EFP	**:**	Educational Policy Framework
ELT	**:**	English Language Teaching
EMIS	**:**	Educational Management Information Systems
ESL	**:**	English as a Foreign Language
EU	**:**	European Union
FIT: COM	**:**	Focus on Integrated Technology: Classroom Observation Measurement
GTM	**:**	Grammar Translation Method
GoK	**:**	Government of Kenya
ICT	**:**	Information and Communication technology
IPR	:	Intellectual Property Right
IRI	**:**	Interactive Radio Instructions
KCSE	**:**	Kenya Certificate of Secondary Education
KESSI	**:**	Kenya Education Sector Support Programmes
KICD	**:**	Kenya Institute of Curriculum Development

LM S	**:**	Lesson Management System
MCAR	**:**	Missing Completely at Random Test
MDG	**:**	Millennium Development Goals
MOEST	**:**	Ministry of Education Science and technology
MOOCs	**:**	Massively Open Online Courses
MTP	**:**	Medium Term Plan
NEPAD	**:**	New Partnership for African Development
NESSP	**:**	National Education Sector Support Programme
OET	**:**	Office of Educational Technology
PK	**:**	Pedagogical knowledge
PCK	**:**	Pedagogical Content Knowledge
SAS	**:**	Support Application Systems
SLA	**:**	Second Language Acquisition
TAM	**:**	Technological Acceptance Model
TBLT	**:**	Task-Based Language Teaching
TK	**:**	Technological knowledge
TCK	**:**	Technological Content Knowledge
TPK	**:**	Technological Pedagogical Knowledge
TPACK	**:**	Technological Pedagogical and Content Knowledge
UNESCO	**:**	United Nations Educational, Scientific and Cultural Organization
VLE	**:**	Virtual Learning Environment
VMS	**:**	Virtual Management System
WSIS	**:**	World Summit on the Information Society

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

In this information age, technical advancements impact education because technological innovations permeate all fields. Education accelerates rapidly due to technological progress. Integrity is provided by the technological advancements in the learning process, the pedagogical competence of educators, and the advancements in overall subject-matter knowledge. Similarly, the usefulness of ICTs to English language instruction stems from the promise of ICT use in education to enhance learning and teaching scholarly productivity of students and instructors and the administration and efficiency of schools. Considering the current relevance of English language instruction, the concern arises as to whether or not instructors in Nairobi County use ICT in the classroom. Previous studies have shown that teachers need specialised knowledge in order to integrate new ICTs into their classroom instruction proficiently.

Despite this, studies show that it is not the technology per se, but instead the way teachers manipulate the tool that contributes to pedagogical shifts in the classroom. It is also evident from the literature that teachers' views, attitudes, and dispositions regarding innovative technology influence how they employ such ICTs in the classroom. Teachers' choices to incorporate ICTs in English language classrooms may be related to teachers' cognitions. Consequently, it was necessary to investigate teachers' understanding of the incorporation of ICT into English instruction in high schools in Nairobi County, Kenya. In light of this context and the relevance of recognising teacher comprehension, this section includes the following sections: background, statement of the problem, intent, objectives, research questions, assumptions, justification,

significance, scope and limitations, theoretical framework, conceptual framework, and operational definitions of key terms.

1.2 Background of the Study

The development of Information and Communication Technologies (ICTs) has brought many transformation processes in the field of Education globally. The successful integration of ICTs needs teachers' cognition on how to do so effectively and efficiently. In a digitally advanced teaching-learning environment, a teacher requires more sophisticated pedagogical practices. Technological pedagogical content Knowledge (TPACK) is such a new innovative framework which assist teachers to enhance this. The TPCK was introduced in 2005 as a framework Koehlar & Mishra, 2005) of knowledge and skill that teachers of English need for the integration of ICT in the instructional processes, thus TPCK is a powerful mechanism of teacher cognition (Vijayan & Joshith, 2018). Although it is acknowledged that ICT is not a panacea, technology continues to be a crucial component in learning (Underwood, 2014). It is therefore of paramount importance that ICT is incorporated in Education and training and be linked to English language teacher training programs to accommodate the new and upcoming technological innovations. Incorporating ICT into instruction is one of the primary goals to enhance education worldwide and render it available to all. Information and communication technologies are a broad collection of technological instruments and materials employed for communication as well as the creation, distribution, storage, and management of information (Blurton, 2002). Information Technology (IT) encompasses the incorporation of such innovations as computer systems, the Web, broadcasting platforms (radio and television), as well as the phone, along with the different applications and services that enable individuals to access, preserve, send, and modify information (Buttner, 2014). Utilizing ICT in the classroom

can improve the quality of learning and teaching, instructors' research output (Kashorda et al., 2007). According to Lankshear & Knobel (2006) and de Winter et al. (2010), ICT has facilitated innovative and more effective ways to accomplish tasks and offers new instruments to enhance students' learning development. The integration of ICT for teaching and learning engineering constitutes the deployment of ICT infrastructure; tools and accessories as classroom instructional resources. The application of ICT into teaching and learning promotes acquisition of English language skills and it enhances knowledge attainment; however, this study focused on the application of ICT to facilitate transfer of knowledge. The purpose of technology is to transform students from passive recipients to active learners and allows more profound and enhanced linguistic immersion. Technology enables teachers to adopt classroom activities, thus enhancing the language learning process. Nonetheless, studies indicate that teachers' adoption of ICT remains modest (European Union, 2013); hence, it is crucial to recognize why and how ICT is employed and not being used.

According to prior studies (Gao & Hargis, 2010; Saleh, 2008), the use of ICT in the classroom enables students to take a more active role in their education as opposed to being passive participants or listeners. Students study their English course using comprehensive apps which synchronise even without internet; thus, it was necessary to investigate the scenario in Nairobi County. ICT is also viewed as having numerous benefits in education, particularly English learning and instruction, the pursuit of problem-solving abilities, the promotion of student engagement, the provision of flexible learning possibilities, and the enhancement of performance (Bitter & Legacy, 2008; Chambers, 2011).

In addition, ICT is deemed essential for monitoring the efficacy of school-based instruction and learning (Lin, Wang & Lin, 2012). The study, therefore, sought to investigate teacher cognition on the integration of the integration of ICT in teaching English in secondary schools in Nairobi County. As a result of its promise, ICT has emerged as an integral component of educational policy interventions. Furthermore, ICT in education is seen as a means of increasing access to education especially to the rural population and making teaching and learning lively. Currently, the countries face opposition in all sectors as a result of the emergence of a knowledge-based economy. Governments in all parts of the globe are striving to achieve access and good quality education for their citizens (UNESCO, 2013)**.**

Consequently, ICT in education is seen as a means of increasing access to education especially for the rural population and making teaching and learning lively. Various studies have championed the utilisation of ICT in education as an enabler in the process of teaching and learning by assisting the learners to grasp concepts that would otherwise have remained abstract (Kozma, 1991). Some researchers assert that the utilisation of ICT in education has little benefit because they are merely delivery mechanisms relying on the teacher's pedagogical abilities (Clarke, 1983).). Amid these discourses, policymakers have carried on to lay premises for the utilization of ICT to profit from the perceived benefits. Numerous nations have committed significant funds to deploy ICT in educational settings. Since the late 1990s, many countries have made plans to boost their spending on ICT inside their school systems. In 2011, the OECD observed that many countries are making substantial expenditures on information and communication technologies. In 2008, the Australian authorities projected approximately $8 billion was committed to ICT for schooling (Lane, 2012).

The United States Department of Education acknowledged investing over $9.5 billion in digital learning in state education in 2006 (Brunk, 2008). Great Britain, like the US and Australia, made significant expenditures on instructional technology. British Educational Communications and Technology Agency (BECTA, 2009) reported that during 2008 and 2009, the UK invested £880 million in ICT. Numerous European nations have likewise acknowledged the significance and rewards of ICT. In the past decade, ICT has been integrated into the instruction of numerous school courses (Balcon, 2003). Likewise, Saudi Arabia has recognised the significance of the utilization of ICT in educational circles (Almuqayteeb, 2009).

In 2007, King Abdullah of Saudi Arabia initiated extensive adjustments to the Saudi education sector. King Abdullah's Public Education Development Project (Tatweer), which aimed to equip schools with ICT facilities such as laptops, projectors, and smart boards, was one of the most significant of these initiatives. Moreover, almost 400 thousand instructors in a variety of topics obtained the requisite training to operate it. The project was initiated with six-year funding of SAR 9 billion (Ministry of Education, 2006). Even in developing countries, there have been increased investments in ICTs for schools despite the lack of adequate empirical evidence on the outcomes of such efforts (Piper et al., 2015). However, the Global Innovation Index (GII) 2019 report by the World Intellectual Property Organization ranks South Africa, Kenya, and Mauritius as the leading innovation centers in Sub-Saharan Africa. This means that there is a demand to traverse the opportunities and the challenges that exist in these countries regarding technology and its use in education. In Kenya, the policymakers view ICT in education as an enabler for knowledge acquisition leading to innovation and skill development to address the challenges faced by the country’s education

system (Republic of Kenya, 2019). In line with Kenya's development blueprint, Vision 2030, the education curriculum has been reviewed from the 8-4-4 system to a competency-based curriculum (CBC). The vision of the basic education curriculum reforms is to equip learners with world-class standards and skills needed to thrive in the 21st Century such as digital literacy (KICD, 2017). Research has also demonstrated that ICT in education helps in creating opportunities for the learners to develop 21st Century skills but this also depends on the digital literacy of teachers (UNESCO, 2012). To realize this, the integration of ICT in the curriculum is emphasized in the teaching of every subject a shift from the previous system which did not include the integration of ICT in primary schools but only in secondary schools as an elective subject. Kenya initiated significant adjustments to its school system in 2005.

Among the most significant improvements was the ICT grand plan, which aimed to provide schools with ICT infrastructure, primarily laptops, with the early stages of laptop distribution occurring in various primary schools for grade one students (GoK 2016). The state has implemented the National ICT Policy and E-Government Framework, which give directions for Kenya's transition into an information world. In both texts, the government acknowledges that ICT-competent personnel are essential to the nation's transformation into a knowledge-based society. With these substantial expenditures on ICT for instruction, it is necessary to inquire to what degree ICTs have been incorporated into the classroom practises of Kenyan English language teachers. Does the actual situation fit the aspirations? While some studies have yielded valuable information, most are unable to provide a comprehensive understanding of how ICT is utilised in Kenyan secondary schools or the justification for not adopting ICT into instructional procedures.

A study by Murithi & Yoo (2021) focused on the assessment of the availability of ICT facilities in public primary schools, teachers' ability to use technology in teaching and learning, and the perception of teachers on the usefulness and ease of use of ICT. The current study investigated teachers' cognition of the integration of ICT in teaching English in secondary schools. Since digital literacy is considered an important skill to cope with the 21st Century developments, the teacher is a crucial player in the successful implementation of ICT and should be well prepared through adequate training (Hwang et al., 2010). Furthermore, previous researches manifest that some challenges have been impeding technology integration in the country. For instance, in a study conducted by Karsenti et al. (2012) in over ten schools around Kenya, various factors were identified as impediments to the pedagogical integration of ICTs. Some of these factors included: a lack of ICT devices, the perception of ICT by teachers as time-consuming and as an additional workload, technophobia by older teachers, teachers' inadequate ICT expertise among others. To address some of the issues, the Jubilee government had a plan in 2013 to integrate ICT in education by providing laptops to all class one pupils (Muinde & Mbataru, 2019).

According to Wanzala and Nyamai (2018), by July 2018 19,000 out of 23,951 public primary schools had been provided with technology devices but only 70,000 out of over 300,000 teachers had been trained just months before the rollout of CBC. A survey by the Teachers Service Commission that purposefully targeted some schools and 1200 respondents also revealed that teachers in public institutions had serious challenges in using ICT in their teaching. 84.2% of the teachers who responded to the survey agreed that they had problems with the use of technology in classrooms.

The survey ranked technology integration as the top professional skills gap affecting the delivery of services by teachers (Oduor, 2018; Wanzala & Nyamai, 2018). Therefore, although similar studies have been carried out in the country focusing on the integration of ICT in education, they mostly targeted secondary school teachers in other disciplines and were done on the basis of application. At the core of what teachers do is their cognition. Thus, this study gives a more in-depth grasp of Kenyan secondary school English language teachers' awareness of ICT implementation in respective classroom activities.

1.2.1 Teacher Cognition of ICT in Language Teaching

There have been numerous labels, conceptualizations, and definitions of teacher cognition. Borg (2006, 2015) characterizes teacher cognition as teachers' belief systems, knowledge, concepts, sentiments, images, preconceptions, metaphors, perceptions, and viewpoints about education, teachers, learners, content knowledge, curriculum, instructional resources, and themselves. In addition, other names have been used to describe teacher cognition during the past few decades, including 'teachers' knowledge,' 'teachers' views,' ' knowledge and attitudes,' and 'teachers' conceptions. Scholars on the subject (Borg, 2006; Freeman, 2007) are curious about teachers' cognitive states, what they understand, how they acquire their information, and how they apply their understanding in the classroom. Numerous aspects of the educational profession impact what English teachers believe, understand, perceive, and practise. Borg (2006) presents a paradigm for the schematic conceptualization of education, demonstrating that teachers' conceptions of learning and instruction are formed early in their schooling careers. Such early ideas may continue to have an impact on subsequent professional careers.

Professional preparatory schemes that provide teachers with training, instructional apprenticeships, and innovative learning approaches may influence teachers' views on learning and teaching. Nonetheless, when instructors are at work, teaching and curriculum environment can impact their practises, which might or might not be consistent with their fundamental beliefs. In the meantime, instructors' continuing classroom encounters may subconsciously or intentionally influence their cognition via contemplation. This study focused primarily on what teachers believe, know, and anticipate using ICTs in English language instruction. The subsequent section elaborates on these three aspects of teachers' knowledge. Teacher Knowledge about technology could be seen as a crucial aspect of the ICT qualities of educators (Van Break, 2001). The lack of teacher skills or knowledge regarding implementing ICT for educational purposes has been identified as a significant barrier to the effective use of technology (Hew & Brush, 2007; Bingimlas et al.,2009).

Williams et al. (2002) claimed that early-stage ICT implementation necessitated instructors' competence and knowledge. It is essential to stress that solely focusing on instructors' technical expertise is insufficient for efficient technology implementation (Lloyd, 2010). Likewise, based on the TPACK concept, teachers need more than technical knowledge (Mishra & Koehler, 2006). Koehler and Mishra (2006) designed TPACK as a conceptual model relating the type of knowledge teachers need to use technology effectively in the classroom (Koehler & Mishra, 2007). This paradigm suggests that interrelationships and capacities exist among the three essential knowledge structures (pedagogy, content and technology) (Koehler & Mishra, 2008). As such, the aspects of Knowledge transcend, and a comprehension of teaching subject with appropriate technical techniques and computers would result.

The confluence of all components is the model's foundation, which consists of the TPACK elements. Following Shulman's terminology, Mishra & Koehler (2006) and Voogt et al. (2012) characterise this concept of teacher cognition as containing content, the field expert knowledge; methodology, the expertise of learning and teaching processes; and pedagogical content expertise (Shulman, 1986). This description specifies the knowledge needed to make the material understandable to others and the knowledge needed by teachers. The TPACK elements may be described as a teacher's understanding of integrating and blending subject-specific initiatives using new innovations to support learning outcomes (Cox & Graham, 2009). Incorporating technologies into learning and instruction necessitates establishing a new skill set among instructors, which must be accomplished through professional growth (Mishra & Koelhar, 2006; Loveless, 2011).

This idea is defined by Mishra & Koelhar (2006) as the attributes of teacher expertise needed to incorporate technology into education. Consideration must be given to methodology and what teachers ought to know for ICT to help learning and teaching (Mishra & Koelhar, 2006). This is referred to as Technological Pedagogical Content Knowledge (TPCK), and the TPACK hypothesis has been employed to evaluate teachers' understanding of the use of technology in education in advanced western economies (Cox & Graham, 2009; Chai, Koh, & Tsai, 2010; Archambault & Barnett, 2010). The unknown is the applicability of this approach to English teachers in Kenya who exist in a distinct economic and cultural setting. Since the Kenyan authorities have made significant gains toward ICT incorporation in academia, there was a tremendous need to establish teachers' knowledge and ICT integration in English classroom practises.

The concept assumes that the relationship between teachers' utilisation of ICT and their TPACK is comprehensive, i.e., that teachers with "strong" TPACK will now have tremendous success integrating ICT into their lessons. Consequently, exploring the utility of integrating ICT from the TPACK viewpoint was appropriate. This study postulates that the greater a teacher's TPACK, the more effectively they would implement ICT in English classrooms. This, in essence, corresponds to advancement into the more advanced phases of the LoTi Digital Age Paradigm. As teachers' beliefs in the use of technology are mirrored in various classroom activities, numerous authors all across the literature cite instructors' convictions as having a substantial influence on the incorporation of ICT (Ottenbreit-Leftwich, 2010). Nevertheless, instructors' views are often implicit and tacit in practise, making them challenging to express (Donnelly et al., 2011). This section explored instructors' perspectives in further detail, including pedagogical beliefs, attitudes toward the utilization of ICT, trust and proficiency in technology application, and the link between these factors. Ertmer et al. (2012) and Liu (2011) highlight that although some investigations find that educators utilise ICT to promote their ideas on teacher-centred or student-centred learning, student-centred learning ideals are rarely put into reality.

Ertmer et al. (2012) and Kim et al. (2013) investigated why teachers incorporate technology unevenly by focusing on their beliefs. Regarding what constitutes effective instruction and the foundation of learning and knowledge, they observed differences in how teachers perceive the effectiveness of ICT and their ideas regarding student- or teacher-centred approaches. Kim et al. (2013) emphasize that such ideas are interrelated since teachers' perceptions about the foundation of learning and knowledge influence their opinions on what constitutes good instruction as well as how ICT is utilised to

facilitate learning. John (2005) highlights how teachers of various high school subjects incorporate and see ICT uniquely depending on their subject perspective. Meyer et al. (2011) observed that coordinated engagement from other educators helped foster positive attitudes about the employment of ICT to enhance learning and teaching. To employ ICT into the classroom, teachers must have a friendly perception toward it, and those who increase their abilities frequently have a more positive mindset (Kreijn et al., 2013). Self-efficacy is among the teacher-level characteristics that influence ICT adoption. According to Ertmer & Ottenbreit-Leftwich (2010), although it requires time to build. Teachers do not require a high degree of professional ICT expertise to implement ICT in the classroom. However, they need a high degree of personal conviction (Loveless, 2003). ICT incorporation is impacted by second-order hurdles, including teacher assumptions regarding ICT skills and attitudes (Mueller et al., 2008). Teachers who opt to increase their ICT abilities frequently demonstrate a positive attitude toward using ICT to enhance learning (Meyer et al., 2011).

Hammond et al. (2011) found teacher-level characteristics that influence ICT use, such as self-efficacy, material taught and views regarding the favourable impact of ICT on education. Teachers who are competent in their capabilities and who anticipate that ICT would benefit education utilise ICT more frequently. The degree to which teachers utilise ICT in the classroom is proportional to their ICT confidence and knowledge (Wastiau et al., 2013). Furthermore, teachers more competent overall with ICT skills are more inclined to utilise ICT in student-centred approaches (Wastiau et al., 2013). Kreijns et al. (2013) discovered a correlation between teacher competence and confidence, although the causal link between the two was inconclusive. Celik and Yesilyurt (2013) investigated the linkages between educators' technophobia, self-

efficacy, perceptions toward Information technology use, and the use of ICT to assist learning and teaching. They discovered that minimal anxiety, strong self-efficacy, and a favourable attitude toward ICT utilization are all markers of the probability of using ICT - based instruction. Educators who adopt favourable perceptions toward ICT also raise their conviction and lower their worry. Teacher cognition comprises beliefs, knowledge and hypothesis (Borg, 2007). Recognizing teachers' beliefs is crucial for the creation and execution of new initiatives and for achieving effective instruction (Richardson et al., 2012). Teachers' perceptions play a significant role in the selection of educational technologies (Gilakjami, 2012). Teachers' cognitive functions significantly impact and even dictate their actions. Clark and Peterson (1986) suggested that the teaching procedure cannot be fully comprehended until teachers' cognitive functions, behaviours, and apparent consequences are integrated and analysed simultaneously.

It is essential to recognize that instructors' attitudes toward ICT in an English language classroom could affect whether they include it in their lessons. Participants' perspectives on technology-enhanced educational contexts revealed concerns about teachers' conceptions regarding technology utilization in EFL writing lessons (Suwannasom, 2010). It was discovered that respondents' attitudes regarding the normal utilisation of ICT in EFL writing education were heavily impacted by their beliefs about how learners should be taught to write in English as well as how technologies can enhance the learning experience. Cox and Graham (2009) recognized that using ICT as a tool, a teacher, a setting, or a resource increases the complexity of educational logic. The information, abilities, and comprehension that educators must possess have long sparked interest, and research has examined the qualities of educators' professional

expertise (Woollard, 2005). Koehler et al. (2007) offer a paradigm for describing teacher competence's dynamic, relational aspect, which includes content, methodology, and innovation. They conceive their paradigm as Technological Pedagogical Content Knowledge (TPCK) and claim that competent pedagogical applications of technology need the creation of a sophisticated, contextual understanding (Koehler et al., 2007). This research concentrated on technical, pedagogical knowledge (TPK), technical content knowledge (TCK), and technical knowledge (TK), as well as ICT incorporation in English language instruction. Given that teacher comprehension (beliefs, thoughts, and knowledge) is necessary for effective ICT implementation and that TPACK is a comparatively recent concept within the field of learning, "there are many areas that need to be researched" (Riales, 2011, p. 10). From the ongoing conversations about integration off ICTs in education reforms, the thirst for educational technology in the instructional processes is crucial.

The establishment of technological pedagogical content knowledge (TPCK) framework by Khoeler & Mishra, (2009) has blossomed this quest to its ferocity. It involves the interaction between content, pedagogy and technology. The interrelationship between technology, pedagogy and content is the underlying design of TPCK which is the principal aspect of educational technology. However, there was no established theory and conceptual framework on the integration of technology. This forced the endowment of TPCK on the existing constructs of PCK (Pedagogical Content Knowledge) that was first introduced by Shulman (1986). However, the existing pedagogy may not get by the 21st Century learner. The new generation learners and teachers can be made satisfied by the proper integration of technology to content and pedagogy. The teacher in this digital era confronts many challenges while trying to incorporate varied educational

technologies to enhance effective student learning. To advance teaching with technology, teachers of English required to develop knowledge for dealing with instructional processes while incorporating ICTs into instructional practices.

Thus, there is a need for teachers of English language to develop TPACK. In the 21st Century where ICTs have become increasingly accessible and valued for instructional purposes, TPCK framework is indispensable for quality instructional process. The English language is among these areas of concern, so this research was motivated by this fact. From this background information, it has been established that most studies have focused on provision of ICT infrastructure and teachers‟ perception; however, minimal attention has been given to teacher cognition on the integration of ICT in the teaching of English. This has affected the development of appropriate practical strategies for the effective integration of ICTs in the teaching of English in secondary schools. The purpose of this study was to assess teacher knowledge on the integration of ICT and its influence on the teaching of English in secondary schools.

1.3 Statement of the Problem

In the 21st Century which is also termed the “digital age”, technological developments reflect upon education as the technological innovations are integrated into all areas (Ergen, Yelken & Kanadli, 2019). Information and Communication Technology (ICT) is considered a stimulus for transformation in teaching styles, learning approaches and accessing information in the glove (Oyugi, 2020). The technological developments in the teaching process as well as the pedagogical competency of teachers and the development in their subject matter knowledge provide important integrity. The education sector has received tremendous support in terms of technological resources and financial support to integrate ICT in teaching and learning, yet teachers have not

adopted the use of technology in their classroom instructional processes. Thereupon, governments have invested heavily in the integration of ICT in education at all levels to equip learners with the skills needed for modern life and beyond (Wambiri & Ndani, 2016). Although the integration of information and communication technology in teaching and learning in secondary schools in Kenya has received substantial attention for sometimes now, however, the status of actual implementation is quite different from adoption and the initiatives taken to integrate ICT in English language teaching (ELT), and the performance of students in English in the Kenya Certificate of Secondary Education (KCSE) examination has remained dismally, scoring below 6 out of possible mean of 12 (Indembukhani, 2021), Mugweru, (2018). A report from the ministry of education (MoE) on the integration of ICT revealed that only 5% of schools in the country have integrated ICT into teaching with Nairobi County having 2.1% by 2018, which was a slow progress from the previous 0.17% (Oyugi, 2020).

Despite the provision of ICT resources by the government in schools, teachers in Kenya continue utilizing the old traditional, non-technologically-based approaches in teaching English. Nairobi County is one of the largest Counties endowed with ICT-based resources and infrastructure, the integration of ICT was expected to be in most schools and teachers of English could be incorporating ICT in their teaching. Unless this trend is checked and drastically reversed, Kenya's desire to achieve the millennium development goal (MDG) and vision 2030 by embracing the educational technology to acquire relevant information will be jeopardized. Previous studies involving the utilization of technology in World language teacher education (WLTE) has mainly focused on how to enhance the teachers' practice (Debbagh & Jones, 2015), with most studies focusing on provision of ICT infrastructure and teachers' perception.

The study of knowledge systems of teachers of English as they relate to technology integration to support teaching English has received little attention. Several studies have been conducted in primary schools on integration of ICT in teaching, but little is known about secondary schools' English teachers in Nairobi County, and have focused on provision of ICT infrastructure and teachers' perception about teaching with technology. No study seems to have been carried out on teachers' cognition on the integration of ICT in teaching English in secondary schools in Nairobi County, Kenya. Therefore, the current study sought to bridge these gaps in the current literature by advancing a theoretical framework that explains teachers' cognition on the integration of ICT in teaching English in Secondary schools in Nairobi County in Kenya.

1.4 The Purpose of the Study

The study focused on the assessment of teachers' ability to use technology, and the perception of teachers on the usefulness and ease of use of ICTs in teaching the English language in public secondary schools in Nairobi County, Kenya.

1.5 Objectives of the study

The study aimed to:

a) Examine the Technical Knowledge (TK) of teacher of English for ICT integration in secondary schools in Nairobi County,

b) Assess the technological content knowledge (TCK) of a teacher of English for ICT integration in secondary schools in Nairobi County,

c) Determine the extent of technological pedagogical knowledge (TPK) of a teacher of English for ICT integration in secondary schools in Nairobi County,

d) Find out teachers' attitudes toward ICT integration in secondary schools in Nairobi County,

1.6 Research Questions

To address the research objectives, the study sought to answer the following questions:

a) What is the technological knowledge (TK) of a teacher of English for ICT integration in secondary schools in Nairobi County, Kenya?

b) What is the technological content knowledge (TCK) of a teacher of English for ICT integration in secondary schools in Nairobi County, Kenya?

c) What is the extent of technological pedagogical knowledge (TPK) of a teacher of English for ICT integration in secondary schools in Nairobi County, Kenya?

d) What are teachers' attitudes towards integrating ICT in teaching English in secondary schools in Nairobi County, Kenya?

1.7 Justification of the Study

Integration of ICT in teaching and learning enables the use of innovative educational resources and the renewal of learning methods, establishing a more active collaboration of students and the simultaneous acquisition of technological knowledge. Examining Secondary school teachers of English in Nairobi County using a mixed methods approach and applying TPACK and Teacher Cognition Frameworks, the researcher intended to provide a broader understanding of English language teachers' cognitions in teaching using technologies. Despite the usefulness of ICT in education, there are still several gaps. The most common reasons for internal skill gaps (ICT professionals lacking full proficiency in their current jobs) are reported as 'lack of skills or experience of new technologies' and 'failure to train and develop staff'.

Understand and identify the key components of ICT capability, make holistic judgements against broad criteria when assessing ICT utilisation, promote learning progression in the development of concepts, knowledge, skills and confidence applied to tasks, and finally, in the range and type of problems tackled, therefore, calls for teachers of English language to be technologically compliant with to fit into the digital society. The review of related studies revealed that there was a scarcity of documentation elucidating how TPACK and the successful application of ICT have to do with each other. It was not clear how much knowledge affects successful ICT implementations. Kenya Government in 2016 brought on board the Competency-Based Curriculum (CBC) which aligns its instructional delivery modes to the use of ICTs. The study sought to ascertain teachers' cognition of the incorporation of ICT into English instruction in secondary schools in Nairobi County, Kenya.

1.8 Significance of the Study

The findings of this study could provide useful information to various stakeholders in the field of education. The study would inform teachers of English on the importance of integrating ICTs in the English instruction. Furthermore, the findings would provide the status of the resources and ICT integration in teaching and learning English in Nairobi County. The outcomes of this study would increase English language teachers' knowledge of their instructional strategies in using new technology in English language teaching. The findings of the study could assist school stakeholders in education sector establish or revise policies that will enhance the use of ICT in pedagogies by all instructors, hence reducing the wastage caused by the under-utilisation of ICT tools. Secondly, the findings have theoretical, practical and policy implications for the government of Kenya, Ministry of Education (MOE), Board of Management (BOM), English language training policy experts, curriculum developers and education and

training in their initiative of implementation of ICT integration in secondary schools in the country and the vision 2030 development plans. The study could be important to curriculum designers in formulating policies in respect to developing and increasing more training opportunities for teachers in ICT in their instructions. The findings will also create awareness of the importance of effective and efficient ICT integration in English language education training. Ultimately, the study would inspire other scholars to conduct research in this field so as to bridge the gaps which could be exposed by this study, contribute to the body of research by shedding light on how knowledge connects to the utilisation of ICT in teaching.

Consequently, these insights are important to the philosophy of teachers' professional activity and the incorporation of ICT in teaching practicums. Theoretically, findings of this study may be beneficial to researchers in English language education pedagogy as the results may contribute to advancement of knowledge about ICTs integration in teaching English in secondary schools in Kenya. In practice, the study findings could benefit teachers of English to identify the appropriate pedagogical techniques for integrating ICTs in English instructions as well as across other disciplines. Finally, the findings of this investigation have added to the expanding body of knowledge addressing the incorporation of ICT into teaching English in Kenyan secondary schools. English language curriculum designers may use the results to review and adjust English language syllabus/programmes to reflect and accommodate the current sophisticated methods. English language trainers and institution would benefit from this study by appreciating and embracing the benefits of integrating technologies in their classroom practices.

The findings of this study may be beneficial to the Nairobi County Quality Assurance (QA) and Standards Officers as the results pointed out the challenges in ICT integration in teaching English in secondary schools.

1.9 Scope and Limitations of the study

The scope relates to the conditions under which it will be conducted. In contrast, Limitations are circumstances, obstacles, and happenings that transpired throughout the investigation beyond the researcher's influence. In sum, limitations are the factors the investigator could not affect. They restrict the scope of an investigation and can occasionally influence the results and implications.

1.9.1 Scope

This research aimed to assess teachers' cognition of the integration of ICT into English instruction in high schools in Nairobi County, Kenya. The study also examined teachers' knowledge of ICT abilities and their perspectives on employing ICTs in English instruction. The study also investigated teachers' TPACK for ICT incorporation. Specifically, the research concentrates on investigating the technical knowledge (TK) of an English teacher for integrating ICT, examining technical content knowledge (TCK) of an English teacher for Integrating ICT; assessing technological pedagogical knowledge (TPK) of an English teacher for Integrating ICT in secondary schools in Nairobi County; and find out teachers' attitudes, and perceptions regarding ICT integration in teaching English in secondary schools. The study utilised a mixed-method approach and a descriptive survey design. The sample consisted of twenty English teachers from public secondary schools in Nairobi County who replied to the interview guide and the questionnaires.

This analysis was confined to the framework's (TPACK) three principal concepts: TK, TPK, and TCK and teacher cognition model. Technological knowledge (TK) is the ability to operate computers and far more complex innovations, like the web and digital video, as well as all types of technological capabilities. The survey was confined to only using questionnaires and interview schedule as the only tools for collecting data. The study surveyed teacher cognition of the integration of ICT in teaching English.

1.9.2 Limitations

This study was limited to only two data collection instruments: questionnaire and interview schedule and did not use actual classroom observation of teachers incorporating ICTs in teaching English; which could affect the quality of data as some valuable data could not be accessed, and the reluctance of some teachers to be interviewed, thus the findings may not reflect the actual classroom teaching. This study was limited to a smaller sample size of 20 teachers of English; thus, the findings may not be used to generalise the status of ICT use in the whole country. During piloting of the instruments, the study was limited to four secondary schools and engaged only one teacher of English per each school, hence, limiting the scope of information related to the study. The study was limited to sequential explanatory mixed approach and survey design. Therefore, the researcher minimised the scope of the analysis and the sample size. This study was also limited two methods of data analyses: quantitative and qualitative data analyses. Triangulation investigations comprised of qualitative and quantitative tools were employed to provide a complete perspective of the subject under investigation while offering extensive information on instructors' perspectives and experiences. Finally, with a small number of participants completing the survey, the

likelihood of generalizing the findings of the study is limited. Therefore, investigation with a larger sample size is necessary.

1.10 Assumptions of the Study

This investigation presumed the following:

a) That secondary school teachers had adequate technological pedagogical content knowledge necessary to integrate ICT in English language teaching

b) That secondary school teachers integrate ICT during their English language instructions

c) That secondary schools in Nairobi County had available ICT resources required to enhance integration of English language teaching

d) That the respondents would willingly give 100% information pertinent to the current study

e) The adopted survey instrument was reliable and valid, predicated on their effective use in earlier studies.

f) Relying on the TPACK concept, this study hypothesised that teachers with positive sentiments toward ICT or higher TPACK could integrate ICT more effectively in their language lessons.

1.11 Theoretical Framework

This study's theoretical underpinnings consisted of the TPACK framework and the teacher cognition paradigm, emphasising two forms of teacher framework study. The two contexts are essential in understanding how various teachers integrate Information and Communication Technologies (ICTs) in their English language classrooms. In order to enhance the validity of the two approaches used to describe the results of the present study, the two theories were triangulated to counteract the weaknesses of one

paradigm with the strengths of the other. On the basis of these realities, a theoretical triangulation was employed to strengthen trust in the precision and veracity of the study results. According to Denscombe (2007), the motivation for utilising triangulation in social science research is that by examining something from multiple perspectives, the investigator can gain a deeper understanding of it. In sum, triangulation enables data reliability through cross-verification from many sources. It examines the consistency of findings received from several tools and increases the likelihood of controlling or assessing some of the dangers or factors impacting the findings (Patrick, 2009).

1.11.1 The TPACK Framework

The development of information and communication technologies (ICTs) has brought many transformation processes in the education sector globally. The successful of integration of ICTs needs teacher cognition on how to do so effectively and efficiently (Vijayani & Joshith, 2018), In a digitally advanced teaching-learning environment, a teacher requires more sophisticated pedagogical practices. Technological pedagogical content knowledge (TPACK) is such a new innovative framework which assist teachers to enhance this (Vijayani, & Joshith, 2018). TPCK was introduced in 2005 as a framework (Koehler & Mishra, 2005) of knowledge and skill that teachers of English need for the integration of ICT in instructional processes, thus TPCK is a powerful mechanism of teacher cognition. Successful ICT incorporation in teaching English necessitates that teachers possess current knowledge as well as a comprehensive grasp of how ICT can be deployed in conjunction with domain expertise and instructional techniques to enhance the standards of knowledge construction. The objective of selecting this paradigm was to establish a connection between the incorporation of ICTs in instruction and learning; the TPACK model supported it. The TPACK paradigm

presented by Mishra and Koehler (2006) posits that for teachers to integrate technology into their instruction, they must possess three kinds of knowledge: pedagogical knowledge (PK), technological knowledge (TK) and content knowledge. Mishra and Koehler (2006) described CK as "knowledge about the actual content to be imparted" and PK as "knowledge about the practices and processes or methods of teaching and learning and how it encompasses the overall educational purposes, values, and aims" (p. 1026). The TPACK was developed as a theoretical foundation to represent the body of information teachers need to successfully incorporate technology into their instruction (Koehler & Mishra, 2006). The TPACK paradigm postulates that teachers require TPACK in addition to technical skills.

According to the TPACK framework, specific technological tools (hardware, software, applications, associated information literacy practices) are best used to instruct and guide students toward a better, more robust understanding of the subject matter. The three types of knowledge – TK, PK, and CK – are thus combined and recombined in various ways within the TPACK framework. Technological pedagogical knowledge (TPK) describes relationships and interactions between technological tools and specific pedagogical practices, while pedagogical content knowledge (PCK) describes the same between pedagogical practices and specific learning objectives; finally, technological content knowledge (TCK) describes relationships and intersections among technologies and learning objectives. These triangulated areas then constitute TPACK, which considers the relationships among all three areas and acknowledges that teachers are acting within this complex space. This model recognizes the complicated link between the various parts and illustrates how teachers' grasp of technologies, methodology, and curriculum could interact to generate successful discipline-based instruction. This

analysis was limited to the three major framework components of TK, TCK and TPK. The TK must change with time and ought to be viewed as a changing knowledge base, given that technology is also constantly evolving. Technological Content Knowledge (TCK) seems to be the conceptual domain resulting from the interaction of CK and TK. TCK is the knowledge of technologies that may be used to conduct research and produce unique content. As per Mishra and Koehler (2006), TCK is knowledge of capabilities that can be utilised to express and grasp particular material. Teachers of English must comprehend how technology can alter the academic content, in this case, English. PK and TK cross to form technological pedagogical knowledge (TPK).

It is the understanding of innovations that can be employed in a generic educational setting, including the potentials and limitations of those innovations and how those innovations impact or are affected by the teacher's instructional tactics and learning outcomes. TPK understands how to employ technology to aid broad instructional practises, independent of the specific subject. Hence, English teachers require TPK that enables them to repurpose such innovations for specific educational uses, seeing beyond the technological advancements and redesigning them for their instructional goal. As the various knowledge constructions interact, this would open the door to a comprehension of teaching subjects using suitable pedagogical approaches and innovations. The cornerstone of the framework culminating in the knowledge of technological pedagogical content is the interaction of all constructions Consequently, based on the pioneers, TPACK is presented as effective teaching with technological advances, needing comprehension of the portrayal of basic ideas using innovations; instructional techniques that incorporate innovations in productive ways to convey subject matter; understanding of what renders constructs complicated or straightforward

to learn, as well as how innovation can eradicate some of the difficulties faced by students; comprehension of students' prior understandings and understanding of how innovations can be used to leverage existing knowledge to create new conceptual frameworks or enhance old ones. Koehler & Mishra (2008) claimed that incorporating technologies into a wide variety of individual tasks does not happen in a vacuum but rather in particular environments. To effectively teach with technical expertise, English teachers must have the fortitude to incorporate an understanding of learners, the institution, the existing infrastructure, and the surrounding environment. Consequently, they attached context to the paradigm as a crucial component of the TPACK theoretical model (Figure 1.1). In this investigation, TPACK was employed to successfully clarify and link the intricacy of teachers' cognition to incorporate ICT into their English instruction. TPACK refers to the linkages and interactions between subject knowledge, instructional knowledge, and ICT expertise and the modifications that occur when combining these areas. The TPACK concept offered a method of conceiving about effective ICT incorporation, particularly the knowledge necessary to successfully incorporate ICT into English language courses. The TPACK provides the investigator with a foundation to interpret the results of a study. This relationship is illustrated in Figure 1.1.

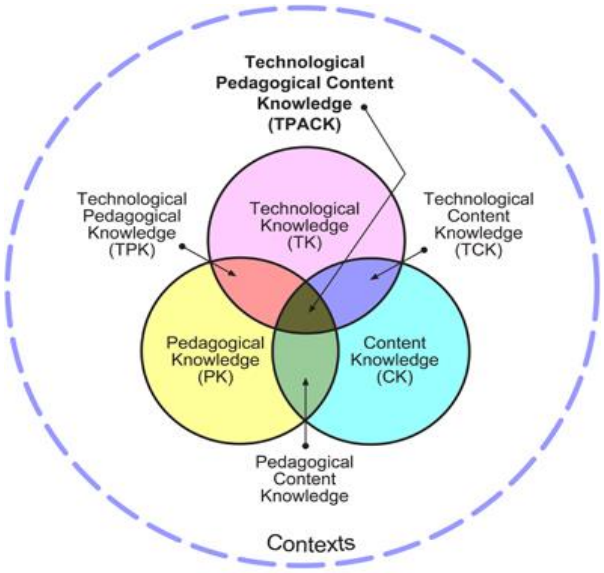

Figure 1.1 Interaction of Technological Pedagogical Content Knowledge (TPCK)

This approach has clarified why innovation should not be seen standalone but rather concerning pedagogical and subject requirements (Mishra & Koehler, 2006). Researchers have noted that comprehensive conceptual and professional paradigms that give assistance, direction, and efficacy are lacking (Koehler & Mishra, 2005). The TPACK could be crucial in language instruction when ICT is integrated. Numerous investigations have examined the connection between all TPACK elements and technology adoption. Consequently, this paradigm was helpful in the current study since it informed the researcher about TPACK degrees of English teachers for the integration of ICT.

1.11.2 Teacher Cognition Framework

Teacher cognition is a theoretical construct which has emerged in recent decades to describe the complexity of teachers' 'mental lives' (Borg, 2006). Teacher cognition as a theoretical framework refers to a complex combination of knowledge, beliefs and thoughts held by language teachers regarding their instructional decisions and actions (Borg, 2006). It is a field of research and practice that is concerned with teachers'

beliefs, knowledge and self-reflections on teaching, students, and classroom practices. It is a theoretical construct meant to represent the mental lives of teachers, in other words what teachers think, know, and believe. Borg (2003) described teacher cognition as the "unobservable cognitive dimensions of language teaching" (p. 81). In this study, features and processes of language teacher cognition served as a point of departure for exploring the link between teacher cognition and specific TPACK elements and ICT implementation. As the study continued, due to the evolving aspect of mixed methods approaches, the researcher gradually realised where technologies were to be positioned inside the teacher's cognitive viewpoint. The researcher subsequently had a clearer understanding of the links between language teachers' various cognitive aspects and procedures and the TPACK concepts. According to research, teachers confronted with such situational considerations may, for instance, refrain from exploring novel teaching approaches (Borg, 2003). Figure 1.2 overviews the factors that affect teacher cognition and their interplay.

