UNIVERSITY OF CAPE COAST

TECHNOLOGICAL, PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK) AS PREDICTORS OF TURNOVER INTENTION AMONG TUTORS IN THE COLLEGES OF EDUCATION, GHANA

PHILIP NARTEY

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BY

PHILIP NARTEY

Thesis submitted to the Department of Education and Psychology of the Faculty of Educational Foundation, College of Education Studies, University of Cape Coast, in partial fulfilment of the requirement for the award of Master of Philosophy degree in Educational Psychology

JUNE, 2023

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: …….. Date: …….

Name: ……..

Supervisors' Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on thesis laid down by the University of Cape Coast.

Supervisor's Signature: ……...…… Date: …….

Name: …….

ABSTRACT

The study examined technological knowledge, pedagogical knowledge, and content knowledge (TPACK) as predictors of turnover intention among tutors in the college of education, Ghana. The study employed a cross-sectional descriptive research design with a quantitative approach. A sample size of 153 tutors was used for the study. The TPACK and turnover intention instruments were used for data collection. The data were analysed using frequencies, percentages, mean and standard deviation, multiple linear regression, and smart PLS. The study revealed that technological knowledge among the colleges of education tutors was low as compared to pedagogical knowledge and content knowledge. A negative weak relationship was found between technological knowledge and turnover intentions. TPACK was found to predict turnover intentions among tutors. Sex and years of teaching experience was not a significant moderator in the relationship between TPACK and turnover intentions. The study recommended that the National Council for Tertiary Education (NCTE) should organise seminars as a form of learning platforms for tutors in the college of education to learn the necessary technological skills and knowledge needed to enhance teaching and learning in and outside the classroom.

KEYWORDS

Content Knowledge

Pedagogical Knowledge

Technological Knowledge

Turnover Intention

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DEDICATION

To my Mother Georgina Nartey

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CHAPTER ONE

INTRODUCTION

The concept of "technology" is essential in many fields today, including education, in the twenty-first century. This is because, in most countries, technology has become the primary means of spreading information. The employment of technology in modern civilization has resulted in inventions and changes that have fundamentally altered how people think, work, and live (Grabe, 2007). As a result, schools and other educational institutions that are expected to prepare students to function effectively in "a knowledge society" must carefully consider how to include technology into their lesson plans (Ghavifekr, Afshari & Amla Salleh, 2012). Ghana, along with other countries worldwide, is facing concerns regarding the preparation of teacher educators with limited experience in educational technologies (ET) and their ability to learn from countries that have successfully integrated ET in K-12 classrooms (Cawthera, 2003). In response to this, the current study focuses on examining the relationship between technological, pedagogical, and content knowledge and the likelihood that these variables will predict turnover intentions among tutors in colleges of education, Ghana.

Background to the Study

A post-secondary education has become a must in today's society, owing to the increasing desire for individuals to get information and develop new skills in order to meet the demands of their respective occupations. People are pursuing some types of training and education in order to better their abilities and employment chances (McFarlane, 2011). McFarlane (2011) believes that we are living in a school economy, he argues that huge

proportion of students attend college with the aim of acquiring a degree that society considers to be the new pre-requisite for a middle-class lifestyle. In light of these and other considerations, technology has emerged as a crucial tool to assist both tutors and students in the process of acquiring skills and knowledge.

Technology is a broad word that was adopted due to the rapid evolution of various tools (Atzori, Iera, & Morabito, 2017). Digital and computer-based technologies, however, form the backbone of the vast majority of today's useful applications. Presently, digital images permit the cross-temporal and -spatial exchange of source materials (Rueda, & Lara, 2020). Immediate feedback provides students with the opportunity to practice essential skills, while creativity tools empower them to apply their conceptual understanding across various media. Additionally, social networks and other publishing resources allow students to share and showcase their work (Rueda, & Lara, 2020). Computer models and games create a low-risk environment for testing hypotheses and tackling complex problems, thereby expanding students' abilities beyond traditional reading and writing (McNaughton et al., 2018). To support these technological advancements in education, governments across the world have offered funding and assistance in various forms of technology implementation in schools (Rasmitadila et al., 2020). Initiatives like Goals 2000 and the Enhancing Education through Technology (EETT) Act have allocated funds and political influence to schools and districts. The Preparing Tomorrow's Teachers for Technology initiative has supported teacher education programs in integrating technology training. Additionally, states have strengthened teacher credentialing standards to

encompass technology and have developed plans for incorporating educational technologies (Lai, Li, Wang, & Zhao, 2008).