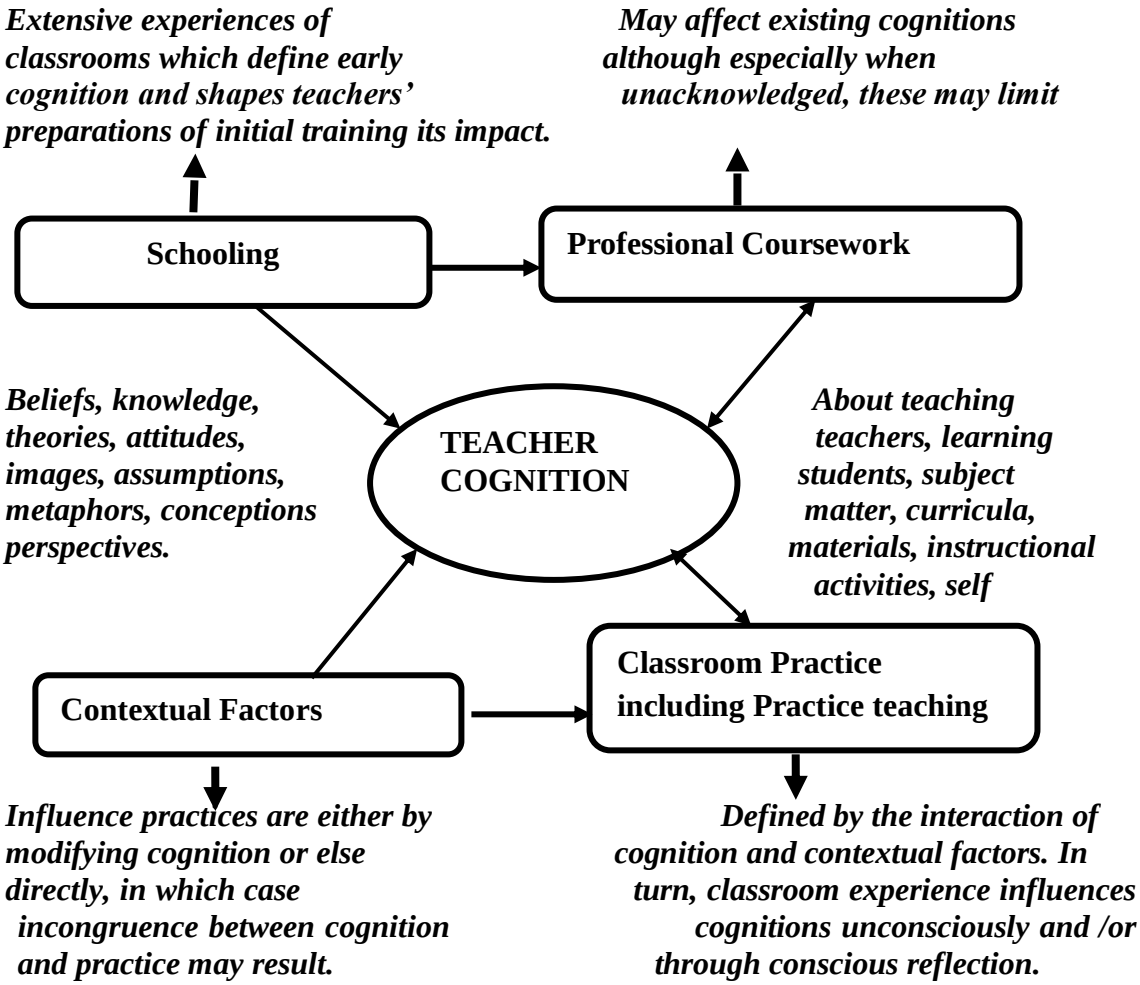

Figure 1.2 Components and mechanisms in language instructor knowledge (Borg, 2003)

Using the preceding illustration as a guide, the researcher reviewed the publications detailing the relationship between cognition and early experiential learning, teacher preparation, classroom practise, and environment, with specific regard to ICT assimilation, to establish a connection with the contribution of teacher cognition in ICT incorporation in this research. Several labels were adjusted somewhat to communicate the breadth of this investigation. For instance, schooling involves the development of learning-related thought patterns "through relationships with individual adults such as parents" (Borg, 2006, p.281). Consequently, the investigator substituted early interactions as L2 learners for this designation. Likewise, professional education has been substituted with language teacher training to enhance terminology correctness. As

Borg (2006) denoted, teacher cognition demonstrates itself in the teachers' decisions regarding classroom practises and material selection and is affected by formal schooling during professional education and teachers' life experiences as language learners. Borg (2015) also notes that teachers' conduct is primarily affected by their recollections of classroom procedures and resources from their encounters as L2 learners. Borg (2003) discovered that teachers' classroom interactions might change their cognition. Scholarly evidence also reveals that teachers' cognitions are shaped by their educational encounters (Borg, 2006). The cognitive aspect of teachers' knowledge is nonetheless commonly expected to exemplify itself in classrooms in the form of the teacher's instructional decisions, whether plotted or impromptu, in the teacher's sentiments about various context-specific factors, and the teacher's educational objectives (Borg, 2003). In addition to the substantial role that contextual circumstances play in moulding both cognitions and practise, it is increasingly recognised that these variables may also explain discrepancies between teachers' stated views and real classroom behaviour (Borg, 2006).

1.12 Conceptual Framework

This study's conceptual framework highlights the link among the three fields of knowledge of TPACK and the application of ICT in teaching, which were generated from the TPACK constituents and Teacher Cognition conceptual approaches. Figure 1.3 presents a framework tying the three aspects of TPACK to incorporating ICT in instructing English. In contrast, the teacher cognition paradigm connects teachers' perceptions, reasoning, and perspectives concerning the use and incorporation of ICT in teaching the English language. The relevant factors are classified into three main groups: predictors, which have been conceived as TCK, TK, and TPK, as well as teachers' belief systems, thoughts, and perceptions; intervening variables, which include

teacher comprehension, ICT incorporation, and language education processes; and the response variable, which include effective ICT incorporation resulting in efficient English language educational objectives. The TPACK paradigm was utilised as an evaluative method to determine teachers' understanding of Integrating ICT in English language instruction. Figure 1.3 depicts the conceptual model built by the researcher to forecast the relationship between variables.

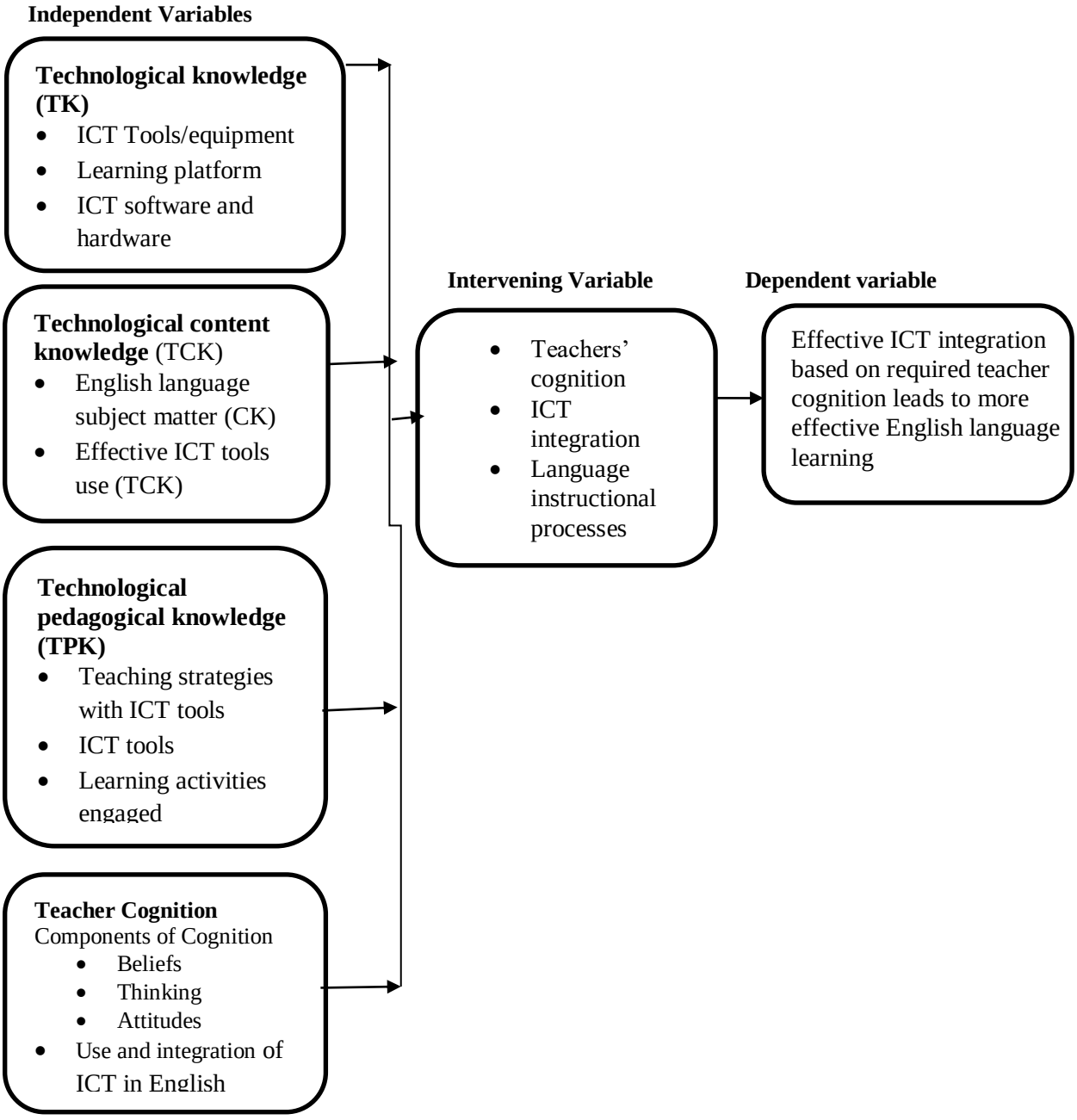

Figure 1.3: Conceptual framework

Utilising Technological Pedagogical Content Knowledge (TPACK) as a conceptual framework, the researcher described the knowledge base teachers of English require to effectively and efficiently teach with technology. This conceptual framework helped the researcher to first identify and then clarify what was already known, and the value as the central aspects of the study and then connected these with the various aspects and influences on the development of this research. This conceptual framework includes more than one theory in part and other concepts and empirical findings from the literature. The framework was used to show relationships among these ideas and how they relate to this study. It helped to facilitate a common understanding of basic principles and concepts of ICTs integration in teaching English. The conceptual framework guided this study throughout. It helped the researcher to demonstrate how different concepts; the TPACK constructs and Teacher Cognition elements interact to facilitate the study and a clear understanding of results. The conceptual framework linked the concepts to help facilitate the understanding of the relationships among the variables in relation to the real world, and provided an easily understood interpretation for the model's use.

1.13 Operational Definition of Key Terms

Computer Assisted Language Learning: Computer-assisted language training or any other computer-based language-learning activities

English Language Teaching: The practice and theory of learning and teaching English for the benefit of people whose first language is not English.

Information and Communication Technology: Any innovation that enables the development, storage, and information display in all formats for long-distance interaction.

Integration of Information and Communication Technology: Teacher's use of any of the computer and Internet technology from language software, desktop programmes (word processors, Microsoft PowerPoint, Computer-Mediated Communication tools (e-mail, chat), a Learning Management System, and the World Wide Web to Web 2.0 tools (blogs, wikis) in English language instruction

Teacher Attitudes: Response of the teacher's positive or negative emotions to a given circumstance.

Teacher Beliefs: Teacher's state of certainty about integrating ICT

Teacher Cognition: In this study teacher cognition is defined as pre-or in-service teachers' self-reflection; beliefs and knowledge about teaching, Students, and content; and awareness of problem-solving strategies endemic to classroom teaching.

Technological Content Knowledge: It is the knowledge about the topic that is to be taught. Content knowledge varies in different educational scenarios like the differences between the content of school level math and graduation level math. e.g. Knowledge about different content areas in English. Teacher's awareness of the subject matter or representation with technologies or technological tools

Teacher Knowledge: The knowledge about both the standard technologies and more advanced technologiesTeacher's awareness or familiarity with materials and capacity to effectively apply these materials in a learning environment.

Technological Knowledge: It is the knowledge about operating digital technologies such as internet, software applications, simulations, modelling tools etc. e.g. Knowing how to use digital tools like blogs, wikis etc. Teacher's awareness or familiarity with technologies or technological tools and their ability to effectively incorporate ICT in learning and teaching,

Technological Pedagogical Knowledge: -It is the pedagogically sound ways of using technology with no reference towards specific content matter. It is the interaction of TK and PK. Knowledge about how to use online tools that facilitate collaborative learning for geographically separated learners, the knowledge about how teaching and learning change when particular technologies are used. Teacher's awareness or familiarity with various technological tools and ability to apply and implement various teaching strategies to integrate these technological tools, including the selection of technology tools, activities in teaching English.

Teacher Thinking: Teacher's perceptions, opinions, views or ideas about a particular teaching and learning situation

1.14 Chapter Summary

This chapter began with the background of the study, laying the foundation for this study, including highlighting the information about teacher cognition of ICT in language teaching. The chapter captured the problem statement, objectives, research questions, assumptions, significance, justification, scope and limitations. This chapter highlighted the theoretical framework, which was based on TPACK and teacher cognition frameworks, conceptual framework, operational definition of critical terms of the study, and a summary of this chapter. The next chapter examines the scholarship related to this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Since information does not occur in solitude, the investigator examined a variety of published works. The objective was to develop the research concepts, exhibit an understanding of the present level of awareness on the issue, and connect the research to a broader context. This section includes a literature review that guided the formulation of this research. The chapter examines both empirical and pertinent literature. This study focuses not only on English language instructors but also examines their beliefs and attitudes regarding ICT usage in English language education in the Kenyan context. Literature sources included reviews, journals, books, theses, research papers, case studies, and online references. These categories serve as umbrellas under which the literature is organized into:

a) Language Teacher cognition

b) Information and communication technology

c) Teachers and technology used in the language classroom

d) Integration of ICT into secondary school English language teaching

e) Teacher as a critical factor in ICT integration

f) The TPACK theoretical framework

g) Teachers' TPACK level and ICT integration

h) Teachers' views, beliefs, and attitudes towards ICT adoption in teaching English

2.2 Language Teacher Cognition

Before the concept of teacher cognition started to be used dominantly in the literature, teacher belief refers to "broadly as tacit, often unconsciously held assumptions about

students, classrooms, and the academic material to be taught" (Kagan, 1992, p.65). Teacher cognition has been labeled as; "what teachers know, believe, and think. Teachers are active decision-makers. They decide on instructional choices by drawing on complex context-sensitive networks of cognition" (Borg, 2003, p. 81). Having aimed to operationalize the teacher cognition framework, Borg (2003) states that teacher cognition encapsulates "beliefs, knowledge, theories, attitudes, images, assumptions, metaphors, conceptions and perspectives about teaching, teachers, learning, students, subject matter, curricula, materials, activities, and self." (p. 82).

As for the factors shaping the dynamics of this operational definition, Borg (2003) puts forward four main factors: the role of language learning experiences of teachers, their professional careers, contextual realities, and teaching practices. This complex nature of teacher cognition is claimed to significantly influence teachers and their pedagogical and instructional practices since teachers' beliefs are regarded as cognitive filters underlying teachers' performances in instructional settings n(Shavelson & Stern, 1981). Likewise, Johnson's (1994) educational research on teachers' beliefs share three basic assumptions: (1) Teachers' beliefs influence perception and judgment. (2) Teachers' beliefs play a role in how information on teaching is translated into classroom practices. (3) Understanding teachers' beliefs are essential to improving teaching practices and teacher education programs (p. 439). Teacher cognition studies teachers' mental processes, including their beliefs, knowledge, and ideas. It deals with teachers' mental processes, the unobservable aspects of teaching (Borg, 2006).

Most studies on language education were primarily concerned with effective teaching behavior, resulting in successful learning measured through achievement tests. The

effective behaviors were identified and then applied by language teachers to ensure more outstanding achievement by learners (Borg, 2006). Borg (2003) describes teacher cognition as educators' thoughts, knowledge, hypotheses, sentiments, images, preconceptions, analogies, beliefs, and views regarding instruction, teachers, education, learners, content knowledge, curriculum, materials, including educational activities, as well as themselves. In addition, another terminology has been employed in the past few decades to describe teacher cognition, including 'teacher knowledge' and 'teachers' conceptions (Freeman, 2007). Such concepts, including teacher perceptions, pedagogical skills, and ideas, encompass teacher cognition's more comprehensive definition. This study employed the term teacher cognition to allude to the unobservable psychological construct of teaching-what teachers to perceive, understand, and believe (Borg, 2006). What teachers understand, perceive, and consider regarding technology would impact its application in teaching the English language; thus, this is the emphasis of the present study. Shulman (1987) established the TPACK-related concepts of teaching methods and pedagogical logic.

2.2.1 Teacher Cognition and Teacher Education

The realization that teachers are active, deliberative decision-makers who assume a crucial role in influencing classroom experiences has been a catalyst for the increase in teacher cognition studies, not just in language instruction but in education generally. Combined with discoveries from the discipline of psychology that demonstrate how information and beliefs profoundly impact human behaviour, this realization suggests that grasping teacher cognition is fundamental to comprehending instruction (Borg, 2015). According to mainstream pedagogical scholarship, learners may have an inaccurate, idealistic, or naive conception of learning and instruction (Brookhast &

Freeman, 1992). Numerous investigations on teacher preparation indicate the impact of apprentice programmes on student-teacher cognitive abilities (Borg, 2009; Farrel, 2009; Ertmer & Ottenbreit-Leftwich, 2010). Prospective teachers bring to their courses ingrained impressions and deeply ingrained attitudes about learning and teaching that have been moulded by years of preceding education. Johnson (1994) indicates that pre-service teachers' educational attitudes are primarily shaped by their past encounters as second language learners and concludes:

> *The most striking pattern that emerged from these data is the apparent power that images from prior experiences within formal language classrooms had on these teachers' images of themselves as teachers, teaching, and instructional practices* (p.449).

Although teacher comprehension is a well-established subject of study, limited studies have looked into the effect of trainees' cognitions on educator preparation in ICT (Kay, 2006; Belland, 2009). One possible explanation is that scholarship on technology training is still in its inception (Reinders, 2009) and that investigations on teacher training in CALL are progressively appearing (Hubbard & Levy, 2006; Hong, 2010). According to the available evidence, there is a close association between teacher cognition and the significance of ICT in educator preparation. For instance, Belland (2009) notes that because prior learning activities influence how knowledge is incorporated, the omission of a technology component during the school days may influence teachers' preconceptions of the contribution of ICT in schooling and potentially trigger them to avoid using it in successive instruction. He emphasizes that if professional educators, as positive examples for student-teachers, utilize minimal or no technologies in their programs, they implicitly convey that ICT is not an essential aspect of learning and teaching.

Belland (2009) emphasizes that most professional education courses do not include the technology aspect, and if one does exist, it is provided in the manner of a self-contained, standalone course. In addition, Ertmer and Ottenbreit-Leftwich (2010) found that pre-service teachers' perceptions and the utilization of ICT that teacher education programs can influence pre-service teachers' practices and beliefs by characterizing effective instruction as that in which ICT is completely incorporated for improved learning objectives. Consequently, ICT is only integrated into part of the learning experience for the students. This study aims to determine teachers' perspectives on incorporating ICT into English instruction. The growth of educator cognition studies has revealed that what educators accomplish during classroom practice is influenced by what they believe and understand about the issue (Borg, 2009). According to studies on teacher cognition, the teachers' encounters with students impact their beliefs. The cognitions determine how and what student instructors accomplish in the classroom. According to Belland (2009), most teacher education courses lack a technological aspect, and if one does exist, it is provided in the guise of a self-contained, standalone course. As a consequence, ICT is only integrated into part of the learning experience of the students.

2.2.2 Teacher Cognition and Language Teaching

The approaches which predominantly guided the process of second language acquisition (SLA) and language learning are the grammar-translation method (GTM), the audiolingual method (ALM), the communicative language teaching (CLT) method, and the task-based language teaching (TBLT). Even though they belong to distinct periods and represent different learning settings, all of these methods have the potential to be successfully implemented in a classroom setting today. According to Tassev (2019), language acquisition in many nations was dominated by the GTM from the

eighteenth century to the 1960s. This Strategy was originally used with classical Latin and Greek, later with current foreign languages. According to Munday (2008: p. 7-8, as cited in Tassev, 2019), this Strategy was essentially based on the "rote study" of the L2's structures and grammatical norms. The proponents of this technique felt that translation exercises and mastery of vocabulary knowledge were crucial for the study of L2 (Mart, 2013). Nevertheless, the GTM fell out of favor with the emergence of the communicative approach to English language instruction in the 1960s and 1970s.

Munday (as cited in Tassev, 2019) also added that this technique valued spoken forms above written ones and abandoned translation as the primary means of language acquisition. Audiolingualism is a linguistic, or structure-based, method of language instruction. The beginning point is a linguistic syllabus, which covers the essential aspects of the language's phonology, morphology, and syntax in the sequence in which they are presented. According to Vidhiasi and Lengari (2018), these aspects may have been generated in part from a contrastive examination of the gaps between the native tongue and the target language, as these gaps are regarded to be the source of the learner’s primary challenges. In most cases, a lexical syllabus comprising core vocabulary items is also set in advance.

Bagheri, Hadian, & Vaez-Dalili (2019) stated that there are several aspects of the audiolingual teaching approach. Using Audiolingual method to learn English involves habit development, meaning words can only be learned in a cultural or linguistic context, and analogies are a stronger base for learning English than analysis.

In addition, grammatical faults are frowned upon and should be avoided. However, in the Audiolingual method, incorrect replies result in negative feedback (Bagheri,

Hadian, & Vaez-Dalili, 2019). Dialogue is also an important aspect of the Audiolingual approach. Butzkamm and Caldwell (as cited in Bagheri, Hadian, & Vaez-Dalili, 2019) stated that dialogue improves a learner's fluency and agility in using language. Dialogues allow students to memorize, replicate, and perfect their English. Students participate in various exercises in classroom lessons utilizing the Audiolingual method, including phrase repetition, reading dialogues aloud, and hard practice. The students concentrate on accurately imitating a teacher's statement. To generate exact output and pronunciation, repetition is used.

According to Butzkamm and Caldwell (as cited in Bagheri, Hadian, & Vaez-Dalili, 2019), the teacher provides an example, and the pupils serve as an imitation. Drills urge pupils to constantly rehearse a certain line or grammatical construct until they can utilize it without thinking or pausing. The communicative language teaching (CLT) method emphasizes the functional features of language above the formal parts. The audiolingual method's shortcomings are founded on the premise that conversing in English as a foreign language leads to successful mastery of English as a foreign language. As a result, the method depends on interaction as the primary way of language learning (Candlin, 2016). Engaging students in real-world dialogue improve their language skills.

According to Bagheri, Hadian, and Vaez-Dalili (2019), three main factors form the foundation of the communicative language instruction technique. Tasks, communication, and meaning are among the components. "Tasks" are activities in which the English language is employed to complete meaningful tasks that aid learning. Tasks are completed in various situations and contexts to give students a broad understanding of how to utilize the language. Furthermore, "communication" is a

crucial part of CLT since activities involving actual encounters improve learning. Finally, the "meaning" component is an essential feature of student learning since a language that is meaningful to a student helps his or her learning (Richards, 2005). The studies conducted in the field carry a prominent potential to indicate what kind of variables influence teacher cognition and how these variables are reflected in L2 grammar teaching practices. Firstly, Farrell and Lim (2005) put forward the fact that language teachers' beliefs and practices can constitute unity in a compatible way in that most of the beliefs and practices of language teachers were found to be consistent. Likewise, Sanchez and Borg (2014) revealed some findings that support this compatible aspect of beliefs and practices.

The participants were observed and found that their beliefs and practices consistently complement each other. This consistency was attributed to the flexible nature of the context because the institutional policies did not restrict teachers, and they were allowed to implement their pedagogies in class. However, this context is only sometimes available in all language learning environments. Nishimiro and Borg (2013) state that the participants in their study used teacher-led grammar instruction 80% of the time, and the teachers related it to the necessity to catch up with other classes, time limitations stemming from the pacing, and the exams containing discrete-point grammar questions. Similarly, Moini (2009) touches upon the differences between state and private schools, which affects how language teachers perform. In this sense, it is stated that language teachers in private schools carry out various activities compared to state schools. This difference is related to the limitations in state schools and the students' low motivation. However, it is also possible to see that while there is a plausible context; language teachers may not adapt their previous cognition following

the requirements of this context. Liviero (2017) points out that although there has been a new policy ensuring a more communicative, functional, and skill-based curriculum for modern languages in England, the teachers have maintained the traditional approach. This mismatch is attributed to the teachers' language learning experience and the previous teaching context. As a profession, teaching requires cognitive processes such as establishing relationships between education methods and concepts and developing differentiated instruction philosophies from learning environments (Richards, 2006). Depending on a person's values, convictions, and goals, the term 'teach' has diverse connotations for educators.

It is backed by Borg's (2003) description of educators as "active, thinking decision-makers who make instructional choices by drawing on complex, practically-oriented, personalized, and context-sensitive networks of knowledge, thoughts, and beliefs" (p.81). Thus, instructors' thought processes significantly influence their orientations to and innovations in day-to-day instruction. Several aspects of the instructional profession impact what instructors know, think, believe, and practice. Understanding the effects on teachers' knowledge has been a significant area of research. In his interpretation of teacher cognition studies, Borg (2006) presents a model of schematic concepts of instruction that demonstrates that teachers' conceptions of learning and instruction are formed throughout their first classroom experiences (Figure 1.2). Professional preparatory initiatives that provide teachers with education, teaching apprenticeships, and innovative learning perspectives may impact their views of learning and teaching. Nevertheless, when educators are on duty, syllabus and instructional culture impact their practices, which could be more or less coherent with their understanding implicitly or deliberately via introspection. According to Borg's

(2006) guideline of teachers' knowledge, there are four primary factors to consider when exploring teacher professional cognition: previous language lessons learned, conceptions of foreign or second instruction during instructor education, situational factors, and classroom practices (Figure 1.2). Graus and Coppen (2016) conducted a study with undergraduate and postgraduate language teachers, revealing that the role of student expectations and teaching experience are common in both groups. Besides, they differ in that undergraduate teachers rely more on their language learning experience than postgraduate teachers do. In a similar study,

Moini (2009) highlights that postgraduate teachers teach grammar inductively, and form and meaning are integrated. However, undergraduate teachers teach L2 grammar more structurally and deductively. The academic background of language teachers might influence their cognition; however, Borg & Burns (2008) revealed some findings that do not support the role of academic background. Accordingly, EFL teachers use a more integrated way of teaching grammar, which does not derive from teacher education but from their language teaching experience. Another point Moini (2009) emphasized is the role of experience in cognition. The study revealed that experienced teachers tend to pay less attention to grammar teaching than novice teachers. Similarly, Uysal and Bardakçı (2014) revealed similar findings and added that time constraints, crowded classrooms, and low motivation prevented them from adopting a more communicative approach. As stated in Liviero's (2017) study, teachers appear to resist adopting new approaches because of cognitive and contextual factors.

This kind of inconsistency was studied by Phipps & Borg (2009), and it is stated that even though teachers may have core (theoretical) beliefs, they may rely on their

peripheral (experiential) beliefs because of the necessities arising from the context. The distinction between the two belief systems explains the inconsistencies between beliefs and practices. In addition, there is common ground that Turkish EFL teachers tend to implement traditional grammar teaching methods that are based on discrete-point, explicit and deductive instruction no matter what they believe and what they are suggested to do through the curriculum (Çakır & Kafa 2013; Hoş & Kekeç, 2014; Uysal & Bardakçı, 2014). This discrepancy is generally attributed to contextual factors such as time constraints, syllabus, students, and materials. Based on this literature and overview, a few gaps constitute this study's skeleton.

First, the studies include critical dimensions; however, these dimensions studied in these articles are not comprehensive enough in that not all aspects of teacher cognition have been analysed in detail. So, this study focuses on teachers' beliefs, practices, the relationship of beliefs and practices, and cognitive factors affecting this relationship rather than working on a specific aspect of teacher cognition, such as experience or academic background. From the standpoint of this investigation, teacher perception concerning these four factors captures only the incorporation of ICT into language teaching. Dialogue is also an essential aspect of the Audiolingual approach. Butzkamm and Caldwell (as cited in Bagheri, Hadian, & Vaez-Dalili, 2019) stated that dialogue improves a learner's fluency and agility in using language. Dialogues allow students to memorize, replicate, and perfect their English. Students participate in various exercises in classroom lessons utilizing the Audiolingual method, including phrase repetition, reading dialogues aloud, and challenging practice.

The students concentrate on accurately imitating a teacher's statement. To generate exact output and pronunciation, repetition is used.

2.2.3 Teacher cognition and Early Experiences as Learners

Literature indicates teachers' beliefs are affected by their interactions with students (Graves, 2009; Ertmer & Ottenbreit-Leftwich, 2010). The terminology "Apprenticeship of Observation" was coined to describe the often-unnoticed influence of years of schooling on educators' educational belief systems. Borg (2006) claimed that students spend hundreds of hours engaging with educators in the classroom and that the educators who subsequently decide to become a teacher again begin their careers with the belief that "what constituted good teaching then constitutes good teaching now" (p.65). The impact of these formative days should be emphasized, especially in implementing new teaching approaches or adopting technologies. Most educators have experienced traditional schooling regimes, so they may need help to adopt constructivist instruction methods if they choose (Windschitl, 2002).

Similarly, since most educators did not interact with computers during their school days, their preconceived notions of teacher quality probably need to include the application of such innovations. Those who received a traditional education are likely to adhere to traditional views, and their utilization of ICTs will portray these beliefs. Consequently, the problem for ICT educators is training teachers for new educational contexts incorporating technology they have yet to encounter (Ertmer, 2005). Hence, one of the aims of this study is to inquire into an English teacher's technological subject understanding concerning ICT incorporation.

2.2.4 Teacher Cognition and Classroom Practices

Numerous researchers have examined the connection between instructors' knowledge and classroom practices (Webb & Cox, 2004; Borg, 2006; Lin & Chai, 2007; Garton, 2008; Tondeur et al., 2008). The research found that their relevant experience significantly impacted teachers' perceptions. Teachers construct pictures of what comprises best practices and gain a grasp of various facets of their profession through countless hours of engagement within formal educational settings. Conversely, teachers' cognitions are the strongest indicator of instructional choices and eventual ICT adoption (Churchill, 2004). (2006). A concern frequently raised is, "*Does technology shape pedagogy, or does pedagogy shape pedagogy*"? Scholars have suggested that there is no element intrinsic in technologies that leads to pedagogical transformation and that, as a resource, it's worth is contingent on how it is employed by instructors (Vrasidas & McIsaac, 2001; Ferding, 2006).

Evidence from educational institutions around the globe confirms this claim. It implies that ICT does not encapsulate any particular methodology and that educators employ technology based on their cognitions. The response to the subject as to whether innovation alters or is transformed by pedagogy could be summed as such, depending on the research study in this research: There is no inherent pedagogical bias in innovation, and it could be employed to serve a variety of beliefs. Nevertheless, there is enough evidence that teachers should embrace ICT to accommodate their knowledge. The link between knowledge and practice is complex. It is highly intricate, complicated, and exciting. Moreover, it influences and is influenced by the sociocultural situations in which educators operate. Thus, the link between teacher cognition, practice, and context needs additional study.

This study assessed an English teacher's technical and pedagogical knowledge (TPK) for ICT incorporation predicated on classroom interactions.

2.2.5 Teacher Cognition, Practice, and Context

The significance of researching the circumstances of teachers to comprehend ICT incorporation cannot be overstated. From an ecological point of view, the link between cognition, practice, and setting suggests that the transition to technology acceptance is a progressive development phase. This investigation aims to determine an English teacher's technical and pedagogical knowledge (TPK) for ICT incorporation from a training and practice standpoint. From the viewpoint of this research, teacher cognition pertains to these four aspects; this research captured the incorporation of ICT into the language teaching process and used teacher comprehension as an exploratory tool to determine why English teachers in high schools utilize or do not utilize ICT.

2.2.6 Teacher Beliefs and Knowledge in Language Teaching

Ertmer (2005) demonstrates that when individuals acquire particular expertise, they only sometimes accept it as accurate. In the field of language instruction, scholars have investigated the influence of pedagogical attitudes and expertise on the teaching approaches and choices of English as a second language educators (Borg,2015). Although knowing teachers' beliefs is crucial for enhancing teaching practices and professional courses, Johnson (1996) observes that teachers' views need to be more precisely interpreted or explored because they are frequently held informally. Consequently, they do not typically communicate their instructional views to themselves or people and could be unaware of the factors that influence their teaching. As outlined in the literature, knowing teachers' views and expertise may elucidate why and how educators select relevant details, place varying focus on the same material, and

employ differentiated instructional styles and learning methods. Following is a discussion on teachers' knowledge and technological content expertise.

2.2.7 Teacher Cognition about Technological Pedagogical Knowledge

According to the current information, there is a close association between teacher knowledge and the significance of ICT in teacher development. Since previous educational experiences influence how knowledge is assimilated, Belland (2009) suggests that the lack of a technology component throughout the school years could influence teachers' opinions of the significance of ICT in the classroom and drive them to refrain from employing it in the future instruction.

Belland (2009) and Ertmer & Ottenbreit-Leftwich (2010) concur that teacher candidates must be put in realistic educational environments where they will observe the use of technology and have the opportunity to implement it in their classrooms. In sum, they must "experience" instruction with technology in authentic circumstances to implement technologies more efficiently in the future. The pre-service educators' cognitions operate as a sieve via which they assimilate their educator training experience, and only minimal technological integration will occur if these concepts are not acknowledged (Ertmer, 2005; Tondeur et al., 2008; Inan et al., 2010). If we consider that learning proceeds through ongoing collaboration between existing information and novel encounters, then it becomes a goal for educators to confront preconceived beliefs and deconstruct prior interactions (Borg, 2009). Scholars have reported that there is no attribute inherent to technologies that contribute to pedagogical innovations and that, as an instrument, its efficacy is contingent on how instructors are employed (Ferding, 2006). Bruce (2002), in defense of the viewpoint mentioned earlier, asserts:

> *"Unfortunately, new technologies are no panacea for problems in education, and by themselves, they at most enable, rather than create, change. Ironically, the research shows how powerful computers can ultimately bring us back to the idea that it is the teachers who make the difference*" (p. 17).

This argument is supported by research from various educational contexts around the globe. It implies that ICT does not constitute any particular philosophy and that educators employ technology based on their beliefs. Niederhauser & Stoddart (2001) conducted a study in the United States examining the connection between instructors' perceptions and their utilization of instructional media. The investigators concluded that ICT does not symbolize a distinct educational style since teachers employed computer-based materials to promote their instructional views, expressed in various educational strategies.

Likewise, Demetriadis et al. (2003) study revealed that educators incorporated technological resources to supplement their traditional methods of instruction, which emphasized the teacher's critical role as well as the test-driven curricula in Greece. Similarly, Zhong and Shen (2002) evaluated innovative-based EFL classes in China's secondary schools. Their research found that innovations had little impact on learning and teaching processes. In traditional contexts, instructors remained the focal point of engagement. As ICT was utilized to complement centuries-old teaching processes, only the physical appearance of classrooms was altered. The authors emphasized the necessity of addressing teachers' educational beliefs as a prerequisite for successful technological integration. Lam (2000) also highlighted the importance of teachers' perceptions of incorporation.

In her assessment of Canadian instructors of second languages, she established that educators who eschewed innovation did not do so out of fear of innovation but rather because they were not persuaded of technology's potential advantages. Gobbo and Girardi (2001), citing studies concerning the use of technologies in Italian institutions, concluded that while most instructors maintained positive sentiments regarding ICT, they were reluctant to displace conventional teaching practices. The authors emphasize that their conclusions do not corroborate the commonly held belief that the introduction of technologies into classrooms alters teachers' existing methods of instruction.

2.2.8 Teacher Cognition and Technology-Mediated Language Teaching

It is generally agreed that efficient technology integration involves accurately comprehending the roles of technologies and teachers in a classroom influenced by technology. Frequently, studies note that technology-enhanced instruction is effective when teachers emphasize learner-centred and constructivist instructional strategies (Judson, 2006). There are major consequences of constructivist methodology regarding using technologies that enhance the learning experience, boost student incentive to learn, and encourage reasoning and production of knowledge. Therefore, technology facilitates students' inquisitive engagement and knowledge production rather than knowledge transfer; learners engage 'with' rather than 'from' innovation. Nevertheless, innovation inevitably leads to educators' adoption of constructivist concepts. According to them, if teachers use computers constructively, it is not due to the technology's capabilities but rather to their knowledge and experience. Judson (2006) interviewed 32 teaching staff to determine their attitudes toward teaching. The teachers were also personally watched and graded using the Focus on Integrated Technology:

Classroom Observation Measurement (FIT: COM), which examines the extent to which constructivist concepts are linked with tech instruction. No significant correlation was found between instructional approaches and teachers' professed beliefs. Even though most instructors strongly associated constructivist beliefs in the study, these beliefs were not reflected in their activities. Tondeur et al. (2008) examined the connection between primary teachers' pedagogical ideas and their average Strategy for computer utilization in the classrooms. The study demonstrated a correlation between educators' ideological characteristics and technology utilization in the classroom. It was discovered that educators with a traditional instructional pattern are more inclined to implement technology for drill-and-practice exercises. Still, educators with a constructivist character are more likely to offer learners more autonomy when using a computer for study or information processing. Educators would demonstrate conventional or constructivist ICT use since they already adhere to these classroom philosophies. According to many studies, instructors who utilize technology do so since their perceptions of ICT use align with their current teaching views or philosophies (Sugar et al., 2004). In addition, it was discovered that teachers' educational ideas are a predictor of their classroom practices, including how they use instructional tools, such as computers (Tondeur et al., 2008).

Cope and Ward (2002) interviewed high school teachers to determine their perspectives on learning tools. The significance of teacher perspectives regarding incorporating educational technologies was investigated using a phenomenological study technique. Furthermore, they observed that successful implementation is more likely when teachers view innovations as instruments that motivate students to adopt deep learning strategies. Egbert (2008) states that efficient technology-based instructional methods

will occur when proactively managed on the following components: learning objectives, support, and training times to acquire suitable techniques and materials and employ innovation only when suitable. To summarize this part, educators can create appropriate technological practices by developing language lessons that enable the students to utilize technologies to improve their learning based on their capabilities, skills, or instructional goals. According to Felix (2003), the best practice is utilizing the proper equipment to its total capacity to accomplish good educational outcomes and processes.

Teachers must make sure that their utilization of ICT includes both curriculum-based and relevant uses of ICT for learning outcomes. Hoopingarner (2009) suggests that technologies should be utilized to "replace some aspects of teaching, augment some aspects of teaching and learning, and transform the learning experiences" concerning best practices in language education using ICT (p.233). Kerr (1991) affirms that “if technology is to find a place in classroom practice, it must be examined in the context of classroom life as teachers live it” (p.259). Likewise, Attia (2011) asserts that innovation in the classroom should be considered in the framework of educational processes as instructors experience it. When educators view technology as a resource that may improve learning and instruction by giving more chances for language practice and providing a platform promoting enhanced technologies and linking them to their instructional practices, technology utilization in English classrooms can realize its full potential.

2.3 Information and Communication Technology in Education

One of the many challenges encountered by developing economies today is preparing their societies and governments for proliferation and the information and

communication revolution (Pushpanathan, 2011). By enabling Information and Communication Technologies (ICTs), countries can face the challenges of the information age. The emergence of this new global economy has profound implications for the nature and purpose of educational institutions (Pushpanathan, 2011). Information and Communication Technologies (ICTs), which include radio and television as well as newer digital technologies such as computers and the Internet, have been touted as potentially powerful enabling tools for educational change and reform, hence have been integrated into nearly every element of people and culture. Multiple establishments have observed significant growth due to the rapid expansion of ICT (Zhang & Aikman, 2007).

The use of ICT has also brought about significant changes in the education system. In the early 1980s, when computers first appeared in schools, instructors discovered an invaluable tool for educating children. According to a report, ICT shall continue to serve an important role in educational situations for future generations (Bransford et al.,2002). Technology offers several opportunities for bolstering education (Lefebvre et al., 2006). In the early 1980s, ICT systems started to appear in educational establishments in more developed nations, while internet services became widespread in the second part of the 1990s. In emerging economies, this was more constrained. The US has made the highest advances in ICT, and its budget for implementing technology in education is considerable. The United States Department of Education reportedly committed up to one billion dollars to using ICT in public schools.

Until now, numerous countries have started global developments in ICT to enhance learning. In 2008-2009, the administration of Great Britain, for instance, spent £2.5

billion on pedagogical ICT (Nut, 2010). In 2009, the US spent $4.7 and $6 billion on higher education institutions and schools correspondingly (Nut, 2010). In New Zealand, the state annually invests over $ 410 million in ICT facilities for institutions (Johnson et al., 2009). Notwithstanding these efforts in ICT facilities and equipment, including professional training to enhance schooling in some countries, there has been a slight improvement. The concern is what might be the basis for such contentions. It is widely acknowledged that the acceptance of ICT in education has moved from the development of fundamental computer capabilities, computer-assisted instruction, interactions, and inquiry, to the use of computers throughout all subjects. The confluence of communications and computer systems, especially email and the Web, has expedited this.

Various nations' and regions' economic and social realities have defined the degree of Integrating ICT into the educational curriculum, which has led to this evolution. Undoubtedly, training and education play a crucial role in economic and social advancement, given that one of its objectives is to constructively contribute to developing the human potential necessary to accomplish the socioeconomic pillar priorities, in addition to achieving Education for All (EFA) aspirations by 2015, which is now in the past. Considering the benefits of ICT in education, specifically in language teaching, the government of Bangladesh adopted the 'ICT in Education Master Plan 2012-2020'. According to the Plan, ICT-based education and training facilities have been ensured in all education sectors. The government has implemented multimedia/smart classrooms to create a real-time effect of ICT in educational institutions (Master Plan for ICT in education in Bangladesh, 2019). Training on using ICT tools in the classroom setting has been ensured for secondary school teachers. As a

part of the training, the government emphasizes ICT-based English language teaching in secondary education rather than only ICT literacy (Rank et al. 2011). National Curriculum and Text Book (NCTB) has developed a teacher's guide for the teachers to easily understand the contents and teach the students properly by using ICT tools and materials (Talukder et al. 2016). To achieve the vision, the Kenyan education ministry, science, and innovation recognize various obstacles in providing education programs, including the need to increase access, fairness, and effectiveness, which necessitates better decision-making, leadership, and initiatives (MoES&T, 2012). An efficient Educational Management Information System (EMIS) framework is now being pushed out to facilitate the analysis, utilization, exchange, and dissemination of all relevant data and information to tackle these issues. In Kenya, as part of Vision 2030 and the Medium-Term Plan (MTP), the state intends to deliver 20,000 computer systems to institutions as a flagship program in the education system, in parallel to the Ministry's ongoing efforts to direct more funds toward establishing suitable ICT facilities. In agreement with this, the Ministry of Education produced a precise cost estimate for providing institutions with laptops between 2010 and 2015, predicated on one laptop per instructor and one desktop for every fifteen students. Table 2.1 shows expenses (in Millions of Kenyan Shillings) from 2010 to 2015.

Table 2.1: Country's ICT in Education Investments

Description	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**TOTAL AMOUNT**
1. An Effective Organizational and Framework for ICT	26.66	41.7	45.66	50.17	49.18	**213.36**
2. Improved management and administration of ICT utilization	84	83.2	81.39	84.7	94.72	**428.02**
3. ICT Facilities and Instructional Solution Advisory and Support in Academic Institutions	4,136.20	4,300.97	4,473.01	4,651.93	4,833.01	**23,483.39**
4. Robust ICT assistance for Efficient Management of Infrastructural Facilities and Systems at all tiers.	274.9	282.69	293.9	307.77	320.08	**1,479.42**
5. Provision of connections improves cooperation and information exchange across all levels.	41.17	42.81	44.53	28.49	29.63	**186.62**
6. Integration of technology into the process of education.	354.44	366.76	338.08	351.61	367.29	**1,778.18**
7. Partnering with the private sector to pool resources in ICT.	7.4	7.7	8	8.32	8.66	**40.08**
8. Monitoring and Evaluating ICT Use in the Instructional Process	1.7	1.3	1.82	1.41	1.95	**8.18**
TOTAL	**4,926.46**	**5,127.13**	**5,286.48**	**5,484.39**	**5,709.52**	**27,617.25**

Source: National Education Sector Support Programme (Ministry of Education, 2012)

The state's five-year investment strategy for ICT adoption in education is presented in Table 2.1. The massive financial allocation to ICT in academia demonstrates the government's dedication to guaranteeing that Kenya is ICT-compliant. Based on the initial estimations, the Kenyan government decided to invest about Kshs.428 billion to increase the use of ICT for management and administration at all educational levels.

Since they are the executors of ICT in teaching in institutions, it is essential to understand the perspectives of educators as well as how they react to these efforts. Evidence suggests that the use of ICT in the classroom improves instructional practices. In traditional learning, learners are passive observers and passive listeners. ICT enables learners to be more involved and engaged in their education. ICT becomes a substitute teacher for the students. It helps students develop their views and comprehension of a subject (Oyaid, 2009). For instance, in "*The ICT impact: A review of studies of ICT impact on schools in Europe*'' (Balanskat et al., 2006), educators perceive the use of intelligent boards as stimulating and improving their classes by providing simple access to digital content. Other international assessments have verified the capability of ICT to improve student performance.

Eng (2005) re-evaluated 42 studies involving almost 7,000 learners. Outcomes showed that students who were given computer-assisted education obtained more outstanding scores. Employing ethical and social norms and practices when utilizing ICT, investing in ICT, producing using ICT, interacting with ICT, or controlling and administering ICT are regarded as general competencies in the recently published Australian national curriculum (ACARA, 2009). It validates the role of ICT as a cross-curricular study aid across all ages and specialties. Waxman et al. (2003) analysed studies performed in the United States from 1997 to 2003 using a sample size of nearly 7,000 participants. The objective was to examine the impact of learning and teaching using ICT on the scholastic performance of students. Compared to conventional teaching, this meta-analysis found that learning and teaching using ICT had a negligible impact on student educational attainment (Waxman, Lin, & Michko 2003). While ICT has the potential to

improve instruction dramatically, this promise still needs to be achieved. Successful ICT use must be enhanced to legitimize further expenditure on ICT in teaching.

2. 3.1 Definition of ICT

Information and Communication Technology refers to the digital signal processing and usage of information via computer systems. It includes information archiving, retrieval, formatting, and transfer (Ifueko, 2011). Television, radios, cellular phones, satellite systems, computer and network hardware, and software are all a part of ICT, in addition to the applications and services that go along with them, like teleconferences and virtual classrooms. ICTs are frequently discussed in academia, health care, and libraries. It is the research, planning, development, application, administration, and support of computer-based communication technologies. The term is frequently used as a substitute for computer systems and networks, including televisions and cell phones (Chandler et al., 2012).

The discipline of engineering is concerned with storing, retrieving, transmitting, and manipulating data using computer and communication devices (Daintith & John, 2009). ICT encompasses all types of communication and computer software and hardware used to produce, design, preserve, transfer, analyse, or transform data in its many incarnations. ICT instruments include pcs, smartphones, transportation systems, TVs, and internet applications, among others. All of the definitions agree that information must be produced and distributed. In addition, they believe that such data must be electronic or computerized. The definitions may not limit ICT and information technology to computers alone; they also include telecommunications gear. There is little difference between the above interpretations. Nevertheless, Margaret Rouse

further claims that ICT applies to software and hardware, unlike the other interpretations. This distinction needs to be clarified, as one could claim that software is required to operate the equipment described in the other descriptions. In sum**,** CT is a generic word that defines the process of generating, manipulating, storing, and transmitting information, in various formats, between machines and humans, utilizing various electronic systems to accomplish a goal.

2.3.2 History of Information and Communication Technology (ICT)

Information communication technology has existed for a very long period; essentially, as humans have, information systems have existed. In the early twentieth century, about 1910, motion films permeated schooling. In 1927, schools became the public's principal source of broadcast radio. In 1936, the BBC commenced transmitting television programs, and non-commercial television debuted. After roughly twenty years, the digital revolution began by introducing the first machine for educational purposes. Over the last 30 years, Information technology has advanced rapidly and continuously (Timerime, 2010). When discussing the history of technology in education, experts typically split it into distinct periods.

Roblyer & Doering (2010) suggest that the development of information and communication technologies (ICTs) in educational institutions can be broken down into three distinct phases: The Internet eras, microcomputers, and pre-microcomputer (Roblyer & Doering, 2010). ICT, according to Lambert & Cuper (2008), "provides the contemporary classroom teachers with the chance to progress from a substantially right schooling surrounding to a progressively unpredictable surrounding" (p. 266). Roblyer & Doering (2010) state that the pre-microcomputer age lasted from 1950 until the late

1970s. The most prominent characteristic of this era was that computer systems were cumbersome, expensive, and challenging to operate. The pre-computer era began in 1950 when the initial computer was used for instruction at the Massachusetts Institute of Technology (MIT). In 1959, the first computer was used by students in New York City to teach mathematics. University faculties and academics in the United States employed mainframe computers for coding and shared services between 1960 and 1970. In the 1970s, when the computer-assisted instruction (CAI) revolution emerged, federal subsidies were used to install huge minicomputer facilities in institutions (Roblyer & Doering, 2010). Subsequently, in the 1970s, when computer-based training skills were seen as crucial in coding and word processing system was utilized, the computer-based training movement began. The expectation was that learners who needed computer literacy would be academically deprived (Molner, 1978). Even with this period, instructors began to despise the management of CAI programs by institutions and local offices across the nation, as they needed more authority over the use of computer-based technology in their classes.

Therefore, teachers began to reject the assumption that technology would improve education (Roblyer & Doering, 2010). The invention of the first tiny, standalone desktop minicomputers in 1977 marked the beginning of the microcomputer revolution (Roblyer & Doering, 2010). It allowed teachers to have control over the devices in their lessons. Throughout the 1980s and 1990s, integrated learning systems (ILS) emerged. Schools began to view ILS network systems as cost-effective alternatives for teaching to meet essential criteria, signifying a shift from standalone platforms to centralized servers that connect devices (Roblyer, 2006). The mid-1990s are considered the peak of the computer development process. Tim Berners-creation Lee's of the World Wide Web

(www) in 1994 marked the beginning of the Internet era. Web 1.0 was primarily developed as a source of information and a platform for digital resources. To create a Web page, mastery of HTML was necessary (Rosen & Nelson, 2008).

Furthermore, Web 1.0 was indeed a one-way communication system, so most Internet users were merely accumulating content (Albion, 2008). Web 1.0 continued for roughly a decade until 2004 when it shifted to the reading Web, or "Web 2.0", which facilitates communication and collaboration (Solomon & Schrum, 2007). Web 2.0 emphasizes user-generated content and is much more than a static source of information. It is ideally viewed as an engaging tool that enables students and educators to add to a website's material to disseminate information, collaborate, and network among themselves (MaAfee, 2006). Web 2.0 technologies include, for example, web-based forums, social media sites, streaming video websites, web apps, wikis, and blog sites (McAfee, 2006). Concerning Web 2.0, students and educators can use these technical tools to facilitate simulation and distribution of material, social networking, collaboration with other civilizations, actors, and work or data outcomes (Solomon) (Schrum, 2007). Web 2.0 applications are simple to use and do not necessitate considerable skills or knowledge, allowing students to concentrate on information exchange (Boulos, Maramba, & Wheeler, 2006). Table 2.2 summarises the most significant breakthroughs in the last four decades.

Table 2.2: The History & Development of ICT in Education (Roblyer & Doering, 2010; Timetoast, 2011)

Period	Year	
Before-Microcomputer Period	1910	Silent Films introduced
	1927	Broadcast radio introduced
	1936	BBC introduced television broadcasts
	1950	First computer was introduced for instruction
	Early 1970s	Computer-assisted instruction (CAI) movement formed
	In the late 1970s,	The Computer skills movement commenced as the CAI campaign fell.
Microcomputer Period	1977	First educational microcomputers The Apple corporation is founded
	1981	The IBM corporation founded
	1982	PC introduced.
	1990	mobile phone use expanded
	1991	It took ten years after the invention of the first smart board until it became widespread.
The World Wide	1994	The advent of WWW. The Netscape browser was introduced.
	1995	Microsoft introduced Windows 95
	1997	Internet Explorer version 4 introduced
	1998	The Search Engine Google is introduced
	1999	Bluetooth introduced
	2000	Windows 2000 was released by Microsoft. Apple introduces the iPod.
	2001	Wikipedigoes online
	2004	The advent of Web 2.0
	2007	The first iPhone released
	2010	iPad hit markets

In the mid-1980s, the first CD-ROM was introduced into the educational setting. Learners could now save video, sound, and a complete encyclopaedia on a solitary compact disc for the very first time.

The CD-ROM is still utilized in modern computers, suppressing the floppy disc and paving the door for the employment of the floppy disk. The early to mid-1990s saw the Internet's introduction to the regular populace. Previously, only the military, educational organizations, and NASA were using it. Initially, it was a dial-up connection that utilized a telephone line. It will be intriguing to observe where education will go in the coming two decades due to technological advancements (Katie Parson, 2016). The advent of moderately affordable mobile applications, the explosive increase in interaction power via cellular connections, and the advancement of web applications that allow everybody to circumnavigate and explore connected digital sources of knowledge have opened up new avenues for the advancement of education generally. The rise of relatively inexpensive, user-friendly technology, the explosive rise of interaction power alongside wireless connections, and the introduction of browsers that enable everyone to investigate and start exploring connected digital information sources must result in current opportunities for boosting education as a whole (Zucker, 2004). In other words, ICT may be a source of knowledge, a medium for transmitting knowledge, as well as a "bilateral asset advancing discourse and generating investigation"; consequently, it affords opportunities for alternative instruction and learning, making them more relevant and gratifying (Levin & Wadmany, 2008, p.234). Therefore, an increasing emphasis has been placed on ICT usage techniques in many education sectors (Forkhosh-Baruch et al., 2005). The subsection that follows describes in full Kenya's ICT policy for education.

2.3.3 National ICT Policy and e-Government Strategy in Kenya

The government has adopted two policies, the National ICT Policy, and the e-Government Plan, which outline the transition of Kenya into an information world.

In both texts, the government acknowledges that ICT-literate personnel is essential to the nation's transformation into a knowledge-based society (MoEST, 2006). In this context, the state will use education to educate the population with ICT capabilities to foster sustainable and dynamic productivity expansion. The 2004 E-Government Strategy and E-Government Strategy highlight the transition of public services from conventional to digitalization. The specific aims include increased synchronization of government departments to decrease redundancy of operations, increase resource utilization efficiency, and enhance the country's competitiveness through prompt information dissemination and provision of services.

In pursuit of these aspirations, the Strategy emphasized utilizing academia to empower the population with the requisite ICT capabilities, skills, and related breakthroughs. In addition, the Roadmap highlighted information technologies that will be led by the education system, including implementing the Education Management Information System (EMIS). EMIS, the Strategy envisions the application of ICT to gather and analyse data necessary for enhancing educational policies, organization, execution, and supervision. In addition, it includes the administration of online tests, the management of enrolment for secondary and elementary schools, and the electronic distribution of educational and other academic programs.

National ICT Policy

The primary purpose of the National Action Plan was to promote sustainable development and economic growth as well as alleviate poverty through applying competitive and efficient technology. The Plan also sought to advance the socioeconomic integration of all citizens via equal coverage. In addition, the Policy attempted to boost development in the ICT sector while simultaneously fostering an

innovative spirit via research and innovation (MoES&T, 2006). The Policy envisions leveraging the prospects of ICTs and innovative technologies to alleviate poverty, encourage primary education for all, enhance maternal health, achieve maximum agricultural output, combat illnesses, guarantee food security, encourage commerce and industry, conserve natural resources, establish international partnerships for economic development, and integrate technology into the mainstream execution of development initiatives. In terms of human capital advancement, the Policy places a focus on the following points: incorporating ICTs into the curriculum guide at all educational levels; instituting e-educational infrastructures for sharing academic materials and boosting e-learning across all levels; supporting and encouraging instructional support for planners, society and society organizations representatives; create opportunities and guidance for the underprivileged, women, as well as teenagers, to accumulate ICT knowledge and skills;

As stated in the millennium proclamation, the WSIS Action Plan seeks to promote the use of information and communication technologies in the service of achieving universally recognized development objectives. Achievable by 2015, this WSIS Course of Action's strategic targets included linking localities to ICTs via the development of community base stations, linking colleges, universities, high schools, and preschools to ICT, and connecting academic as well as research institutions to ICT. Other goals encompass connecting library resources, cultural venues, exhibitions, and post offices, as well as archival materials with ICT; connecting care facilities and hospices with ICT; expediting ICTs to all central and local government agencies and instituting websites and email accounts; and acclimatizing all secondary and primary school syllabuses to meet the requirements of the Information Age, taking into consideration national conditions. The Plan seeks to ensure that every person globally has access to radio and

television programs. The primary goal of the Plan is to guarantee that everybody has the required skills to reap the full benefits of the digital age.

The NEPAD E-Schools Programme

The New Partnership for Africa's Development (NEPAD) was established to address the problems confronting African nations and selected infrastructure facilities as a major activity area for fostering conditions conducive to sustainable growth. The E-Africa Commission, founded in 2002, carries out NEPAD's ICT-related programs and policies. NEPAD intensified efforts to bridge the digital gap between Africa and wealthy nations in 2003. This acceleration of ICTs selected six high-priority sectors. One of them is the NEPAD e-Schools Initiative, whose goal was to incorporate ICT into the provision of secondary and elementary school curricula to increase access, excellence, and education equity across member states. The implementation strategy anticipated high school integration within five years and primary school inclusion within ten years.

Nevertheless, most discussion surrounding ICTs in Kenyan education concentrates on ICTs as a distinct subject instead of an instructional instrument. CT is typically taught in high schools as computer studies, an option for students with a strong interest in computer science and information networking. Numerous educators continue to employ conventional methods of instruction, which view learners as passive vessels to be supplied with skills and knowledge. Continuously, English instruction in Kenyan secondary schools presently is typified by storytelling, narration, an overemphasis on information recollection, and the application of ancient classroom practices, despite numerous existing and innovative breakthroughs that allow students to work meaningfully by themselves under the instruction of their educators, strive to complete

the comprehensive examination curriculum, and constrained teacher-student engagement as a result of large class sizes (Tamale, 1999; ESA,2004). Students accustomed to technology frequently demonstrate apathy, insignificance, irrelevance, or weariness during chalk-and-talk teaching sessions (Savich, 2009; Haydn, 2011). These obstacles have been compounded by the fact that most public education library services, particularly in rural areas, seem to have an inadequate supply of pertinent, suitable, and up-to-date infrastructure, notably technical assistance that can facilitate the assimilation of ICT facilities like computer systems, E-learning, and others where distribution is still static and unchanged.

Given these deficiencies, a technologically-based study was necessary to determine the elements that affect ICT incorporation and acceptance in English language instruction, emphasizing English language teachers' understanding of ICT incorporation. Consequently, employing innovations as an educational breakthrough to increase ICT integration in English language learning in Kenya's secondary schools could present hurdles, such as teachers' technological and pedagogical competence. To guarantee a secure take-off with the ICT integration in the instruction and learning of the English language in high schools in Kenya, this study aimed to assess English language teachers' understanding of ICT abilities and their attitudes toward their use. Even if ICT is freely accessible in schools, the curriculum will not be altered. Individually, ICT needs to improve instruction. That is to argue, the availability of technology in the classroom may not matter; instead, what is crucial is how ICT enhances classroom instruction (Bingimlas, 2010). It is recognized that ICT ought to be utilized only to replace current methods (Stolle, 2008).

Teachers should begin ICT integration by identifying educational difficulties, the second primary factor for success. Applying ICT to help the teaching experience should begin with "dissatisfaction with the educational opportunities offered to students and strive to do better" (Newhouse, 2002, p. 5). Rather than focusing solely on technology, teachers ought to be able to conduct a systematic study of educational challenges that must be addressed (Van Melle et al., 2003). Teachers should ask, "What are the instructional challenges plaguing our pupils?" Furthermore, "Do our learners need to develop improved academic skill sets?" Then, teachers carefully select ICTs, considering their advantages and drawbacks in achieving well-defined academic goals. In addition, ICT is less successful when ambiguous instructional goals (Honey et al., 2005). They agreed that those that effectively implement ICT demonstrate a clear and significant connection between technologies and broader academic expectations rather than focusing on ICT usage.

This discussion moves on to the third element of successful ICT use, which is the creation of constructivist learning environments. There is a growing movement in the scholarship to encourage teachers to transition from traditional education study halls to learner-centred education, often known as constructivism (Pedersen & Liu, 2003). Constructivists believe that "humans construct all knowledge in their minds through participation in certain experiences" and that "learning occurs when one constructs both mechanisms for learning and one's unique version of the knowledge, coloured by background, experiences, and aptitudes" (Roblyer & Doering, 2010, p. 35). Constructivism in academia refers to how students construct understanding. It hinges on what pupils presently know, determined by their experiences, how they have structured those interactions into cognitions, and what they think about what they understand.

As per constructivist educational environments, students acquire knowledge through vigorous participation in rigorous activities, contrary to passive information users. Effective ICT integration is evidenced by using ICT as instruments for knowledge development instead of as educational materials (Johnson et al., 1998). They espoused the application of ICT as mental technology to help students interpret and analyse what they understand rather than as educational materials to present information and facts to them, letting learners "function as designers" or ICT as a perceptual amplification instrument "for interpreting and organizing their knowledge" (Jonassen et al.,1998, p.24). Mindtools include computer apps encouraging students to participate in higher-order, content-based rational reflection (Kirschner & Erkens, 2006). Such resources include databases, semantics, workbooks, system simulation techniques, global information-seeking engines, visual analytics, multimedia publication instruments, live discussion settings, and computer seminars (Kirschner & Erkens, 2006). Thus, successful ICT integration supports constructivist learning settings in which learners interact with ICT to encourage critical and creative thought and understanding in the real world. Limiting the techno-centric perspective, beginning with assessing educational challenges, and embracing the constructivist approach is, in conclusion, the most crucial part of the efficient use of technology in education. Nevertheless, various and varied aspects influence the assimilation and application of ICT in classrooms and schools. In the following sections, those aspects are also explained briefly.

2.3.4 Information and communication technology in Education Policy in Kenya

The current ICT educational policy contains three components: The National ICT Policy, the 2005 Sessional Paper No. 1, and the e-Government Strategy. Electric Board, Radio for Interactive Radio Instructions (IRI) and Audio Cassette, Video/TV-Learning,

Integrated ICT infrastructure, and Support Software Systems have been employed in the education delivery to make it more accessible, learning, teaching, and management through this list is not exhaustive. This Strategy envisioned utilizing these components to enhance the accessibility and quality of teaching methods in Kenya. In 2005, the Ministry of Education of Kenya launched the Kenya Education Sector Support Programme (KESSP), which included ICT as one of the critical areas for integrating ICTs into learning and teaching. The document detailing the government's expenditure strategy for implementing the ideas outlined in 2005's Sessional Paper No. 1. The investment supports the organization and usage of ICT in education (e-learning). In particular, the capital program aimed to implement a policy and framework for ICT in the classroom and create ICT facilities and organizational management solutions.

During the KESSP execution phase (2005-2010), the Ministry of Education, Science, and Technology (MoEST) reports some achievements. Among these was expanded training for education administrators and managers in basic ICT literacy. Nevertheless, it was highlighted that although ICT initiatives had placed a great deal of focus on using ICT in management, assistance was needed to ensure the proper use of ICT to assist the state management systems. The Ministry of Education designed the National Education Sector Support Programme (NESSP 2012/2013-2017/2018), also referred to as Sessional Paper No.1 of 2012, to capitalize on the successes of the Kenya Education Sector Support Programme (KESSP) 2005-2010. The NESSP was a five-year initiative designed by the Ministry of Education, Science, and Technology (MoEST) to implement the curriculum changes outlined in the Kenya Vision 2030 and the 2010 Constitution. The Sessional Paper describes the necessity of prioritizing operations and the financial consequences of the implementation process.

In addition to identifying the difficulties affecting the education system, the report outlined a comprehensive set of guidelines and methods for tackling them. The purpose of the ICT Investment Fund, as stated in the NESSP, was to incorporate ICTs into all aspects of education for management, administration, and instruction and training. Increasing the adoption of ICT for management and administration at all tiers of academic institutions was identified as one of the NESSP's core policy objectives. Given that the objective of the Ministry of Education is to enhance the use of ICTs effectively to enhance access, acquiring knowledge, and management in the dispatch of learning services and programs, each academic establishment, educator, student, and the general public must be equipped with the relevant ICT facilities, proficiencies, and guidelines for utilization and advancement.

The Ministry of Education's initiatives to enhance the use of ICT in the classroom are an effective technique for enhancing institutions' administrative and educational processes. Consequently, awareness of the access and usefulness of ICT technologies in management will go a long way to improving service delivery excellence. It necessitates ongoing updating of information regarding the use of ICT in high school admin and the academic sector as a whole. The policy papers and programs that the government invested in ICT were the impetus for this study to investigate the attitudes of high school English language instructors on using ICT technologies in the classroom. The Ministry of Education, Science, and Technology's mission is to promote ICT as a fundamental tool for training and education. To realize this vision, each academic establishment, teacher, student, and community must have the necessary ICT infrastructure, skills, and regulations for utilization and advancement. It asks to acknowledge the reality that ICT offers the necessary skills and competencies for a

knowledge-based society. It also asks for the transformation of learning and teaching to embrace 21st-century-appropriate approaches. The objective of the Ministry of Education, Science, and Technology (MoEST) is to enable the use of ICT to enhance access, teaching, and management of education services and programs. The primary purpose would be to incorporate ICT into training and education curriculums. The unification aims to unite and consolidate educational policies on ICT, such as its scope, utilization, management, and methods for addressing breakthroughs and the associated Intellectual Property Rights (IPR) (MoEST, 2006). Audio Cassette, Video/TV-Learning, Electric Board, Computer, Radio for Interactive Radio Instructions (IRI), and Integrated ICT infrastructure have been employed in the education delivery to make it more accessible, instructing, acquiring knowledge, and management through this list is not comprehensive.

In most African countries, these strategies are utilized to varying degrees. This Strategy envisions the application of these components to enhance the accessibility and quality of classroom instruction in Kenya. The most significant issue associated with this element is the need for digital technology at nearly all educational levels. Whereas the average accessibility rate in most industrialized countries is one computer per 15 students, the accessibility rate in Kenya is about one computer per 150 students. In addition, the Education Policy Framework (EPF) identifies numerous barriers to access and utilization of ICT in Kenya. High levels of inequality that impede the use of ICT infrastructure, limited infrastructural development, and regular power outages are a few examples. Whenever electricity is available, the deployment of ICT is hindered by high Bandwidth provision charges, digital device expenses, and inadequate support and infrastructure.

The Policy commits to providing digital infrastructure to academic institutions, including colleges, high schools, and elementary schools. Even though most of Kenya's secondary schools have computer devices, only a tiny proportion have basic Infrastructure facilities. In most instances, initiatives funded by parents, the state, non-profits, and the corporate sector, such as the NEPAD E-Schools initiative, have equipped schools with ICT facilities. Very little effort is made to implement basic Infrastructure facilities in primary schools.

2.3.5 Integration of Information and Communication Technology in Education

Whereas other nations have achieved up to 41% ICT integration into learning and teaching, the percentage in Africa, including Kenya, remains notably lower (Odera, 2014). The objective of incorporation is to utilize ICT to assist teachers and students in the execution of the various curriculum in order to improve educational outcomes. Since ICT is an effective way of communication, it enables students to acquire the skills necessary for modernization and a knowledge-based society. It also permits students and teachers to operate at varying speeds depending on the conditions. According to this research, incorporating ICT into the classroom might also significantly prepare students for the competitive labour market. In addition, it was acknowledged that the schooling and language sectors must be aggressive in meeting the demand for ICT capabilities (MOEST, 2006). ICT integration is not a product but a journey (Yalin, Karadeniz, & Sahin, 2007). They noted that implementing ICT into education necessitates incorporating ICTs efficiently and effectively across all process aspects, an increasing number of academic studies that hinder the proper incorporation of ICTs into the classroom (Balanskat et al., 2006; Luan et al.,2009; Tezci, 2011). The most general conclusion was that ICT incorporation is a complicated process with numerous

contributing elements. In most publications, these elements are typically referred to as "obstacles." An obstacle is "any condition that makes it difficult to make progress or achieve an objective," which in the present case is the seamless incorporation of technology into education, particularly English language education (Schoepp, 2005). Some scholars have divided the obstacles to the successful adoption of ICT into two groups: extrinsic issues and intrinsic factors. Extrinsic factors are linked to institutional support, including access to hardware, legislation, and planning. In contrast, intrinsic factors pertain more to sentimental, individual concerns, such as educators' attitudes and beliefs regarding the use of ICT (Ertner et al., 2007), with the present study focusing on intrinsic factors. The hurdles to implementing ICT can also be categorized based on whether they pertain to the personnel (obstacles at the teaching level) or the institution.

The constraints at the educator level comprise limited time, loss of confidence, or unfavourable attitudes. The difficulties at the institutional level involve limited access to ICT tools, lack of adequate preparation, and technicalities (Becta, 2004). Other investigations divide the obstacles into three primary categories: school-level, teacher-level, and system-level obstacles (Balanskat et al., 2006). Hew and Brush (2007) classified obstacles according to their relationship to finances, organization, beliefs and attitudes, skills and knowledge evaluation, and topic culture using six components (Hew & Brush, 2007). Consequently, the study would classify the variables that hinder the achievement of ICTs incorporation into two primary categories: non-teacher-related and teacher-related factions. In an evaluation of a non-teacher affiliated group that impedes the accomplishment of ICT assimilation in classroom instruction, particularly the instruction of the English language, the conclusions indicated that the lack of sufficient framework, Policy, planning and management, and assistance is the primary

periodic obstacle in the publications, such as support personnel, and educators as a crucial element, that could include their knowledge of ICT integration, thus making them the focus of this research. Improving the quality of education and training is a critical issue, particularly at a time of educational expansion. ICTs can enhance the quality of education in several ways; by increasing motivation and engagement, facilitating the acquisition of basic skills, and enhancing teacher training (Pushpanathan, 2011). ICTs are also transformational tools that, when used appropriately, can promote the shift to a learner-entered environment.

2.4 Teachers and Technology use in Language Classrooms

As internet and computer innovations become quickly widespread in many academic institutions, some advanced instructional technologies are made available to face-to-face educators. Felix (2003) argues that two distinct forms of language classroom usage exist. Teachers offer courses and engage with learners via digital 'virtual classrooms' in the initial form of web-based teaching. Still, in the second version, face-to-face teaching is supplemented with virtual learning. The second option is also referred to as a hybrid or blended learning approach. Blended education is defined by Rovai & Jordan (2004) as a combination of classroom and digital instruction that combines some of the benefits of online programs without eliminating face-to-face interaction. According to Lord & Lomika (2008), blended learning programs grant participants the advantages of face-to-face or online groups as they integrate the two modes of instruction. In blended classes, various technical tools, including CMC, Blogs, and wikis, can enhance debate and engagement. Incorporating these technologies is essential for enhancing face-to-face classroom student learning experiences by fostering interaction and engagement. According to Sharma and Barrett (2008), instruction with technologies in a blended learning setting should indeed be motivated by teaching methods, emphasize learners'

requirements, and permit teachers to contribute to lesson diversity while ensuring a balance between educators' and technology's roles. Any form of innovation used in language classes, according to Brandl (2002), begins with presenting instructors with potential methods for incorporating technology into education and with suggestions for constructing pedagogically sound courses. Despite the availability of technology resources, educators may require examples of technology-enhanced instruction of specific skills to implement instructional interventions that promote English language development.

2.4.1 Technology Tools and Language Teaching and Learning opportunities

The development of computers and the Internet has provided educators with a vast array of communication and information platforms and new prospects and resources for language instruction and learning. Recent advancements in information and communication technology that facilitate a variety of learning methodologies and multimedia resources that may be valuable for language students can be utilized by language instructors (Suwannasom, 2010). Kern & Warschauer (2003) noted that language students with an Internet connection could interact with native English speakers from around the globe. Furthermore, CMC studies in language education frequently suggest that resources such as emails, online forums, or chats facilitate the introduction of more collaborative and communicative methods to language education (Bonk & King, 1998). Earlier studies have shown that during CMC chat, students can relieve stress about participation, enhance motivation to use language skills, and create more target language (Chun, 1998).

According to Warschauer et al. (1996), the utilization of asynchronous CMC by students may boost the teaching and learning process by enabling students to take charge of their learning languages and allowing them to interact whenever they choose. Internet and similar technologies are excellent teaching and learning tools for foreign language instruction since they provide access to real educational materials without requiring students to travel to English-speaking regions (Gonglewski, Meloni, & Brant, 2001). Teachers can promote students' target language usage in a realistic context when they use online interactive technologies (Mosquera, 2001). It could boost the engagement and enthusiasm of EFL learners to acquire the target language (Jarvis, 2005).

Teachers and researchers have lately shown a growing interest in utilizing Web 2.0 with Lesson Management Systems (LMS) in language education. Web 2.0 tools, such as blogs, podcasts, wikis, and social networking sites, are modern breakthroughs that provide significant prospects for both language experts and non-native speakers. Utilizing Web 2.0 tools within the classroom could stimulate discussions, online relationships, and educational networks. Additionally, learners can engage in productive discussion, give their thoughts, respond to inquiries and remarks, and provide recommendations and other material to broaden their language adventures (Beldarrin, 2006; McLoughlin & Lee, 2008). In particular, academic institutions are increasingly adopting a Lesson Management System (LMS), otherwise known as a Course Management System (CMS), as well as a Virtual Learning Environment (VLE). An LMS is a web-based tool created for distance learning that distributes class content, communicates with students, facilitates student conversations, presents quizzes, and manages classroom responsibilities. Levy and Stockwell (2006) noted that LMS is a

valuable resource for language classrooms because teachers may integrate various apps, produce teaching materials, and communicate their knowledge with colleagues and students. Brandle (2005) claimed that an LMS could build an effective e-learning environment by providing capabilities that may be employed to enhance both traditional and blended classrooms. However, Tudor (2003) notes that the actual usefulness of innovation relies not only on the promise of the tool itself but also on the appropriateness of its usage in a specific environment and the beliefs and dispositions of the individuals who will be utilizing it. It implies that educators may need to consider the viability and practicability of integrating technology with their specific curricula, enabling hardware and software at respective institutions, and classroom methodology. Nevertheless, the digital resources and apps included here represent only a portion of what technology has to provide in language instruction (Sharma & Barrett, 2007; Egbert, 2010). When adequately incorporated into the English classroom, such innovations can enhance a variety of explorative and worldwide learning capabilities, such as access to authentic assessment, better prospects for interaction and communication, personalized teaching, autonomy from a single information source, and student inspiration (Blake, 2001), as well as strengthen students' utilization of the chosen language in an intercultural context (Mosquera, 2001). Nevertheless, teachers must decide how to incorporate new technology into the instruction of particular language competence in the classroom.

2.4.2 Teachers' Technology Practice in Language Instruction

It is commonly agreed that effective technology integration necessitates aknowledge of the roles of technologies and educators in technology-mediated settings.

Frequently, studies note that technology-enhanced instruction is efficient when educators emphasize learner-centred and constructivist instructional strategies (Judson, 2006). Therefore, technology is employed to facilitate students' inquisitive training and knowledge production instead of for knowledge transfer; students are taught 'with' instead of 'from' technologies. Recently, many scholars have claimed that technology adoption need not conform to the best practices described in the scholarship. According to Windchitl and Sahl (2002), outstanding technological uses come from the interaction between instructors' perceptions about the possibilities of technologies and their teaching methodology. According to several studies, instructors who utilize computers employ them because the perceptions of ICT use align with their current teaching views or philosophies (Sugar et al., 2004).In addition, it was discovered that teachers' pedagogical ideas are a predictor of overall classroom practices and how they use instructional tools, such as innovation (Tondeur et al., 2008).

Cope and Ward (2002) interviewed educators to determine their perspectives on learning tools. The significance of teacher perspectives regarding incorporating educational technologies was investigated using a phenomenological study technique. Moreover, they observed that assimilation is more likely to be achieved when educators view innovations as instruments that motivate students to adopt deep learning strategies emphasizing the interrelationships between the studied topic's components. It is reinforced by Egbert (2010). He stated that technology-based instructional strategies would be beneficial if educators focused on the following components: learning objectives, support, and training opportunities to learn suitable techniques and resources and employ technology only when it is suitable. How strong pedagogical principles might direct educational technology is another crucial issue.

According to Felix (2003), ICT should be utilized to establish educational experiences in which instructors could set up realistic instructional activities where both the procedures and goals are engaging and exciting and where specific student peculiarities are considered. As per Young & Bush (2004), a methodological approach and contextual issues could help English language arts educators improve their individual "best practices with technology." To guide the effective utilization of technology, important questions like "Why do I want to employ innovations?", "What innovations tools are readily available for my students and me, and how might they be used?" as well as "How will the use of technology affect or enhance my students' overall literacy?" should be asked (p. 10). Integrating technology is more effective with multidisciplinary divisions that contextualize student activities. In addition, learners should have the chance to participate in a learning community where they can extend their understanding, enhance their abilities and cooperate. Such engagement can foster lifelong learning, critical thinking, and motivation to use technologies autonomously among learners (Suwannasom, 2010).

Consequently, successful technology practices can be founded by educators developing language lessons that provide students with opportunities to use innovation to improve their education per their skills, abilities, and instructional targets. Educators should also guarantee that the application of innovation encompasses using innovation in curriculum-based and creative ways for students' education. According to Hoopingarner (2009), technologies should be utilized to "replace some aspects of teaching, augment aspects of teaching and learning, and transform the learning experiences" when it comes to language instruction (p. 233). If teachers view technology as a means that may better teaching by offering more chances for language practice and serving as a foundation for

prolonged engagement and learning practices, the most significant potential of technology deployment in language classes can be realized. Consequently, it is essential to comprehend how teachers comprehend innovation and apply it to existing classroom methods.

2.5 Integrating ICT into Secondary School English Language Teaching

In recent times, ICTs have exploded in popularity worldwide. In Europe, a large bulk of instructors (90%) utilize ICT to organize classes (Empirica, 2006). All European Union member states. In addition, the European Union has established goals for improving digital literacy, abilities, and inclusiveness (European Commission, 2012). The Office of Educational Technology (OET) in the United States has created a "National Educational Technology Plan" (OET, 2010) to revolutionize education via the use of technology. The excitement for using ICT in education is evident and pervasive throughout East Asia. Studies have shown that the usage of ICT in African nations is on the rise, despite restricted availability (Trucano, 2012; Tella et al., 2007).

In Latin America, Information technology is also showing up in high schools, but inconsistently. According to studies, the degree to which instructors are given the opportunity and access to relevant instruction to use technology to promote learning is a fundamental factor in deciding whether innovation significantly impacts accomplishment. (Samuel & Zitun, 2007). Rodgers and Finlayson (2003) believe that ICT can transform the learning and teaching process but that "pedagogical skills play a crucial role in turning the promise into reality" (Rodgers & Finlayson, 2003, p. 105). Nevertheless, this preparation needs to be provided in many instances, and educators are left to their resources. Individual teachers who incorporate technologies in their classrooms have a specific personality type. In essence, these educators utilize easily

accessible, free internet technologies and learn how to employ them via social media and online networks of practice. These educators construct their learning networks (Couros, 2008) and interact with other educators worldwide to share their knowledge and assist others in education. Although research indicates that ICT is not currently standard in language instruction, Thomas and Black (2007) state:

> *While those involved in educational technology often assume that their pursuits are central to what is happening in their institution, the reality is that a rather limited percentage of any given group of educators, either in the school or university sector, consistently integrate technology into any great effect*.

It has been discovered that educators in Kenya need to integrate ICT into their lessons. There are very few studies on ICT use in education, and the ones that exist focus on computer system education and the field of sciences (Wanjala, 2013; Amuko et al., 2015; Wanjala, 2016). There needs to be more research on the integration of ICT in English language instruction. This gap was filled by assessing teacher knowledge of ICT incorporation in English language education in Nairobi County, Kenya.

2.6 Teacher as a Critical Factor towards Successful ICT Integration

It was commonly believed that once ICT needs, such as ready accessibility to technology, outstanding technological teacher training, and a supportive policy and atmosphere, are met, ICT assimilation will inevitably follow (Lim & Khine, 2006). Nevertheless, further studies have shown that the educator is one of the most critical factors in determining the success of ICT incorporation (Albirini, 2006; Tezci, 2009). Although some studies (Kozma, 2003) stated that the availability of ICT within the classroom promotes efficient use, other research findings suggested that poor use is related to instructors' dispositions and knowledge levels (Lim & Khine, 2006; Zhang & Aikman, 2007). Similarly, Ertmer (2005) asserted that whether and when to utilize ICT for academic purposes relies hugely on the educators and their associated aspects, such

as beliefs, trust, and skills, concerning ICT incorporation. According to studies, teachers' beliefs and attitudes can either lessen or amplify the impact of other obstacles, such as a shortage of resources or administrative and technical assistance (Hativa & Lesgold, 1996). If educators do not employ ICT in their classrooms, it has no educational value in and of itself (Tezci, 2009). Consequently, educators, not ICTs, are the key to integrated information technologies adoption. Successful ICT integration is necessary to comprehend the elements that impact teachers' choices and actions concerning ICT in the classroom. The expertise and skills of teachers are among the most crucial of these aspects. The following paragraphs discuss this subject.

2.6.1 Technological Knowledge and Skills

Technological expertise and abilities, or mastery as some scholars term them, have been regarded as crucial for educators to successfully integrate ICT into their classrooms (Albirini, 2006). The previous study has demonstrated that a significant proportion of educators' ICT skills and proficiency is the primary barrier to their practical usage in the classroom (Becta, 2004; Balanskat et al., 2006; Hew & Brush, 2007). In his investigation, Albirini (2006) examined the association between teachers' technology perceptions and five factors, including computer ability. According to the findings, most participants needed more knowledge concerning the employment of computers for educational purposes. Regardless of the accessibility of technological gear, the study indicated that it would not be utilized unless educators possess the necessary skills and knowledge to incorporate technology into learning programs. According to the research, there are connections between teachers' skills and knowledge and other teacher-related characteristics. According to Newhouse (2002), most educators who lack the abilities and expertise to use technology are similarly unenthusiastic about the

concomitant modifications to their classroom methods. When instructors lack technological expertise, they are more likely to feel apprehensive about potential technical difficulties due to their less comprehension of how to prevent or autonomously address such challenges (Becta, 2004). The confidence of instructors to use ICT in their teaching practices is another element related to their degree of skills and knowledge. According to Albirini (2006), educators' need for more technology integration confidence stems from their level of computer competence. Likewise, when reacting to Becta's (2004) study, most teachers who mentioned that their lack of self-assurance was a hindrance also reported that they possessed inadequate ICT skills (Becta, 2004). Moreover, teachers' technological proficiency strongly influences their views about computers (Albirini, 2006).

Technology-related lesson management abilities pertain to the administration of ICT in the classroom. Educators need specific organizational skills that enable them to plan their classes so that all learners have equal opportunities to use ICT facilities or to understand what to do when students encounter technical difficulties when employing these facilities (Hew & Brush, 2007). Also highlighted for the successful incorporation of ICT, also termed technology-supported learning strategies, are skills and knowledge (Hughes, 2005; Ottenbreit-Leftwich, 2010). This form of knowledge has indeed been described as teachers' comprehension of the relationship between instructional devices and teaching techniques. Koehler and Mishra (2009) introduced topic knowledge to TPACK, which refers to instructors' expertise in using innovation to enhance pedagogical strategies in teaching certain content subjects. Hughes (2005) argued that instructors should be equipped with technology-supported instructional skills and a knowledge foundation to turn to it when planning to implement ICT in their classroom

procedures. As per Hew & Brush (2007), teachers' lack of familiarity with the methodology of employing ICT could be an obstacle to successful ICT incorporation. Hew & Brush (2007) acknowledged that professional growth initiatives primarily dealt with ICT tools. Teachers' skills and knowledge are essential to ICT integration in the classroom. However, teachers must possess technical expertise, TPACK, and other forms of knowledge (Koehler & Mishra, 2009). According to Balanskat et al. (2006), the level of knowledge of educators is directly proportional to the quality and quantity of their professional training initiatives. In addition to training instructors to use ICT tools, such programs must incorporate content and pedagogical instruction (Becta,2004). Professional development content must be relevant to teachers' ambitions and classroom practices to affect teachers' knowledge and skills (Hew & Brush, 2007). Particularly, to improve teachers' technology-supported teaching methods, avenues for active learning should be provided; educational processes should be grounded in content-related technological demonstrations (Hew & Brush, 2007). Establishing suitable pedagogical methods is crucial for seamlessly incorporating ICT into education (Murphy, 2006). In the subsequent section, an essential theoretical framework (TPACK) is used to provide a more in-depth comprehension of the purpose of teachers' expertise and how it might increase effective ICT adoption.

2.7 The Discussion of TPACK Theoretical Framework

While considering ICT incorporation in the classroom, teachers face the dilemma of how to successfully use this incorporation to accelerate learning outcomes (Harbi, 2014). The preceding section showed that effective ICT incorporation necessitated new teacher knowledge. To maximize the likelihood of constructive engagement, they must have a cohesive grasp of how ICT could be utilized in conjunction with subject content and educational methodologies. This comprehensive knowledge is provided by the

TPACK concept introduced by Mishra and Koehler (2006). This subsection describes the TPACK conceptual foundation, beginning with a synopsis of TPACK as a framework, knowledge architecture, and an overview of TPACK's use in the literature. The TPCK or TPACK framework stresses the proper incorporation of practical technology for teaching specific content, which requires a thorough conceptualization of the relationships between Technology, Pedagogy, and Content. Teachers who obtain this capability to relate these knowledge components meaningfully would constitute a form of excellence of knowledge in specific content, teaching, and technology.

The TPACK framework emphasizes the blended relationships between the knowledge of content, pedagogy, and technology. In the present educational scenario, the TPACK framework can act as a practical organizing frame for the professional development of teachers in educational technology. The availability of technology alone cannot determine the success of technological Integration. However, it must be determined whether or not the teachers' expertise and aptitude in selecting and efficiently employing technology are compatible with learning content and pedagogy (Bilici, Guzey, & Yamak, 2016). To define such a skill or aptitude, the proper technology integration model is Technological Pedagogical Content Knowledge (TPACK) (Joo, Park, & Lim, 2018). The core and integration components (a mixture of the essential components) comprise the TPACK framework. The basic components consist of Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). In addition, the integration components include Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical and Content Knowledge (TPACK) (Koehler, Mishra, & Cain, 2013; Valtonen, Kukkonen,

Kontkanen, Makitalo-Siegl, & Sointu, 2017; Valtonen et al., 2018). These seven elements are intertwined and cannot be separated. As a result, a teacher must acquire fluency and cognitive flexibility in each of the primary components and interactions between them to have an effective TPACK, Components of TPACK. Finally, they can create effective technology integration strategies (Koehler et al., 2013). In the literature, there are numerous definitions for TPACK. TPACK was defined by Koehler and Mishra (2009) as the ability to use technology to support pedagogical practices, to assist students in solving challenges they experience during learning, to consolidate existing information, and to work on technology at the point of sustaining new information. TPACK is defined by Niess (2005) as how teachers employ 21st-century technologies to plan, organize, and change class circumstances to meet the requirements of students. TPACK, as described by Timur and Taşar (2011), is the successful Integration of educational technologies with Pedagogical Content Knowledge in the classroom. TPACK can be defined as the successful use of technology in the teaching-learning process and instructors' enrichment of their pedagogical content knowledge using technology using these definitions.

2.7.1 A summary of TPACK as a Theory

Koehler and Mishra proposed TPACK in 2005 as a theoretical framework to demonstrate teachers' expertise in efficiently employing ICT in instructional procedures (Koehler et al., 2007).

The framework argued that teachers require TPACK rather than only technological proficiency (Mishra & Koehler, 2006). The statement recognizes the complex interrelationships among the many aspects and outlines how instructors' understanding

of technologies, methodology, and material can interact to generate effective discipline-based instruction utilizing ICT (Shin et al.,2009). Koehler and Mishra (2005) define TPACK as the links and interconnections between pedagogical skills, subject knowledge, and technical knowledge and the change that occurs when such domains are combined. Koehler & Mishra (2006) contend that effective teaching is not merely the addition of technologies to the established instruction and subject domain. Instead, technology adoption induces the depiction of novel ideas and necessitates the development of awareness of the changing, transactional link between all the TPACK elements. The TPACK is critical because it brings together variables that occur during the integration process, brings attention to their interrelationships, and thus provides multiple elements that are part of the teacher education program and must be pursued for integrating technology (Akkoc et al., 2011).

According to Koehler & Mishra (2006), the TPACK model is founded on the design of learning programs in which educators use technical, pedagogical content understanding in a constructivist manner (Yanpar-Yelken et al., 2013). This framework, according to Swenson et al. (2005), "involves asking how technology can support and expand effective teaching and learning within the discipline, while simultaneously adjusting to the changes in content and pedagogy that technology by very nature brings about" (p. 222). Seven components comprise the TPACK concept (Mishra & Koehler, 2006). TK, CK PK, TPK, TCK, TPACK, and PCK. This concept posits that the three primary knowledge areas (technology, pedagogy, and content) are interconnected and complex (Koehler & Mishra, 2008; Mishra & Koehler, 2006). Mishra and Koehler (2006) underlined this approach by developing a framework for teacher knowledge that focuses on technological Integration known as Technological, Pedagogical Content

Knowledge (TPACK), and it was inspired by Shulman's (1986) theory of Pedagogical Content Knowledge (PCK). TPACK, a technological integration model, explores teachers' comprehension of how ICT can be used as a pedagogical tool in teaching and learning (Altun & Akyildiz (2017, p. 469); it states that the basis of TPACK is to create effective teaching with technology. It entails a deep understanding of technology use, pedagogical techniques using technologies in constructive ways to generate teaching content of what makes learning easy or difficult, and how technologies can remedy the problems students face (Ammade et al., 2020). In the following sections, these three realms are discussed in greater detail.

Content Knowledge

Content knowledge (CK) is information about the topic that will be addressed (Mishra & Koehler, 2009). The domain could include the reality, attitudes, aim, and methodology of a topic field, along with a comprehension of verification, proof, theories, and agreed-upon methods for enhancing existing knowledge in that subject. Content Knowledge is essential for educators. They must possess a solid foundation of content understanding in their particular subject; otherwise, students may need more accurate information and develop misunderstandings about the material (Koehler & Mishra, 2009). This study presupposes that educators have sufficient subject matter expertise to handle the English language. Consequently, this study concentrates on technical content knowledge (TCK) and examines how this knowledge facilitates the incorporation of ICT in English language instruction.