According to Acquah (2021), nearly all public school teachers in Ghana regularly use at least one computer in the classroom. This demonstrates how commonplace it is for modern classrooms to have access to the Internet and computers (Gray, Thomas, & Lewis, 2010). The recent introduction of powerful, affordably priced laptops and versatile tablet computers has provided every reason to expect that access to computers will continue to grow, with computers being as normal as "school supplies" in the not-too-distant future.

Despite the fact that billions of dollars have been spent in the United States to bring digital technologies into classrooms, there is still an urgent need for high-tech tools that can improve the quality of teaching and learning (Brynjolfsson & McAfee, 2012). High-level educational goals that can be helped by technology include improving student learning, making school more interesting and relevant, ensuring equal access for disadvantaged groups, improving communication between the school and the community to help students, improving teacher professional development, and holding schools accountable for student outcomes (Kraut, 2013).

Effective use of technology in the classroom depends on a solid foundation of knowledge about content, pedagogy, and the interplay between the two. Because of the interactions that occur between and among the three components, there is a great deal of variety in both the extent to which instructional technology is integrated and the quality of that integration. The dynamics of these exchanges change according to the circumstances. The core

of content knowledge, pedagogic knowledge, and technology knowledge can be broken down into three categories of information (TPACK).

In the realm of higher education, content knowledge stands as a foundational element for educators, particularly those in Colleges of Education (Kereluik, Mishra, Fahnoe & Terry, 2013). It encompasses a profound understanding of the subjects taught, enabling tutors to effectively convey complex concepts to aspiring teachers. The dynamic nature of educational advancements underscores the importance of continuous professional development, ensuring that content knowledge remains current and aligns with evolving pedagogical practices (Eady & Lockyer, 2013). In the context of technological integration, content knowledge extends to staying abreast of contemporary developments in both subject matter and teaching methodologies facilitated by digital tools.

Complementing content knowledge, pedagogical knowledge plays a crucial role in shaping effective teaching strategies (Guerriero, 2017). This facet of knowledge delves into the art and science of teaching, covering instructional methodologies and classroom management. In an era where technology is seamlessly woven into education, pedagogical knowledge extends beyond traditional methods.

Technological knowledge, within the educational landscape, revolves around the understanding and proficiency in using digital tools to enhance teaching and learning experiences (Ertmer & Ottenbreit-Leftwich, 2010). In the contemporary classroom, educators need to be well-versed in a spectrum of technologies, from learning management systems to interactive multimedia tools. A strong grasp of technological knowledge empowers tutors to design

dynamic lessons that foster student engagement and participation, ultimately contributing to optimal learning outcomes. The convergence of content knowledge, pedagogical knowledge, and technological knowledge forms the Technological Pedagogical Content Knowledge (TPACK) framework. TPACK represents a holistic integration of these components, emphasizing the seamless incorporation of technology to enhance teaching practices and improve student learning outcomes.

Educators, as stated by Graham et al. (2009), have realized that it is not enough to simply know how to use technology tools; instead, they need the proficiency to utilize these technologies effectively to aid their students' learning. This has led scholars to redirect their attention to finding effective ways to implement and leverage technological tools in the classroom. In a study, Koehler and Mishra (2005) argued that teacher knowledge about technology was and relate to teaching. Based on what Shulman said about Pedagogical Content Knowledge (PCK) in 1987, Mishra and Koehler (2006) came up with the Technological Pedagogical and Content Knowledge (TPACK) framework, which brought together the three aspects of teachers' knowledge.

It has been argued by Amega-Selorm and Awotwi (2010) that the present educational environment in Ghana is indeed a consequence of important national measures that have been implemented by the government of Ghana. Various policy initiatives and committee reports have helped to shape the education of Ghana. Between 1961 and 1992, several pieces of legislation were passed, including the Education Act of 1961, "The New Structure and Content of Education" in 1974, "The Education Commission

Report on Basic and Secondary Education 1987/88," "The Education Reform Programme 1987/88," "The University Renationalization Committee Report 1988," and "The Free Compulsory Universal Basic Education Programme, 1996, and 1992 Coordination."

Incorporating technology into education is one approach to ensure growth and effectiveness across all educational sectors (Lawless & Pellegrino 2007). Despite the fact that other socioeconomic sectors have previously exploited technology to enhance productivity by replacing it for human labour, teaching in Ghana has grown increasingly labour-intensive due to a lack of resources. Therefore, the Teacher Laptop Initiative (TLI) was developed as a strategy to promote originality in the classroom by increasing teachers' subject and pedagogical expertise.

Ofori (2019) asserts that modern education is built on the shoulders of technology. Every student needs the skills to enter, assess, preserve, and produce data and information as it becomes increasingly relevant in the academic environment. Because of this, all higher educational institutions in the nation must have a technological basis that is extremely stable. According to Ofori (2019), to succeed in the information super highway, one must be computer literate since the idea of computer literacy has evolved with changes in the curriculum's content. Computer exercises may have a significant and widespread effect on today's academic environment. Every student should be familiar with them.

According to Mnisi (2016), both teachers and students may benefit from the use of technology, material, and pedagogy to better arrange and organize their learning activities in ways that support outcome-based

education and training. This could be beneficial for both parties. The paradigm of education known as outcome-based education places a greater emphasis on the actual process of learning as opposed to merely obtaining knowledge about a specific topic or set of topics.

Despite all of the real and prospective advantages of technology, the use of technology comes with its own set of obstacles. One of the challenges of using Information and Communications Technology (ICT) in academia is that lecturers and students lack the skills to use their devices for academic purposes (Putnam et al., 2016). Another issue with academic ICT adoption is insufficient network/wireless capabilities to improve learning. According to Fathima (2013), various researches have shown that instructors and students' capacities to incorporate Information and Communication Technology (ICT) into learning programmes are contingent on adequate preparation. As a result, it is critical that instructional and learning programmes be well-planned in order to successfully incorporate ICT into the classroom.

Teacher turnover is a prevalent issue in the field of education, impacting countries worldwide regardless of their economic status. This problem is not limited to developing nations but also affects wealthy countries. A study by Mampane (2012) revealed that in South Africa alone, approximately 20,000 teachers resign from their positions annually.

According to Arthur (2016) and Cudjoe (2016), indications of turnover intention among tutors in Colleges of Education in Ghana have become apparent, evident through multiple observable indicators. The educational sector in Ghana is experiencing a significant surge in the departure of tutors from these academic institutions, marking a worrisome trend in the stability of

the workforce (Arthur, 2016; Cudjoe, 2016). Reports sourced from various colleges underscore a noticeable rise in resignations and retirements among teaching staff, collectively shaping the prevailing scenario of turnover intention within these institutions.

In addition, the principal of Tamale College of Education voiced his concern with the high staff turnover rate at the Colleges of Education (Ghana Business News, 2021), stating that in Tamale College of Education alone, 15 staff exited the college from August 2020 to 2021. Four out of this figure retired, whilst 11 voluntarily resigned. From one perspective, it is conjectured that the current revision of the curricular of the teacher training colleges has enhanced the difficulty levels of the content demands beyond the experiences of the existing tutors (Cochran-Smith, 2021).