Pedagogical Knowledge

The (PK) requires teachers to comprehend teaching practices in-depth (Koehler & Mishra, 2009). It requires comprehension of educational aspirations, values, objectives,

instructional strategies, classroom management, and evaluations. It also requires an understanding of the learners' educational background, the desired recipient's qualities, and the elements of educational psychology (Schmidt et al., 2009). Teachers need PK students to understand how to expand their knowledge, acquire skills, and increase their enthusiasm for school. Again, this study postulates that educators learn this understanding during their English language training. As a result, technical and pedagogical expertise is the focus (TPK). It involves learning and instruction in many technological situations. Do English language teachers in the area under study have enough technological pedagogical knowledge to integrate ICT into teaching? Such questions informed the decision to conduct this study.

Technological Knowledge

The (TK) has been increasingly prevalent in numerous research investigations in recent years. However, this phrase is difficult to define. It is due to the nature of technology evolving rapidly. Remarkably, the scope of technology is continually being replaced by models of emerging technologies. As a result, different concepts of TK have been employed in academia, based on which innovations and types of knowledge are incorporated. Mishra and Koehler (2006) define TK as knowledge of capabilities, which consists of the information and abilities required to operate specific innovations. In addition, technological knowledge (TK) includes information on interactive media, interactive whiteboards, and more modern technologies like the Internet (Cox & Graham, 2009; Shin et al., 2009; So & Kim, 2009; Jang & Tsai, 2013). Koehler and Mishra (2006) describe TK as understanding particular methods of conceiving about and operating with technologies, resources, and tools and collaborating with technology that may be applied to all innovation resources and tools. It encompasses a comprehensive enough grasp of information systems to apply it effectively in the

profession and daily life, identifying when digitalization can aid or hinder the attainment of a purpose and continuously adjusting to technological changes (Koehler & Mishra, 2009). English language teachers must be able to effectively plan the use of ICT in the classroom. Other investigations used TK to allude to digital technology expertise (Niess et al.,2009; Bower et al., 2010; Lee & Tsai, 2010). Some investigations described TK as encompassing all digital innovations (Niess et al., 2009), whereas others employed TK to describe specific innovations. They investigated instructors' perceived self-efficacy and technical and pedagogical subject mastery. Lee & Tsai (2010) concentrated on the pedagogical use of internet technologies. They created a paradigm for comprehending teachers' Technological Pedagogical Content Knowledge-Web once they implement Web technology in their educational practices.

Another illustration is by Bower et al. (2010). The researchers concentrated on Web-based technologies and TPACK to create a comprehensive paradigm for envisioning and implementing Web 2.0 learning architecture. Mishra & Koehler (2006) claimed that it is essential for instructors to be capable of learning and adapting to technological advances, irrespective of the type of technology being referred to. The three primary areas (PK, TK, and CK) are the meeting point between these categories of knowledge, proffered as (TCK, PCK, TPACK, and TPK (Kohler & Mishra, 2009), the primary focus of this study (Figure 2.1).

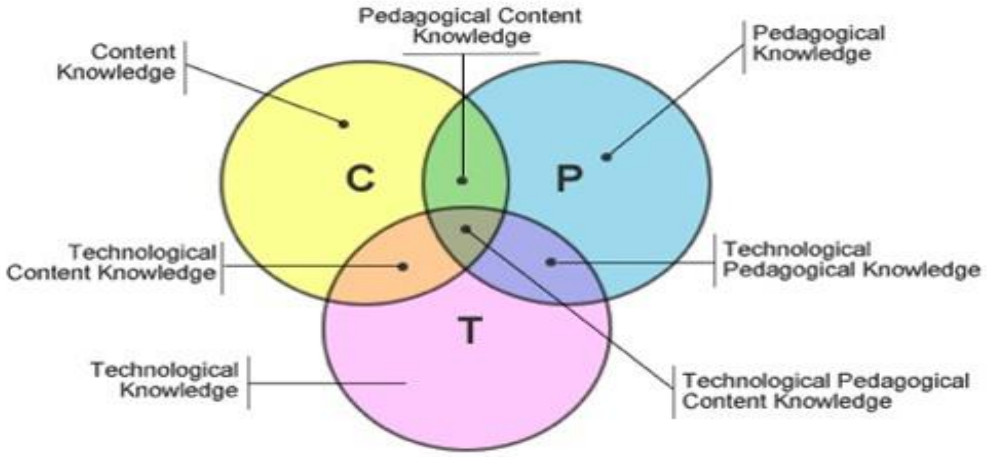

Figure 2.1 Technological Pedagogical Content Knowledge Components (Mishra & Koehler, 2006)

Pedagogical Content Knowledge (PCK)

The PCK appears where the CK and PK overlap. The educators' specific area of expertise in which the PK and CK of a material intersect, enabling them to deliver that specific CK effectively. In other words, PCK accelerates understanding a specific subject (Koehler & Mishra, 2009). PCK is effectively similar to Shulman's notion of knowing how to merge content and pedagogy (Shulman, 1987). Consequently, PCK differs from becoming a specialist in a single topic and familiarity with general instructional methods.

According to Shin et al. (2009), PCK understands which teaching methods are appropriate for the subject and how subject materials can be structured to improve instruction. This form of comprehension requires knowledge of learners' prior competence, epistemological ideas, and how the material relates to students' comprehension. In particular, PCK includes estimates of the types of questions and issues teachers are most likely to encounter, as well as an understanding of what renders a particular topic difficult or simple to comprehend (Koehler & Mishra, 2005).In

addition, educators with PCK are aware of common fallacies and strategies for addressing them (Koehler & Mishra, 2009). Koehler and Mishra (2005) claim that PCK consists of "knowledge of teaching strategies that incorporate appropriate conceptual representations to address learner difficulties and misconceptions and foster meaningful understanding" (p. 1027). Educators with PCK know that diverse pedagogical approaches are required to teach unique disciplinary concepts (Schmidt et al., 2009).

Technological Content Knowledge (TCK)

Understanding the effects of ICT on the practices and expertise of the English language is essential if we set reasonable goals. Educators must grasp the content of the story they teach and how technology can transform subject material. That is where the need for Web 2.0 tools in English could be initiated to fulfil the stipulated educational objectives in the Kenyan English language syllabus and the ICT objectives. How ICT is incorporated into lessons impacts instructors' subject-matter expertise and understanding of how ICT relates to it. Some educators select ICT resources that pertain to a specific topic, while others utilize ICT to show the students' work creatively, regardless of the topic. The evidence indicates that instructors' utilization of ICT has a more significant direct impact on students' achievement when they employ their understanding of the Curriculum and how students understand it. The influence on achievement is best when students are encouraged to question and debate their learning via topic-specific software alone, in groups, or during a whole-class discussion. The TCK is the idea of knowledge that emerges at the intersection of TK and CK; it is the understanding of innovations that may be applied to inquiry and creating a specific content domain. This understanding does not pertain to teaching but learning; hence, TCK is the knowledge of technology employed to grasp and analyze certain subjects. TCK, according to Koehler and Mishra (2009), is the understanding of "how

technology and content influence and constrain one another" (p. 65). According to Cox and Graham (2009), TCK involves knowledge of improving content organization. Notably, teachers need TCK to understand how to use technology to demonstrate and develop the essence of CK. This study aims to determine English language educators' technical subject knowledge and content knowledge management.

Technological Pedagogical Knowledge (TPK)

Technological pedagogical knowledge (TPK) is how specific technology usage affects learning and instruction. It understands the educational capabilities and limitations of various technological instruments concerning developmentally and disciplinary relevant pedagogical models and tactics. Developing the ability to repurpose accessible resources for specific instructional aims is an essential component of TPK. Teachers must avoid functional fixity, cultivate the ability to see beyond the present technologies, and "reorganize" it for instructional goals.

The teacher's personal pedagogical views and ideals play a significant role in shaping possibilities for technology-mediated instruction. It is still not apparent from the literature whether this culminates in technologies being employed as a "servant" to strengthen teaching methods or as a "partnership" to transform how students and teachers connect with assignments and one another. Teachers must broadly understand ICT to identify the most appropriate resources. They must also comprehend how to integrate ICT into their classes, which may require the development of new methodologies. Koehler and Mishra (2009) describe TPK as "an understanding of how teaching and learning can change when specific technologies are employed in specific ways" (p.65). Cox (2008) defined TPK as "knowledge of the technologies that may be used in a generic pedagogical context, including the affordances and constraints of

these technologies, and how these technologies influence or are influenced by the teacher's pedagogical strategies and student learning" (p. 76). TPK is the knowledge of utilizing technology to promote general teaching practices without referring to a specific topic. With this information, teachers must be adaptable, inventive, and receptive while pursuing technology to enhance their students' learning and comprehension. Most popular developing innovations are designed with something other than education in mind. Therefore, teachers require TPK to adapt these innovations for specific pedagogical applications. According to Koehler and Mishra (2008), educators must "look beyond the immediate technology and 'reconfigure' their pedagogical goals" (p. 17).

Technological Pedagogical Content Knowledge (TPACK)

TPACK is an evolutionary knowledge that transcends each of the three constituents. TPACK is the understanding that results from the interplay of content, teaching methods, and technical expertise. Numerous studies have identified TPACK as a paradigm for articulating and explaining teachers' ICT application-related knowledge and abilities (Koehler & Mishra, 2008).

The TPACK paradigm is a novel framework that illustrates how English teachers might easily incorporate ICT. Therefore, they should grasp how technical methodology and content can interact to generate discipline-based instruction with efficient ICT (Shin et al., 2009). Teachers utilizing the TPACK architecture must develop proficiency and intellectual agility in every one of the three primary areas and how the domains intertwine. Effective technology-based instruction needs the ongoing creation, maintenance, and re-establishment of a dynamic balance between all components. Understanding what to do with innovation is distinct from knowing about innovation.

Teaching assistive technologies alone provides little to allow educators to understand how to utilize online technologies to teach more efficiently, manage the linkages between technologies and content representations (CK), or even use them to assist students in studying a specific topic. Similarly, knowing curriculum material or pedagogical content abilities in isolation will not necessarily improve instructors' knowledge of how to apply this information. It is the interaction and result between TCK, TPK, and TK. TPACK is the expertise of utilizing technology to develop teaching strategies for many topic areas. Consequently, these bodies of knowledge were the focus of the present investigation. The framework's foundation, the TPACK element, is the interplay of all elements.

Koehler & Mishra (2009) underlined that the TPACK element differs from the understanding of all three aspects, particularly the overlap and interplay of these conceptions. Therefore, Koehler and Mishra (2009) described TPACK as:

> The basis of effective teaching with technology requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructing ways to teach content; knowledge of what makes concepts difficult or easy to learn, and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.

In this study, TPACK was used to investigate the intricacy of teachers' beliefs and knowledge on the efficient use of Technology in English language instruction. TPACK will allude to the linkages between subject understanding, teaching methods, and ICT expertise (how to do so using ICT) and the change that occurs when such areas are combined. This conceptual perspective gives a way to consider effective ICT incorporation, particularly the knowledge required to integrate ICT into English instruction properly.

Teachers must have the necessary skills and knowledge to integrate ICTs effectively into their teaching activities. It necessitates a detailed understanding defined in the TPACK conceptual framework shown in the following section.

2.7.2 The evolution of the TPACK Framework

In this context, Koehler and Mishra (2005) established the Technological Pedagogical Content Knowledge (TPACK) framework founded on Shulman's (1986) pedagogical content understanding paradigm. In the TPACK Framework, technology is incorporated into educators' understanding, skills, and capabilities (Koehler & Mishra, 2005), which serves as an extension of the PCK, characterized as a systematic way of combining technical competence with pedagogical material understanding. Shulman (1986) argued that content and pedagogy should not be segregated (Shulman, 1990). Figure 2.2 depicts an overview of these details.

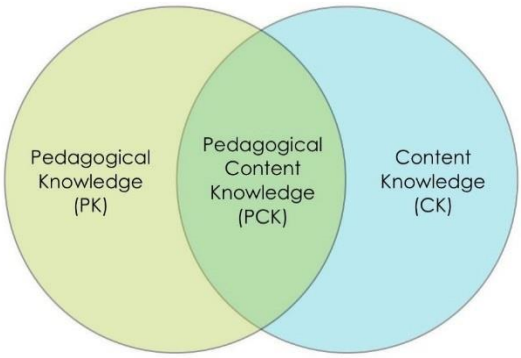

Figure 2.2: The PCK framework and knowledge elements (Mishra & Koehler, 2006)

Shulman (1987) provides a synopsis of seven knowledge categories necessary to develop adequate teacher expertise. The first three categories are content-based, whereas the other four are pedagogy-based. These classes are:

a) Content Knowledge;
b) It is the Curriculum understanding, with an emphasis on the resources and initiatives that function as educators' essential tools.

c) Pedagogical content knowledge, which is a unique blend of subject matter and pedagogy, along with their unique type of professional knowledge;
d) It is the general pedagogical understanding, specifically, broad classroom organization and management standards and procedures.
e) Knowledge about students and their attributes
f) Understanding educational environments span from the internal dynamics of the class or classroom to the administration and funding of school districts and the nature of local cultures and communities. It the
g) comprehension of educational goals, ideals, and their historical and philosophical justifications (Shulman, 1987).

PCK has been the subject of numerous investigations utilizing various approaches in numerous educational settings (Baxter & Lederman, 2002). As a result, PCK has garnered considerable interest and improvement for use in current circumstances (McCrory, 2011). Considering the advent of technology, a greater focus has been placed on the significance of effective technology exploitation in education. Multiple attempts have been made to expand on Shulman's PCK framework, incorporating technology as an additional domain of knowledge that educators must incorporate into the PCK (Mishra & Koehler, 2006; Angeli & Valanides, 2009). Scholars extended the PCK model using various constructs by defining the links between technology, pedagogy, and content. Franklin (2004) employed the electronic descriptor PCK. However, Niess (2008) referred to it as technology-enhanced PCK. Some studies also employed a variety of naming conventions and schemes, such as Niess (2008), who referred to it as technology-enhanced PCK. Slough and Connell (2006) adopted technological content knowledge, while Angeli & Valanides (2009) adopted the term

ICT-related PCK. Koehler & Mishra (2005) adopted PCK, combined it with technological skills, and reframed it to TPACK (Mishra & Koehler, 2006). However, Koehler & Mishra (2005) discovered a need for more theoretical foundations in the literature regarding the use of technology in educational settings. They asserted that with such a foundation, it is possible to grasp a more extensive understanding of technology deployment (Sheffield, 2009).

Koehler & Mishra (2005) investigated the cooperative creation of online programs by faculty and recent graduates in teacher training. Through the interaction, the participants gained a more precise grasp of the intricate web of connections between material, methodology, and innovation and the settings in which they operate. Koehler and Mishra described TPACK as a theoretical foundation of the base of knowledge educators need to properly incorporate technology into their teaching activities (Mishra & Koehler, 2006). Mishra & Koehler offered a practical explanation for why blending innovation in the classroom regularly fails. They explained that context-neutral approaches are most likely to fail since they need to emphasize technical skills. Numerous disciplines, notably teacher development, have been rapidly added to the present framework, as indicated by numerous investigations (Voogt et al., 2012). Thomson & Mishra (2007) argued that the present acronym emphasizes the existence of three categories of knowledge (technology, pedagogy, and content) while also indicating that these kinds of understanding should be viewed as an interconnected unit. Koehler & Mishra (2008) asserted that incorporating technologies into instructional strategies does not operate in isolation but within specific settings. Teachers must have the versatility to integrate information about learners, the school, the infrastructure facilities, and the surrounding environment to educate with technologies properly.

As illustrated in Figure 2.3, Koehler and Mishra (2008) added the environment to the framework as an integral component of the TPACK theoretical perspective.

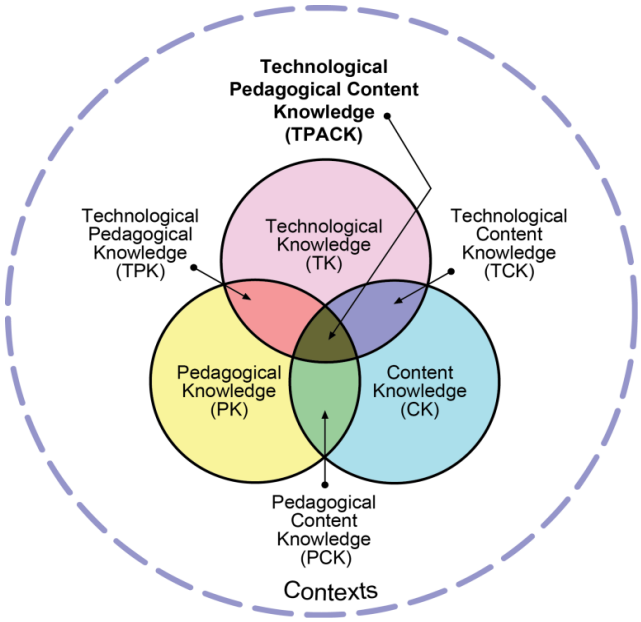

Figure 2.3. TPACK model and its cognitive elements

To comprehend the PACK framework, content knowledge, pedagogy knowledge, and technology knowledge (TK) must be understood individually.

2.7.3 Criticism of the TPACK Framework

Shulman's (1986) PCK model spawned TPACK, which has been hailed as a remarkable framework, has also garnered criticism (Graham, 2011). For example, there is some disagreement regarding the significance of TPACK and development. Studies have questioned if TPACK represents a distinct type of understanding or only the expansion of one of its aspects. According to Koehler & Mishra (2009), TPACK is an interaction between three forms of understanding and their interconnections in a specific context. The developers argued that the evolution of the three fields of knowledge (TK, CK, and PK) resulted in the evolution of TPACK. Angeli & Valanides (2009) claim that a distinct and unique information collection can be revised and evaluated independently. They further state that improvement in each component knowledge base does not

certainly boost TPACK in the absence of teaching focusing on TPACK as a distinct body of information. Academics characterize this discussion as a synthesis of the three areas of knowledge that comprise TPACK (Graham, 2011; Voogt et al., 2012). Despite the criticism of TPACK, scholars continue to view it as central to their endeavors toward effective technology implementation (Angeli & Valanides, 2009; Cox & Graham, 2009; Archambault & Barnett, 2010; Graham, 2011). There suggest further studies to address the deficiencies in the TPACK construct interpretations and to demonstrate how the concepts are interrelated.

2.7.4 The Application of TPACK in the Literature

TPACK is a crucial component of the modern education system since it includes the increasing need for the utilization of technology in schools as well as the continued emphasis on the subject matter and how to deliver it. Hence, it prepares instruction for the future and learners for technological learning in the education domain. TPACK as a paradigm has attracted numerous researchers intrigued by the efficient incorporation of technology into classroom practice. Diverse bodies of knowledge exist about TPACK. Numerous kinds of studies on TPACK have considered a variety of approaches (Koehler & Mishra, 2008; Sahin, 2011), investigating the impact of professional growth (Guzey & Rochrig, 2009; Richardson, 2012) or exploring educator development initiatives (Graham et al.,2011; Voogt et al., 2012; Wilson & Wright, 2010). Koehler and Mishra (2007) hypothesized that while educating instructors to incorporate technology successfully, it is crucial to teach technology within the framework of a book that exemplifies the strong links between innovation, Curriculum, and teaching methods.

Respondents in their design groups "demonstrated a significant shift toward developing Technological Pedagogical Content Knowledge, involving the development of deeper understandings of the complex web of relationships between content, pedagogy, and technology and the contexts in which they operate" (p. 149). They developed and improved the TPACK structure in the following years (Koehler & Mishra, 2008). They emphasized that successful digital transformation needs the establishment of TPACK, a complex, situational understanding. Besides Koehler & Mishra's (2008) study, several scholars have begun characterizing and evaluating instructors' TPACK to enhance technology integration. Nevertheless, evidence indicates that most studies on TPACK are restricted to pre-service educators (Chai et al., 2010; Schmidt et al., 2009). (Abbitt, 2011). Few studies have examined in-service educators, high school educators, and English language instructors.

Archambault and Crippen (2009) undertook a quantitative assessment of TPACK. The purpose of the study was to collect data regarding K-12 online educators' perceptions of their knowledge regarding the TPACK theoretical model. The authors developed a 24-item measure using TPACK as a foundation for the information virtual educators should possess. 596 K-12 online instructors from 25 jurisdictions in the United States participated in the study to assess their understanding of the three dimensions specified by the TPACK model: PK, CK, and TK, as well as the mix of each area. The study's findings demonstrated that teachers' understanding of the TPACK paradigm was greatest concerning the CK, PCK, and PK areas, suggesting that they felt the most confident about their mastery in these areas. In addition, a modest association was seen between the realms TK and PK and CK and TK, highlighting the distinction between these areas.

In comparison, there was a significant association between CK and PK, which calls into question the uniqueness of these areas. Their research improved the comprehension of K-12 online educators' perspectives on TPACK understanding. The study provided a starting point for assessing and describing the TPACK components of K-12 virtual educators. In Greece, a comparable study on measuring TPACK assessed secondary computer science educators' competence in the three areas and the mix of each among the categories (Doukakis et al., 2010). The study aimed to determine the extent of technological application among educators. The TPACK structure questionnaire was utilized. The study results showed that Computer Science educators valued content knowledge more than most cognitive subdimensions, indicating that the CK for Computer Science was outstanding.

In addition, instructors revealed high levels of TK, TPK, TPACK, and PK but comparatively low levels of PC and TCK, suggesting that they are less satisfied with their TCK and PCK. Only 62 percent of educators utilized technology equipment and computer laboratories, even though computer science teachers professed competence in the characteristics mentioned earlier. Participants cited time constraints, the number of participants per classroom, and a need for sufficient technology and teaching resources as grounds for refraining from using computer laboratories. Based on their results, the study argued the necessity of teacher preparation courses on the most effective ways to integrate digital tools into teaching approaches (Doukakis et al., 2010). Undoubtedly, several of these studies proposed links between the use of technology and instructors' TPACK. Nonetheless, additional study is required to establish the dynamics of these interactions inside and across multiple settings, such as technology type and topic matter.

According to the previous studies, more needs to be documented concerning a study evaluating the relationship between TPACK and ICT integration that has addressed the adoption of ICT by high school English Language Instruction settings in Kenya and studied disparities within curriculum areas. Investigating such domains could contribute to the existing body of evidence about adopting TPACK for more efficient and effective Blended learning by contributing to the existing body of evidence. In addition, implementing the TPACK model to the ICT skills of Kenyan English language instructors remains to be determined. Thus, the present study is the first to use TPACK to examine teachers' ICT expertise in English Language classrooms.

The availability of technology alone cannot determine the success of technological Integration. However, it must determine whether or not the teachers' expertise and aptitude in selecting and efficiently employing technology is compatible with learning content and pedagogy (Bilici, Guzey, & Yamak, 2016). To define such a skill or aptitude, the proper technology integration model is Technological Pedagogical Content Knowledge (TPACK) (Joo, Park, & Lim, 2018). The core and integration components (a mixture of the essential components) comprise the TPACK framework. The essential components consist of Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). In addition, the integration components include Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical and Content Knowledge (TPACK) (Koehler, Mishra, & Cain, 2013; Valtonen, Kukkonen, Kontkanen, Makitalo-Siegl, & Sointu, 2017; Valtonen et al., 2018). These seven elements are intertwined and cannot be separated. As a result, a teacher must acquire fluency and cognitive flexibility in each primary component and interactions between

them to have practical TPACK components. Finally, they can create effective technology integration strategies (Koehler et al., 2013). In the literature, there are numerous definitions for TPACK. Koehler and Mishra (2009) define TPACK as the ability to use technology to support pedagogical practices, to assist students in solving challenges they experience during learning, to consolidate existing information, and to work on technology at the point of sustaining new information.

2.8 Teachers' TPACK level and ICT Integration

Before the development of TPACK, the innovative educational discourse needed a cohesive theoretical foundation (Mishra & Koehler, 2006). As a consequence, the creation of the TPACK paradigm has swept the innovation domain (Cox & Graham, 2009), and other academics have created associated curriculum materials, instructional design frameworks, forms of assessment, as well as improvements to the structure altogether (Schmidt et al., 2009). Nevertheless, while TPACK is theoretically valuable, particularly when envisioning how the attributes of technologies may improve innovation and instruction, it requires further research to determine whether technologies, materials, and teaching methods combine to generate the framework's distinct domains. Archambault and Barnett (2010) investigated the basis of TPACK, which they characterized as the knowledge of the links and connections between or among course material, technical skills, and pedagogical skills to enhance students' understanding (Koehler & Mishra, 2005). They employed two questionnaire surveys to quantify TPACK, one designed for undergraduates (Schmidt et al., 2009) and the other for online instruction (Archambault & Crippen, 2009). The findings suggest that subscales with alpha values between 0.89 and 0.70 had acceptable internal consistency (Morgan, Leech, Gloeckner, and Barnett, 2011).

In addition, the results suggested that the seven widely acknowledged mutually distinct realms of the TPACK concept may not materialize in practice. In particular, respondents mentioned three aspects: pedagogical content, technology-curricular content, and technical knowledge.

Practitioners revealed strong linkages between pedagogical content knowledge and expertise, as demonstrated by the intersections between responses to the items on content pedagogy. There was a relationship between concerns about technical content, technological teaching methods, and technological pedagogical material; moreover, participants needed to differentiate between these concepts. The research findings suggested that assessing these areas was initially complex and confusing, maybe due to the assumption that they are not distinct. The findings of the present study corroborated these findings. It prompted investigators to consider what type of framework could more aptly depict teachers' pedagogical and content knowledge and how such a model could help inform higher education institutions of instruction and teacher training programs in training future teachers for the difficulties of instruction in the twenty-first Century.

Moradkhani et al. (2013) investigated the primary components of the pedagogical body of knowledge of English language teachers. The results revealed that prospective teachers' instructional knowledge comprises various categories, such as knowledge-related disciplines and comprehension of ELT theories and skills. The results likewise found no statistically significant differences between the categories presented by the three groups. The study concluded that the eight discovered macro-categories could be a stepping stone toward a more structured method for the training and selection of

language educators. Candidates for educators, for instance, must be chosen among the teacher educators with more eloquent and extensive expertise. In this respect, solid educational credentials may indicate instructional knowledge, but other reliable methods can also be considered. Additionally, candidates can participate in a training scheme whose content is founded on the eight macroeconomic groups. Due to the rapid expansion of digital media, innovation has constituted an integral aspect of pedagogical and subject knowledge. Prior conceptualizations of understanding, in which innovations were generally stable and regulated, necessitated a change in teachers' attention to a vastly different subject. Technology-based teaching necessitates comprehension of the depiction of constructs using innovations; pedagogical methodologies that use innovations constructively to teach subject matter; understanding of what tends to make constructs complicated or simple to grasp, and how technologies can enhance remedy a few of the difficulties that learners encounter; understanding of students' previous understanding and suppositions of epistemology; as well as an understanding of how innovations can be employed to capitalize on existing understanding and build novel knowledge. TPK is understanding the presence, elements, and capacities of technological developments as they are utilized in education and learning contexts, as well as understanding how teaching can aid in accomplishing the intended outcome as a result of employing particular innovations (Deshmukh, 2013).

2.9 Teachers' Beliefs, Thoughts, and Attitudes towards Integration of ICT in Teaching English

This section examines secondary school teachers' ideas, thoughts, and perspectives regarding incorporating ICT in teaching English. The subsequent review will examine teachers' beliefs, opinions, and dispositions.

2.9.1 Teachers' Beliefs about ICT as a Teaching and Learning Tool

Early-formed beliefs are hard to change, regardless of the face of contrary information (Nisbett & Ross,1980). Those very belief systems are composed of episodically captured material obtained from significant situations in a person's private encounter (Nespor, 1987); consequently, educators learn a great deal about instruction from their extensive encounters as students, what Lortie (1975) termed the "apprenticeship of observation." Mainstream research demonstrates the impact of instructors' student experiences on their perceptions (Holt Reynolds, 1992).

Clark and Peterson (1986) identified the investigation of teachers' implicit assumptions and belief systems as a critical segment of studies on teacher cognition. Nevertheless, there has been little unambiguous debate in the literature on how the investigation of belief systems may differ from the study of linked psychological concepts, including knowledge, conceptualizations, and perceptions. Pajares (1992) significantly contributed to this topic with the most thorough literature evaluation on teachers' perspectives accessible. As he explains at the beginning of his work, scholarship on teachers' convictions had been limited by the absence of precise characterization of the idea, despite the widespread recognition of the importance of belief in instructors' perceptions, judgments, and instructional behaviours. In pursuit of such a description, Pajare (1992) argues that it is inappropriate to speak broadly about instructors' ideas, as this phrase is just vast. According to Van Driel et al. (2001), most earlier reform proposals could have been more effective as their top-down strategy failed to consider educators' current understanding, attitudes, and beliefs. Consequently, a comprehensive investigation of teachers' ICT ideas in education might shed light on the requirements for successful training.

Searching out effective methods to equip instructors to incorporate ICT as an integral element of their daily teaching tactics has been a primary concern in the majority of nations around the globe (Hennessy et al., 2005). Jimoyiannis & Komis (2014) studied the impact of an ICT training scheme implemented in Greece as part of the Information Society Programme (Information Society, 2003), which also investigated teachers' thoughts and beliefs towards ICT in the classroom. Generally, the sampled teachers were receptive and prepared to accept ICT as a learning and teaching tool, according to their conclusions. They identified three distinct groups of instructors who demonstrated a sensible approach across study variables: a group with very positive views toward the use of technology in education, a group with generally negative views, and a team with indifferent views. They also discovered that personal characteristics, such as subject material, academic experience, ICT use or expertise, and sexuality, significantly correlate with particular implications for teachers' ICT preparedness.

Studies on how perception affects the Integration of ICT in education show that what teachers think about using technology affects their acceptance and subsequent application in their activities (Wambiri & Ndani, 2016). They argue that the government's investment through the provision of devices needs to address teachers' attitudes and beliefs to yield the desired results. In a study to assess teachers' beliefs, attitudes, self-efficacy, computer competency, and age, Wambiri and Ndani (2016) found that younger teachers had a highly positive attitude toward technology. This finding could be attributed to the younger teachers receiving technology training in the teacher training colleges. However, Bebell et al. (2004) observe that teachers' age and years of service should be used and interpreted sparingly concerning technology use in schools.

They argue that the difference by age would be insignificant in some specific technology uses if a multi-faceted approach were to be applied in measuring technology usage. A study on teachers' perception of the usefulness of ICT in schools was also conducted by Buliva (2018) in Vihiga County in Western Kenya. The study that used a convenient sample of teachers from the County used the variable of gender to determine whether there were statistically significant differences between male and female teachers. The results obtained from an independent samples *t*-test suggested no statistically significant difference between the mean scores of male teachers. The study concluded that there was no statistically significant difference in perception of the usefulness of computers between the teachers by gender in the County. While studying the implementation of the laptops project in public primary schools, Muinde and Mbataru (2019) found that 68.5% of the sampled teachers had a high perception of the use of laptops in their teaching and learning. However, they established that 39% of the teachers felt that the time allocated for integrating technology was inadequate and that most of their lessons were spent assembling the gadgets. The perception of time and ICT integration was also noted by Heinrich et al. (2020) in a study on the potential and prerequisites of effective tablet integration in rural Kenya.

2.9.2 Teachers' Thoughts about ICT as a Teaching Tool in English Instructions

The teachers' cognition domain had altered significantly by 1986 relative to 1975. Clark (1986) and Clark and Peterson (1987) explored the evolution that occurred throughout this time. Clark (1986) also remarked that the most significant conceptual advancements in studies on teacher thought to have to do with how researchers view the teaching setting. He compares the older understanding of the classrooms as a distinctly circumscribed yet complicated task setting with the recognition in 1986 that classrooms

and schools are the centres of psychological, social, political, metaphysical, and physical acts rooted in and influenced by the word. This issue for the broader context of instruction contrasts with previous work on decision-making, wherein teachers' behavior was discussed and construed without reference to the socio-psychological circumstances where they took place. In addition, many previous studies of educator thought were carried out in the lab and, therefore, in isolation from the context-specific factors that influence educators in virtual educational environments.

2.9.3 Teachers' Attitudes towards ICT Integration in Teaching English

While studies are looking at knowledge and readiness among teachers (e.g., Avelino & Ismail, 2021), there is a need to study attitudes regarding technology. Albirini (2006) says that attitude consists of three components: emotional, cognitive, and behavioral. The affective element is the emotional case of the person; the cognitive element is the transparent behavior corresponding to the individual's understanding. A person's general feeling for technology or ICT and specific computer and Internet activities is the attitude toward technology integration (Smith, Caputi & Rawstone, in Abedalaziz, Sharir, & Chin, 2013). Considering all these components is vital to understanding one's attitude toward technology integration. Studies in information technology have also consistently found that user attitudes are crucial elements influencing the system's success (Hashim, Yunus, & Embi, 2016). Focusing on teachers' attitudes is necessary because teachers have a large influence in choosing how much technology they use or do not use in the classroom, and identifying negative teacher attitudes and fostering favorable ones is essential if integrating technology in the classroom will be successful (Gilakjani & Leong, 2012). Teo et al. (2016) also claimed that teacher attitudes regarding technology integration in the classroom are critical to its effectiveness.

This was also reinforced by Semerci & Aydin (2018), who said that teachers' attitudes significantly impacted their usage of technology in the classroom. Thus, teachers' attitudes have a key role in their technological Integration in the classroom. While teachers agree that technology may assist their students to feel comfortable with certain technologies, teachers must first experiment with them before attempting to integrate them into the classroom (Constantine, Roowa, Szostkowski, Ellis, & Roehrig, 2017). Chiu and Churchill (2016) collected data from secondary school teachers using questionnaires regarding their views, attitudes, and anxieties regarding utilizing mobile devices in the classroom before and ten months after adoption. Teachers were given professional development on using mobile devices in their classrooms before their introduction. They discovered that while using mobile devices did not enhance teachers' views toward teaching with mobile devices, it did reduce anxiety levels. Because technology may help them reach their instructional goals, math and science instructors' questionnaire ratings improved significantly regarding computer self-efficacy, perceived utility, and perceived ease of use.

According to Buabeng-Andoh (2012), despite challenges such as a shortage of hardware and software, teachers' positive attitudes are a determinant in the successful Integration of technology in learning activities. Furthermore, according to Kimmons & Hall (2018), teachers' views and values may impact Integration more than their expertise. In other words, the attitude of the teachers might have a moderating effect on the successful Integration of technology into learning activities. In Malaysia, the latest data on teachers' attitudes toward technology competencies and English teachers' TPACK is still scarce, and it primarily consists of descriptions. Several studies on TPACK are still in the process of describing and focusing on specific materials, such as

investigating science teachers' perceptions of technological pedagogical content knowledge (TPACK), focusing on teachers' perceptions of the affordances of technology application in instruction (Mai & Hamzah, 2016; Chieng & Tan, 2021), Mathematic teachers (Belgheis & Kamalludeen, 2018, Bakar, Maat, & Rosli, 2020), Art teachers (Rahmat & Au, 2017) and English teachers (Rauf & Suwanto, 2020). According to these studies, there appears to be a gap to be filled between teachers' attitudes toward technology integration and English teachers' TPACK. These variables are related and influence one another. There was also no data on teachers' attitudes toward technology integration as a moderator variable in the relationship between technology competencies and TPACK.

Samuel and Zaitun (2007) investigated the accessibility of ICT facilities and the ICT competence of English language teachers. The purpose of the study was to assess if Malaysian teachers could integrate ICT into the learning and teaching of the English language. Similarly, Melor (2007) studied the aspirations and practicalities of Malaysian ESL instructors' usage of technology in the classroom. The purpose of the study was to examine the usage of ICT, the variables that influence the use of ICT, and teachers' perceptions of ICT skills in the classroom. Davis' Technology Acceptance Model (TAM) was utilized to determine ICT perceptions and contributing factors to the use of ICT in the classroom. The outcomes revealed that most teachers viewed ICT in ESL instruction positively. According to the teachers, using ICT in the classroom facilitated new learning opportunities. In addition, many educators had computers at home, which positively affected their attitudes toward ICT, such as more excellent knowledge, self-assurance, and enthusiasm. Approximately 76 percent of teachers acknowledged having access to only one computer room, which posed a significant

barrier to incorporating ICT into the classroom. As a result of low-quality hardware, 75 percent of teachers could not search the web for the material. During the conversation, the teachers wanted knowledge and training to assist with fundamental concerns and investigate potential solutions. In the other two studies (Samuel & Zaituni,2007; Melor,2007), English teachers had a constructive mentality but lacked abilities since they were unfamiliar with application technologies and had inadequate facilities. Teachers lacked the knowledge and experience necessary to offer assistance and direction to better the learning experience. Implementing ICT-related initiatives requires and benefits from teachers' positive attitudes toward ICT. The educators' positive outlook will also assist them in acquiring input and conveying the material to the learners. A positive outlook will facilitate the acceptance of transformation. Efficient application of ICT initiatives hinges on teachers' preparedness and supportive sentiments toward ICT; teachers who view it as valuable for improving learning will incorporate ICT more smoothly (Papanastasious & Angeli, 2008).

Pamela & Noraza (2007) examined the obstacles ESL teachers had while integrating ICT into their learning and teaching routines and the adjustments they had to make to adapt to the new educational setting. Teachers were surveyed to determine their perspectives on ICT and how ICT aids instruction. The teachers believed that ICT is an essential and beneficial instrument to assist them in transmitting or delivering their instruction engagingly because students anticipate classes done with multimedia instead of the conventional form of instruction. As they lacked the skills and knowledge, many teachers acknowledged that they had to devote more time to preparing to use ICT. While studies are looking at knowledge and readiness among teachers (Avelino & Ismail, 2021), there is a need to study attitudes regarding technology.

Albirini (2006) says that attitude consists of three components: emotional, cognitive, and behavioral. The affective element is the emotional case of the person; the cognitive element is the transparent behavior that corresponds to the individual's understanding. A person's general feeling for technology or ICT and specific computer and Internet activities is the attitude toward technology integration (Smith, Caputi & Rawstone, in Abedalaziz, Sharir, & Chin, 2013). Considering all these components is vital to understanding one's attitude toward technology integration. Studies in information technology have also consistently found that user attitudes are crucial elements influencing the system's success (Hashim, Yunus, & Embi, 2016). Focusing on teachers' attitudes is necessary because teachers have a large influence in choosing how much technology they use or do not use in the classroom, and identifying negative teacher attitudes and fostering favorable ones is important if integrating technology in the classroom will be successful (Gilakjani & Leong, 2012).

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2.10 Related Studies

Modernization and expeditious technological adjustments have created a knowledge-based economy in the 21st Century. Information and communication technologies (ICTs), including radio and television, and the current digital technologies, such as computers and the Internet, have been touted as powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital

workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life (Pushpanathan, 2011). Thereupon, governments have invested heavily in integrating ICT into education at all levels to equip learners with the skills needed for modern life and beyond (Wambiri & Ndani, 2016). Technology enables teachers to adopt classroom activities, thus enhancing the language learning process. Technology continues to grow in importance as a tool to help teachers facilitate language learning for learners. Research has demonstrated that ICT in education helps create opportunities for learners to develop 21st Century skills, but this depends on teachers' digital literacy (UNESCO, 2012). Studies on the capacity of teachers in primary schools in Kenya show that, despite the policy formulation for ICT in education and financial investment, the integration of technology in Kenyan classrooms remains low (Piper et al., 2015).

In a study by Abobo (2018), similar sentiments were made by teachers, who asserted that two-thirds of the respondents could not integrate technology into teaching the Kiswahili language. Further, Omolo et al. (2017) also found that student-teachers could not practice using technology in teaching Kiswahili in classrooms after learning from their tutors. Both studies suggest that the teachers were willing to apply technology in their teaching after going through training sessions. However, in some cases where teachers received training, it was basic computer literacy or computer programming such as Microsoft Office and Excel that did not equip them for technology integration in classrooms (Mwangi & Khatete, 2017). Comparably, Wambiri and Ndani (2016) opine that their analysis of documents on primary teacher training in Kenya proved a gap in the pedagogical use of ICT.

A study by Muinde & Mbataru (2019) in Machakos County found that 85% of teachers had received ICT training from the ministry of education. However, 62.3% of the trained teachers felt that the training was inappropriate for teaching and learning. The findings in this study corroborate Majumdar (2005), who observed that most teachers who receive ICT training as part of the professional development (PD) programs still lack the self-reliance needed to integrate ICT in teaching and learning because, in most cases, due to time limitations, the training only focused on computer applications.

Murithi and Yoo (2021) researched teachers' use of ICT in implementing the competency-based Curriculum. The study has demonstrated that ICT in education helps create opportunities for learners to develop 21st Century skills. The education sector all over the globe plays a pivotal role in preparing societies to face a technologically-oriented working environment, hence incorporating ICTs into the classroom has been considered deeply to create a more enabling environment for improving teaching and learning. However, the accelerated growth of modern technology creates new challenges in various professional development and practice arenas, including the education sector (Murithi & Yoo, 2020). Adopting new or innovative technology in teaching is part of the obstacles in the present digital era. However, the mere adoption of technology will not be enough to meet learners' needs. Teachers' competencies in integrating technology into their teaching can form a bridge to underpin the learners in maximizing their achievements, therefore preparing teachers for information and communication (ICT). Integration in class could support them by sparking their professionalism. The Ministry of Education (2012) admitted that higher education had not achieved the desired goals of ICTs incorporation in schools despite outstanding achievement and substantial economic investment to integrate educational technology.

The literature reviewed revealed that most studies on ICT integrations targeted primary school teachers, and the outcomes looked at factors influencing the Integration of ICT in teaching and learning. Most academic research on ICT has primarily concentrated on fundamental ICT as a curricular subject rather than a pedagogical tool. Wanjala (2016), for instance, explored the incorporation of ICT in Mathematics. Fewer researchers have explored teachers' cognition in implementing ICT in English language instruction, particularly in secondary schools in Nairobi County (Ammande et al., 2020). Therefore, there is evidence that some studies on the use of ICT in teaching languages have been conducted in secondary schools in Kisumu County (Owino, 2016 and Kirinyaga County (Mugweru, 2018), respectively. They tie an investigation to the ongoing discourse in academia, filling loopholes and expanding on previous research (Cooper, 2010; Marshall & Rossman, 2011). They establish a framework for defining the significance of the study and a standard for contrasting the findings with those of other studies. Therefore, reviewing relevant studies provided the researcher with a framework for producing academic literature on a particular topic, often organized from the broader issue to the more particular problem that leads right to the research methodology.

Deshmukh (2013) examined an instructional strategy for incorporating ICT in English language instruction. This research aimed to investigate the pedagogical strategies employed by English language instructors. She argued that instructors' pedagogical attitudes and values significantly shape chances for technology-mediated instruction. She also stated that when English instructors spontaneously create the relationship between existing teaching methods and ICT skills, the usage of ICT will result in participatory, adaptable, and creative ELT.

The usage of ICT throughout the Curriculum has created new beliefs that alter ELT's instructional logic. To successfully implement ICT into the English syllabus, English teachers must possess basic ICT skill sets and cultivate teaching methods; ICT requires the transformation of an instructor from a traditional position to a facilitator (Deshmukh,2013). Deshmukh (2013) observed that the incorporation of ICT will not only contribute to the diversity of English content, settings, instructional strategies, and the learning context. ICT will expand the boundaries of English instruction, defining it as interactive, adaptable, and creative. The combined efforts of teachers, educators, and innovation will ensure a positive outcome for ELL students in their scholastic and professional lives. This study has supplied the investigator with significant evidence of the importance of technological content subject knowledge in incorporating ICT into English language instruction. Nevertheless, it has not adequately described the methodology, data collection, and analysis processes. Furthermore, the investigation was more focused on the outcome than the procedure. Since the preceding study was conducted in India, an entirely different setting, the present study aimed to assess teacher knowledge of Integrating ICT in English language instruction in Kenya.

Suwanttosom (2010) sought to determine how Thai teachers perceive technology-mediated EFL training. The primary objective was to explore technology-using educators' teaching philosophies and practices. The results demonstrated that university EFL teachers' perspectives on innovation were heavily influenced by their classroom setting and personal attitudes toward English language acquisition. Teachers incorporate technology into their lessons and apply basic guidelines or maxims. Moreover, numerous sociocultural factors appeared in teachers' perspectives on technology application in their EFL classroom situations, generating theoretical

consequences for how educator cognition is conceived. Among the most significant policy implications are the need to motivate EFL educators to reflect on their instructional philosophies concerning their working environments, the importance of empowering teachers with frameworks of innovation use within tertiary EFL instruction, and the enhancement of available technologies to deliver local practices. The technologies' consequences include applying numerous context-specific tools and techniques to extract instructors' underlying attitudes and perceptions towards technology-mediated instruction.