The demand for technological integration, particularly in the wake of online teaching trends, adds a layer of complexity to the role of educators (Gandolfi, Ferdig & Kratcoski, 2021). Tutors who lack sufficient TPACK might find it challenging to adapt to the changing educational environment, potentially leading to dissatisfaction and increased turnover intention (Morris, 2021). In this light, higher education institutions in Ghana have reviewed the demand for their curriculum to meet 21st-century skills. In some cases, there is a total change or introduction of new courses. Another area of concern that is likely to induce turnover intentions among staff is the current demand for the use of technology (particular internet related demands) teaching. For example, following the COVID-19 pandemic, higher education institutions transitioned to online teaching and learning. The dynamics of e-classrooms can be frustrating to tutors who have little knowledge on the use of such internet

connected devices (Twum et al., 2021). Technologically driven classrooms according to Chun, Kern and Smith (2016) require the use of pedagogy quite unique from the ones used under face-to-face meetings or settings. For example, the use of emojis such as raise hand, lower hand, sharing screen with students and the like are all needed for teaching in the e-classroom (Chen, 2021).

As a result, teachers who have other job options leave, while others seek training to meet the demands that technological pedagogy brings (Carlson & Gadio, 2002). According to Plash and Piotrowski (2005), students academic success seems to be affected by instructor morale or satisfaction. Due to these considerations, educational groups have lately expressed worry about teacher satisfaction with technology integration as well as about the retention of skilled teachers.

Many schools therefore, are displaying their enthusiasm for increased use of technology in the classroom by providing students with tablets and computers, improving access to the internet, and instituting training programs for both instructors and students. Most educators recognize the value of incorporating technology into the classroom, yet many struggle to effectively do so. Even at the elementary school level, educators have a hard time figuring out how to use technology effectively in the classroom. The issues span from funding the purchase of updated technological resources to the difficulty of incorporating these resources into existing lesson plans and pedagogical approaches (Lazar, 2015). The integration of technology in classrooms for enhanced teaching and learning has become a necessity, as emphasized by Buabeng-Andoh (2012). This shift in teaching methodologies calls for

educators in Ghana's various Colleges of Education to adapt and effectively incorporate technology into their teaching practices. Consequently, it is crucial to examine how tutors in these institutions are responding to the demands of this new teaching approach with technology.

Furthermore, educational technology facilitates collaboration among teachers from different countries and their respective students. Interactive whiteboards allow students to engage directly by touching the screen, while teachers can provide them with mental exercises. Additionally, specialized software and scanners are available to cater to students with specific educational needs. These technologies can assist visually impaired students in reading, aid students with learning disabilities in reading practice, and support dyslexic students in improving their reading skills (Hargis & Wilcox, 2008).

With these considerations in mind, the purpose of this investigation is to explore how technological, pedagogical, and content knowledge influence the turnover intentions of tutors in Colleges of Education in Ghana. By examining these factors, the researcher aim to gain insights into the relationship between Tutors proficiency in educational technology and their commitment to their teaching roles in this context.

Statement of the Problem

The fast rise of technology has brought about remarkable changes in the twenty-first century, and it has also had an impact on the expectations of society today (Jamieson-Proctor et al., 2006). Using technology modifies how individuals teach and learn (Özel, Bayındır, İnan, & Özel, 2009). The use of technological pedagogy or methodologies in educational institutions

throughout the globe is increasing as more students are being taught what they will need to know and be able to do in the 21st century (UNESCO, 2002).

Many governments around the world have made significant investments in technological pedagogy, including the provision of technology infrastructure and equipment in schools. For example, the government of Ghana has spent millions of dollars to provide educational institutions at the Secondary, Colleges and University levels with the technological resources they need. Computer laboratories, the internet, and scientific resource centres are just a few of the resources made available as a result of the huge sums of money dedicated to increasing the quality of education (Ministry of Education, 2009). The full potential of technology to enhance the teaching and learning experiences of both students and teachers has not yet been fully grasped by the education community. It has been suggested that despite significant financial investments made in the nation's technology infrastructure, equipment, and the professional development of its instructors, Ghana's educational system has not reached the level that was anticipated (Ministry of Education, 2009).

Numerous research studies have been conducted in Ghana to explore the utilization of technology in educational settings. These recent investigations have yielded valuable insights into the impact of technology on teaching and learning, as well as the attitudes of both students and instructors towards its integration. Notable examples include the study conducted by Ofosu-Appiah (2017) at Wisconsin International University College which examined the variables of perceived usefulness, perceived ease of use, computer self-efficacy, facilitating conditions, behavioural intention to use technology, and user behaviour regarding technology integration. The research

carried out by Amoaful (2011) at the University of Ghana explored the variables of student satisfaction with educational technologies, student self-efficacy with technology, and student perspectives on the benefits and limitations of technology in their learning.