Similarly, Attia (2011) conducted a qualitative study on teacher cognition and ICT utilization in instructing Arabic to non-Arabic learners. Results indicated that educators' cognitions regarding learning and teaching and themselves as Arabic language experts influenced innovation to use, and resolute responses to perceived difficulties revealed variances between professionals working in a similar environment regarding incorporating ICT into their practice. Methodologically, this study employed a qualitative research design. The present study employed a sequential mixed methodology. In addition to various data collection methods, classroom observation was employed in the research, as mentioned earlier. Only questionnaires and an in-depth interview guide were utilized in this investigation. The backdrop of the preceding research was the instruction of Arabic to students of other dialects; the present study examined teacher cognition for integrating ICT in the instruction of English.

Kisirkoi (2015) investigated teachers' technical knowledge, the reason computer systems were utilized in the institution, and the elements that contributed to the success of the institution's use of computer systems as a teaching-learning asset.

The research determined that both students and educators were computer savvy and capable of using computer programs for learning and teaching. It was determined that the learning method was practical, with instructor engagement and activity-based learning. Motivating factors were a desire to improve teaching and a visionary, supporting school administration. The school implemented ICT as a training tool, improving the educational environment and results. Based on the school development strategy defined by Tonduer (2007) and the TPACK concept (Koelher, 2011), a case study methodology was utilized for this study. The results suggested that all surveyed teachers claimed to be computer literate. Additionally, all newly hired instructors attend night-time computer skills training, and after around two months, they gain basic digital skills. It was determined that the most significant motivator for ICT integration in the classroom was teachers' passion for teaching, with supporting leadership and management playing a second significant role.

Amuko (2015) surveyed the use of ICT in mathematics learning and teaching in Nairobi secondary schools. According to the findings, instructors confront significant obstacles, such as expanding their knowledge and technical skills and self-training in implementing ICT in their classrooms. Despite their excitement, teachers who lack development support are less likely to integrate technology into their classrooms, according to the findings. Consequently, the study suggested that educators undergo training on utilizing the information system regularly and at least once every six months at the Zone level.

Wanjala (2016) examined ICT pedagogical incorporation in secondary mathematics instruction. The study was founded on Roger's concept of diffusion of innovations.

According to the findings, supporting professional growth in ICT application has been the primary concern for many school instructors. Furthermore, the results revealed that instructors who utilized ICT in a given scenario were much more likely to receive continued support for their use in math. The restricted use of ICTs in teaching mathematics was linked to poor self-confidence, inadequacy in utilizing ICT, and a lack of access to relevant software materials and tech assistance. The study suggested that schools should be equipped with ICT resources, content-specific applications, and tech support. Educators also needed professional growth in ICT pedagogy since they lacked the necessary knowledge and abilities to implement these technologies. Examining the literature shows that ICT incorporation has been implemented. Even though its application has widespread rewards, the pace of its deployment and the environment and substance of its use vary. According to the literature, numerous nations have increased their efforts to promote the incorporation of ICT in the educational Curriculum. Nonetheless, several studies have demonstrated that obstacles have adversely affected and hindered the deployment and application of ICT in high schools. Several studies focus substantially on the application of ICT in education, but it is necessary to comprehend instructors' understanding of ICT integration in English language education.

Mugweru (2018) conducted a study on the Integration of Information and Communication Technology in Teaching English in Secondary Schools of Kirinyaga East, Kirinyaga County, Kenya. The purpose of the study was to establish the Integration of ICT concerning the teaching English language in secondary schools of Kirinyaga East Sub-County Theoretical framework involved Constructivism. At the same time, the conceptual one adopted E-learning Acceptance Model (E-LAM) for

teaching and learning. Research findings showed the majority of teachers were prepared to use and operate ICT facilities; many computers were not installed with educational software for teaching English; the majority of teachers rarely integrated ICT; some ICT facilities were inaccessible to both teachers and students; tutors and learners appreciated ICT integration but many schools do not have ICT technical support staff. The study concluded that although teachers were prepared and competent to use ICT facilities, lack of appropriate software, inaccessibility of ICT facilities, and shortage of ICT technicians have gravely hindered the dissemination of skills. The study, however, has not indicated whether teachers of English surveyed in secondary schools in Kirinyaga County were utilizing ICTs in their teaching. The study used the constructivism paradigm, while the conceptual adopted the E-learning Acceptance Model (E-LAM) for teaching and learning. The current research sought to determine whether teachers of English in secondary schools in Nairobi County were integrating ICTs in their classroom instructions and their cognitions towards integrating ICT in teaching English. This study was anchored on pragmatism as its philosophical paradigm underpins the TPACK framework and Teacher Cognition model.

Vijayan & Joshith (2018) studied technological pedagogical content knowledge: a framework for 21st-century teacher cognition. The study aimed to provide an updated understanding of Technological Pedagogical Content Knowledge (TPCK) or TPACK, its benefits, and challenges, exploring TPCK conceptually through the lens of a twenty-first-century educator. The study concluded that TPACK is a full-fledged knowledge framework for thinking about the type of knowledge that teachers should have to integrate technology into the teaching-learning process and ways of developing this knowledge. TPACK framework has a wide range of benefits that curtains the

challenges for its implementation. TPACK Framework renders instruction of higher quality and transmits reality using simulation. It is learner-oriented, and the teacher acts as a facilitator. Using TPACK as a framework for teacher knowledge could positively impact 21st-century education as it comprises meshed knowledge of content, pedagogy, and technology. In the 21st Century, there is an urgent need to reframe our teacher preparation practices and propose a TPACK framework that better prepares new-era teachers to mold their teacher Cognition to provide quality education.

Mutai (2021) conducted a study on the Integration of Information Communication Technology in the Teaching and Learning of Engineering Courses in Kenya: A Case of National Polytechnics. The study aimed to investigate the status of ICT integration in teaching and learning as an innovative approach to address the challenge of engineering training in National polytechnics in Kenya. The study employed a mixed method approach that combines quantitative and qualitative techniques, anchored on the constructivist and guided by technology, organization, and ecological theory. The research tools used for data collection were questionnaires, interviews, and observations. The findings revealed that over 75% of the trainers were competent in ICT basic knowledge and internet skills; 66% of the trainers were skillful in multimedia and advanced ICT skills, while an average low of 20% could use ICT for teaching and learning in both theory and practical lessons. The study concluded that the trainers had a positive perception of ICT utilization but inadequate ICT infrastructure, which could be attributed to the low ICT integration in the teaching and learning of engineering courses. However, the study was interested in how trainers use technology in the classroom and targeted only polytechnic trainers. The current study was mainly interested in whether teachers of English in Nairobi County integrate ICTs in their

classroom instructions and their perceptions towards using ICT in teaching English. Indembukhani (2021) studied the Integration of information and communication technology and its contribution to teaching English in secondary schools in Kisumu county, Kenya. This study aimed to assess the Integration of ICT and its contribution to teaching English in secondary schools in Kisumu County. The researcher adopted Bruner's constructivism theory (1990) to guide the study. The study revealed that teachers lack ICT pedagogical integration competence in teaching English, Integration of ICT is at the applying level. It is not yet transforming; teachers do not apply effective ICT integration strategies in teaching English. The study concluded that: the teaching of English is ineffective due to a lack of teacher competence; teaching of English does not benefit maximally from the current level of ICT integration; teaching of English has not effectively collaboration, communication, and interaction strategies offered by ICT; ICT integration face several challenges; ICT as minimally contributed to the teaching of English. This study focused on how teachers of English integrate ICTs in teaching in secondary schools in Kisumu County and used document analysis. The current study focused on whether teachers of English in secondary schools in Nairobi County use ICTs in their teaching and what their Cognition is. It was important for the current study to find out whether teachers of English incorporate ICTs in their English classroom instructions before looking at how they utilize the ICT resources.

Azhar & Hashim (2022) investigated the Level of ESL Teachers' Technological Pedagogical Content Knowledge (TPACK) Skill and Attitude toward Technology. This study aimed to examine the TPACK skill and attitude towards technology among ESL teachers in Malaysia. The study used a metanalysis to analyze the data. The findings show that the ESL teachers' TPACK level is amazingly high.

It also shows that the teachers' attitude towards technology is promisingly significant. The findings also disclosed a significant relationship between ESL teachers' TPACK skills and attitudes toward technology. While the study used a metanalysis, the current study used a mixed methods approach. It used a questionnaire and interview schedule to collect the research data as the researcher suggested that future research studies incorporate the administration of the questionnaire to analyze attitudes. The review of related literature on the Integration of ICT in English Language Teaching and the massive initiatives taken by the government, researchers, and various organizations of Kenya motivated the researcher to explore the ground-level reality of the implementation of policies and initiatives of ICT in Education by studying the cognitions of the secondary school teachers English in Nairobi County towards ICT integrated ELT and their TPACK level during its real-time implementation.

A wealth of research involving technology use in World Language Teacher Education (WLTE) has mainly focused on enhancing teachers' practices. Most studies have focused on the provision of ICT infrastructure and teachers" perception; however, minimal attention has been given to teachers' cognition of the integration of ICT in teaching English. It has hampered the development of appropriate practical strategies for the effective integration of ICT in teaching English in secondary schools. The purpose of this study was to assess the integration of ICT and its contribution to the teaching of English in secondary schools. The study of knowledge systems of teachers of English languages as they relate to technology integration to support language teaching has received little attention. This study aims to fill the current literature gap by presenting a theoretical framework that explains technology integration in English language teaching and teachers' cognition using Technological Pedagogical Content

Knowledge (TPACK) as a conceptual framework underpinned by the elements of teacher Cognition. Nevertheless, there is a dearth of research concentrating solely on teacher understanding of incorporating ICT into English language instruction. In addition, the majority of current findings are needed to provide an insight into the current predicament concerning teacher knowledge of integrating ICT in English language instruction in high schools in Nairobi County, where the knowledge of participants in the study may have varied depending on the context, duration, and subject matter. In addition, most of the examined studies were conducted in industrialized Western nations, in environments distinct from Nairobi County. As the application of ICT in education gains importance, school systems around the globe are under mounting pressure to employ ICTs to educate students on the information and skills required for a future knowledge-based society; nevertheless, there is little study on ICT integration in teaching English especially in secondary schools in Nairobi County, hence the need for the current study.

2.11 Chapter Summary

The chapter summarises the research on essential elements related to the present study, such as teachers' knowledge in language instruction, pedagogical skills, technology-mediated learning, teachers' preconceptions about innovation use in the English classroom, incorporating ICT into language learning, teachers as crucial factors for fruitful ICT assimilation, the TPACK roadmap, and teachers' belief systems, thoughts, and sentiments toward ICT incorporation. The researcher has reviewed literature globally, regionally, to locally in context to the study objectives. Contrary to the present study, most of the reviewed studies (Wambiri & Nadani, 2016; Mwangi & Khatete, 2017; Muinde & Mbataru, 2019; Oyugi, 2020); Murithi & Yoo, 2021) and others had

their focus on ICT integration in teaching and learning process in primary schools. However, a few studies focused on secondary schools (Mugweru, 2018; Indembukhani, 2021) have major contextual differences from the proposed study. As noted by (Azhar & Hashim, 2022), most of the studies were done in countries that have better ICT infrastructure as compared to some public secondary schools in Nairobi County, Kenya, focusing on the provision of ICT infrastructure and teachers' perceptions; however, minimal attention has been given to integration off ICT in teaching English**.** It has negatively impacted the development of appropriate practical strategies for implementing ICT and its role in teaching English in secondary schools in Kenya. Azhar and Hashm's (2022) study dealt with the level of ESL teachers' technological pedagogical content knowledge (TPACK) skills and attitude towards technology in Malaysia with access to ICT resources and the Internet in their homes and schools; most were highly trained in ICT. Similarly, a study by Sutter and Kihara (2019) involved teachers from the vast and partially remote Baringo County in Kenya, where some lessons are held without physical classrooms. Thus, the findings from such studies cannot be assumed to hold for secondary schools in Nairobi County; hence, this study was conducted against such a background to address these gaps.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the philosophical underpinnings of the study, research design, research methodology, the study area, study population, sample and sampling procedures, data collection instruments, reliability and validity, data gathering procedures, data analysis, and ethical considerations.

3.2 Philosophical Paradigm

While philosophical notions remain mainly concealed in inquiry (Slife & Williams, 1995), they continue to impact research practice and must be recognized. A researcher's perspective affects the research methodology (Creswell, 2014). Research philosophy is a theory or perspective regarding collecting, analyzing, and applying evidence on a specific subject. A paradigm is a collection of opinions about the world's existence and how humans may comprehend it. Jwan and Ong'ondo (2011) describe ontology as the ultimate reality or the author's ideas concerning truth or understanding. Epistemology is the acquisition of information instead of what is thought to be true and comprises numerous ideologies and disciplines. Based on this viewpoint, science aims to transform assumed things into recognized things. Bryman (2004) defines a paradigm as a set of assumptions and specifics that determine what should be examined, how the inquiry should be conducted, and how the outcomes should be evaluated. Frameworks are contradictory viewpoints or dogmas that mirror and inform the decisions made by academics. Positivism, transformational, pragmatism and constructivism are the four basic philosophical frameworks. This research was motivated by pragmatism as the philosophical foundation to describe teachers' perceptions of Integrating ICT in English instruction in high schools in Nairobi. As a philosophical foundation for mixed

methodology studies, Patton (1990), Tashkkeri & Teddlie (2010) and Morgan et al. (2011) emphasize the significance of pragmatism for concentrating on the study topic in studies in social sciences and employing pluralistic strategies to derive understanding the issue. This occurs because the pragmatic alternative allows for a mixed-methods, quantitative and qualitative strategy for the research. Likewise, pragmatism permits the investigator to address problems that did not easily fit inside a purely qualitative or quantitative method, tying the choice of methodology directly to the aim and nature of the study question asked (Creswell, 2012). This pragmatic strategy could address the complexity of the investigated research topic. Pragmatists do not view the world as a unified whole. Similarly, researchers using mixed methods use two methods for data collection and analysis instead of a single quantitative or qualitative methodology. Pragmatism is not devoted to any specific ideology and belief system. Utilising Morgan et al. (2011) and my views as a scholar, pragmatism offered a stronger philosophical foundation on which to reinforce this research, emphasizing that a personal response was evoked and construed via interaction between the investigator and respondent, who heavily relied upon, and that frameworks were richly explained. Following the principles of the mixed method, interview schedules and questionnaires were utilized to collect qualitative and quantitative information for this research.

3.3 Research Design

Research design is a strategy that connects philosophical hypotheses to particular procedures; qualitative, quantitative, and mixed approaches are all types of research design (Creswell, 2014). It is a design and technique for answering the research questions (Kumar, 2011), as well as a step-by-step procedure that links the actual evidence of the research problem to its final result (Magigi, 2015). It has traditionally been a guide for gathering, evaluating, and interpreting data. This implies that it

comprises the investigator's techniques when gathering, analyzing, or interpreting data. This study employed a descriptive survey design to determine and comprehend the meaning that English language teachers acquire from their perceptions and experiences regarding the use of ICT in English language teaching. The design is a science-based process involving observing and describing a subject's conduct without altering it. The decision to choose a survey design was based on the fact that it is inexpensive, has a speedy method of data collecting, is less expensive in regards to time, and is easily accessible data.

It provides numerical or quantitative characterizations of a population's patterns, behaviours, or viewpoints based on sampled respondents. This is accomplished by studying a portion of a population using survey questions. The philosophical perspective and research technique influenced the decision to use a descriptive survey design. The purpose of this study was to get a generalized grasp of teachers' knowledge of the ICT integration in instructing English using 20 sampled English teachers. The descriptive design enabled the investigator to record the knowledge, preconceptions, and encounters of the respondents, allowing the investigator to distinguish and group distinct themes from the data and investigate their connections through conversation and interpretive mechanisms intended to investigate the technical capabilities of an instructor of English for Integrating ICT, and develop technological subject knowledge of an educator of English for Integrating ICT. In the initial portion of this investigation, the researcher employed quantitative methods to gather information and then interviewed teachers who responded to the survey. The purpose of this sequential mixed method was to explain the reasoning and significance of the quantitative findings

(Jellesmark et al., 2012). Therefore, the advantages of one technique could be exploited to compensate for the flaws of the other (Creswell et al., 2018).

3.4 Research Methodology

According to Creswell (2007), research methodology comprises the inquiry's philosophical and foundational premises. This philosophical aspect is what affects the research techniques. The researcher utilized a mixed-methods technique, a mechanism for gathering, evaluating, and combining or combining qualitative and quantitative information at some steps of the investigation phase inside a survey (Tachakkori &Teddie, 2003; Creswell, 2005). The reasoning for combining both forms of information is that neither qualitative data nor quantifiable methods alone are satisfactory to encapsulate the patterns and specifics of complicated matters, like teachers' knowledge of the use of ICT in instructing English in high schools in Nairobi County, Kenya's distributed environment. Quantitative and qualitative methodologies reinforced each other and produced a more comprehensive understanding of the study issue when utilized together (Creswell, 2018; Johnson & Turner, 2003). The research employed a sequential mixed methods approach with two distinct periods (Creswell et al., 2003). In this design, the quantitative data were initially collected, followed by the qualitative information gathered and processed successively. The qualitative information was used to explain or expound on the quantitative data acquired in the initial phase and to determine the possible predictive ability of selected internal and external variables for phase two. The sequential approach is suitable for those with a strong analytical background or those from domains where qualitative techniques are relatively new (Creswell,2014). Data gathering consisted of two parts: the investigator acquired quantifiable information during the first phase, performed an analysis, and

then gathered qualitative information in phase two and utilized the results to expand on the findings. The results obtained guided the individuals picked on purpose for the qualitative stage and the questions posed to those respondents. The objective was for qualitative information to help clarify initial quantitative findings in more depth. The study utilized triangulation to substantiate the two sets of information. By collecting and aggregating various types of information and sources, like responses, the investigator is more likely to obtain a comprehensive, well-rounded picture of the patterns they are examining. In turn, this implies that a researcher can enhance the overall dependability of data by employing various sampling tactics and procedures. Choosing a mixed methods approach enabled the researcher to proactively triangulate the data using a systematic triangulation procedure.

Cohen & Manion (2008) state that methodical integration is the process of using two procedures to verify the conclusions of a research project. Jwan and Ong'ondo (2011) defined triangulation in qualitative inquiry as using several methodologies, techniques, procedures, and data sources to increase a study's credibility. Gray (2009) believes combining a variety of quantitative and qualitative methodologies can make research more robust. Methodological triangulation is a way to seek congruence between qualitative and quantitative methodologies (Patton, 1990). Gay et al. (2009) assert that triangulation is anticipated to provide higher-quality and more comprehensive findings. The advantages of the multiple techniques are adopted to support the provided conclusions (Creswell, 2014). Furthermore, the order in which research methodologies are employed during data collection is irrelevant.

Data might be acquired simultaneously in a single phase or two phases, with each approach operating independently of the other. Consequently, utilizing any of the strategies integrated into the design first had no impact on the results of this investigation. The survey findings were presented initially, followed by the interview findings, which included validation comparisons to the survey data. Using surveys and interview guides, data was gathered progressively. This involves gathering, analyzing, and evaluating qualitative and quantitative information at various stages of the research process (Creswell, 2014). Creswell and Clark (2007) state that:

> Mixed research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves a philosophical assumption that guides the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analysing and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that combining quantitative and qualitative approaches provides a better understanding of research problems than either approach alone (p.5).

The mixed method supplied the best possibilities for addressing the study's objectives in this investigation, the responses of which rely entirely on a wide range of information acquired and which provided greater confidence in the reliability and validity of the findings compared to the use of a single approach and may also support the generalization of the findings.

Each approach compensated for the flaws of the others, but instead of coalescing into a single all-encompassing supermethod, the distinct methods remain interdependent and coexist. Abowitz & Toole (2010) argued that various techniques could eliminate errors by using a single approach and evaluating data effectiveness. Therefore, the study employed mixed-method techniques, and the two were reconfigured, which increased trust in the study's reliability and validity.

According to this approach, theoretical viewpoints serve as perspectives to inform the selection of research methods (Figure 3.1).

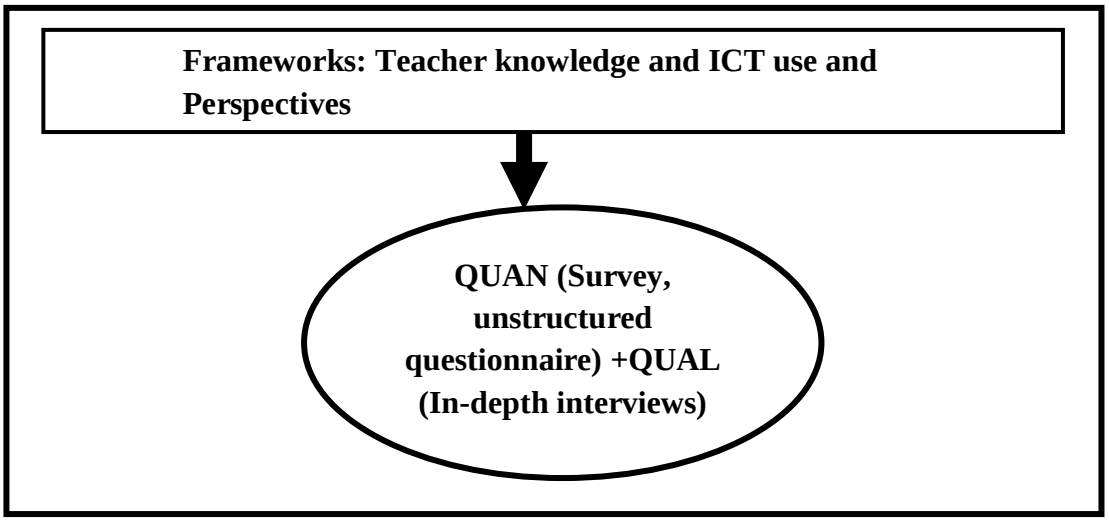


Figure 3.1: Explanatory sequential transformative designs (Creswell, 2014)

Priority is given to quantitative surveys, whilst qualitative data from the interview is incorporated to provide a broader view of the conclusions. In the quantitative portion of the research, a survey was employed as the method of inquiry, while in the qualitative portion, in-depth interviews were conducted. Consequently, data collection techniques produced quantitative and qualitative data to support comparable questions. In addition, numerical data were utilized to investigate the relationship between the dependent and the independent variables. Figure 3.2 provides a summary of the research methodology.

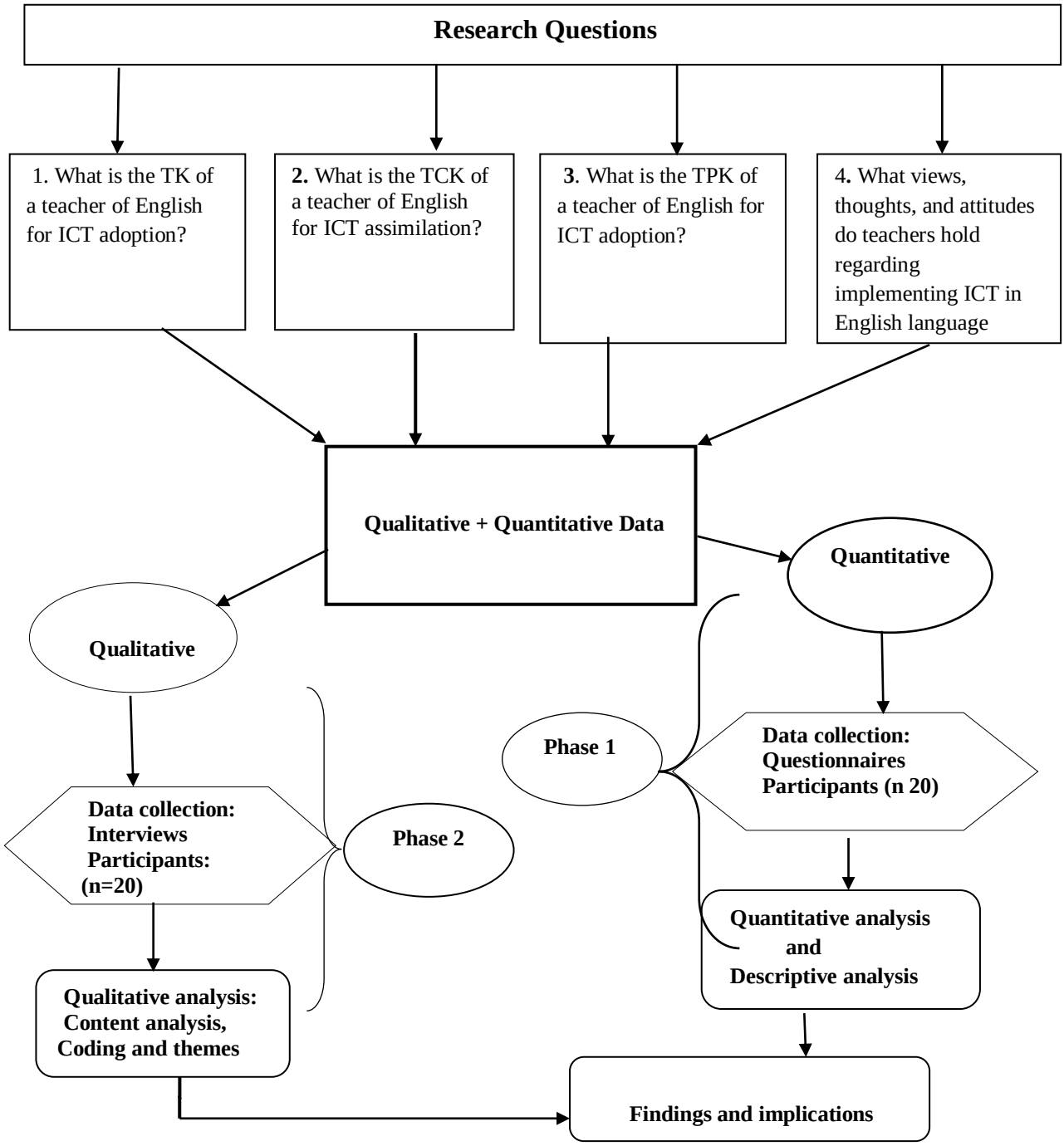


Figure 3.2: The Research Methodology Design

3.5 The Study Area

This study took place in high schools in Nairobi, Kenya. The elevation of Nairobi County (See Appendix G) is between 1,600 and 1,850 metres above sea level. The region lies between 36o 45' East longitude and 1o 18' South latitude as Nairobi is the capital of Kenya.

It is also Kenya's educational, political, industrial and commercial centre. It shares borders with Kiambu, Kajiado and Machakos counties to the east. Nairobi County has 84 secondary schools: seven National, six extra County, sixty-one County and ten Sub County schools. The County has 158 teachers of English: 24 in National, 18 in Extra-County, 108 in County and 8 in Sub-County schools (County Education Office records, 2016). This location was purposively selected for its suitability and relevance to the purpose of the research. Being a well-economically endowed County, it was assumed that it has the necessary infrastructure to support educational technology implementation, such as electricity and good internet connectivity, which is crucial in using various equipment inclined to the application of ICT tools. Hence, hosting such economic power, it was assumed that most regional secondary schools were equipped with computers or ICT tools necessary for educational technology integration, including ICT-equipped English language classrooms. Nairobi County was chosen because most studies on ICT integration in teaching have been done in primary schools (Oyugi, 2020; Murithi & Yoo, 2021). The researcher is unaware of a study about secondary schools in Nairobi County, especially on teacher cognition on the integration of ICT in teaching English, hence the choice for Nairobi County.

3.6 The Study Population

A population is a group of humans, objects, or instances from which quantitative samples are selected (Kombo & Tromp, 2006). The population can also relate to a whole group of individuals or items with at least one characteristic. This includes individuals, occurrences, organizations, or portions with similar features from which research findings may be obtained (McMillan & Schumacher, 2010).

3.7 Sample and Sampling Procedures

Kumar (2011) explains that a sample is a subset of the population in which an investigator is interested. Sampling is picking a few individuals from a broader group to serve as the foundation for assessing and projecting the prevalence of an undetermined snippet of information, circumstance, or event in the larger population. In this investigation, sampling happened during both the qualitative and quantitative phases. Typically, mixed studies integrate qualitative and quantitative elements to form a total more than the sum of its parts (Cardenas, 2017). Small samples are characteristic of single-subject designs, which commonly employ qualitative methods. In contrast, quantitative research, such as evaluation research, can employ huge samples. Mixed methods have no set standards for choosing the optimal sample group (Creswell & Plano Clark, 2018). In addition, as Patton (2015) observed, purposive sampling involves selecting an information-rich case. For example, from the literature reviewed on mixed methods approach studies, many researchers have suggested appropriate sample sizes, which vary according to the research design and methods used. Table 3.2 gives a snapshot of the sample size requirements for some of the most prevalent study designs.

Table 3.2: Minimum Sample Size for Most Quantitative and Qualitative Designs

Research Design /Method	**Researcher(s)**	**Minimum Sample Size**
Experimental	Onwuegbuzie et al., 2004	21 participants per group for one-tailed hypothesis
Case Study	Creswell, 2002	3-5 participants
Phenomenology	Creswell, 1998	≤ 10 Interviews
	Morse, 1994	≥ 6 Interviews
Grounded Theory	Creswell, 2002	Between 15 and 20
	Creswell, (2007).	Between 20 and 30
Sampling Design		
Subgroup Sampling	Onwuegbuszie &Leech ,2007	≥ 3 Participants per subgroup
Nested Sampling	Onwuegbuzie & Leech, 2007	≥ 3 Participants per subgroup
Data Collection Procedure		
Interview	Guest, Bruce & Johnson, 2006	12 Participants
Focus Group	Langford, Shoenfield & Izza 2001; Johnson & Christensen, 2004	Between 6 and 10 participants

The above information shows no universally recommended sample size in qualitative and quantitative studies. However, Onwuegbuzie and Collins (2007) state that investigators may utilize any of the twenty-four recommended major sampling techniques for mixed methods sample designs. Even evidence from a single individual could explain diversity in detail and precision if carefully picked. Data gathering is predicated on a predefined sample; thus, the saturation point differentiates their usage in quantitative and qualitative studies.

Guest, Bruce & Johnson (2006) suggested a minimum sample size of 12 participants for data collection procedures. According to Sandelowiski (1995), the sample size should not be vast that a case-oriented evaluation is challenging to comprehend. It should be emphasized that qualitative and quantitative research goals are generalizable, and there is no universally accepted sample size criterion. It relies on the researcher's objectives, the aim of the Study, and the constraints. As recommended by Sandelowski, the

investigator used his discretion in this investigation (1996). Cluster sampling was applied to group the institutions into National (29%), Extra-County (33%), County (7%) and Sub-County (20%) clusters. A total of 10 secondary schools participated in the Study. The categories assisted in eliciting a broad range of teachers' perspectives, attitudes, perceptions, and thoughts regarding incorporating ICT into English instruction. Two teachers were picked at random from every category of school. The researcher first ensured that the participating school had two or more teachers of English. In schools with two teachers, two were automatically picked. In schools with three or more teachers of English, a simple random sampling was employed, where two teachers were picked using a lucky dip method. A total of 20 teachers of English from secondary schools in Nairobi County participated. The investigator elected to do qualitative follow-up interviews with all initial respondents, culminating in a comparable number of respondents. As stated by Creswell and Clark (2018), collecting sufficient data from all the educators was crucial so that relevant concepts could be generated to contextualize selected numeric results were contextualized. Table 3.3 provides an overview of the chosen schools.

Table 3.3 Sample size for the Study

School Category	**Sample Size**
National	4
Extra-County	4
County	8
Sub-County	4
Total	**20**

3.8 Data Collection Instruments

The primary tools utilized in mixed-methods studies include interviews, questionnaires, and participant observations (Zohrabi, 2013). These various data collection methods

can mutually enhance the authenticity and trustworthiness of the data obtained. Creswell and Clark (2018) encourage using different data sources and note that in mixed methods, quantitative and qualitative data must be collected in parallel. Collecting information from two instruments, in this case, the questionnaire and interview, allowed the researcher to triangulate the data sets, strengthening the investigation's Validity and findings (Creswell, 2012).

According to Creswell (2008):

> "Triangulation is the process of corroborating evidence from different individuals (teacher and student), types of data (for example, observational field notes and interviews), or methods of collection (such as documents and interviews) in the description of themes in qualitative research" (p. 266).

3.8.1 The Questionnaire

Questionnaires are among the key data collection methods in all research efforts. It is a popular research instrument for collecting educational data. It is extensively employed to collect data about phenomena that cannot be observed directly; interests, opinions, values, and experiences (Gall, Gall & Borg, 2003). For quantitative data, the researcher created a four-part self-report questionnaire (See Appendix A), while the open-ended question provided qualitative data.

Part I: Teacher's demographic characteristics

This section was designed to collect basic information about English language educators, including their Internet connectivity and years of involvement with computer technology. The segment also inquired if any respondents had participated in ICT skills training initiatives.

Part II: Teacher's level of TPK and ICT integration

In this part, nine statements with options: Excellent, Good, Fair and Not Capable expected participants to rate their Levels of ICT use. This part aimed to determine

teachers' knowledge of incorporating ICT into English instruction. Hence their ICT proficiency was vital. Similarly, their thresholds of TPK could significantly influence the incorporation. As a teacher progresses from one stage to the next, a progression of modifications in their teaching methods is analysed. The deployment of ICT by a teacher shifts from activities that necessitate only low-level technologies to assignments that require students to solve real issues and use deeper cognitive abilities. Therefore, the instructor's use of ICT objectives becomes more learner-centred and less teacher-centred (Moersch, 1995). The Teachers' Level of ICT Incorporation Scale was answered using a 5-point verbal-frequency instrument. Consequently, the Study was deemed credible for gauging the extent of Integrating ICT among instructors. At the outset of the research, the questionnaire (See Appendix C) was administered to twenty English language instructors. The questionnaire was utilized for research reasons, including establishing a benchmark for ICT integration in high schools in Nairobi County. Despite having some information on the extent of ICT integration in Kenya's secondary schools, the investigator turned to it to acquire a wider picture of the current status of ICT application in the English language curriculum, the topic of the present Study. This instrument proved useful in the case selection process. Questionnaires have limits when used to study educator cognition and are neither suited for conducting in-depth analyses of problems (Attia, 2011).

Part III: The TPK scale

In this part, there are sixteen questions on Technological Pedagogical Knowledge with answer options strongly disagree (SD), disagree (D), neutral (N), agree (A) and strongly agree (SA). The researcher reviewed relevant literature (Graham et al., 2009; Shin et al., 2009; Schmidt et al., 2009; Burgoyne et al., 2010; Chai et al., 2011; Yurdakul et al., 2012) to determine if an established TPACK instrument could be used to assess the

TPACK components of Kenya high school English language educators. Consequently, this Study utilized and revised the TPACK-deep scale, which was initially developed to evaluate the TPACK qualities of pre-service educators during teacher preparation. According to Kabakci Yurdakul et al. (2012), the TPACK Scale used in their Study was a valid tool for assessing TPACK; therefore, it was deemed suitable for the research with changes to meet the demands of the present investigation. In this research, 22 items asked the respondents to respond accurately by placing a cycle according to instructions.

Part IV: Teachers' Beliefs, Thoughts and Attitudes towards ICT Integration

In this part, the participants responded to questions about their beliefs and attitudes towards teaching with ICT. The Likert scales were ranked from strongly disagree, disagree, neutral, agree and strongly agree depending on the nature and question format, Part IV (See Appendix A).

3.8.2 The Interview Schedule

This instrument sought to find participants' ICT skills, their attitudes towards integration in teaching English, and possible challenges in incorporating ICTs in their instructions. Interviews are the most common technique used in qualitative inquiry (Doryei, 2007). Interviews have frequently been utilized to research teachers' knowledge (Borg, 2006). They enable the researcher to reach far beyond the observable, enter the internal world of participants, and gain a deeper understanding of reality as experienced by them.

The interview schedule was used to underpin and verify the information from the questionnaires. It was also used to collect data on the objective of the level of teachers'

ICT knowledge and skills, ICT infrastructure and its application of ICT in the process of teaching English. The researcher utilized a semi-structured interview protocol because it is prevalent, adaptable, interactive, and helps the respondent to reveal more details (Best & Khan, 1998). In addition, an interview is a great tool for enabling people to express their thoughts, emotions, and understandings, which were previously latent (Arksey & Knight, 1999). In contrast, semi-structured interviews and case prompts were utilized to determine English teachers' beliefs about ICT-based activities in English language education.

According to Gay (2009), these enabled the investigator to watch the gestural responses of educators, so letting the investigator clarify and rectify any misconceptions. Eighteen interview questions cut across all the concepts the Study wanted to get from the participant about their cognitions concerning ICT integration. The interview covered teachers' ICT capabilities, skills and content areas. They also allow a researcher to investigate further any reactions that may need clarity. The researcher performed in-depth face-to-face interviews with English teachers. The conversation enabled the researcher to understand the participants' experiences, sentiments, and attitudes regarding incorporating ICT into English instruction.

3.9 Validity and Reliability of Research Instruments

The research methods chapter must present these two notions concisely and precisely. Consequently, the numerous methods for enhancing the instruments' reliability and Validity will be explored below.

3.9.1 Pilot Study

A pilot study was done before the instruments were used for collecting data; this was done in four schools in Kiambu County, Kenya**.** Kiambu County was purposively selected for a pilot study because it had schools with similar characteristics and teaching environments to schools in Nairobi County, where the main Study was carried out. A pilot study is a mini-research acting like a reconnaissance stage to establish the research fact and test instruments before conducting the main research (Magigi, 2015). According to Orlando (2009), a pilot study is required since the Validity and reliability of the survey instrument cannot be determined with absolute certainty. The actual piloting was conducted using one method. In this method, the teacher's questionnaires were distributed as a pilot questionnaire to four teachers of English purposively selected from four secondary schools in Kiambu County, each representing each of the four categories of the schools. The teacher's survey was then modified based on the collected input. After the pilot study, items found to be ambiguous and not framed were revised and fixed accordingly. A test-retest method was used to establish the reliability of the questionnaire. It was done by giving the questionnaire twice to the same group within two weeks. The responses were calculated using Pearson product-moment correlation coefficient (r). A correlation coefficient of 0.05 or 5% was considered high enough for the instrument to be reliable for the Study.

3.9.2 Validity of Research Instruments

Validity is defined as the accuracy of an instrument in measuring the anticipated construct within a research (Klenkel, et al, 2016; Noble & Smith, 2015). Gay et al. (2009) describe instrument validity as the extent to which the tool assesses what it is designed to assess. It is crucial in all studies (Ary et al., 2010).

It evaluates how well the instrument captures what it is meant to quantify (Robson, 2012; Pallant, 2011). Validity is crucial for developing rigour in d qualitative research. According to Simons (2009), Validity refers to how a study justifies research; if it is logical, coherent, logical, well-grounded, and applicable to the situation. In this research, selected methods were used to achieve this objective.

3.9.2.1 Internal Validity

This Study's questionnaire was a revised, expanded version of previously tested and utilized checklists from other investigations. To enhance the internal Validity of the tools, the Study adopted triangulation and gathered data from two sources, namely interviews and questionnaires. In order to determine the content validity of the research instruments, the researcher discussed the contents of the research instruments with the supervisors to find out whether the questions in the questionnaires and items in the interview schedule could elicit the expected responses for this Study, if they measured what it was supposed to measure or not. The inputs, which included suggestions, advice and clarifications, were all incorporated into the development of the instruments.

3.9.2.2 Triangulation

The researcher took caution over internal Validity by considering the appropriate triangulation strategy. Triangulation is one of the regularly used ways to ensure Validity. As stated by Creswell (2008):

> *Triangulation is the process of corroborating evidence from different individuals, types of data or methods of data collection in descriptions and themes in qualitative research.*

Triangulation among approaches is currently the most prevalent method (Silverman, 2006). It highlights inefficiencies that may result from employing a single instrument of

data collecting and increases research trust in the findings, particularly if such approaches are distinct (Cohen et al., 2007). In this research, the author triangulated interview recordings and survey results. Consequently, the research revealed triangulating multiple methodologies to be particularly beneficial for saturating groups, recognizing recurring patterns, and bolstering confidence in conclusions. Using triangulation, investigators can get quantitative and qualitative evidence to support their conclusions (Jwan & Ong'ondo, 2011).

3.9.2.3 Construct Validity

Construct Validity was defined by Hair et al. (2010) as the extent to which a collection of scale characteristics corresponds to the theoretical construct that those measures are designed to observe. Validity, dependability, and generalizability were taken into account as a result of this Study's mixed-methods design. Efforts were made to guarantee the soundness of the survey tool by addressing construct validity. Frankel and Wallen (2003) define construct validity as the extent of assurance that the data supplied by the instrument accurately reflects the activity being evaluated. In this investigation, the author demonstrated construct validity by evaluating the associations created by prior research conclusions to determine the types of survey questions and segments. The questionnaire topics were developed to elicit teachers' understanding of ICT incorporation in English instruction. The assessment was also pilot-tested with a sample of English teachers who were as compared to the target population as possible. In addition, instrument validity was established by pre-testing data collection tools through a pilot study.

3.9.3 Reliability of Research Instruments

The term reliability refers to the extent to which results are consistent over time or a measure of how consistent the results from a test are (Kivunja, 2017). Reliability deals with the consistency of the research measurements (Middleton, 2019). Reliability tells the researcher the extent to which the results of a research can be repeated under the same condition (Middleton, 2019). It is the stability and consistency of the scores from an instrument (Braun, Clark, Hayfield & Terry, 2019; Jamal & Hamidah, 2017). Different terms various scholars synonymously use besides reliability include: trustworthiness, credibility and dependability among others. Trustworthiness refers to the degree to which a research process is truthful, careful and rigorous enough to qualify it to make the claims that it does (Denzin & Lincoln, 2005). Lincoln & Guba (1985) define credibility as the confidence that can be placed in the truth of the research findings. Credibility establishes whether the research findings represent plausible information drawn from the participants' original data and is correct interpretation of the participants' original views.

Dependability refers to the consistency and reliability of the research findings and the degree to which research procedures are documented, allowing someone outside the research to follow, audit, and critique the research process (Sandelowski 1986, Polit et al., 2006, Streubert 2007). According to Creswell & Guetterman (2019) dependability is the extent that the study could be repeated by other researchers and that the findings would be consistent. A major technique for assessing dependability is the dependability audit in which an independent auditor reviews the activities of the researcher (as recorded in an audit trail in field notes, archives, and reports) to see how well the techniques for meeting the credibility and transferability standards have been followed. Dependability is important to trustworthiness because it establishes the research study's

findings as consistent and repeatable. Researchers aim to verify that their findings are consistent with the raw data they collected. If the researcher does not maintain any kind of audit trail, the dependability cannot be assessed and dependability and trustworthiness of the study are diminished. Test-retest reliability was undertaken. Test-retest reliability is a measure of consistency between measurements of the same construct administered to the same sample at two different points in time (Drost, 2011). Gay et al. (2009) define reliability as the consistency with which a tool measures the measured variable. In quantitative research, trustworthiness is demonstrated by internal validity, external validity, reliability and objectivity Preserving an audit trail is indeed a crucial approach for achieving consistency in both quantitative and qualitative studies (Robson, 2002; Flick, 2009); the degree to which the research process is transparent enough for other investigators to reproduce the Study and receive consistent outcomes (Yin, 2003; Mason; 2002; Nunan, 1990). It evaluates investigation reliability, precision, reproducibility, and reproducibility (Chakrabartty, 2013).

According to Lincoln & Guba (1985), auditing could be essential for establishing credibility known to naturalists. Creating a paper trail involves maintaining documents of all research processes (Creswell & Miller, 2000). The diary contained crucial insights and observations that impacted fieldwork-period study choices. In this Study, the researcher kept a complete audit trail using a variety of methodologies and regularly reported field achievements to the supervisors, presenting and debating a comprehensive record of the Study's growth at each stage. All sessions with examiners were conducted face-to-face from the onset of this research, and all were captured, evaluated, and included.

Given the one-of-a-kind interactions with the supervisors, debating and implementing the needed adjustments to the study's direction maintained its reliability and credibility. Meanwhile, reliability statistics is related to Cronbach's Alpha, which is a measure of consistency within a scale in an instrument (Noble & Smith, 2015; Vaske, Beaman & Sponarski, 2017). In addition, the comments and ideas of the supervisors were solicited and included in a manner that assured the reliability and credibility of these research instruments. Finally, the responses from the pilot instruments were calculated using Pearson product-moment correlation coefficient (r). A correlation coefficient of 0.05 or 5% was considered high enough for the instrument to be said to be reliable for this Study.