Another notable study was conducted by Sey et al. (2013) in selected junior high schools within the Ga South Municipality. Their research aimed to investigate the variables of availability of ICT tools, frequency of use of technologies for instruction, teacher competency levels with technology, and teacher attitudes towards ICT adoption. The study also explored student access to technology, student confidence in using technology, and student perceptions of how technology aids their learning. Their research aimed to explore the use of technology in teaching and learning, along with the attitudes exhibited by both students and teachers towards its implementation.

Despite the current surge in research on technology use in education, the predominant focus has been on students and their adaptation to internet usage in learning (Romero & Ventura, 2013; Apeanti, & Danso, 2014; Coman et al., 2020). There is paucity of research on teachers and their experiences towards the use of technology in teaching. Ideally, any revision in curriculum or curricular changes requires that teachers receive some sort of on-the-job training, or their opinions are gathered for effective implementation.

However, there have not been enough studies on teachers' understanding and competencies to practice the revised curriculum in the Colleges of Education. Educational research in response to the current use of technology and content competencies in all facets of teacher education is needed because most of these tutors were trained and equipped with the

pedagogy of face-to-face teaching. Because of ecological differences, many of TPACK studies were conducted in the Western world (Mouza et al., 2017), East Asia (Long et al., 2020), and Oceania (Boris, 2013), and the findings cannot be easily transferable to our practice here in Ghana. Based on the aforementioned changes in college practices in recent times, the researcher attempts to fill this research gap and widen the awareness of readers and other researchers on the factors that lead to teacher turnover in Colleges of Education in Ghana.

Purpose of the Study

The purpose of the study was to examine whether technological, pedagogical, and content knowledge (TPACK) would predict turnover intentions of tutors in the college of education.

Specific Objectives

Specifically, the study sought to assess;

1. the level of technological knowledge among tutors in College of Education
2. the level of pedagogical knowledge among tutors in College of Education
3. the level of content knowledge among tutors in College of Education.
4. the relationship between technology knowledge and turnover intentions of tutors in College of Education.
5. the relationship between pedagogical Knowledge and turnover intentions of tutors in College of Education.

6. the relationship between content knowledge and turnover intentions of tutors in College of Education.
7. whether technological, pedagogical and content knowledge predicted turnover intentions of tutors in Colleges of Education
8. Whether gender moderated the relationship between TPACK and turnover intentions of tutors in Colleges of Education.
9. Whether teacher experience (in terms of years of teaching) moderated the relationship between TPACK and turnover intentions of tutors in Colleges of Education.

Research Questions

1. What is the level of technological knowledge among tutors of the Colleges of Education?
2. What is the level of pedagogical knowledge among tutors of the Colleges of Education?
3. What is the level of Content knowledge among tutors of the Colleges of Education?

Research Hypotheses

1. **H_0** There is no statistically significant relationship between the Technological knowledge and turnover intentions of tutors in Colleges of Education

   H_1. **T**here is a statistically significant relationship between the Technological knowledge and turnover intentions of tutors in Colleges of Education

2. **H_0.** **T**here is no statistically significant relationship between the Pedagogical Knowledge and turnover intentions of tutors in Colleges of Education

   H_1. **T**here is a statistically significant relationship between the Pedagogical Knowledge and turnover intentions of tutors in Colleges of Education
3. **H_0** **T**here is no statistically significant relationship between the Content Knowledge and turnover intentions of tutors in Colleges of Education

   H_1 **T**here is a statistically significant relationship between tutor's Content Knowledge and turnover intentions.
4. **H_0.** Technological, Pedagogical and content knowledge will not predict turnover intentions of tutors in Colleges of Education

   H_1. Technological, Pedagogical and content knowledge will predict turnover intentions of tutors in Colleges of Education
5. **H_0.** Sex will not moderate the relationship between TPACK and turnover intentions among tutors of Colleges of Education.