3.10 Data Collection Procedures

Data collection took place in July 2017. The researcher obtained an official approval letter from Moi University to apply for the research permit. The investigator sent the letter to the MoE and NACOSTI, which authorized the researcher to undertake the Study. After permission letters were approved, the researcher contacted teachers of English through their head of department. Before starting the data collection, the researcher visited schools where data were collected one after the other, contacting the head of the school and seeking permission to gather the data from teachers of English. The researcher met each participant face-to-face and explained the Study's purpose. Teachers and the researcher agreed on the dates to fill in the questionnaires and to participate in the interviews. First, the researcher personally administered and collected completed questionnaires at the agreed dates, assisted by the head of the English department in each participant's school. Later, the researcher called teachers who had left their contacts to arrange the interview sessions.

Nineteen teachers of English who completed answering the questionnaires also participated in the interviews. The researchers performed face-to-face interviews with each teacher. Every interview lasted forty minutes and was manually documented. The goal of following this sequence was to design interpersonal interview questions that could uncover more tailored and context-specific perspectives and practises, especially ICT use in teaching English, based on the preliminary results from the survey responses. In this research, the initial administration of quantitative tools was intended to facilitate the creation and use of other qualitative components, in addition to the triangulation of conclusions from various perspectives regarding teachers' perspectives on integrating ICT in English language teaching. The considerations regarding data collection for the sequential mixed design centred on establishing a strong link between the two stages (Creswell et al., 2018).

3.11 Data Analysis Procedures

Data was coded and cleared, ready for analysis. The Statistical Package for Social Sciences (IBM SPSS Version 21.0) was used to analyse the data producing descriptive statistics in the form of percentages, means, and standard deviations of responses. Data analysis is the process of organizing raw data in order to extract usable information from it (Magigi, 2015). The analyses were conducted through an inductive approach; it progressed methodically through a cycle of "categorical aggression," in which occurrences in the data were examined for deeper insights. Stake (1995) asserts that the pursuit of meaning is frequently a quest for coherence and that such trends either derive from the study objectives or the analysis process. This Study analysed data in small parts and determined subcategories. The relevant occurrences were then regrouped under conceptual topics with greater scope.

The research topics and theoretical foundations identified the primary areas of examination that led the analytical method. They did not, however, constitute rigid frameworks for categorical grouping. As this Study examined a comparatively recent academic subject, it was vital to balance the understanding one brings to the data and the fresh insights that emerge through the analyses. The investigator began by organizing and preparing qualitative and quantitative information for analysis. The data were divided into categories based on the information sources. Closed-ended items were allocated numbers for quantitative information. All conversations were coded, transcribed, and categorized by date and institution for qualitative data. Other than the quantitative data, the assessment began as soon as the interviews were conducted (Creswell et al., 2018). Quantitative analysis was conducted first, then qualitative analysis.

3.11.1 Quantitative Data Analysis

The data from questionnaires were analysed using IBM SPSS statistics Version 21 displayed and summarised in the form of statistics: frequencies, tables, means and standard deviations. Tables containing frequencies and summary data were created to illustrate the findings.

3.11.2 Qualitative Data Analysis

The qualitative analysis required meditation on the evidence, making meaning of the information, and interpreting the significance of the data. The investigator began the data analysis by reviewing all free-form responses, documenting and structuring the conversations into text, and reading all open-ended responses. The investigator reviewed the interview transcripts, made notes, and jotted down general observations to comprehensively understand the data. They reviewed and reorganized for preliminary

categorization. During this phase, the researcher reviewed interview transcripts and written responses grouped similar data and designated each group based on its features. After developing primary themes, the investigator searched for closely linked categories that may be grouped under a broad category. It was discovered that some particular extracts might be related to the previously established broad classifications and that concepts appeared. Consequently, the researcher grouped, organized, and formed new classifications for them. The following step consisted of organizing the classified data into topics for Study. The concepts were examined, subdivided, and backed up by data from various sources. Consideration was given to teachers' perspectives, beliefs, and attitudes on integrating technology.

3.11.3 Stages of Teacher Development Overall Outcome

The data analysis used a modified version of the concept of educator occupational ICT qualities created by Newhouse et al. (2002). The system was designed based on Educators' Professional ICT Qualities as they advance through five phases: inactivity, inquiry, applicability, and execution. The interview protocol included these 5 phases. There is a key use boundary between the introduction and implementation phases, indicating that the final two phases are the optimum levels of ICT usage in education, where an educator can assume leadership positions and display the characteristics of an ICT-savvy teacher (Chandra, 2008). At all these two distinct levels, the usage of ICT gets crucial for supporting an educational atmosphere and giving students a chance to attain educational objectives (Trinidad et al., 2006). Figure 3.3 provides an overview of the entire procedure.

Description of Principal Distinctions

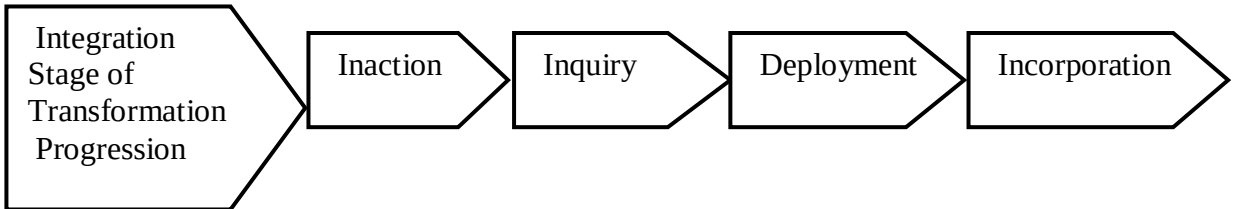
Inaction

Description of Principal Distinctions

Inaction	At this point, there is an overall lack of activity or enthusiasm; TCK is missing.	**0 – 20 %**
Investigation	The instructor has become interested in incorporating ICT with students and is ready to act on this enthusiasm.	**20 – 40 %**
Application	At this point, the teacher frequently utilizes ICT with learners and is competent in employing TPK, objective 3.	**40 -60 %**
Critical Use Border		
Integration	At this point, the use of ICT is crucial to the support of educational environments and the opportunity for students to accomplish educational objectives through the given learning opportunities. At this time, TPACK becomes crucial as well**.**	**60 – 80 %**
Transformation	At this phase, the teacher may assume informal or formal leadership responsibilities in applying ICT, deliberate on their and others' integration of Information technology, and employ TPACK concepts.	**80 -100 %**

Figure 3.3. The Phases of teacher professional development (Newhouse et al., 2005)

There are three levels available to describe each development outcome. The layers represent the final product, its elements, and its components. Components of the result comprise vision, contributions, execution and usage, skills and emotions, whereas elements explain each of the final aspects (Newhouse et al., 2002). Figure 3.4 provides an overview of the process.



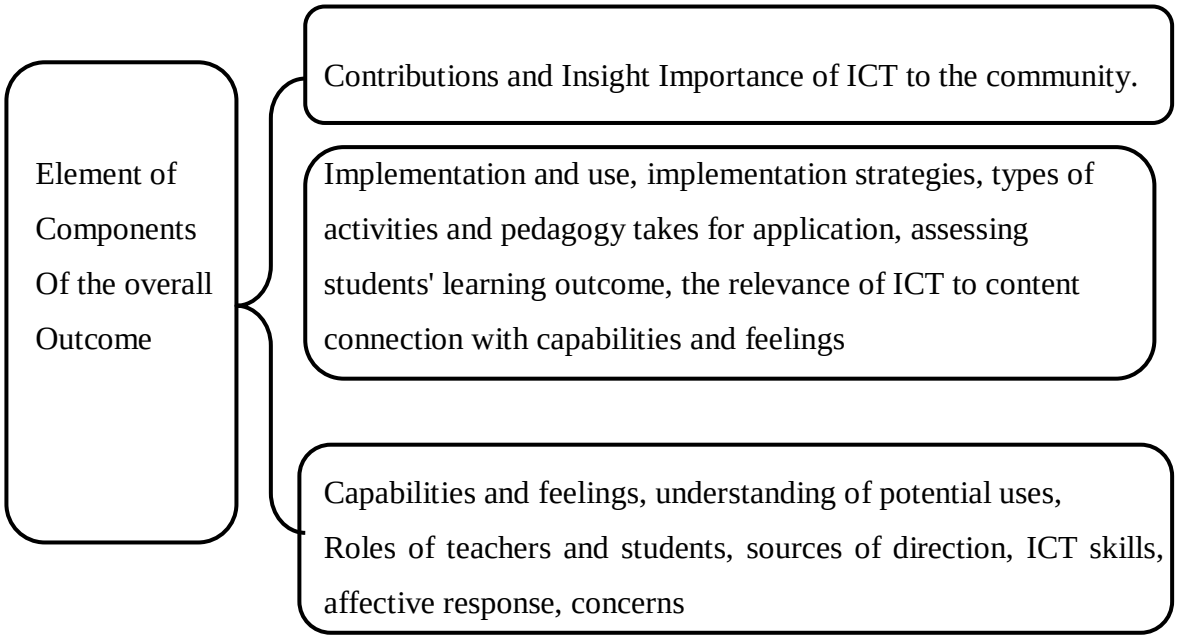


Figure 3.4 Phases of development for elements of prospective applications and elements of the constituents of the outcome (Newhouse et al., 2002).

Visions, accomplishments, applications, capabilities, and attitudes of educators toward ICT in the school environment reveal where they are in ICT integration (Newhouse et al., 2002). Employing this paradigm offered a better knowledge of the status of instructors concerning the ICT integration and what they require to proceed to the next phase so that they may receive greater support.

3.12 Ethical Considerations

Research ethics is defined as the act of doing what is normally and legally right in research (Praveen & Showkat, 2017). Research ethics are the norms required to distinguish between right and wrong when conducting a research, (Praveen & Showkat, 2017). Ethics addresses the difference between the acceptable and unacceptable behaviour when conducting a research (Resnik, 2015).

For example, it not ethical to expose the information provided by the participants to another person. Ethics is very vital to every researcher. It guarantees how participants of a research will be treated, and clarify the activities in which researchers should or should not engage the participant. Throughout the Study, the investigator adhered to the standards of ethical inquiry (Fraenkel & Wallen, 2008). Considerations concerning the respondents' rights and the confidentiality of the data regarding professional and personal beliefs, values and encounters comprised the research's ethical aspects. The author acquired permission from NACOSTI and Moi University before undertaking this investigation. By masking the respondents' identities, the researcher assured them that this research had no chance of causing harm to them. Participants' identities were protected, and personal information stayed anonymous. The consent of participants was sought. Furthermore, participants were made aware of the intended use of the collected information. Consequently, anonymity was crucial when doing research, particularly with educators. To this end, teachers' approval was requested at the Study's outset, and absolute confidentiality was ensured. The researcher explained the rationale behind his activities and inquiries and worked to create a positive atmosphere for the interviews with the teachers. Finally, antiplagiarism was done on the document, passing the University's plagiarism Awareness test with a similarity index of 04% and striving to maintain academic integrity.

3.13 Chapter Summary

The chapter discusses the research designs and methodology, philosophical foundations, study location, various research instruments, questionnaires, interview schedule and safety measures to ensure the Validity and reliability of the data. The chapter also discusses sample size and methods of sampling used to select the respondents, data collection and analysis procedures, and ethical concerns have all been

covered in this section. The organization, analysis, interpretation, as well as discussion of the results will be covered in the following chapter.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This study evaluated teachers' cognitions of ICT incorporation in secondary school English education in Nairobi County, Kenya. The chapter discusses the presentation, analysis, and interpretation, including a discussion of the findings. The study sample comprised 20 teachers from the sampled ten secondary schools drawn from the English language departments.

Response Rate

The researcher administered questionnaires to the teachers of English departments by dropping them at the heads of departments' offices and collected after they had filled them. The respondents were given adequate time to answer the stated items in the research instrument. A total of 20 questionnaires were administered, filled and returned. After analyzing the questionnaire, only 19 were properly and completely. The response rate for the trial was 95%. This study targeted 20 (100 %) secondary school teachers of English but achieved a 19 (95%) response rate (13 females and 6 males) who completed answering questionnaires and participated in interviews, respectively. The result is displayed in Table 4.1 below.

Table 4.1 The Response Rate after the elimination of the missing values

	Targeted Sample	**Obtained Sample**	**Response Rate (%)**
Teachers of English	20	19	95%
Total	**20**	**19**	**95%**

After analysing the collected data more closely, one teacher submitted a questionnaire that did not answer over half of the items, and this was treated as missing data. Even though the sample was already small, it was appropriate to eliminate that additional participant from the overall analysis, thus, reducing the sample size to 19 teachers. Once the researcher had eliminated one teacher, the amount of data missing was minimal and randomly scattered throughout the database. Creswell (2014) postulates that lost values might occur when participants do not supply those values. This matter is one of the most critical statistical problems in quantitative research studies in social sciences (Baraldi & Enders, 2010). They might bias parameter estimates and degrade the confidence interval's performance, which can produce invalid conclusions.

As they mean less information, missing values may greatly minimise statistical power, which could dramatically affect the results (Pallant, 2013). He pointed out that to avoid these risks, researchers must consider this matter carefully and choose the appropriate strategy. There are several techniques available for researchers to work with when dealing with missing values, and these can be grouped into two main categories: traditional and modern. Traditional methods include listwise deletion, pairwise deletion, and mean substitution. In this method, the researcher discarded cases with missing values, so the analyses were limited to cases that included completed data (Baraldi & Enders, 2010). They also warned that, while this method is convenient, it can dramatically reduce the sample size, degrading the statistical power of significant tests. Listwise deletion assumes that the data are missing completely at random, but if this is not the case, applying this method will produce biased estimates (Baraldi & Enders, 2010). In the pair deletion method, a researcher discards the case only if missing data in a specific variable involves a specific analysis (Pallant, 2013). While Pairwise deletion

seems to minimise the number of missing values, it must be missing completely at random. To avoid minimising the sample size, some researchers use imputation approaches. One traditional imputation method is known as mean substitution, which refers to calculating the mean value for a specific variable and giving every missing case this value (Pallant, 2013). The researcher considered Baraldi and Enders (2010) suggestion and applied List Wise deletion and discarded cases of missing values. Consequently, the analysis was limited to 19 completed data. This study targeted 20 (100 %) secondary school teachers of English but achieved a 19 (95%) response rate (13 females and 6 males) who completed answering questionnaires and participated in interviews, respectively. A response rate of 50% can be considered adequate to establish the research objectives and answer the research questions (Mugenda & Mugenda, 2003). Therefore, this response rate was considered adequate for the study

4.2 Quantitative Data Presentation and Analysis

This section provides an examination of the quantitative data. IBM SPSS Statistics V.21.0 was used to analyse the data.

4.2.1 Teachers' ICT background information

In this section, there were seven questions on teachers' ICT information: access to computers at school, ownership of computers, ICT experience, and formal levels of ICT training with answers options Yes/No, excellent, very good, good, fair and not sure. Concerning the availability of a computer at school, virtually all teachers (94.7%) indicated they had a computer available, whereas only 5.3% indicated they did not. Most educators (94.7%) reported having an Internet connection at school. Regarding ICT skills, most educators (68.7%) said they received formal ICT training, whereas five instructors (33.7%) indicated that they had no official ICT training.

The majority of 16(84.2%) of the teachers of English had more than two years of experience with ICT, while 3(15.8%) of the teachers of English had less than two years of experience with ICT. Regarding the years of ICT experience, the researcher established two groups as follows: Less than two years-(3 teachers) and more than two years- (16 teachers), showing that the majority of participant teachers in this study were experienced enough to be able to teach English effectively. A total of eighteen teachers of English in sample 18(94.7%) reported access to a computer at school and had Internet access.

Concerning ICT training, the researcher established only two groups: trained ICT (N=13) teachers and no ICT training (N=6 teachers). The study further established that most of the ICT training was on general computer applications such as MS Word, MS Excel, Email and the Internet. Regarding the levels of ICT proficiency, three groups were established: Excellent (N=2) teachers, Very good (N=6) teachers and Good (N=11) teachers. This representation shows that over half of the teachers (58%) were familiar with ICT. The majority, 18 (94.7%), reported having access to a computer at school, and 1(5.3%) indicated they did not have a computer. All teachers interviewed indicated that they had access to the internet at school. Regarding levels of ICT training, 4(21.1%) indicated that they got training from the university, 2(10.5%) got training from computer studies centres, while the majority (53%) indicated they had trained in other unspecified institutions. The findings on teachers of English ICT background are displayed below.

Table 4.2 Teachers' categorization per their ICT Competence

Variables		N	N%
Access to Comp. at School	Yes	18	94.7
	No	1	5.3
Access to the Internet at School	Yes	18	94.7
	No	1	5.3
Years of ICT Experience	Less than 2 years	3	15.8
	More than 2 years	16	84.2
ICT Training	Yes	13	68.7
	No	5	33.3
Training Institution	University/Col.	4	21.1
	Cyber café	2	10.5
	Others	13	68.4

Table 4.2 indicated that a few teachers enhanced ICT in their classrooms. However, the use of ICT comes with challenges which include lack of access to computers in schools, technological knowledge, internet access, and therefore, a pointer that teachers of English are not ready to use technology for teaching based on the ICT background information.

4.2.2 Teachers' Knowledge of Technology for ICT Integration

In this part, there are eight questions on technological knowledge with answer options Excellent (E), Good (G), Fairly (F), and Not Capable (NC). The results are summarised in the table below.

Table 4.3 Frequencies, Percentages, Means and Std. Deviations of Teachers' TK Levels for ICT Integration

Statement	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)	M (SD)
Word processing (MS Word)	9 (47.4)	7 (36.8)	2(10.5)	1 (5.3)	**1.74 (0.87)**
Spreadsheets (Excel)	1(5.6)	6 (33.3)	7(38.9)	4 (22.2)	**2.78 (0.88)**
Presentation software (PowerPoint)	3 (15.8)	7 (36.8)	5(26.3)	4 (21.1)	**2.53 (1.02)**
Emailing	10 (52.6)	7 (36.8)	2(10.5)	0	**1.58 (0.69)**
Internet (browsing, surfing)	10 (52.6)	8 (42.1)	1 (5.3)	0	**1.53 (0.61)**
Publishing software (Publisher)	1 (5.3)	5 (26.3)	4(21.1)	9 (47.4)	**3.11 (0.99)**
Programming language (logo, CDs)	0	3 (15.8)	5(26.3)	11 (57.9)	**3.42 (0.77)**
Database (Access)	1 (5.3)	3 (15.8)	9(47.4)	6 (31.6)	**3.05 (0.85)**
Graphics (Paint, Photoshop)	1 (5.3)	2 (10.5)	6(31.6)	10 (52.6)	**3.32 (0.89)**

N (%) is frequency (percentages); M(SD) is mean (standard deviation)

These findings spotlight participants' levels of technical knowledge. The first statement on the survey covers whether respondents use Word processing (MS Word), and the results showed that 47.4% of the respondents indicated that they often use it, and 36.8% sometimes use it. The second statement in technology knowledge deals with using spreadsheets (Excel). As shown above, one of the 19 respondents (6%) stated often, 33% sometimes took, 39% pointe rarely, and 22% never took the option. The third statement concerns the PowerPoint application, and the results showed a little bit high percentage of those who sometimes answered in using it 37%, 16% pointed out often, 26% rarely took it, while 21% showed never. The fourth statement in the survey asked respondents to indicate their usage of Emailing and showed that 53% often, 37% took it sometimes, and 11% answered rarely. However, none of the respondents indicated they could use the Emailing application. The fifth statement concerns using Internet (browsing, surfing), and 53% often answered, 42% sometimes answered, 5% rarely

answered, and none of the participants ever took the option. Most of the participants indicated they never use publishing software 47%. The item that is never used by most teachers of English in this study is Graphics, and the results showed that most teachers (53%) never used Graphics and programming language (logo CDs) (58%) as ICT applications to teach English. Furthermore, findings indicated that the majority (47%) had not used Publishing software (Publisher) applications in their English language teaching. From these findings, the researcher understood that many teachers in this study were unaware of various ICTs software they could use to teach the English language. In other words, secondary school teachers in this study do not know about available ICT tools that could be useful in teaching English. Therefore, these findings revealed that secondary school teachers in this study do not have the prerequisite technological knowledge to integrate ICTs in teaching English, while others have some technological knowledge; hence those who have TK can apply ICT. So, the results suggested that much knowledge of solving technical problems in technology (58%) is required.

4.2.3 Technological Content Knowledge (TCK) of Teachers of English for ICT Integration

The survey on TCK covers eight research questions and sought to determine the TCK of an English language teacher for ICT incorporation, with answer options strongly disagree (SD), disagree (D), neutral (N), agree (A), and strongly agree (SA). Data were analysed and summarised using Frequencies, Percentages, Means and Std. Deviations and presented below (Table 4.4).

Table 4.3 Frequencies, Percentages, Means and Std. Deviations of Teachers' TK Levels for ICT Integration

Statement	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)	M (SD)
Word processing (MS Word)	9 (47.4)	7 (36.8)	2(10.5)	1 (5.3)	**1.74 (0.87)**
Spreadsheets (Excel)	1(5.6)	6 (33.3)	7(38.9)	4 (22.2)	**2.78 (0.88)**
Presentation software (PowerPoint)	3 (15.8)	7 (36.8)	5(26.3)	4 (21.1)	**2.53 (1.02)**
E-mailing	10 (52.6)	7 (36.8)	2(10.5)	0	**1.58 (0.69)**
Internet (browsing, surfing)	10 (52.6)	8 (42.1)	1 (5.3)	0	**1.53 (0.61)**
Publishing software (Publisher)	1 (5.3)	5 (26.3)	4(21.1)	9 (47.4)	**3.11 (0.99)**
Programming language (logo, CDs)	0	3 (15.8)	5(26.3)	11 (57.9)	**3.42 (0.77)**
Database (Access)	1 (5.3)	3 (15.8)	9(47.4)	6 (31.6)	**3.05 (0.85)**
Graphics (Paint, Photoshop)	1 (5.3)	2 (10.5)	6(31.6)	10 (52.6)	**3.32 (0.89)**

N (%) is frequency (percentages); M(SD) is mean (standard deviation)

The first question asks about having sufficient knowledge of both technology and knowledge about English. Here, the data findings showed that 58% of respondents agreed they could not select appropriate software to teach English. The second question asks if the participants can use computer programmes to prepare teaching materials for their class, of which 42% strongly agree. In contrast, none of the participants strongly disagree with the statement. The third statement sought to find out whether teachers can design technology to enhance learning activities, with the majority of 19 participants 47% agreeing with the statement that they cannot design technology to enhance learning activities in their English class, 21% of the respondent took a neutral, 11% strongly agree with the statement meaning they are not sure whether they can design technologically enhanced classroom activities. On the use of Email, 74% of the

participants agreed they chat or web discussion to communicate with their students, 11% took a neutral option while 11% took disagree option.

Regarding the selection of appropriate software and having students work collaboratively on an online English language project, the majority of the participants, 42% took a neutral option, meaning they are not sure; 32% strongly agree with the statement, while 26% strongly agree that they cannot use appropriate software to teach their students. The sixth statement sought to find out whether they can teach students how to create web pages or Weblogs to post English assignments, with 47% disagreeing with the statement, meaning they can teach their students how to create web pages. This means that teachers are conversant with web pages and weblogs. From the findings, it can be observed that 74% of teachers of English in this study strongly agree that they use or download online content for learning. Likewise, 58% of English teachers in this survey strongly felt they could employ the Internet in teaching English classes to achieve specific learning objectives. In addition, most English educators strongly believed they could use technology tools to produce classroom materials. On the other hand, according to the results (Table 4.4), some items received the poorest percentages of ICT use by high school English teachers in Nairobi County.

4.2.4 Technological Pedagogical Knowledge (TPK) of a Teacher of English for ICT Integration

In this part, the researcher sought to investigate the technological pedagogical knowledge (TPK) of a teacher of English for ICT integration. The participants were asked to answer 22 Likert-scale items measuring their technological pedagogical approaches and ICT levels in teaching English. There are twenty-two statements, including knowledge about how to use online tools that facilitate teaching and learning

with answer options strongly disagree (SD), disagree (D), neutral (N), agree (A), and strongly agree (SA). The findings of the descriptive analysis (Means, Standard Deviations, Frequencies and Percentages) on TPK are displayed below.

Table 4.5 The Extent of Teachers' ICTs integration (Pedagogy) indicated by (the TPK) Scale

Statements	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)	M (SD)
I cannot update an instructional material (paper-based, electronic or multimedia materials, etc.) based on the needs (students, environment, duration etc.) by using technology	3(15.8)	3(15.8)	3(15.8)	7 (36.8)	3 (15.8)	3.21 (1.36)
I cannot use technology to determine student's needs related to a content area in the pre-teaching process	1 (5.3)	3(15.8)	8(42.1)	5 (26.3)	2 (10.5)	3.21 (1.07)
I cannot use technology to develop language activities based on students' needs to enrich the teaching and learning process	1 (5.3)	2(10.5)	4(21.1)	9 (47.4)	3 (15.8)	3.58 (1.07)
I cannot plan the teaching and learning process according to available technological resources	0	0	8(42.1)	4 (21.1)	7 (36.8)	3.95 (0.91)
I cannot develop appropriate English language assessment tools by using technology	1 (5.3)	2(10.5)	7(36.8)	6 (31.6)	3 (15.8)	3.42 (1.07)
I can implement effective classroom management in the teaching and learning process in which technology is used	0	2(10.5)	7(36.8)	5 (26.3)	5 (26.3)	3.68 (1.003)
I can assess whether students have the appropriate content knowledge by using technology	1 (5.3)	4(21.1)	3(15.8)	8 (42.1)	3 (15.8)	3.42 (1.17)
I can apply instructional approaches and methods appropriate to individual differences with the help of technology	2(10.5)	2(10.5)	5(26.3)	8 (42.1)	2 (10.5)	3.32 (1.16)

I cannot use technology for implementing language activities such as homework and projects	2(10.5)	1 (5.3)	2(10.5)	8 (42.1)	6 (31.6)	3.79 (1.27)
I can use technology-based communication tools (forum, chats, and email in the instructional process	0	4(21.1)	4(21.1)	6 (31.6)	5 (26.3)	3.63 (1.12)
I can be a suitable model for the students in following codes of ethics for the use of technology in English language teaching	1 (5.3)	3(15.8)	4(21.1)	6 (31.8)	5 (26.3)	3.58 (1.22)
I cannot use innovative technology (Facebook, Twitter, blogs) to support the English language teaching and learning process	0	0	4(21.1)	8 (42.1)	7 (36.8)	4.16 (0.77)
I cannot use technology to update my knowledge and skills in the content areas that I will teach	0	1 (5.3)	0	6 (31.6)	12(63.2)	4.53 (0.77)
I can update my technological knowledge of the English teaching process	0	0	2(10.5)	8 (42.1)	9 (47.4)	4.37 (0.68)
I cannot use technology in every phase of the teaching and learning process by considering the copyright issues (licenses)	1 (5.6)	5(27.8)	3(16.7)	6 (33.3)	3 (16.7)	3.28 (1.23)
I can follow the teaching profession's codes of ethics in an online educational environment (Web CT, Moodle)	1 (5.3)	1 (5.3)	7(36.8)	7 (36.8)	3 (15.8)	3.53 (1.02)
I can guide students by leading them to valid and reliable digital sources	0	1 (5.3)	5(26.3)	9 (47.4)	4 (21.1)	3.84 (0.83)

I can behave ethically regarding the appropriate use of technology in educational environments	0	3(16.7)	2(11.1)	7 (38.9)	6 (33.3)	3.89 (1.08)
I cannot troubleshoot any kind of problem that may occur while using technology in any phase of the teaching-learning process	2(11.1)	3(16.7)	8(44.4)	5 (27.8)	0	2.89 (0.96)
I can use technology to find solutions to problems (structuring, updating and relating the content to real life)	0	3(15.8)	7(36.8)	8 (42.1)	1 (5.3)	3.37 (0.83)
I cannot become a leader in spreading the use of technological innovation in my future teaching community	0	2(10.5)	3(15.8)	9 (47.4)	5 (26.3)	3.89 (0.94)
I can cooperate with other disciplines regarding the use of technology to solve problems encountered in the process of presenting content	0	1 (5.3)	2(10.5)	11 (57.9)	5 (26.3)	4.05 (0.78)

The first statement required participants to indicate whether they can update instructional material using technology, with the majority, 37%, agreeing with the statement, while the other four options each received 16% responses. In the second statement, participants must give their technological level to determine students' needs. Here, the majority, 42% of the teachers of English in this survey, took a neutral option, and 26% of the participants agreed with the statement. The third statement required the subjects to state whether they can use technology to develop language activities, with the majority, 47% of the subjects, answered they agree. In comparison, 21% took a neutral option. The fourth question sought whether the participants can plan teaching according to available technological resources, with the majority, 42% of the teachers in the survey, taking a neutral option, meaning that most teachers here aren't sure of their technological levels. On the positive side, item 22nd received the highest score; 58% of the participants acknowledged that they could operate with other disciplines regarding the use of technology to solve problems encountered in presenting content. These results reveal that the majority of responses to seven questions were "neutral", and many teachers interviewed for this study were unaware of their technological pedagogical knowledge according to these findings. The researcher construed that teachers in this survey do not have the prerequisite TPK levels necessary for integrating ICT in teaching English.

4.2.5.1 Teachers' Beliefs about ICT Integration in Teaching English

Teachers were prompted to choose propositional assertions from Part IV of the form that aligned with their opinions towards ICT incorporation in secondary English education (See Appendix A). In this part, there are twelve proposal assertions, with answer options strongly disagree (SD), disagree (D), neutral (N), agree (A) and strongly agree (SA). The summary of the findings is displayed below.

4.2.5 Beliefs, Thinking and Attitudes among Teachers of English towards ICT Integration

The components for this question have been further separated into three sections: attitudes, thoughts, and beliefs, with 25 questions examined in the next section.

Table 4.6 Frequencies, Percentages, Means and Std. Deviation of Teachers' Beliefs about ICT Integration

Statement	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)	M (SD)
I feel comfortable using ICT as a tool in teaching and learning English	0	1(5.3)	3(18)	9 (47.4)	(31.6)	4.05 (0.85)
The use of ICT in teaching and learning English can be very exciting	0	0	0	6 (31.6)	(68.4)	4.68 (0.48)
A computer is a valuable tool for English language teachers	0	0	1(5.3)	4 (21.1)	14(73.7	4.68 (0.58)
The computer will change the way students learn the English language in my classes	0	0	1 (5.3	5 (26.3)	13(68.4	4.63 (0.6)
The computer will change the way I teach	0	0	2(10)	7 (36.8)	10(52.)	4.42 (0.69)
The computer helps the students understand English concepts in more effective ways	0	0	2(10.5)	6 (31.6)	11(57.9	4.47 (0.7)

The computer helps English language teachers to teach in more effective ways	0	0	1(5.3)	7 (36.8)	11(57.9)	4.53 (0.61)
Technology is so important for teaching English and for supporting the learning process	2(10.5)	0	1(5.3)	7 (36.8)	9(47.4)	4.11 (1.24)
I believe that ICT can help students' critical thinking	2(10.5)	0	0	6 (31.6)	11(57.9)	4.26 (1.24)
I believe that I will not be able to use ICT effectively in my instruction because I feel insecure about its application in language teaching	8(42.1)	8(42.1)	2(10.5)	0	1 (5.3)	1.84 (1.02)
The computer helps students learn because it involves them to express their thinking in better and different ways	1 (5.3)	2(10.5)	1 (5.3)	10(52.6)	5 (26.3)	3.84 (1.12)
The computer will help English language teachers teach in more effective ways	1 (5.3)	1 (5.3)	0	5(26.3)	12(63.2)	4.3(1.12)

As evidenced by the Mean score, over 50% of the English teachers generally "agree" or "strongly agree" with most of the claims. The researcher observed the Means, Std. Deviation and Percentages, and confirmed that the highest percentages of scores in teachers' beliefs in the integration of ICTs in teaching English by secondary school teachers in Nairobi County were: "*The use of ICT in teaching and learning English can be very exciting*" 19(100%) of teachers answered "agree" with Mean score (M=4.68) and Std. Deviation (SD=0.48), "*A computer is a valuable tool for English language teachers*," 18(94.8%) of teachers answered "agree" with the statement, with Mean score (M=4.68) and Std. Deviation (SD=0.58), "*The computer will change the way students learn the English language in my classes*," 18(94.7%) answered "agree" with the statement, with Mean score (M=4.63) and Std. Deviation (SD=0.6).

On the information, "*The computer will change the way I teach*," 16(89.4%) of teachers answered "agree" with the statement, with a Mean score (M= 4.42) and Std. Deviation (SD=0.69), "*The computer helps the students understand English concepts in more effective ways*," (89.5%) of teachers answered either "agree" or "strongly agree" with Mean score (M=4.53) and Std. Deviation (SD=0.61), "*Technology is so important for teaching English and for supporting the learning process*," 18(94.7%) of teachers in this study answered either "agree" or "strongly agree" with Mean score (M=4.11) and Std. Deviation (SD=1.24). On the other hand, the majority, 16(84.2%) of the participants answered either "strongly disagree" or "disagree" with the statement, "*I believe that I will not be able to use ICT effectively in my instruction because I feel insecure about its application in language teaching*" with Mean score (M=1.84) and Std. Deviation (SD=1.02). Overall, more than half of the teachers of English in this study either "agree" or "strongly agree" with most of the statements as

indicated by the Mean score (M=4.0 and above. In addition, teachers in this survey think that technology is a wonderful resource for English language teachers and that the use of technology would facilitate the English instruction of students. The preponderance of teachers stated that incorporating computers could improve students' comprehension of English topics and their capacity for critical thinking. Most teachers said that incorporating computers could improve students each understanding of English topics and their capacity for critical thinking.

4.2.5.2 Teachers' Thinking about Integration of ICT in Teaching English

This second part of research question four explored teachers' perspectives on incorporating ICT into English instruction. In this part, there are six proposal questions on teachers' thinking about ICT integration in teaching English. Participants were prompted to rate their opinions regarding the inclusion of ICT in the English classroom with answer options strongly disagree (SD), disagree (D), neutral (N), agree (A), and strongly agree (SA). The results of teachers' responses were analysed and presented using Frequencies, Percentages, Mean, and Std. Deviations.

Table 4.7 Frequencies, Percentages, Means, and Std. Deviations of Teachers' Thinking about ICT integration

Statement	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)	M (SD)
If something goes wrong, I will not know how to fix it	0	8 (42.1)	5 (26.3)	6 (31.6)	0	**2.89 (0.88)**
The ICT is not conducive to students learning because it is not easy to use	6 (31.6)	8 (42.1)	3 (15.8)	0	2 (10.5)	**2.16 (1.21)**
I feel technology is necessary for teaching, but there is a serious lack in my school	1 (5.3)	5 (26.3)	5 (26.3)	5(26.3)	3 (15.8)	**3.21 (1.18)**
As an English teacher, I should have permanent access to technological means such as computers, projectors, videos and cassette player	1 (5.3)	0	0	6 (31.6)	12 (63.2)	**4.47 (0.96)**
I want to use computers in the instruction of my subject matter, but it frightens me that students are more skilled in ICT	7 (36.8)	6 (31.6)	4 (21.1)	(5.3)	1 (5.3)	**2.11 (1.15)**
I should use ICT in my instruction, but I do not know how to organize and manage my students' learning tasks	4 (22.2)	6 (33.3)	4 (22.2)	2 (11.1)	2 (11.1)	**2.56 (1.29)**

In the first item, teachers were asked to respond to a statement: "*If something goes wrong, I will not know how to fix it*" 8(42.15%) of teachers answered "disagree," 5(26.3%) teachers answered "neutral," and 7(31.6%) of teachers answered "agree") with Mean score (M=2.89) and Std. Deviation (SD=0.88) The first statement, "*The ICT is not conducive to students learning because it is not easy to use,*" 6(31.6%) of the teacher participants answered "strongly agree," (42.1%) of teachers answered "disagree," 3(15.8%) of teachers answered "neutral," and 2(10.5%) answered "strongly agree" with Mean score (M=2.16) and Std. Deviation (SD=(1.21). The third proposal, "*I feel technology is necessary for teaching, but there is a serious lack in my school,*" 1(5.3%) of teachers answered "strongly disagree," (26.3%) answered "disagree," 5(26.3%) answered "neutral," 5(26.3%) answered "agree" and 3(15.8%) of teachers answered "strongly agree" with Mean score (M=3.21) and Std. Deviation (SD=1.18).

For the fourth statement, "*As an English teacher, I should have permanent access to technological means such as computer, projector, videos, and cassette player,*" 1(5.3%) of teachers answered "strongly disagree," 6((31.6%) of teachers answered "agree" and 12(63.2%) of teachers answered "strongly agree" with the statement with Mean score (M=4.47) and Std. Deviation (SD=0.96), Fifth statement, "*I want to use computers in the instruction of my subject matter, but it frightens me that students are more skilled in ICT,*" 7(36.8%) of teachers answered "strongly disagree," 6(31.6%) of teachers answered "disagree," 4(21.1%) of teachers answered "neutral," 1(5.3%) of teachers answered "agree" and 1(5.3%) of teachers answered "strongly agree" with the statement, with Mean score (M=2.11) with Std. Deviation (SD=1.15). The sixth statement, "*I should use ICT in my instruction, but I do not know how to organize and*

*manage my students' learning task*s," 4(22.2%) of the participants in this study answered "strongly disagree," 6(33.3%) of the participants answered "disagree," 4(22.2%) of teachers answered "neutral," 2(11.1%) of teachers answered “agree” and 2(11.1%) of teachers in this study answered “strongly agree” with the statement, with Mean score (M=2.56) and Std. Deviation (SD=1.29). From the results, the researcher observed that 42% of teachers thought using technology in teaching English is complicated in case something goes wrong; they don't have the technical knowledge to fix it. They also think there is a serious scarcity of ICTs among teachers' schools to effectively and successfully incorporate ICTs in English classroom instructions. Teachers in this survey thought they should have permanent access to ICT resources in their respective schools and English classrooms.

4.2.5.3 Teachers’ Attitudes towards Integration of ICT in Teaching English

This section aimed to determine teachers' perspectives on incorporating ICT into English instructions. Participants were invited to respond to survey questions regarding their views on incorporating ICT into English instruction. There are seven statements with answer options strongly disagree (SD), disagree (D), neutral (N), agree (A), and strongly agree (SA). The findings on attitudes are displayed below. The negative comments were initially reverse-coded.

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Table 4.8 Frequencies, Percentages, Means, and Std. Deviations of Teachers' Attitudes towards ICT integration

Statement	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)	M (SD)
The use of computers in English language teaching and learning can be stressful	4 (21.1)	6(31.6)	6(31.6)	3(15.8)	0	**2.42 (1.02)**
I can do what the computer can do equally well	0	9 (50)	6(33.3)	3(16.7)	0	**2.67 (0.77)**
The computer is not conducive to good teaching because it creates technical problems	5 (26.3)	9(47.4)	1 (5.3)	3(15.8)	1 (5.3)	**2.26 (1.2)**
ICT is impressive but cannot contribute substantially to teaching and learning English	7 (36.8)	7(36.8)	2(10.5)	3(15.8)	0	**2.05 (1.08)**
I need more reasons to be convinced about ICT's usefulness in the educational process	6 (31.6)	8(42.1)	1 (5.3)	2(10.5)	2(10.5)	**2.26 (1.33)**
I believe that ICT cannot contribute to learning because it does not activate students	12 (63.2)	6(31.6)	1 (5.3)	0	0	**1.42 (0.61)**
The idea of using a computer in teaching and learning English makes me sceptical	7 (36.8)	9(47.4)	2(10.5)	1 (5.3)	0	**1.84 (0.83)**

Teachers responded to 7 items related to their levels of attitudes toward the integration of ICT. The results of their responses are analysed using descriptive statistics (Frequencies, Percentages, Means, and Std. Deviations). Regarding the first statement, "*The use of computers in English language teaching and learning can be stressful*," 10(53%) of the teachers answered that they "agree or strongly agree" with the statement with a Mean score (M=2.42) and Std. Deviation (SD=1.02). Regarding the second statement, "*I can do what the computer can do equally well,"* 9(50%) of the teachers disagreed with the statement, 6(33%) answered neutral, 3(17%) agreed with the statement, with Mean score (M=2.67) and Std. Deviation (SD=0.77).

In the third proposal, *"The computer is not conducive to good teaching because it creates technical problems*," 16(73%) answered "agree" with the statement, with a Mean score (M=2.23) and Std. Deviation (SD=1.2). For the fourth statement, *"ICT is impressive but cannot contribute substantially to teaching and learning English*," 14(74%) of the teachers answered "Strongly disagree and disagree" with the statement, 4(21%) answered "Agree" with the statement, with Mean (M=2.05) and Std. deviation (SD=1.08). Regarding the fifth statement, *"I believe that ICT cannot contribute to learning because it does not activate students*," 18(94%) of teachers of English answered "agree," with Std. Deviation (SD=1.42) and Mean score (M=0.61). On the sixth proposal, "*The idea of using a computer in teaching and learning English makes me skeptical*," 16(84% of teachers of English answered "strongly agree and agree," with Mean (M=0.83) and Std. Deviation (SD=1.84). However, the most frequent negative use of ITCs was: The seventh statement, "*I believe that ICT cannot contribute to learning because it does not activate students*," where (94.8%) of teachers answered that they "strongly disagree" and "disagree" with the statement, with Mean score (M=1.42) and Std. Deviation (SD=0.61). The overall average for the

Means of secondary school teachers' attitudes toward integrating ICT in teaching English was (M=1.93), and the Std. Deviation (SD=0.98).

4.3 Qualitative Data Analysis

This section contains the findings from semi-structured interviews regarding teachers' understanding of Integrating technology into English education. Interview reports from semi-structured interviews, and open survey responses are offered to confirm teachers' underpinning cognitions and comprehension of incorporating ICT into English instruction. The investigator elected to follow up qualitatively with all first-phase respondents, culminating in an equal number of respondents of 19 English teachers who responded to the survey. Data was prepared, organized, and analysed, guided by the interview questions based on the research objectives: to examine the technological knowledge of a teacher of English for adopting ICT, to establish technological content knowledge for ICT adoption, to investigate technological pedagogical knowledge for ICT integration, and to find out teachers' beliefs, thinking and attitudes towards integrating ICT in teaching English. The researcher linked Teachers' interview accounts directly to the five stages of progression of the Teacher Professional ICT Attributes Framework that had five stages.

4.3.1 Teachers' Technological Knowledge Levels and ICT Integration

The researcher interviewed teachers of English further to establish their technical knowledge of and level of ICT integration. Interviews from semi-structured and conversational accounts were used to provide evidence of teachers' underlying levels and understanding of the integration of technology in teaching the English language. The first item in the interview guide asked: "*What is your knowledge level in using ICT for teaching the English language*? The researcher observed that even though

teachers were conversant with various technology tools, the majority only had good knowledge of using the following applications: Word Processing (MS Word), E-mailing, PowerPoint, and Internet browsing. Similarly, data obtained from survey questionnaires analysis gave the same results. The findings revealed that most participants in this study had good knowledge of MS Processing applications, E-mailing, PowerPoint, and Internet browsing. However, the researcher observed that these teachers' technological knowledge levels did not guarantee ICT use in teaching, citing other factors.

To further establish teachers' technological knowledge levels in integrating ICT in teaching English. I asked them to mention some of the ICT tools they are familiar with and apply them in teaching English. The second question is, "*Mention some of the ICT tools you are familiar with and apply in teaching English* ."In response to this question, a teacher indicated that she had little technology knowledge in basic computer skills and knew very basic things about computers, Microsoft Office, and Word Processing (TR2, 2017). Similarly, one teacher stated:

> I had only used video to analyse literature books and drama work, especially the Caucasian Chalk Circle. I also use a projector with the help of a computer expert to present some CDs on literary works, focusing much on using technology. Each lesson has many activities that need to be performed, and I have very limited time to incorporate computers. Sometimes the Kenya Institute of Curriculum Development (KICD) provides teachers with CDs that include the subject lessons, but they are not appropriate for the time of the lesson. It takes so much time to teach with those CDs. English Teachers can see them as an exemplary way of teaching, yet they are not practical. On my side, I cannot use them to teach English since I would not finish even 70% of the syllabus as required by the Ministry of Education and the school administration. So, to me, there is a specific pattern in which I could use technology with my English students (TR 3, 2017)

4.3.2 Teachers' Familiarity with ICTs for Integration in Teaching English

To further establish teachers' technological content knowledge for the integration of ICT in teaching English, teachers were required to explain some of the language tasks they employ to achieve full integration of ICT. The researcher asked: *"Which language tasks have you used ICT"?* The researcher explored the survey transcripts to understand their levels of integration based on the teachers' Professional ICT Attributes Framework adopted by Newhouse et al. (2002). The researcher created a table of levels of ICT integration using the five phases of teacher progression as an overall outcome (Newhouse et al., 2005) (Figure 3.4) and stages of progression for components of potential uses (Newhouse et al., 2002), (Figure 3.5) indicating teachers' technological content knowledge levels represented in Table 4.10.