   H_1. Sex will moderate the relationship between TPACK and turnover intentions among tutors of Colleges of Education.
6. **H_0.** Teaching experience in terms of number of years will not moderate the relationship between TPACK and turnover intentions of tutors in Colleges of Education.

   H_1. Teaching experience in terms of number of years will moderate the relationship between TPACK and turnover intentions of tutors in Colleges of Education.

Significance of the Study

Over time, educators have formulated various assumptions about the interplay of technological, pedagogical, and content knowledge with student learning. This research seeks to delve into the nexus between the technical, pedagogical, and content knowledge of tutors at the College of Education in Ghana and their intentions to leave their positions. The primary objective is to gain valuable insights into whether these knowledge domains can serve as predictors for tutors' likelihood of resigning from their roles. The implications of this study extend to various stakeholders in the education sector. Policymakers and college management bodies stand to benefit by obtaining essential information that can aid in formulating strategies to mitigate teacher turnover intentions associated with the complexities of technological, pedagogical, and content knowledge.

The findings will also offer guidance to the Ministry of Education in recognizing the imperative of organizing in-service and on-the-job training tailored to address specific challenges related to these knowledge domains. Furthermore, this study contributes to the broader educational discourse by shifting the focus to a West African context, specifically Ghana, thereby expanding our understanding of technological, pedagogical, and content knowledge dynamics in a unique educational setting. This research not only serves the immediate stakeholders but also lays the groundwork for future researchers aiming to explore similar themes in diverse global contexts.

Delimitations

The study exclusively focused on tutors in College Education and the evaluation of the tutors in this study was based solely on their self-reported

assessments. Moreover, the research was conducted in the Central Region colleges of Ghana, limiting the demographic to tutors in this region and potentially extending the findings to tutors in colleges across the country. Furthermore, the study specifically examined the relationship between tutors' knowledge of technological, pedagogical, and content aspects and how it influences their intentions to leave their positions.

Limitation

It was important to recognize potential limitations that could impact the study's outcomes. One such limitation was associated with the distribution of questionnaires to tutors, allowing them to respond at their convenience. This approach introduced the possibility that some respondents might have been influenced by their colleagues, potentially introducing bias into their responses.

Additionally, the nature of the study involved participants sharing information about their experiences and perceptions, which could have raised concerns about the safety and confidentiality of the provided information. This concern could have led to hesitancy among certain participants to take part in the study or to disclose information openly. To address these potential limitations, the researcher emphasized the importance of honest and unbiased responses. Participants were reassured that the information they provided was strictly for academic purposes and would be treated with the utmost confidentiality. Emphasis was placed on the significance of their openness and sincerity for the success and credibility of the study.

Definition of Terms

1. **Technology Knowledge (TK):** It refers to the understanding of how to use various technologies in teaching.
2. **Content Knowledge (CK):** It refers to the knowledge teachers must have about the courses they teach.
3. **Pedagogical Knowledge (PK):** It refers to the methods and processes of teaching and would include fundamental knowledge in areas such as classroom management, assessment, lesson plan development, and student learning.
4. **Turnover Intentions:** The desire for tutors to leave a present job position in search for a better job.

Organization of the Study

The study comprises of five chapters. Chapter one captures the background to the study, the statement of the problem, the research objectives, the research questions, the purpose of the study, the significance of the study, scope and organisation of the study. Chapter two dealt with review of related literature, theoretical as well as the conceptual framework of the study. Chapter three focuses on methodology which describes the research design, the study area, population, sampling technique and sample size, data gathering instruments, data collection procedures of the study, and methods of data analysis. Chapter four presents the results and discussion. Lastly, the chapter five deals with the summary of the findings based on the research questions and hypothesis presented together with conclusions and recommendations. The chapter ends with suggestions for further studies.

CHAPTER TWO

LITERATURE REVIEW

Introduction

In this section, the study delves into the theoretical framework, conceptual reviews, and an exploration of relevant academic and research works that directly align with the study's focus. This chapter critically evaluates and reviews key components of the research, offering a comprehensive examination of the foundational elements underpinning the study.