Teachers' responses from semi-structured and conversational interviews were directly linked to the layers of teachers' Professional ICT Attributes Framework: Inaction, Investigation, Application, Implementation, and Transformation. From my observation, the results revealed that the majority (N=10) of teachers (TR1, TR4, TR5, TR8, TR10, TR11, TR12, TR14, TR15, TR18) were sitting at the Investigation stage, the TCK levels, followed by teachers (TR2, TR3, TR9, TR13, TR16, TR17) were at the Inaction stage and teachers (TR6, TR7, TR19 were sitting at the Application stage. When the researcher looked at the table against each teacher's responses, the result showed that the majority (N=10) of the teachers of English based on the Teacher Professional ICT Attributes Framework, ten teachers were at the Investigation knowledge levels represented (20-40%), TCK levels, six teachers were sitting at the

Inaction stage represented by (0-20%) TCK levels while three teachers were sitting at the Application represented by (40-60%) of the TCK levels for ICT integration.

From these findings, participant teachers of English in this study were explicitly grouped around the first three levels: Inaction, Investigation, and Application. These results imply that, out of the 19 teachers interviewed in this study, ten teachers generally indicated a lack of action or interest and lacked TCK to integrate ICT in their English classroom instructions. Similarly, even though six of the 19 teachers had developed an interest in using ICT with students, they were still beginning to act on it. The results indicate that only three teachers had developed an interest in ICT, regularly used ICTs with their students, and knew how to integrate completely and confidently using TCK skills. Table 4.9 gives a summary of this information.

Table 4.9 Teachers' Levels of ICT Integration based on Teachers' Professional ICT Attributes Framework

Teacher	**Gender**	**Teaching Experience**	**Teachers' Level of ICT Integration**
TR 1	Female	19 years	Investigation
TR 2	Female	20 years	Inaction
TR 3	Male	29 years	Inaction
TR 4	female	26 years	Investigation
TR 5	Female	28 years	Investigation
TR 6	Male	10 years	Application
TR 7	Female	1 year	Application
TR 8	Female	3 years	Investigation
TR 9	Female	20 years	Inaction
TR 10	Female	26 years	Investigation
TR 11	Female	27 years	Investigation
TR 12	Male	7 years	Investigation
TR 13	Female	19 years	Inaction
TR 14	Female	3 years	Investigation
TR 15	Female	4 years	Investigation
TR 16	Female	27 years	Inaction
TR 17	Male	4 years	Inaction

TR 18	Female	8 years	Investigation
TR 19	Female	3 years	Application

Key: TR Teacher

The plurality of teachers in this investigation did not reach the critical use threshold, the more desirable threshold for utilizing ICTs for academic reasons, at which a teacher can assume leadership positions and display characteristics of a leading educator in ICTs, as highlighted in Tale 4.10. It confirms why the majority of teachers of English in this study fall within the first three stages: inaction (0-20%), investigation (20-40%), and application (40-60%) showing how much technological content knowledge levels a teacher of English in this study possessed to effectively and successfully integrate ICTs in teaching English. At the inaction stage (0-20%), there is general inaction; a teacher lacks technological content knowledge and interest in integrating ICTs in teaching English. Similarly, at the investigation stage (20-40%), a teacher is beginning to develop an interest in using ICTs with students and acting on the interest. Yet, he is not integrating ICTs into teaching.

Moreover, at the third level, deployment (40-60%), a teacher uses ICTs with learners regularly and can do so confidently using ICT facilities. In the fourth phase, execution (60-80%), the use of ICT becomes crucial to the reinforcement of the classroom environment and the possibility for learners to achieve educational objectives via the learning opportunities offered. At this stage, TPACK constructs also become critical. Reflecting on the findings, no teacher could cross to this stage, indicating that teachers in this study lacked TCK levels for ICT integration in teaching English.

4.3.3 Teachers' Technological Pedagogical Knowledge Levels for ICT Integration

The third purpose of this study was to investigate an English teacher's pedagogical knowledge competence for ICT integration. I conducted interviews with teachers to determine their degrees of ICT training, the tactics they employ for ICT incorporation, and the subject areas in which they employ ICT facilities for teaching. A large percentage, 16(84%), had participated in or undergone ICT education programs, as determined by the findings from the study. In contrast, the plurality of school teachers said they had received training on basic computer applications, including fundamental computer skills. The results also showed that a small percentage, 3(16%), had received their instruction from recognized technical training institutions. In addition, just four instructors reported receiving ICT training sponsorship from the Ministry of Education. Two teachers held a Diploma in IT, whereas the remaining two held a Certificate in ICT. Concerning the question as to whether educators integrated ICT into their English instruction based on their training, one teacher answered that she did so periodically. She elaborated on how she had struggled to integrate ICT into her English instruction for years. She also mentioned that employing ICT to instruct English gave her access to additional Web resources and employed a projector to convey her English classes using video clips. She declared:

> *I use PowerPoint presentations to deliver English content. I also use computing to assess language skills, pronunciation, writing, and technology to extend students' thoughts about language. I urge them to pronounce and transcribe words as others listen from* CDs (TR1)

Likewise, the results demonstrated that English teachers were unanimous in their support for ICT education and progress to improve teachers' technical and pedagogical skills to integrate ICT into English instruction. To this end, sixteen educators indicated having completed ICT training classes. Three teachers responded that they had not received

Instructional support but were enrolling with various Computer training centres to receive training since they deemed it vital for instructional purposes. Table 4.10 highlights interview replies from teachers.

Table 4.10 Teachers' Classification According to ICT Training

Teacher	ICT Training	Institution/Ministry	ICT Course/Levels
TR 1	Yes	No	Basic Comp. Skills
TR 2	Yes	Yes	Cert. in ICT
TR 3	No	None	Basic Comp. Skills
TR 4	Yes	Computer Training Col.	Cert. in ICT
TR 5	Yes	Computer Training Col.	
TR 6	Yes	Computers in the computer Lab	Diploma in IT
TR 7	Yes	Ministry (MoES &T)	Diploma in ICT
TR 8	Yes	Computer Training Col.	Projector, Mobile Phone
TR 9	Yes	Computer Training Col.	None
TR 10	No	None	None
TR 11	Yes	Ministry (MoES & T)	General ICT Applications
TR 12	Yes	None	General ICT Applications
TR 13	No	None	None
TR 14	Yes	None	Basic Comp. Skills
TR 15	Yes	None	Basic Comp. Applications
TR 16	Yes	None	Comp. Packages
TR 17	Yes	None	Comp. Packages
TR 18	Yes	Comp. Training Col	Cert. in Computer
TR 19	Yes	None	Basic Comp. Skills

Key:
Cert. Certificate
Col. College
Comp. Computer
MoES & T Ministry of Education Science and Technology

TR Teacher

4.3.3.1 Teachers' Challenges in the Use of ICTs in Teaching English In this part of the interview, the researcher sought to find out the challenges teachers faced in using ICTs in teaching English in secondary schools and asked them to name some factors that discourage them from integrating ICTs into teaching English. The researcher

asked, *"What are some of the challenges you face as a teacher of English in using ICTs in teaching?"* Based on interview results, the researcher determined that certain teachers have accepted the incorporation of ICTs into the teaching of English, whereas others have not. Some participants suggested that the Internet contains abundant ICT facilities teachers may exploit in the English classroom.

For example, most teachers stated that the Internet provides important google books, journals, and reports that could be used in teaching English. Although the utilization of ICT comes with its challenges, such as unavailability of computers, lack of sufficient technological skills, computer and Internet access in schools (WI-FI) and modems, and insufficient Power supply, which leads to frequent power blackouts are still some of the barriers that impede the successful ICTs integration. For example, the majority (N=14) of teachers mentioned limited ICT resources in the participants' schools. Most teachers of English generally did not have access to computers, specifically teachers of English, and did not have ICT facilities in their English classrooms.

Similarly, teachers cited their limited ICT skills for integration. From teachers' responses, the researcher found that a high proportion of teachers of English in this study possessed low ICT skills for integration. In addition, teachers cited restricted resources and a shortage of contextual components as obstacles to Integrating ICT into English instruction. Teachers argued that they might use ICT integration assignments successfully with student groups with the language skills necessary for information access on English websites, including ICT facilities and functionalities. Participant teachers also mentioned a lack of access to network computers as a major challenge to

using ICTs in English language instructions. Findings from interview accounts on challenges teachers face in using ICT in English instructions are presented in Table 4.11

Table 4.11 Sample Teachers' ICT Profile, Access & Availability

Teacher	In Classroom	At school	Teacher Ownership
TR 1	No	Projector, Computer in comp. Lab Laptop,	
TR 2	No	Computer Lab	Mobile phone
TR 3	No	Computer Lab	Projector
TR 4	No	No	No
TR 5	No	Yes	No
TR 6	Yes	Computers in the computer Lab	Laptop, Mobile Phone, Projector
TR 7	No	In the Computer Lab	Projector, Mobile Phone
TR 8	No	Yes	Projector, Mobile Phone
TR 9	No	In Science Lab,	No
TR 10	No	In Science Lab, the computer	No
TR 11	No	Computer Room, Computers	Laptops, Mobile Phones, Projectors
TR 12	No	Computer Room, Computers	Laptops, Mobile Phones, Projectors
TR 13	No	In Science Lab	No
TR 14	No	No	No
TR 15	No	No	No
TR 16	No	In Science Lab	No
TR 17	No	In Science Lab	No
TR 18	No	No	No
TR 19	No	No	No

In Table 4.11, the researcher observed that only one teacher (TR6) reported access and availability of ICTs in his English langue classroom. Four teachers (TR1, TR6, TR11, and TR12) reported laptop and projector ownership. The same facilities were reported in some schools. Most teachers said that some desktop computers are found in computing rooms. The researcher observed that mounted computers to teach and learn computer-related courses and IT. For example, a teacher commented:

> Not always, depending on the availability of such devices. Our school's problem is that the ICT facilities are limited. Those available are not meant for English language teaching but for computer science teaching and learning, which computer science teachers normally use; these are mostly

> stored in the computer laboratory, and accessing them is also a challenge. To ring the device with me and plug it in takes time off the lesson, and sometimes the device is unavailable because other teachers are using it, so I use it once a week or once a fortnight (TR17).

4.3.4 Beliefs, Views, Attitudes, and Use of ICT among Teachers of English

To further determine teachers' beliefs, thinking, and attitudes towards incorporating ICT English classes. Respondents were asked to give their views and perceptions about using ICTs in teaching English. This question was in three parts: beliefs, thinking, and attitudes. In response to the questions in the interview guide, participants came up with their beliefs, views, and attitudes toward ICT integration. Data from semi-structured and conversational interviews were presented as follows:

4.3.4.1 Teachers' Beliefs in Teaching English with Technology

In this section, the researcher sought to investigate teachers' beliefs regarding ICTs as teaching tools in English language instruction. In her response to this part, one teacher stated that she considers ICT vital for identifying individual distinctions among her students. She then suggested using ICT in teaching English in Kenyan high schools. She declared:

> I think ICT has so much to offer to students. The government should introduce ICT at all levels in the secondary English syllabus. Sometimes I ask learners to look for information on a particular topic related to the lesson to be discussed. I targeted them by searching the Internet for relevant materials. ICT should be responsive to students' needs, tendencies, and interests. Students learn new English skills such as proper pronunciation, spelling, and basic grammar rules at different levels of language learning (TR4)

Educators in this survey stated that inadequate support service at their institutions and limited accessibility to the Internet or ICT discouraged their use of ICTs in instructing English. Over half of those who participated in this survey were positive regarding using the MS Word program for teaching English (n=12) and E-mailing.

However, less than half of the teachers surveyed (n=4) agreed that the MS Excel program could aid English teaching. Three instructors disagreed with most statements regarding using ICTs in instructing English.

4.3.4.2 Teachers' Thinking about Teaching English using ICTs

This section sought to investigate teachers' thoughts about using ICTs in teaching English. I asked: "*What are your views about ICT utilization in teaching English in secondary schools?"* Findings revealed that teachers held several and varied views towards ICTs integration in teaching English. One instructor believed that ICTs have positive and constructive implications and instructed her learners to surf the Internet for English language-related material at home. She emphasized that using ICTs would increase students' cognitive and language abilities and enhance their cognition and learning capabilities (TR4). Similarly, one teacher expressed a general comment and he stated:

> Technology is a great device; it will make instruction easier and faster, so we should take advantage of it. We should embrace teaching English with technology since it is more effective and interesting. The use of technology is useful for students in the educational process. Technology has become everything everywhere. If students do not use it in learning, they will use it elsewhere in communication (TR17).

Furthermore, one teacher expressing his thoughts said:

> Technology is an idea that the government should have introduced in schools earlier. The incorporation of ICT brings excitement and stimulates learning. When using ICT, I try to go beyond what is in the English book to extend the students' horizons. I ask them who has access to a computer and the Internet at home to search for materials and information related to the topics under discussion. I also use technology in presentations, and my students enjoy the class activities. Therefore, using technology extends students' knowledge and presentation. Technology is important for teaching English and supporting the learning/teaching process (TR6).

In addition, TR6 considered his students' use of ICT very appropriate. He emphasized that he had always encouraged his students and colleagues in the English department to embrace technology and to browse the Internet, even at home, to upload information or print materials relating to the English language syllabus content. Furthermore, he reported that ICT is necessary to support teaching as well as student learning and further said:

> My students use and apply technology individually and in groups because they use it in school and at home. There is a high value in asking the students to search the Internet. When we studied the pronunciation, I asked them to search the Internet for correct sounds and correct word pronunciation. I also try to do this in most lessons as part of their homework. However, as not all students can access computers and the Internet in school because of scarcity, I ask them to work in groups. In general, I consider encouraging students to search and sometimes look at pictures and the language used in them or information related to the lesson. The students need to improve their language proficiencies and competencies (TR6).

4.3.4.3 Teachers' Attitudes towards Teaching English using ICTs

In the interview guide, I asked participants, "*What is your attitude towards integrating ICTs in teaching the English language in secondary schools?* Teachers expressed varied attitudes toward the adoption of ICT.

> Technology is good for presenting the information. It makes students more alert. It is supportive but essential, for it cannot replace a teacher. If I can explain something without technology easily and clearly explain the concept, then ICT may not be very necessary. There is a lack of ICT essentials, so there is no need to struggle with ICT tools. I do not use ICT here in school. No technology equipment was available. I have my own, and bringing it with me is exhaustive since I had to carry it all the time, and plugging the projector into my laptop took too much of my time. I wish these could have been mounted into the English classrooms, and this would save saved a lot of time and effort (TR13).

From the responses of teacher 13, I construed that he had a negative attitude toward ICTs adoption, as evidenced by the following statement; "*If I can explain something without technology easily and can clearly explain the concept, then the use of ICT may not be very necessary"* (TR13). Another educator exhibited a negative attitude

regarding using ICTs in the English classroom. He asserted that using ICT may diminish his position as an educator and the amount of contact he has with his students, which could frighten them and cause them to lose enthusiasm in the session. He reported that:

> *Integration of ICTs is a good idea, even though I don't use ICT in my English classroom. Technology is useful in other fields. I don't focus much on using technology in teaching English. Using technology makes students not pay attention; instead, they only concentrate on the tools and not the content to be prepared. However, I thought it would reduce my role as a teacher* (TR3).

Nevertheless, the majority of teachers reported optimistic views about the incorporation of ICTs into English instruction. For instance, a teacher commented that incorporating ICT into high school English instruction is an excellent concept whose time has come. The same sentiments were reported by TR7, TR1, TR11, and TR12, among other teachers. Similar results were observed in the questionnaire findings.

> I don't frequently use a computer, depending on the availability of the device. Our school's problem is that the ICT facilities are limited. Those available are not meant for English language teaching but for computer science teaching, which computer science teachers normally use. These are mostly stored in the computer laboratory, and accessing them is also an issue. Bringing the device with us and plugging it intakes time off the lesson, and sometimes the device is unavailable because other teachers are using it, so I use it maybe once a week or once a fortnight (TR17).

He further reported that this lack of access to ICTs justified his limited use of ICT in teaching English. Instead, he could bring and plug his devices during the English lessons. He pointed out that, as part of the demands of the current curriculum, some activities in the students' English coursebooks required them to use the Internet to search for information. He could sometimes ask his students to search for specific English materials on the Internet they could access at school and home. The following section presents a discussion of the findings.

4.4 Discussion of the Findings

This study's primary focus was to determine teachers' cognition of the integration of ICT in teaching English in secondary schools in Nairobi County, Kenya. Borg (2003) defines teacher cognition broadly as the unobservable psychological construct of teaching. What teachers know, think, and believe, as well as the linkages between these abstract concepts and what they perform in language instruction. On the other hand, Baker (2011) observes that research into teachers' cognitions has shed light on teachers' beliefs and knowledge about teaching and how they develop and are reflected in classroom practice. In this section, the researcher considered results from both questionnaire and the interviews regarding the content of secondary schools in Nairobi County and evidence from the literature. The discussions proceed within the context of the four primary study objectives and use findings from both the quantitative and qualitative components of the analyses reported in section 4.2 of this chapter. The survey achieved a 95% response rate. Consequently, the explanations of results were driven by the declared research aims in the introductory chapter.

4.4.1 Availability, Access, and Use of ICTs

The qualitative findings revealed that many participants lacked access to fundamental ICT tools, with the plurality reporting that they lacked computer access at school. Some teachers had laptops, mobile phones, and internet connections (Table 4.11). However, it is important to note that simple access may not translate to ready access at any time one needs to use the resources. Participants (n=18) identified a lack of laptops in their classes, which does not equate to readily available access. Other educators have used self-infrastructure, as demonstrated by the fact that less than 50 percent of those educators had a personal computer at home. At the same time, fewer reported having internet access at schools. According to Muriithi (2013) and Muriithi

et al. (2014), the findings reported in Table 4.4 indicate that emailing as well as the Internet were the most often used apps among English educators in this survey (52.6%), trailed by Microsoft Word Processing (47%) and PowerPoint (36.8%).

A portion of the technologies' limited utilization was attributable to internet access and lack of understanding.

4.4.2 Technological Knowledge Level of a Teacher of English for ICT integration

This study's results answer the first research objective: to identify the Technological knowledge level of ESL teachers and ICT skills. The study findings on technology knowledge cover solving technical problems and having the technical skills to use technology. Here, the findings suggest that most respondents have low literacy in technology thus, drew upon insufficient technological knowledge (TK). The results showed that most teachers of English had inadequate technical knowledge (TK) levels could be regarded as an influential factor in the restricted utilization of ICTs in their English language teaching. The results also revealed that only four teachers had moderate TK levels for ICT integration (TR1, TR4, and TR17).

The results further reveal that the majority (53%) of the teachers of English in the survey are familiar with only three technology applications; Emailing, the Internet (Browsing and Surfing) Word processing (MS Word). Respondents further revealed that the three applications are not necessarily for teaching English. The preponderance of English educators had an excellent technical understanding of MS Word because it is one of the frequently utilized apps in their instruction and learning processes. The findings are in parallel with Ammade et al. (2020), whose study found that most

respondents have good literacy in technology knowledge. Their average frequency on all items is above 70%, and none of them are categorized as illiterate (0%) on all items. Their findings further reveal that all respondents are familiar enough with technology, either for the technical skills needed to use it or update new technology. As a result, the respondents' knowledge of technology will be considered helpful in language teaching improvements. The study by Aslan and Zhu (2016) indicates that teachers need to be competent in ICT integration to support their pedagogical process. In addition, most English instructors evaluated their proficiency with MS Word as outstanding; most English instructors at secondary schools in Nairobi County are well-versed in ICT, according to the findings. Overall, MS Word remained dominant as the most ICT application software, followed by Internet browsing, surfing, and Emailing.

Similarly, Al-Zaidiyeen (2010) discovered that teachers working in rural schools preferred using ICT resources for academic reasons. This study indicated that secondary school English instructors in Nairobi County do not possess the required proficiency in technology adoption. The outcomes mirror research conducted by Kandasamy, Parilah, and Shah (2013). However, according to the results, most English teachers could not utilize ICT facilities. These programs play crucial roles since they might use them in English instruction. TK is defined by Mishra and Koehler (2006) as understanding innovations and increasingly sophisticated technology, including the Internet, and the skills required to run certain technologies. These findings suggest that high school teachers' ICT competence spans low to moderate, demonstrating that English instructors are only proficient with a subset of ICT applications. Nevertheless, the findings revealed that the overall mean score for

TK is low (M=1.94), using "MS Word, PowerPoint, and Emailing," suggesting that ICT tools are rarely integrated into the teaching purposes by teachers of English in Nairobi County despite their high rating. In addition, the results demonstrated that the extent of ICT application varied by English teachers and that most educators had low levels of technology integration abilities for teaching English. These results are comparable to Rosnaini & Mohd Arif (2010), who discovered that informed just a minority of teachers were about some ICTs applications. Endrogen's (2011) investigation corroborates these conclusions, as the participants were only acquainted with a few ICT applications (Kandasamy & Mohd Shah, 2013), as opposed to the vast majority. Numerous studies have also shown that educators do not obtain the required expertise.

According to Rosnaini & Mohd Arif's (2010) research (as cited by Kandasamy et al. (2013), most teachers were familiar with fundamental ICT tools. In addition, the findings demonstrated that the amount of ICT integration differed from class to class, with the majority of English teachers having a low or moderate level of ICTs for instructional reasons. The highest school English teachers in this studied area utilized ICT programs and tools for English instruction, including the Internet, PPT, and MS Word. This situation demonstrates that increasing the degree of ICT skills among instructors is the most important aspect of ensuring the effectiveness of ICT-based English education programs. According to research by Erdogan (2010), the Web emerged as the most popular sort of ICT, trailed by Ms. Word. The findings also showed that educators have a high degree of understanding of the program but a poor level of expertise regarding most software applications. According to the author's interpretation of these outcomes, English teachers' ICT knowledge is vital for

integrating ICT into English instruction and training. It demonstrates that teachers of English require technology competence for efficient ICT integration. As a result, the lack of technological knowledge by teachers of English leads to the non-use of such important tools, denying them effective teaching with ICT tools to supplement their content knowledge. According to Newhouse (2002), most educators who lack the abilities and expertise to use technology are similarly unenthusiastic about the concomitant adjustments to their instructional methods. Similarly, it was observed that educators supported the successful integration of ICT into education and learning yet were unaware of the many ICTs applications that might be used to teach English in this study. This observation confirms that secondary school teachers in this study have little technical knowledge to integrate ICTs in teaching English and, therefore, they were not utilizing ICTs in their classrooms.

4.4.3 Teachers' Technological Content Knowledge and ICT Integration

In this section, technological content knowledge (TCK), eight main items in the survey covered the need to identify which specific technologies are best suited for addressing language learning and how language teaching dictates or changes the choice of technology. Research objective two sought to establish teachers' ability to teach lessons that combine English and technology. Technology cannot exist in a vacuum without contents. Educators play a crucial role in deploying ICT in the classroom, and their technical subject expertise is an asset in this endeavour. Specifically, the researcher wanted to establish which ICT applications teachers in secondary schools in Nairobi County know and could apply in teaching English. The TCK necessitates that teachers comprehend how content might be conveyed using diverse ICT options and consider which ICT tools might best suit specific subject

matters or classrooms. Nevertheless, evidence demonstrates that it is not the instrument that results in pedagogical transformation but how educators utilize the technology (Webb & Cox. 2004). The data findings demonstrate that teachers' abilities, opinions, and attitudes toward new technology determine how they employ it in the classroom (Melor, 2007). The results from data research demonstrate that the educators' ability to teach lessons that combine the two core areas of knowledge-technology and content can be considered moderate. The results on the technological content knowledge level of teachers of English using ICTs showed that the majority (42%) of these teachers possessed a moderate knowledge of word processing and could apply it to teach vocabulary and oral skills in English. They are not yet experts in combining the two core knowledge areas very well, but they already comprehend the approach and sometimes implement it when teaching their classes. As indicated by previous studies (Rosnaini & Mohd Arif, 2010; Kandasamy et al., 2013; Al-Zaidiyeen et al., 2010), they were only proficient with a few applications, such as Microsoft Word.

Furthermore, teachers of English indicated that they possess fairly good knowledge of MS Excel applications. Teachers of English could use Excel to transform any worksheet into a web page and distribute it to their learners. Such a visual depiction of knowledge gives students a better chance to recall the material of the English lesson. Teachers can use smart art graphics to teach essays or even literature. 21st-century learning nowadays demands the usage of technology in the classroom. Teachers and students can benefit from using Microsoft Office in their teaching and learning, for example, Word or Excel. Most teachers (42%) from the presentations indicated they had some reasonable knowledge of using PowerPoint applications, emailing, and

internet browsing. Results showed that most participants (42%) could use computer programs to prepare instructional materials for any class, and most of them rated "Strongly agree." Teachers use PowerPoint to engage learners in the teaching of English vocabulary, enhancing emphasis on vocabulary items.

These teachers also use Email writing to enhance the teaching of writing skills and to practice semi-formal emails. Results further show that teachers of English also used the Internet to enable English learners to communicate with others across the globe. However, many teachers fail to realize that the Internet can be of great benefit not only for long-distance exchange but also for linking students in a single classroom. Similarly, a high proportion of teachers (73%) strongly agreed that they used or downloaded online materials as teaching and learning resources and applied the Internet in their English lessons to meet some educational goals. However, the findings revealed that many teachers (47%) of English could not create their Web pages or weblog applications to post their assignments. They could also not apply MS Excel, Programming Language (logo. CDs), Database (Access), and Graphics (Paint, Photoshop), which they had no idea about.

Generally, the findings reveal that the levels of ICT use by teachers of English varied from one teacher to the other. Thus, educators must know how technological tools impact their lessons (Koehler & Mishra, 2009). Coax and Graham (2009) emphasized that TCK requires a grasp of material representation facilitation. This study found that most English teachers seemed to have a high degree of ICT competency but were not leveraging ICTs into English instruction. Most English teachers utilize ICT programs and assets for personal reasons, and only a few use ICT to teach English. The results

further revealed that more than half of the teachers of English used ICTs to teach speech work such as pronunciation skills, do presentations, communicate with colleagues, and prepare progress records for students. These findings are congruent with Owino (2016), who found that English teachers used ICT resources to teach reading, writing, speaking, listening, and pronunciation.

In speech work classes, learners may use a digital audio dictionary to practice their articulation. They could listen and practice pronunciation while also learning the meanings of new words and how to apply them in phrases (Sarhan, 2000). Moreover,75% of the educators were not incorporating ICTs into overall classroom activities, according to the statistical studies conducted during the quantitative stage. Educators did not integrate ICT into their classes due to a lack of availability or a negative opinion of ICT as unsuitable for learning outcomes. During the Inaction phase, educators were not using ICTs completely. They demonstrated no behavior connected to the incorporation of ICTs, as evidenced by the interviews, either due to the absence of ICT facilities or disinterest in implementing ICTs in instruction.

From the descriptive statistics, the mean score for this group is low (M=2.42), demonstrating that English educators in Nairobi County seldom incorporate ICTs into their English language instruction. The findings also showed that the extent of ICT utilization differed among the respondent, with the majority having a relatively low TCK for blended learning in English instruction. Most teachers utilized ICT tools such as Microsoft Word and English-teaching resources. However, MS Excel did not seem to be utilized by the participants in this study. This conclusion is in line with the results of Al-Zaidiyeen (2010), who observed that only a tiny percentage of teachers

use ICTs for learning purposes. Generally, teachers regard ICT at this stage as a subject to be learned about and consider Students' ICT knowledge. The ICTs were merely used for activities not concerned with the student's English learning outcomes. The qualitative analysis indicates further that educators in the Application phase utilized ICTs in contemporary English classroom teaching, with the integration techniques focusing primarily on product presentation or learner Computer skills.

The teachers' use of ICTs was not completely and explicitly related to English learning goals, and they did not consider students' effective ICT incorporation participation. Teachers of English are much more willing to implement ICTs in their classrooms if they perceive the significance of ICTs to classroom instruction or are confident that the architecture of educational apps is consistent with instructional goals and students' particular learning requirements (Williams et al., 2004). Based on these findings, the authors conclude that incorporating ICTs is mostly a complement to classroom exercises and seldom a crucial component of the educational setting.

This result is corroborated by Newhouse et al. (2002), who found that secondary teachers' utilization ICTs did not exceed the critical use threshold, indicating that their utilization of ICTs was not essential to the instruction of English or for learners to accomplish English language educational objectives. It indicates that the English participants in this study never incorporated ICT into their classroom practices because they did not recognize ICT's ability to enhance student learning. Contrary to Empirics's (2006) findings, where 90% used ICTs to plan classes, this study indicates that most instructors do not use them. The result that English teachers in Nairobi County demonstrated low levels of digital literacy assimilation in their classrooms is

similar to the results of a previous study by (Amuko, 2015), who observed that educators faced adversity, including establishing their technical knowledge and skills and self-training in the application of ICTs in their instruction. In addition, the study concluded that a lack of capacity development support influenced teachers' willingness to use technology in classrooms. Moreover, these results align with conclusions from many past studies indicating that many educators do not use ICTs successfully in their classes (Cuban et al., 2001; Wozney et al., 2006).

While a considerable percentage of non-user instructors remained, as exemplified by this study, a small percentage of teachers acknowledged utilizing ICTs weekly in their classroom activities. Despite a minor increase in the proportion of ICT instructors, the findings indicate that their utilization efficiency appears to be increasing. In addition, the results indicated that English teachers primarily used ICTs to showcase photographs, PowerPoint slides, or video clips. These conclusions indicated that all educators who utilized ICTs focused mostly on utilizing projectors to provide learners with information. The literature review also showed that successful ICT integration necessitates using ICTs to construct knowledge instead of instructional aids (Jonassen et al., 1998).

The findings demonstrated that ICT incorporation occurred in classrooms within a conventional instructional style. In addition, the investigator gleaned from the interview reports that the plurality of secondary school English instructors viewed ICTs as educational instruments to provide information and facts to their learners, concentrating mostly on whole-class instruction instead of individualized student interaction. It demonstrated that when incorporating ICTs, the educator was also the

one who delivered information and conveyed expertise, whereas the student had a passive position as a listener; therefore, the classrooms were teacher-centred instead of student-centred, which contributes to rote memorization. According to the study, most teachers in secondary schools employed ICTs to help their students acquire simpler cognitive abilities when they should have encouraged their students to engage more deeply and creatively with the material (Kirschner, 2006). Like the Common Core, the Australian Curriculum suggests that utilizing ICT as a means of learning empowers learners to effectively and efficiently access digital data to support researching problems, problem-solving, as well as making decisions, interacting, sharing, and working in collaboration with others in local, national, and global contexts; and acquiring and applying new knowledge, understanding, and abilities to support knowledge acquisition (Curriculum Corporation, 2006). Learners can become more involved in their education rather than just sitting back and taking in information (Gao & Hargis, 2010). Therefore, educators can realize the benefits of incorporating ICT into the classroom. Literature research indicates that ICT is believed to have several benefits in education. Notably, problem-solving skills, facilitating cooperative learning, giving flexible learning possibilities, and boosting productivity (Chambers, 2011).

If ICT is not utilized efficiently, the maximum benefits of its usage in education cannot be realized. Hence, incorporating ICTs must occur within establishing efficient constructive learning environments' instructional methodologies. ICT should be utilized in manners that allow teachers to function as facilitators to involve students in knowledge acquisition. It will not happen if ICT is employed in conventional teaching methods. Moreover, several teachers indicated using PowerPoint to present courses

using presentations. In this context, the responsibility of learners is to gain from the material provided by ICT, just as they learned from the information provided by their educators; hence ICT is no more successful at educating learners than teachers themselves (Howland et al., 2012). Because of this, the learners were not actively engaged in the learning process but were learning about and from ICT facilities. Although learners passively absorb information offered by ICT when learning from it, studies show that when learning with it, they proactively use it to expand their understanding.

The low degree of successful integration of ICTs in instruction can be explained by the fact that most English educators in Nairobi County do not incorporate ICTs that enable their learners to learn best from Information technology. One important aspect of effective ICT integration was highlighted by Tecci (2009) and Nyland (2011), which stated that the use of innovation should begin with the recognition of an academic conundrum and the determination of what students, educators, or education institutions want to accomplish, rather than with the technology to accomplish. According to the findings of this research, teachers appear to place a high priority on technology. Most teachers were more concerned with the technologies themselves than with the learning objectives they were attempting to achieve in their classrooms.

Teachers of English as a foreign language who lean more toward the constructivist school of thought are more likely to prioritize the educational results for their learners over the technology they use. No English language educators in this survey were found to implement constructivist tactics fully; nonetheless, a few educators said that they had urged their learners to use the Web to study and research topics relating to

the subject material. In addition to focusing on using ICT as a visualization tool, teachers noted that they might use ICT to broaden students' perspectives, which could boost student learning. Teachers with a modest amount of effective ICT integration had a more sophisticated viewpoint of ICT than those who had just employed ICT as a visualization tool and did not consider their students' ICT use as important to enhance their understanding. Demetriadis et al. (2003) noted that educators incorporated technological resources to strengthen their traditional methods of instruction, which put a stronger focus on the central position of the instructor as well as the test-driven syllabus. These data corroborate those conclusions.

It also supports the report's contention that one must develop a clear reason for employing ICT in education (Vallance et al., 2009). According to this survey, the majority of high school English instructors did not seem to have a strong educational justification for using ICTs in overall classroom practices. Despite their attempts to incorporate ICT into their instruction, teachers lacked guidance on how ICT may be most effectively incorporated into classroom activities. In addition, it was noted that high school English teachers lacked a compelling reason for ICT integration. The effectiveness of ICT deployment in education includes incorporating ICT efficiently and effectively into all process aspects (Yalin et al., 2007). Moreover, studies have highlighted that educators' ICT skills, ideas, and perceptions about ICT incorporation are crucial to the desire to embrace and employ ICT in classroom practice (Kumar et al., 2004).

It implies that ICT incorporation should not be viewed as a product but as a process requiring specific steps for accomplishment (Yalin et al., 2007). It commences with

identifying educational challenges and progressing from agreed, well-supported visions of education to guarantee that any proposed solutions are congruent with the desired outcomes. Even if the accessibility of ICT facilities and other situational variables were significant, weaker attitudes and availability were associated with greater ICT usage. Moreover, this study is consistent with the literature's focus that educators, not ICT, are essential to establishing technology integration (Ertmer et al., 2010). The researcher noted that educators' insufficient ICT expertise for assimilation could be credited to their restricted (TPACK) and construed this to mean that educators' TCK thresholds and ICT incorporation mediated the link between educators' TPACK and ICT implementation thresholds.

If English language educators viewed ICTs only as a technique to display information, it is inconceivable that they would consider it a learning instrument for pupils. Most English educators were unaware of the possibilities of ICTs for academic outcomes. In teacher preparation and instruction data, the TCK component of the TPACK framework was not identified. Literature research indicates a connection between educators' TCK and ICT capabilities or other teacher-related characteristics. According to Newhouse et al. (2002), most educators who lack the technical subject skills and knowledge to use computer systems are also unenthusiastic about the concomitant adjustments to their classroom methods. Based on these findings, it was determined that the preponderance of educator respondents' TCK levels fell within the Inaction (0-20%) or Inquiry (20-40%) phases of teachers' growth, in addition to the progression phases for possible usage elements. They noted that the Teacher Professional ICT Qualities result refers to the capacity of educators to use the features of ICTs as they advance through five phases: Inaction, research, deployment, and

transformation. At the Lack of action stage, activity or motivation are inadequate, and TCK capabilities for ICT integration are missing.

Abdul Rahim & Shamsiah (2008) surveyed the student teachers' Competence in incorporating ICT into instruction and their preparedness to use ICT. Male responders were reported to be more assured than their female counterparts. In addition, their studies demonstrated no association between educational excellence and trust in incorporating ICT into the classroom. The conclusions were comparable to those of Samuel and Zaituni (2007) and Pamela & Noraza (2007), in which the participants' confidence level and outlook regarding ICT appeared to be optimistic. Like Melor's research, Abdul Rahim & Shamsiah (2008) reported that vocational educators feel more competent in incorporating ICTs into the classroom (2007). The rationale was that vocational instructors taught technical courses, and their expertise allowed them to implement ICT into the class fully. This study demonstrated that teachers' Competence was crucial in transferring knowledge to students. Teachers were required to have expertise in ICT. The essential question is whether or not teachers have the necessary ICT competence. Rosnaini and Mohd Aris (2010) demonstrated that a minority of educators have fundamental ICT knowledge, whereas most possess just average ICT expertise. There was even a bunch of educators who displayed extremely limited ICT competence. This situation demonstrates that increasing the degree of ICT expertise among instructors is crucial to implementing ICT integration in schools.

According to similar research by Erdogan (2010), the Web was the most popular type of ICT, trailed by Ms. Word. The findings also revealed that instructors had a greater

standard of software expertise t a p of information technology expertise. It demonstrates that training is crucial for the technological pedagogical expertise of instructors. This study found that the conceptual definitions of the seven TPACK categories in the literature might not even exist in practice, particularly in the Kenyan environment. For instance, TCK, regarded as one of the fundamental cognitive domains from the TPACK paradigm, was not identified in the educators' think-aloud observations. This result lends weight to Cox et al. (2008)'s argument. Nevertheless, findings of new fields of knowledge of TPACK areas allowed this study to conclude that instructors' knowledge is not limited to the seven TPACK dimensions but extends beyond the material, technology, and pedagogy. These dimensions were not so deeply ingrained in teachers' planning and instruction notions that it was difficult to summarise the findings without revealing the cognitive components of teachers. It might be stated that the use of ICT in education is proportional to the level of ICT understanding. This knowledge will boost student-cantered learning and increase specific language skills.

4.4.4 Teachers' Technological Pedagogical Knowledge and ICT Integration

Pedagogy encompasses all aspects of student achievement, classroom organization, instructional creation and execution, and student assessment (Deshmukh, 2013). Educators with extensive pedagogical expertise comprehend how learners construct information, gain skills, and promote good instructional practices and attitudes. Practitioners of English language teaching (ELT) must impart conceptual understanding by utilizing a pragmatic pedagogical approach in tandem with ICT skills and understanding. Where English content should be the central purpose and ICT tools constitute pedagogical and environmental agents, the qualitative use and

pedagogically motivated use of ICTs become imperative (Deshmukh, 2013). In this research, TPK addresses how the employment of specific technology affects learning and teaching. In curriculum design, pedagogical knowledge (PK) refers to a comprehensive understanding of pedagogy, a large field of knowledge. The author investigated replies to identify examples of teachers' TPK to determine which forms of TPK influenced teachers' decisions. During the instruction of English, the outcomes revealed that teachers relied entirely on traditional pedagogical expertise in two ways: first, while selecting dates and timetables for instruction and making judgments regarding time management. Secondly, the TPK scale demonstrated teachers' comprehension of certain technological instruments' qualities, features, and contextual cues. A teacher disclosed:

> “I ask students to search the Internet for correct sounds and correct word pronunciation. I also try to do this in most lessons as part of their homework. However, not all students could access computers and the Internet at school because of scarcity; I asked them to work in groups. In general, I consider encouraging them to Google search the Internet to look for information on language related to the lesson. I find this important for the students to improve their language skills, proficiencies, and competencies" (TR6).

Occasionally, teachers appear to use other teaching tools substantially, suggesting their familiarity with these techniques. The study indicated that English teachers used TPK in two ways when instructing: Firstly, TPK may refer to using various technology resources and tools in the classroom. A teacher, for instance, mentioned:

> "Sometimes, I asked students to google search for information about a particular topic related to the lesson to be discussed. I targeted them by searching the Internet for relevant English materials and added that ICT should be responsive to students' needs, tendencies, and interests. Students learn new English skills such as proper pronunciation, spelling, and basic grammar rules at different levels of language learning" (TR4).

Teachers occasionally referred to utilizing a variety of ICTs to evaluate students' skills and knowledge, including the use of online decision boards for teamwork and the

production of appropriate instructional initiatives, as well as the development of Web pages to evaluate students' creative abilities. Secondly, teachers claimed that they might arrange the learning and instruction based on existing technology resources and use these innovations to identify students' content-related needs before teaching. Teachers used radio cassettes to improve the instruction of academic essays, particularly the instruction of article writing in English, according to qualitative data (TR.4). She added that she utilized ICT technologies in the instruction of articulation, language abilities, and to lesser extent, syntax concepts. To be competent, teachers require solid technical and foundational pedagogical abilities. Secondly, the data revealed that a minority of instructors had an adequate rating of TPK understanding, but the majority had poor TPK knowledge levels. Harbi (2014) discovered that less than 50% of Saudi High educators have a greater standard of TPK understanding, roughly one-third possess an average, and only a few possess a poor level of TPK understanding. Instructors' pedagogical abilities would be enhanced by critically examining how they use ICT technologies in learning and instruction (Beaudin & Hadden,2004). Likewise, most participants in this study lacked TPK. The majority of educators were not pleased with the TPK required for Integrating ICT in English instruction, according to the results. Mishra and Koehler (2007) claim that successful technology-based teaching involves pedagogical skills that use innovations in productive ways to convey content, which supports this view. Likewise, the findings indicate disparities in TPK among English educators.

Although TR16 and TR17 claimed to have learned general ICT abilities, they failed to provide adequate TPK understanding. These findings are supported by the theory that the greater TPACK a teacher has, the more effective ICT integration is demonstrated

by the teacher (Koehler & Mishra, 2006). However, most educators claimed they knew how to use the presenting tools available for their English language lessons. The author found that these talents validate vital skills, including computer fundamentals, information seeking, online chats and e-mailing, and excel. In addition, TR9 stated that she had completed an introductory computing course. It demonstrates that the English teachers' technology competence alone would be insufficient for effective ICT usage. These findings are congruent with Rosnaini & Mohd Arif (2010), who discovered that most educators had limited expertise in apps such as web browsing. Likewise, interview assessments revealed that most English instructors lacked the technical expertise properly to incorporate ICTs within their instructors. The conclusions are reinforced by an investigation by Melor (2007) and Samuel & Zaituni (2007), who indicated that ESL teachers, despite reactions toward the Integration of ICT, lacked competencies since they were unfamiliar with numerous new software programs. According to Kandasamy & Mohd Shah (2013), the effective execution of Integrating technology in the learning and instruction of the English language requires the full support and participation of the school officials, a positive outlook from English teachers, additional training to refresh educators' Competence, and mentoring on how to utilize ICT tools adequately. According to Koehler & Mishra (2005), for an educator to effectively incorporate technology, it is essential to teach innovation in environments that demonstrate strong links between innovation, pedagogy, and content. In addition, the outcomes of this research showed that there were few education initiatives in place for English instructors, resulting in the majority of such educators having low skill sets. teachers indicated a high TPK scale following the conclusions of other research conducted in industrialized nations (Archambault & Crippen, 2009; Doukakis et al., 2010; Karadeniz & Vatanartiran, 2013).

According to Bradl (2002), the first step in implementing technology in language teaching is to provide teachers with suggestions for integrating ICT into the curriculum and tips for creating a pedagogically sound lesson plan. The results showed that English language instructors rarely, if ever, made use of TPACK concepts in their lessons. In a study by Amande et al. (2020), the data research results illustrate that respondents' ability to teach lessons that combine the three core areas of knowledge-pedagogy, content and technology-can be categorized in a moderate position. The study further shows that teachers are not yet experts in combining all the three-core knowledge very well, but they already recognize the approach and sometimes implement it when teaching their classes. The same applies to their ability to choose appropriate technologies in the classroom that enhance what to teach, how to teach, and what students learn. Wambiri & Ndani (2016) opine that there is a gap in the pedagogical use of ICT. A study by Muinde & Mbataru (2019) found that 85% of teachers had received ICT training from the MoE; however, 62.3% felt that the training was inappropriate for teaching and learning. On the same note, Mwwangi & Khatete (2017) found that after teachers had receded training on basic computer literacy or programming, Microsoft Office and Excel, these did not equip teachers for technology integration. On the contrary, a study by Azhar & Hashim (2022) found that teachers' TPACK level in Malaysia is amazingly high.

4.4.5 Teachers' Beliefs, Attitudes, and Thinking towards ICT Integration

The fourth objective of the study was to establish the influence of teachers' attitudes on ICT integration in teaching English in secondary schools in Nairobi County. A set of statements in the form of five points Likert scale was posed to the teachers to

indicate the extent to which they agree or disagree with them. The responses were coded so strongly disagree (SD) was rated number 1 while strongly agree (SA) was number 5. Educators have a crucial role in the deployment of ICT within schools, and their beliefs, perspectives, and dispositions are significant determinants of technology usage. These three aspects are explained in detail below.