Theoretical Framework

1. Technological, Pedagogic Content Knowledge theory (TPCK) (Mishra & Koehler 2006)
2. Sequential Turnover Model (Mobley, 1977)

Conceptual review

1. Technology
2. The use of Technology in Education
3. Technology, pedagogy and content knowledge
4. Importance of Technology in education
5. Policy on technology education in Ghana
6. Turnover

Empirical review

1. The level of technological knowledge among college of education tutors.
2. The level of pedagogical knowledge among college of education tutors.
3. The level of content knowledge among college of education tutors.
4. Technology Knowledge and turnover intentions among tutors

5. Pedagogical Knowledge and turnover intentions among tutors
6. Content Knowledge and turnover intentions among tutors
7. Technology, Pedagogical and Content knowledge and turnover intentions among tutors.
8. The moderating role of gender on the relationship between tutors TPACK and their turnover intentions.
9. The moderating role of years of teaching experience on the relationship between tutors TPACK and their turnover intentions.

Theoretical Framework

Technological, Pedagogic, Content, Knowledge (TPCK) Theory

On the basis of Schuman's (1986) concept of Pedagogic Content Knowledge, Mishra and Koehler (2006) established the (TPCK) theory. Schuman (1986), explained that teachers in an attempt to facilitate optimal classroom instruction, must possess both in-depth knowledge of the content of the subject (content knowledge) and in-depth knowledge of the various approaches he or she will use to deliver his or her lessons (pedagogic knowledge). Mishra & Koehler (2006) built on Schuman's (1986) concept by stating that knowledge and usage of technology may be utilized to supplement the teacher's content and pedagogic expertise in order to achieve successful education outcomes. The TPACK model for the 21st century aims to provide educators and students with the skills they need to successfully incorporate technology into the curriculum for the purposes of learning.

Components of TPCK

The theory known as "technological, pedagogical content knowledge" (TPCK) provides an explanation for the intricate interdependence of various

components that are linked in such a way as to facilitate the effective use of information and communication technology (ICT) in educational settings. These are the primary aspects that constitute the theory. Knowledge of technology, knowledge of teaching methods, and knowledge of subject matter are the three types (Mishra and Koehler, 2006). All these factors come together to make it simple to include ICT in classroom instruction and student learning (Mishra & Koehler, 2006).

Content Knowledge

The term "Content Knowledge" (CK) refers to the understanding of the specific material being read or delivered. Due to the importance of differentiating between these areas of study, numerous pedagogical strategies have been developed to accommodate the integration of content knowledge (Mishra and Koehler, 2008). Each topic or discipline has its own distinct nature and qualities, which influence how its material may be distributed from one person to another in order to accomplish teaching and learning objectives. Content knowledge is what a teacher need to know on a topic or what a discipline is about in order to figure out how to share information in that topic or discipline (Mishra & Koehler, 2006).

Technological Knowledge

Technological knowledge (TK) encompasses an educator's comprehensive understanding of the technologies that are currently available and their specific functionalities. This knowledge entails being acquainted with a wide range of tools, software applications, and hardware devices that are relevant to the field of education. By having a solid grasp of TK, teachers are empowered to make informed decisions when choosing the most suitable

technologies that align with their instructional objectives and the unique requirements of their students.

Pedagogic Knowledge

A comprehension of the practices, principles, and goals of education is what is embedded in "pedagogical knowledge," or (PK) for short (Mishra & Koehler, 2006). When a student has a more in-depth understanding of pedagogy, they are better equipped to take in new material and apply what they have learned in the past. If all teachers possessed equal pedagogical knowledge, it is logical to assume that students in their classrooms would achieve a higher level of success overall. This encompasses both the methods used to impart information and the students' ability to receive and effectively utilize that information to fulfil the intended objectives of its transmission. The research conducted by Schuman (1986), Mishra, Koehler (2006), and other scholars has defined this as pedagogic knowledge.