4.4.5.1 Teachers' Beliefs about ICT Integration in Teaching English

According to teacher responses, incorporating ICT in the classroom may be stimulating, making it a great resource for English language instructors. Most educators felt that the technology would alter how learners experience English in their classrooms, increasing the likelihood that they will achieve fundamental linguistic skills.

These findings are comparable to those of Suwanttosom (2010), who discovered that educators anticipated students to gain key writing abilities, such as composing semantically accurate sentences, revising their draughts, and rehearsing writing in various genres. The results indicate that innovation is crucial for instructing English and facilitating the learning experience. Nevertheless, results from some teachers indicate that they vehemently reject the use of ICT. Because of innovation and recent attention to ICT advancements in schools, including ICT abilities, this research also indicates that English teachers' enthusiasm and readiness for using ICT as a learning and teaching tool improved and diversified. The investigation reaffirmed the significance of teachers' ICT abilities and views regarding incorporating ICT and their motivations to incorporate ICT into their classroom practices.

The findings also reveal that English teachers demonstrated diverse attitudes and a desire to integrate ICT into learning and instruction using ICT facilities due to creativity and recent engagement with ICT advancement and capabilities. The given analysis underlined the role of teachers' ICT abilities and views on ICT in their readiness to integrate ICTs into instruction and master English. Becta (2004) supports these conclusions. Similarly, Ertmer (2005) remarked that whether and how to utilize ICTs for instructional objectives highly depends on the educators and their convictions, trust, and ICT incorporation skills. Moreover, a study suggests that teachers' beliefs and attitudes could diminish or amplify other impediments' impact (Hativa & Lesgold, 1996). These results suggest that providing educators with opportunities to improve ICT skills is crucial for bolstering their views about the importance of ICTs in the language classroom. Wanjala (2013) revealed that teachers' attitudes and beliefs toward the application of ICT in public high schools were largely positive, with educators praising the convenience and speed of ICT. The result is comparable with Khan & Kuddus (2020), whose results exhibit the positive attitude of the secondary-level English teachers of Bangladesh towards using ICT in English language teaching. The work contributes significantly to understanding the various factors determining teachers' categorization (Jimoyiannis & Komis, 2007). A teacher's perspective is one of the primary predictors of whether Blended learning is beneficial (Ertmer, 2005; Hew & Brush, 2007; Tezci, 2009). According to the findings, teachers consider the incorporation of ICTs to be fascinating. They also feel that technology is a useful instrument for the English language and that the usage of computers would facilitate the language instruction of students.

The findings agree with Khan & Kuddus (2020), whose findings revealed that teachers completely agree with the advantages of integrating ICT in the English classroom. The plurality of English teachers participating in this study agreed that incorporating computers will improve comprehension of English ideas. In addition, most participants viewed ICTs as supporting English language instruction in their classes. The outcomes of this study indicate that most instructors' opinions regarding the use of ICT in teaching English favour teachers' pedagogical tasks instead of students' and participatory language learning activities. The findings suggested that educators' use of technologies was mostly associated with the lower level of ICT adoption in English language instruction. Similar observations were made by Sawanttosom (2010), who stated that such findings might reflect the current status of ICT use and attitudes among Thai tertiary professors based on their respective working circumstances.

4.4.5.2 Teachers' Views/Thinking about ICT integration in Teaching English

In this study, teachers' thinking was investigated to elicit their perspectives on some activities, including teachers' roles in integrating ICTs in teaching English. Results revealed varied teachers' responses depending on the statement regarding their thoughts. First, results show that most teachers in this study thought using technology is complex in case something goes wrong; they do not have the technical knowledge to fix it. Teachers also thought there was a serious lack of ICTs in the respective participants' schools. To utilize ICTs effectively, teachers in this study thought that they should have enduring access to technology such as computers, projectors, and cassette players both in schools and in their English language classrooms. However,

36% of teachers did not think using computers in English instruction could frighten them because they feel their students are more skilled in ICT.

These findings further revealed that more than half (75%) of teachers of English in this study thought that ICT is not favourable to students' learning since it is challenging to use in teaching English. Therefore, these results have implications: First, teachers thought that they had adequate technical knowledge and that students' knowledge of ICT did not supersede their ICT knowledge to the extent of scaring them. Second, teachers thought that ICT was not conducive to student learning. It implies that learners transfer their perspectives from face-to-face academic contexts to those mediated by technology. Consequently, teachers believed that using technology will improve students' essential linguistic competence, like writing, comparable to their beliefs regarding face-to-face English language training. Muinde & Mbataru (2019) found that 68.5% of the sampled teachers had a high perception of using laptops in their teaching and learning.

This conclusion is in line with past research indicating that, although innovation has advanced and provides more options for education and constructive activities and activities, teachers typically move face-to-face work to online spaces without modifying them (Hampel, 2005; Suwannasom, 2010).

4.4.5.3 Attitudes among Teachers of English towards ICT Integration

Many factors, including instructors' attitudes about using ICT in the classroom, contribute to whether or not computer technology is used effectively in education. Teachers were divided into three groups: those with good attitudes toward

incorporating ICT into their English classrooms, those with negative views, and those with neutral opinions. The results showed that educators have a supportive outlook on using technology to teach English. These findings are consistent with those of investigations by Melor (2007), Samuel & Zaituni (2007), and Al-Zaidiyeen (2010), all of which found that the vast majority of educators had favourable attitudes toward utilizing ICT in the classroom, highlighting the significance of teachers' perceptions as a critical factor in determining students' success with and adoption of ICT., Albirini (2006) found that instructors' attitudes about technology use were the most important factor in the success of innovation in teaching and learning settings. According to research by Kandasamy et al. (2013), educators generally have optimistic views. All of the research concluded that educators' perspectives on technology play a crucial role in determining whether or not ICT tools are used in the classroom (Kandasamy et al., 2013). Educators' acceptance of technology as an instructional tool hinges largely on their attitudes toward technology and its role in the classroom. Seventy-four percent of the educators in this study believed online resources, including research papers, google books, and review papers might be used in the classroom to teach English better. However, there are difficulties associated with integrating ICTs. According to educators, incorporating ICTs into secondary schools' English curricula should have been planned to yield beneficial results in terms of instruction, with the desired results being improved achievements in students' academic performance. According to the findings, most (63%) English teachers only used fundamental software programs for their presentations. These results are consistent with those of investigations by Russell et al. (2003) and Jimoyiannis & Komis (2008), which revealed that teachers typically used the web for lesson planning and research.

In order to keep track of student progress, some educators have admitted to using Microsoft Excel. The study found that some schools had computers equipped with the bare minimum of software by analyzing interview data. This research also confirmed that insufficient specialist or sophisticated software prevented the efficient combination of ICT resources. The results also showed that many educators reported having less-than-adequate access to information and communication technology hardware. It follows that insufficient computer facilities result in insufficient software use. According to the data, it was also determined that the quality of the available infrastructure varied, as only one educator (TR6) admitted to having access to ICT tools in their classroom. These results are consistent with those of Owino (2016), who also concluded that the existing ICT resources were inadequate for use in the English language classroom. These results are consistent with research by Jones (2004), who encountered similar difficulties when attempting to implement ICT into his teaching. Similarly, a study by Mutai (2021) found that teachers positively perceived ICT utilization but cited inadequate ICT infrastructure. It could be attributed to the low ICT integration in teaching and learning Engineering courses.

These results are congruent with the current study. However, Mumtaz (2000) found that low resources restrict teachers' utilization ICTs, and that access to high-quality technological resources was linked to successful technology applications. Participants in this study who taught English as a foreign language reported having insufficient opportunities to learn about and practice using technological tools. It runs counter to the findings of research by Oboko and Njagi (2013), who concluded that teachers' ability to use even the most fundamental forms of information and communication technology was satisfactory. PowerPoint skills, Internet access to educational

materials, computer upkeep, and faculty cooperation all fell short of the desirable benchmark.

Oboko & Njagi (2013) found that teachers' and students' confidence in their ability to use the web to acquire educational resources was poor. Their research also revealed a correlation between teacher capability and educators' enthusiasm to use ICT in the classroom. The instructor's ability to utilize ICT tools influences the student's capacity to use ICTs, thereby enhancing the students' ICT skills. The present study identified poor levels of technology content knowledge among teachers. The findings of this study about the ICT background of instructors showed that the majority were equipped with basic ICT skills. Other researchers, such as Oboko & Njagi (2013) and Mishra & Koehler (2009), corroborate these results (2007). Evidence from various foreign contexts has reported a striking absence of ICT teacher preparation, despite the critical importance of increasing teachers' computer abilities. However, it is important to remember that factors must be considered for tech training to succeed. The pedagogical and technical components of ICT must be covered in instruction (Jones, 2004).

Secondly, it must be incorporated into the setting and meet the urgent needs of the teachers (Egbert et al., 2002). Finally, it must consider the educators' existing worldviews (Antonietti & Giorgetti, 2006). The results of the interviews indicated the essential role performed by the school administration in supporting the incorporation of ICT into English instruction. According to teacher comments, the school administration did not develop approaches for tracking and providing ICT resources,

nor did it oversee the use of ICT tools within the classroom. This result was consistent with that of research by Oboko & Njagi (2013).

Teachers disclosed that the school administration provided the necessary tech assistance for ICTs tools, but maintenance of such resources was not current. Most teachers disagreed that school administration and the state offered essential assistance to English instructors for incorporating ICT into the classroom, as they did for teachers of sciences, particularly computer science classes. Most teacher replies regarding the institution and state motivation and support indicated abysmal performance. According to a study by Roblyer & Doering (2010), ICT adoption processes are most effective when some crucial variables are met. To be efficient and productive in the classroom, instructors require extensive and continuing professional growth, as Harbi (2014) elucidated. In addition, most educators in this study mentioned a lack of ICT resources as the main challenge they face when attempting to integrate ICT into their classrooms effectively. As one example, a teacher mentioned:

> My students nor I have used ICT in the English classroom. My school has no ICT tools that could be used in teaching and learning English. The school only has computers for administrative purposes and marks entry, not for teaching. It limits even those teachers of English would intend to use the tools for teaching and learning purposes. This situation has impacted negatively and has resulted in teachers of English developing negative attitudes towards integrating ICT tools in teaching (TR13)

Teachers play a pivotal role in incorporating ICTs into the curriculum. Educators' perspectives toward incorporating ICT in the instruction and educational experience are critical in determining the success or failure of ICT use in education. Muinde & Mbataru (2019) found that 68.5% of the sampled teachers had a high perception of using laptops in their teaching and learning. Similarly, Toe et al. (2016) contend that teacher attitudes regarding technology integration in the classroom are critical to its

effectiveness. It is also echoed by Semerci & Aydin (2018). Thus, teachers' attitudes have a key role in their technological integration in the classroom.

4.4.6 Discussion based on Theoretical Framework

The study's objective was to determine how much secondary school English teachers in Nairobi County, Kenya, know about using ICT to instruct the language. Two theoretical approaches, TPACK and Teacher cognition served as the basis for the research. The TPCK or TPACK framework stresses the proper incorporation of effective techniques for teaching specific content, which requires a thorough conceptualization of the relationships between Technology, Pedagogy, and Content. Teachers who obtain this capability to relate these knowledge components meaningfully would constitute a form of excellence of knowledge in specific content, teaching, and technology. The TPACK framework emphasizes the blended relationships between the knowledge of content, pedagogy, and technology. In the present educational scenario, the TPACK framework can act as an effective organizing frame for the professional development of teachers in educational technology (Vijayan & Joshith, 2018**).** TPACK Knowledge com Educators need expertise in three broad areas, including pedagogical knowledge (PK), technological knowledge (TK), and content knowledge (CK), as determined by the study.

It was found that TCK, TPK, and PCK emerge from the interplay between CK, PK, and TK, the three principal domains of knowledge. According to the research, these synergies of knowledge improve educators' utilization of ICTs in the classroom. The study also discovered that a trio, TPACK, is formed when PCK, TCK, and TPK domains intersect and that this triad is the perfect mix of necessary understanding by

an English instructor to employ ICTs in teaching methods, as defined by TPACK. Based on these observations, it was advocated that TPACK be used to investigate how well-informed English language instructors in high schools in Nairobi County are about the benefits of using ICT in their lessons. According to Mishra & Koehler (2006):

> "Good teaching is not simply adding technology to the existing teaching and content domain. Rather, the introduction of technology causes the representation of new concepts and requires developing sensitivity to the dynamics; the transactional relationship between all three components suggested by the TP [A] CK framework" (p.134).

In addition, the study concluded that TPACK is a crucial factor in English language educators' use of ICTs for classroom use. Findings revealed that secondary school teachers who participated in this survey exhibit low TPACK levels to integrate ICTs in teaching English. These results are in parallel with Amande et al. (2020), whose data research results illustrate that the respondents' ability to teach lessons that combine the three core areas of knowledge-pedagogy, content, and technology can be categorized in a moderate position. Results from the interview data showed that teachers of English also had limited skills in how ICT might be integrated. The findings agree with Indembukhani (2021), whose study revealed that teachers lack ICT pedagogical integration competence in teaching English, and integration of ICT is at the applying level. It is not yet at the transforming stage; teachers did not apply effective ICT integration strategies in teaching English, and they rarely used ICTs in teaching English. They are not yet experts in combining all three core knowledge areas very well, but they already recognize the approach and sometimes implement it when teaching their classes.

Azhar & Hashim (2022) studied the level of ESL teachers' technological pedagogical content knowledge (TPACK) skills and attitudes toward technology. The findings show that the ESL teachers' TPACK level is amazingly high contrary to the current study. Their findings also revealed that the teachers' attitudes toward technology are promisingly significant; thus, this result agrees with the current study's findings. In contrast, language instructors' knowledge, beliefs, and thoughts, the unobservable cognitive part of teaching, are what language teachers refer to as teachers' knowledge (Borg, 2003). It is generally agreed that instructors' cognitions are influential in the classroom, and these cognitions are complicated and relevant to various issues. The study found that LCT is influenced by several factors, the most important of which are location-based. Further evidence is provided by Van Lier (2004) and Feryok (2005). It is argued, regarding the Kenyan setting as an illustration, that variables external to the classroom may affect teachers' perceptions and actions about using ICTs for teaching English as a foreign language. This study set out to discover what elements, such as LTC and other aspects of the environment, might be affecting the use of ICTs in secondary English classrooms in Kenya. This study aimed to investigate further the roles played by educators' comprehension, TPACK components, and ICT integration. The two perspectives offered a way of considering what is needed for effective ICT integration, particularly the knowledge necessary to incorporate ICTs into teaching successfully, particularly in English language classroom situations. Together, these two models have helped us fully appreciate what English language educators have in mind once they incorporate ICT into their lessons by taking into account teachers' perceptions about the technological and social contexts in which they operate, as well as the English curriculum, their students, and the classroom setting. When considering the concept of methodological triangulation as a technique of finding common ground

between the instructor cognition paradigm and the TPACK paradigm, it becomes clear that doing so is more likely to yield more comprehensive and high-quality outcomes. As a result, this study stresses the need to have English teachers reflect on their pedagogical ideals and familiarity with the potential of ICTs in the classroom. According to Swenson et al. (2005), teachers need to be aware of the sociocultural factors that affect the learning and instruction resulting from integrating technology. Both in-service and pre-service educators must have access to high-quality training programs to effectively advocate for integrating ICT into teaching and learning.

Teachers may benefit from seeing concrete evidence of how computer systems and the Internet are used in classrooms to think critically about their participation in the technology-enhanced education process (Suwannasom, 2010). Evidence from the research helped unify teachers' thoughts, attitudes, and knowledge into a set of guiding principles or practices and context-specific practices for using ICT in the classroom. Prior research on teachers' use of innovation relied on pre-defined inventories or attitudinal checklists to gather information about teachers' innovation use or viewpoints; these tools resulted in decontextualized reports of teachers' technology use and viewpoints since they failed to take into account the individual or sociocultural perceptions of teachers. This investigation uses a mixed-methodology strategy, drawing from two supplementary theoretical perspectives which gave in-depth and context-specific views of the thought patterns of English instructors in various high school contexts. The study found that not all English teachers used ICTs in the classroom. Nevertheless, educators who took advantage of digital tools understood the value of technology in the classroom. This research also shows that English educators are mindful of the benefits of ICT facilities. The educators agreed that new media

might be used to better instruct students in the English language. There are many obstacles, however, that prevent the full implementation of proper integration of such ICT facilities. Inadequate facilities, ICT education, and a lack of enthusiasm by school officials and the state were also mentioned as challenges. Studies on the capacity of teachers in primary schools in Kenya show that, despite the policy formulation for ICT in education and financial investment, the integration of technology in Kenyan classrooms remains low (Piper et al., 2015). In a study by Abobo (2018), similar sentiments were made by teachers, who asserted that two-thirds of the respondents could not integrate technology into teaching the Kiswahili language. Some teachers believed technology could not assist them in lesson planning since it was inconvenient, time-consuming, and complicated. However, other educators have found that technology has increased the resources available. As one of the teachers stated:

> *Using a search engine like Google is convenient for teachers to search for language materials. Teachers can use materials from the Internet and websites to supplement their English course, especially for a large class with differing student needs* (TR6).

Some educators have voiced optimism about using ICTs, noting that multimedia aspects like audio, video, and interactive content could encourage and maintain students' concentration and may boost student engagement while learning English as a second language. Educators seemed interested in trying out new technologies. A similar conclusion was reached in a study by Suwanttosom (2010).

4.6 Chapter Summary

The researcher dives deep into the results and discusses them in detail in this section. First, a preliminary assessment was conducted, during which the problem of the missing values was thoroughly resolved. Following the study's stated goals, the

researcher first analysed and discussed the quantitative data and then moved on to the qualitative data. Teacher cognitions regarding guiding English language education using technology were examined in the context of the TPACK constructs to understand teachers' beliefs, attitudes, and emotions about integrating technology in a specific setting. The research findings on TPACK show that the Framework has been considered a part of making teaching effective.

The Framework merges three core areas of knowledge technology, pedagogy, and content into one unit that teachers need in this digital era. Both deductive and inductive approaches were used to analyse teachers' levels of belief in their abilities to successfully implement ICT into their English language classrooms. More research was conducted to shed light on what educators think about using technology to teach English. This chapter has also covered conceptual approaches, with specifics on how the Teacher Knowledge and Content Knowledge frameworks might be combined to benefit both teachers and their students. Furthermore, the study's key findings are summarized, examined, and anchored to prior research. These findings concerned teachers' understanding of how ICT is integrated into the classroom and the unique contexts in which various schools use technology. For comparability and understanding, the results of this study and those of previous comparable studies were explicitly indicated and discussed in how the findings were similar or different. Application of ICT by secondary school English teachers' prior experience and current perspectives on the potential of ICTs to improve their lessons also shaped the English language classroom environments that students experienced. Teachers' perceptions about the promise of ICT in the classroom shaped their thinking and attitudes on the

adoption of ICT. The following section discusses a summary of the findings, overall conclusions, and suggested next steps.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This section overviews the study's findings, conclusions, and recommendations, including suggestions for future studies. An overview of the results is offered, centred on the objectives of this study presented in chapter one.

5.2 Summary of Findings

The study sought to assess teacher cognition of the integration of ICT in teaching English in secondary schools in Nairobi County, Kenya. In particular, the study focused on teachers' TPACK level of competence in teaching English and ICT integration in teaching English. The sample consisted of 19 teachers of the English language drawn from 10 secondary schools in Nairobi County. The summary of the research findings is based on research questions that guided the study. The major findings are discussed under the following themes: technological knowledge of a teacher for ICT integration in teaching English; technological content knowledge of a teacher for ICT integration; technological pedagogical knowledge of a teacher of English for ICT integration; teachers' beliefs, thinking (attitude) towards ICT integration in teaching English in secondary schools in Nairobi County. The study used a sequential mixed-methods strategy for data collection based on a descriptive survey design and was guided by a pragmatic perspective. This research utilized two theoretical frameworks-TPACK and teacher cognition-to reveal the nuanced principles and varied practices of ICT-integrated English language education among Kenyan educators. Following the aims of the research, the following is a synopsis of what was found:

Objective 1. To examine a teacher's technological knowledge (TK) for ICT integration in teaching English. The study established that teachers' technological knowledge (TK) levels on ICT integration are low. The study also showed moderate technology knowledge in Word Processing (MS Word), Emailing and PowerPoint, and internet surfing. The results further revealed that the majority of teachers of English in this study drew upon the low stages (Inaction and Investigation) of the Teachers Professional ICT Attribute Framework. the results of the findings suggest that most respondents have low literacy in technology knowledge.

Objective 2. To establish a teacher's technological content knowledge (TCK) for ICT integration in teaching English. The study's results revealed that teachers had limited exposure to ICT skills and generally lacked technological content knowledge for ICT adoption in teaching English. The study further revealed that more than half of teachers of English participants strongly agreed that they could use the Internet in their English lessons to meet certain teaching and learning goals. Similarly, the study established that a few teachers of English could download online materials to use as teaching and learning resources and use a computer to prepare lesson notes. In addition, the study revealed that teachers' application of ICTs did not traverse the critical use border, meaning that their application of ICTs was not critical to the teaching of English; they were not embracing ICT in teaching English. The results revealed that a high percentage of English teachers in this study possessed basic ICT skills; Word processor, Emailing, and PowerPoint development skills. Teachers" skills in the use of the Internet were also above average since more than three-quarters of the educators reported that they were skilful in using Internet to search and disseminate information.

The study further established that low TCK significantly contributes to teachers of English language non-use of ICTs. On the other hand, most teachers lack skills in the use of Publishing Software, Database (Access), Graphics, and computer Simulations software, as well as advanced ICT skills. The teachers were knowledgeable and skilful in basic ICT skills and could use online tools, and were motivated to use ICT to their advantage.

Objective 3. To determine the technological pedagogical knowledge (TPK) of a teacher of English for ICT integration. Here the results of the study showed that most teachers in the survey had low TPK since they lacked adequate training to use ICTs in their English language classes. The study data results illustrate that the respondents' ability to teach lessons that combine the three core areas of knowledge technology, pedagogy, and content can be categorized in a low position. The teachers had limited knowledge and skills in using ICT creatively for content delivery; pedagogical skills were unfamiliar. They are not yet experts in combining all three core knowledge areas. Most teachers may not have the same knowledge in their basic technological pedagogical knowledge, which may negatively affect the teaching-learning process. Lack of proper training regarding technology integration may give negative feedback. On the statement on the ability to use strategies combining technologies, content, and teaching approaches in the class, the respondents state that they don't know how to combine technology and teaching approaches in classroom settings. However, they still employ this on an average level. Hence, the three constructs strongly influenced effective ICT integration among participant teachers. The teachers had limited knowledge and skills in using ICT creatively for content delivery; technological pedagogical skills were unfamiliar.

Objective 4. To find out teachers' attitudes towards integrating ICTs in teaching English. The results classified teachers into three groups based on their shared worldviews and values. The research found that many English teachers in this study share common opinions regarding the extraordinary utility of ICT in the classroom. In a nutshell, the findings proved that ESL teachers' attitude toward technology is significantly positive. However, their self-awareness and understanding of their roles as educators may influence how they respond to difficulties they foresee. Furthermore,

the survey found that teachers believe that incorporating ICTs into their lessons helps their students practice their language skills and give them access to more resources for learning languages.

Teachers acknowledged that they might use the Internet to learn better and teach the English language. However, this study found that ICTs were mostly employed to enhance instructors' skills and access to resources and materials in English language education, categorized as low-level activities. The study also shows that teachers view using ICTs to teach English as a promising trend. However, not all English language teachers were convinced of the benefits of integrating ICT tools into their lessons. Inadequate school and government backing, as well as restricted access to Internet or ICT services, were cited by educators as important barriers to the successful and efficient incorporation of ICTs into classrooms. Furthermore, the results indicate that the teachers positively perceive the influence of ICT use in teaching and learning English content in secondary schools in Kenya. However, approximately three-quarters of the teachers strongly disagree that ICT can positively influence learning. The teachers generally believed that ICT enhances content delivery and understanding in English teaching.

5.3 Conclusion

This research explored how English language instructors in high schools in Nairobi County, Kenya, consider using technology-based instruction to facilitate the learning of the English language better. The study looked into how incorporating ICTs into the classroom could help students learn English more effectively. Specifically, the study highlighted the significance of teacher knowledge in incorporating ICTs into English language instruction. Even though these findings may not contextualize beyond the high schools in Nairobi County where it was conducted, they could serve as a source

of inspiration for other investigators looking into situations where there is a discrepancy between ICT-related approaches and the prevailing level of implementation of integrated ICT adoption.

According to the study, English teachers would adopt ICTs on their usefulness, notably in facilitating task completion and improving outcomes. Moreover, the outcomes suggest that the hopes of the ministry of education to establish ICT capabilities do not immediately lead to modifications to pedagogical practices. Another finding from this study was that high school English teacher rarely used available ICT solutions to enhance classroom activities. It has been established that some English teachers have positive views regarding using ICTs in the classroom, whereas others have negativities.

Other elements of the environment, including the availability and accessibility of ICTs, their capability to meet teachers' requirements, teaching practice, and the abilities of educators to make use of various innovations as characterized by skill levels, all play a role in shaping the negative impression. There is a strong correlation between how institutions shape teachers' ICT and classroom environments.

They determine who has access to information and communication technology resources, which helps people gain new abilities and encourages them to continue their education. The results also indicate that a few English instructors have received technological training or are actively participating in the implementation of ICT competency standards. The discussions with English teachers reveal a disconnect between the administration and classroom teachers about the use of technology in the

classroom. More importantly, for the vast majority of English teachers, ICT preparation has benefited only marginally to ICT assimilation in the classroom, creating difficulties as to how these may fulfil the objectives of ICT policies. The following are the conclusions drawn from this investigation.

5.3.1 Technological Knowledge of a teacher of English for ICT Integration

a) Most teachers in this study drew upon a low level of technological knowledge (TK) for ICT integration.
b) Teachers are familiar with a few ICTs used; however, this does not necessarily mean they integrated ICTs into their English language instructions.
c) A few English teachers could use the Internet to download online materials as teaching and learning resources and use MS word applications to prepare lesson notes.

5.3.2 Technological Content Knowledge of a Teacher of English for ICT Integration

a) Most secondary school teachers in Nairobi County who participated in this study had limited exposure to ICT skills and generally lacked technological content knowledge to integrate ICT in teaching English.
b) The most commonly used forms of ICT applications among teachers in this study are; MS Word Processing, Emailing, and PowerPoint.

5.3.3 Technological Pedagogical Knowledge of a Teacher of English for ICT Integration

a) This survey found most English teachers were in the lower critical usage category.

b) TPK are three crucial elements for teachers' motivation to use ICTs in English language lessons.

c) Some of the difficulties teachers of English have encountered while attempting to integrate ICT into their classrooms stem from a lack of enthusiasm by schools, governments, and Internet access.

d) Most English educators surveyed in this study lacked the ICT skills to instruct their students effectively.

e) The results of this study showed that the literacy of teachers of English regarding TPACK is at a low level. The low level here is classified as they can employ the three core knowledge areas of TPACK-technology, pedagogy, and content-in teaching lessons, but the way they utilize them does not link to each other, and they don't use it. Therefore, more training or workshops/seminars regarding TPACK application are advocated.

5.3.4 Beliefs, Thinking, and Attitudes towards ICT Integration in Teaching English

a) According to their worldviews, attitudes, and dispositions, teachers fell into one of three distinct groups: the positive, the negative, and the neutral.

b) More than 50% of the participating teachers concurred that they could utilize the Internet to accomplish certain pedagogical and curricular goals in their English classes.

c) Overall, teachers were found to be just moderately positive towards ICT integration in teaching and learning (M = 2.13, SD = 1.0). However, teachers' attitudes towards the integration of ICT in teaching and learning had a statistically significant influence on ICT integration in teaching and learning in secondary schools in Nairobi County.

d) Most teachers of English were generally positive toward ICTs integration, which has a direct link with the integration of ICTs in teaching the English language. The positive perception further reveals that teachers in secondary schools in Nairobi County would be willing to integrate ICT in teaching and actively learning English.

e) Generally, the outcome of this study shed light on a new topic in the area of Kenya ESL teachers: the TPACK skills and their attitude towards technology/

5.4 Recommendations

Given the above findings, this study presents the following recommendations:

5.4.1 Teachers of English

a) It is important that English teachers be trained to achieve literacy in ICT. All practicing English teachers in high schools, pre-service and in-service, must receive basic ICT training. Teachers' familiarity with technological tools is an important factor to consider in the ICT integration process.

b) Inadequate infrastructure in secondary schools in Nairobi County could be attributed to low utilization of ICT in teaching and learning by teachers of English.

c) The positive perception among teachers in secondary schools in Nairobi County revealed that teachers of English would be willing to participate actively in integrating ICT into teaching and learning.

d) Therefore, more training or workshops regarding the TPACK application for teachers of English are required.

5.4.2 The Policymakers

a) This study highlights the need for reflective practice for continuing professional learning in ICT. It suggests that school administration gives educators necessary ICTs assistance at various levels to boost ICT integration in language instruction.

b) Primarily, there should be the application of ICT in language teacher training as a training tool as opposed to teaching it as an independent unit, as is the case in the current Kenya institute of curriculum development (KICD) training program.

c) Policymakers could better understand the needs of teachers and work to address them in the current educational system by establishing mechanisms for monitoring or evaluating ICTs being adopted in the high school English curriculum and providing ongoing support for the successful integration in instruction.

5.4.3 Ministry of Education

a) Enabling ICTs adoption requires a solid ICT infrastructure basis in schools. Educational partners should work to develop an ICT application strategy by offering the specific and explicit policies necessary for doing so.

5.5 Suggestions for Further Research

a) This study looked at the integration of ICT in teaching English broadly; researchers may wish to conduct a study to narrow down to one content area, such as the teaching of writing, reading, listening, speaking, or Grammar.

b) Further research on how students think about, feel about, and use technology for English language instruction is needed.

c) Future research could delve deeper into the issues at the institutional level, like Legislation and school strategies, that influence teachers' decisions to implement ICT tools in the English classroom, particularly how those decisions are affected by teachers' responses to ICT curricula.

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APPENDICES

APPENDIX A: THE QUESTIONNAIRE

Teachers' cognition of the Integration of information and communication technology (ICT) in Teaching English in Secondary Schools in Nairobi County, Kenya

This survey aims to establish teacher cognition about integrating ICT in English language teaching in secondary schools.

Part 1-111 is about participants' personal information, technological knowledge and ICT skills and use.

Part IV is about participants' beliefs, thinking and attitudes towards teaching with technology

Instruction to Respondent

1) Kindly answer all the questions truthfully
2) You are free to seek direction from research assistant where necessary while filling the questionnaire
3) Do not tick more than one unless directed

Part 1: Teacher's Demographic Characteristics

Please answer all the questions in this part

1	Gender	[ ] Male		[ ] Female		
2	Age Bracket (Years) 20-25 [ ] 26-30 [ ] 31-40 [ ] 41-45 [ ] 46 and above [ ]					
3	Do you have access to computer at school?	[ ] Yes		[ ] No		
4	Do you have access to internet at school?	[ ] Yes		[ ] No		
5	Experience in ICT use in Years(Tick) Less than 2 [ ] More than2 [ ] No experience [ ]					
6	Kindly your ICT proficiency	[ ] Excellent	[ ] Very good	[ ] Good	[ ] Fair	[ ] Not Sure
7	Have you undertaken any formal training on ICT?	[ ] Yes	[ ] No	If yes, at which type of training centre did you do the ICT training? College [ ] University [ ] Others (Specify)		

Part 11: Technological Knowledge Level of English language teachers in using ICT

Kindly rate technological knowledge Level you possess in using ICT skills? Tick only one that describes you.

Statement	Excellent	Good	Fair	Not Capable
Word Processing (MS Word)				
Spread Sheets (Excel)				
Presentation software (Power Point)				
E-mail				
Internet (browsing, surfing)				
Publishing software (Publisher)				
Programming Language (logo. CDs)				
Database (Access)				
Graphics (Paint, Photoshop)				

A12: Self-Confidence in Integrating ICT in English Teaching

Please Circle your Answer

I feel confident that:		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13	I can select appropriate software to use in my English teaching	1	2	3	4	5
14	I can use computer programmes (Microsoft word, PowerPoint) to prepare teaching materials for my class	1	2	3	4	5
15	I can design technology-enhanced learning activities for my students	1	2	3	4	5
16	I can use email, chat or web discussion to communicate with my students	1	2	3	4	5
17	I can teach my students to select appropriate software and have students work collaboratively on an online English language projects	1	2	3	4	5

18	I can teach my students how to create their own Web pages or weblogs to post their assignments	1	2	3	4	5
19	I can use the internet in my English lessons to meet certain learning goals	1	2	3	4	5
20	Use or download online materials as teaching and learning resources	1	2	3	4	5

Part 111: The TPK Scale

For each item, select only one option that best describes you. Please Circle your Answer

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
22	I can update an instructional material (paper-based, electronic or multimedia material) based on the needs (students, environment, duration etc.) by using technology	1	2	3	4	5
23	I can use technology to determine students' needs related to a content area in the pre-teaching process	1	2	3	4	5
24	I can use technology to develop language activities based on student needs to enrich the teaching and learning process	1	2	3	4	5
25	I can plan the teaching and learning process according to available technological resources	1	2	3	4	5
26	I can develop appropriate English language assessment tools by using technology	1	2	3	4	5
27	I can implement effective classroom management in the teaching and learning process in which technology is used	1	2	3	4	5
28	I can assess whether students have the appropriate content knowledge by using technology	1	2	3	4	5
29	I can apply instructional approaches and methods appropriate to individual differences with the help of technology	1	2	3	4	5

30	I can use technology for implementing language activities such as homework, and projects.	1	2	3	4	5
31	I can use technology-based communication tools (forum, chat, e-mail) in the teaching process	1	2	3	4	5
32	I can be an appropriate model for the students in following codes of ethics for the use of technology in my English language teaching	1	2	3	4	5
33	I can use innovative technology (Facebook, twitter, blogs) to support the English language teaching and learning process	1	2	3	4	5
34	I can use technology to update my knowledge and skills in the content areas that I will teach	1	2	3	4	5
35	I can update my technological knowledge for the English teaching process	1	2	3	4	5
36	I can use technology in every phase of the teaching and learning process by considering the copyright issues (licences)	1	2	3	4	5
37	I can follow the teaching profession's codes of ethics in online educational environment (Web CT, Moodle)	1	2	3	4	5

Part IV: English Language Teachers' Beliefs, Thinking and Attitudes towards teaching with Technology

Instruction to respondent: Please Circle your Answer

Items	SDA	DA	N	A	SA
I feel comfortable using ICT as a tool in teaching and learning English	1	2	3	4	5
The use of computer in English language teaching and learning can be stressful	1	2	3	4	5
If something goes wrong I will not know how to fix it	1	2	3	4	5
The use of ICT in teaching and learning English can be very exciting.	1	2	3	4	5
The computer is a valuable tool for English language teachers	1	2	3	4	5
The computer will change the way students learn English language my classes.	1	2	3	4	5
I can do what the computer can do equally well.	1	2	3	4	5
The ICT is not conducive to student learning because it is not easy to use.	1	2	3	4	5
The computer will change the way I teach	1	2	3	4	5
The computer helps students understand English concepts in more effective ways.	1	2	3	4	5
The computer helps English language teachers to teach in more effective ways.	1	2	3	4	5
The computer is not conducive to good teaching because it creates technical problems.	1	2	3	4	5
I feel technology is necessary in teaching, but there is a serious lack in my school.	1	2	3	4	5
Technology is so important for teaching English and for supporting the learning process.	1	2	3	4	5
As an English teacher, I should have permanent access to technological means such as computer, projector, videos, and cassette player.	1	2	3	4	5

I believe that ICT can help students' critical thinking	1	2	3	4	5
ICT is impressive but cannot contribute substantially to teaching and learning English.	1	2	3	4	5
I need more reasons to be convinced about ICT usefulness in the educational process	1	2	3	4	5
I believe that ICT cannot contribute to learning because it does not activate students	1	2	3	4	5
I believe that I will not be able to use ICT effectively in my instruction because I feel insecure about its application in language teaching	1	2	3	4	5
I want to use computers in the instruction of my subject matter, but it frightens me that students are more skilled in ICT	1	2	3	4	5
I should use ICT in my instruction but I do not know how to organise and manage my students' learning tasks.	1	2	3	4	5
The idea of using a computer in teaching and learning English makes me sceptical	1	2	3	4	5
The computer helps students learn because it involves them to express their thinking in better and different ways	1	2	3	4	5
The computer will help English language teachers teach in more effective ways	1	2	3	4	5

Scale: SDA-Strongly Disagree DA-Disagree N-Neutral A-Agree SA-Strongly Agree

☺Thank you very much for your cooperation☺

APPENDIX B: INTERVIEW SCHEDULE

The purpose of this interview is to capture what could have not been addressed within the questionnaire regarding teacher cognition of the integration of ICT in teaching English in secondary schools in Nairobi County, Kenya. You are invited to kindly participate in this interview at the best of your knowledge. Feel free to share any additional information that you feel can support this study. The information you provide will be kept confidential and will solely use for this research study.

Interview Questions

1. Mention some of the ICT skills that you are familiar with and apply in the teaching of English

2. Have you taken any ICT training and to what extent have you used ICT tools in your English instructions?

3. What technological-enhanced tasks have you applied in teaching English?

4. What is your knowledge level in using ICT for teaching English language?

5. To what language tasks have you applied computers in your English instruction?

6. What types of ICT facilities have you used in your English lessons?

7. Which areas in English have taught using ICT tools?

8. What types of ICT applications have you used in teaching English?

9. What skills do you have in using ICT and what steps do you take to develop the skills you need?

10. What activities have you used computers for in your English lessons??

11. Which teaching strategies have you used, and do you use consistently where ICT is involved?

12. What inspires you to integrate technology in teaching English?

13. What does not inspire you to integrate ICT in teaching English?

14. Do you think teaching with technology makes you different from your previous non-ICT use**?**

15. What do you think about using technology in teaching English in secondary schools in Kenya?

16. What are your views about using technology in teaching English?

17. What are some of the challenges and barriers if there are that teachers may face in integrating ICT in teaching English?

18. What would you recommend for technology integration in Secondary schools in Kenya?

Thank you for your participation and time

APPENDIX C: MOI UNIVERSITY INTRODUCTORY LETTER

MOI UNIVERSITY
Office of the Dean School of Education

Tel: (053) 43001-8
(053) 43555
Fax: (053) 43555

P.O. Box 3900
Eldoret, Kenya

REF: EDU/D.PHIL.CM/1001/15 **DATE: 15th May, 2017**

The Executive Secretary
National Commission for
Science, Technology & Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH PERMIT IN RESPECT OF MICHAEL O. OGALO - (EDU/D.PHIL.CM/1001/15)

The above named is a 2nd year Doctor of Philosophy (D.PHIL) student at Moi University, School of Education, Department of Curriculum Instruction and Educational Media.

It is a requirement of his D.PHIL Studies that he conducts research and produces a thesis. His research is entitled:

"Teacher Cognition About ICT Integration in English Language Teaching in Nairobi County, Kenya."

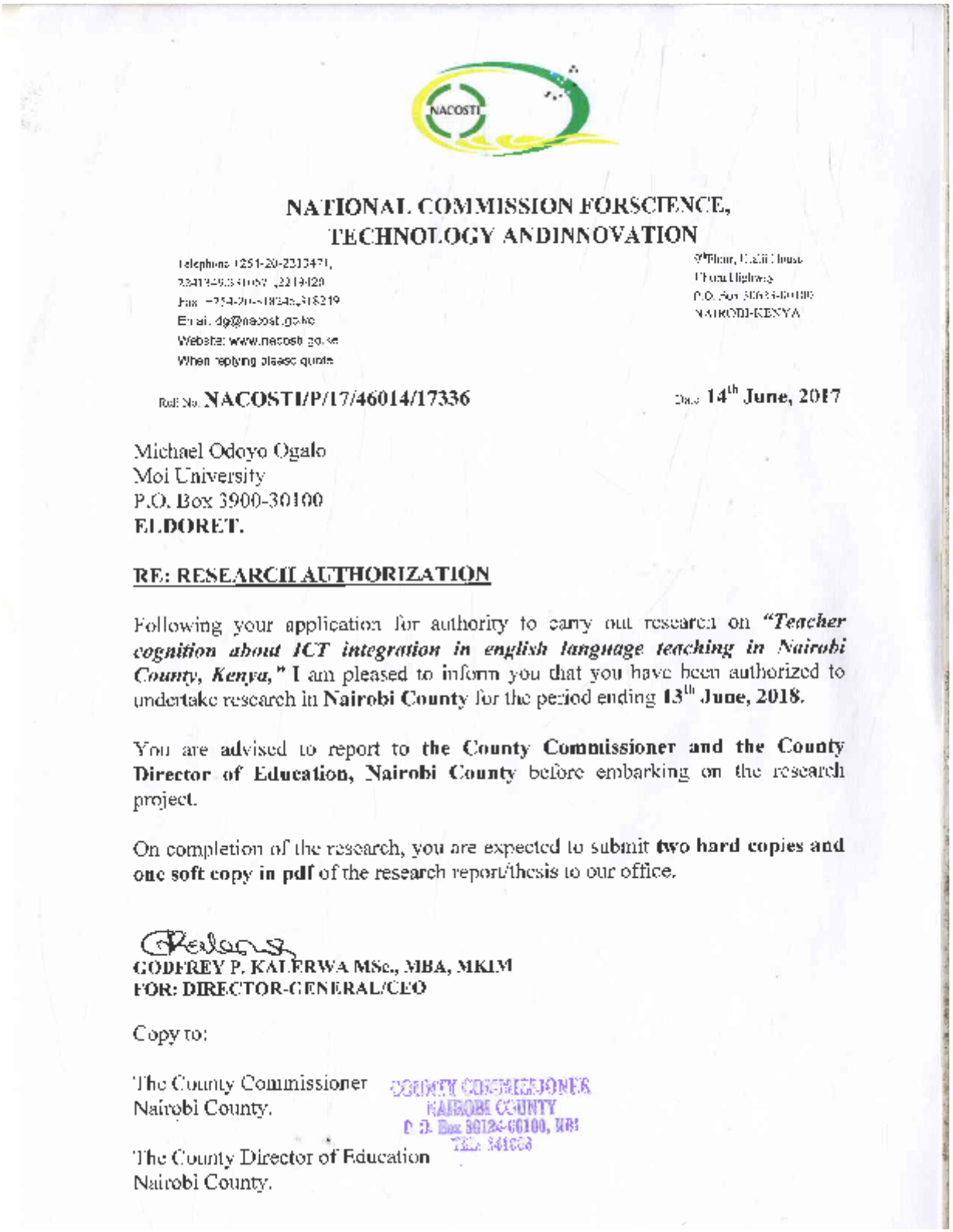
Any assistance given to enable him conduct his research successfully will be highly appreciated.

Yours faithfully,

MOI UNIVERSITY SCHOOL OF EDUCATION 15 MAY 2017

PROF. J. N. KINDIKI
DEAN, SCHOOL OF EDUCATION

APPENDIX D: RESEARCH AUTHORIZATION



NACOSTI

NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION

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Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

Ref: No. **NACOSTI/P/17/46014/17336**

Date: **14th June, 2017**

Michael Odoyo Ogalo
Moi University
P.O. Box 3900-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Teacher cognition about ICT integration in english language teaching in Nairobi County, Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **13th June, 2018.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

COUNTY COMMISSIONER
NAIROBI COUNTY
P. O. Box 30124-00100, NBI
TEL: 341666

The County Director of Education
Nairobi County.

APPENDIX E: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MR. MICHAEL ODOYO OGALO
of MOI UNIVERSITY, 0-200 NAIROBI,has
been permitted to conduct research in
Nairobi County

on the topic: *TEACHER COGNITION ABOUT ICT INTEGRATION IN ENGLISH LANGUAGE TEACHING IN NAIROBI COUNTY, KENYA*

for the period ending:
13th June,2018

Permit No : NACOSTI/P/17/10234/17336
Date Of Issue : 14th June,2017
Fee Recieved :Ksh 2000

Applicant's Signature

Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Offices of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officer will not be interviewed without prior appointment.
3. No questionaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one (1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEACH CLEARANCE PERMIT

Serial No.A 14390

CONDITIONS: see back page

APPENDIX F: STUDY AREA MAP - NAIROBI COUNTY