Interrelationship of TPCK Elements

Mishra and Koehler (2006) stated that Content Knowledge, Pedagogic Knowledge, and Technological Knowledge are intimately intertwined; the figure below depicts this idea with three overlapping circles. Each circle in Figure 1 represents a different type of knowledge: content knowledge, pedagogical knowledge, and technological knowledge. Knowledge at the intersection of pedagogy and content is known as Pedagogical Content Knowledge (PCK), while knowledge at the same intersection between content and technology is known as Technological Content Knowledge (TCK) and between technology and pedagogy is known as Technological Pedagogical Knowledge (TPK) (TPK).

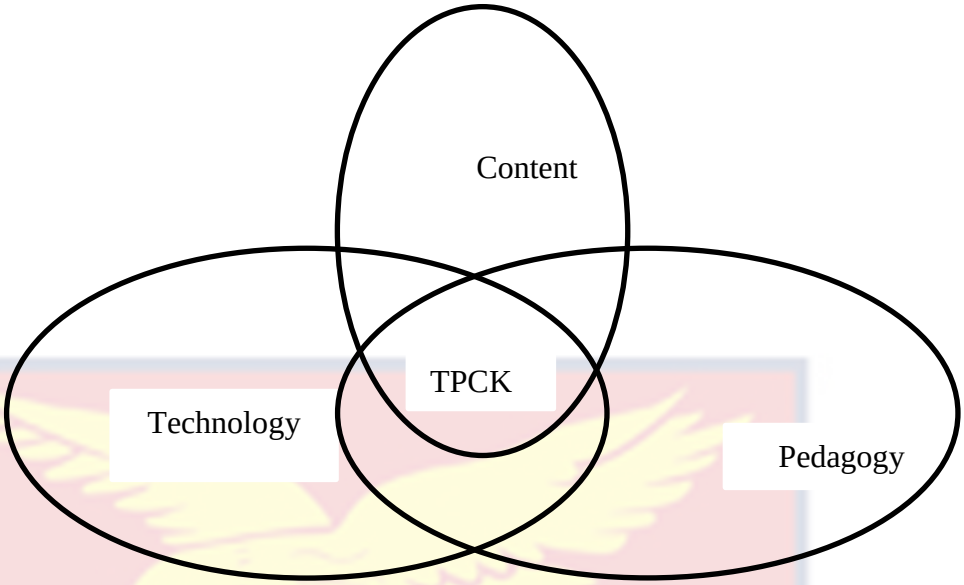


Figure 1: Interrelationship of TPCK Elements

Figure 1 illustrates the overlapping of three components, creating three distinct intersections. Mishra and Koehler (2008) argue that the interactions between these elements, which vary across different contexts, are responsible for the diverse outcomes of integrating educational technology. The first intersection establishes Pedagogical Content Knowledge (PCK), highlighting the close connection between content and pedagogy. The second intersection involves the integration of technology with content, resulting in technical content knowledge (TCK). This emphasizes the importance of understanding how technology influences specific materials or subjects, and vice versa. In essence, certain materials may limit or expand the range of technology options, while others may limit or expand the content and topic, for the sake of simplicity (Mishra & Koehler, 2006).

Technological Pedagogical Knowledge (TPK) is another intersection formed by the fusion of technology and pedagogy (TPK). This interplay illustrates how specific technologies might alter teaching and learning (Mishra & Koehler, 2008). Various technologies might make it easier to apply and

develop various teaching approaches. On the other hand, various instructional strategies will call for the implementation of a wide range of technological modalities.

Achieving the goals of educational technology investment is significantly impacted by integrating content, pedagogy, and technology simultaneously. Figure 1. depicts this graphically

The model presents two fundamental viewpoints:

1. Students and instructors must thoughtfully interweave content, pedagogy, and technology knowledge to ensure the constructive use of ICT in teaching and learning;
2. No single technological approach works for all classrooms, all curricula, or all perspectives on education (Mishra & Koehler, 2006)

These three components, as indicated in Figure1 overlap to generate three unique crossings. According to Mishra and Koehler (2008), the wide range of outcomes achieved through integrating educational technology is due to the interaction between and among these elements, which manifest in different ways depending on context. The initial point of contact is where content and pedagogy come together to form Pedagogical Content Knowledge (PCK). This implies that different approaches are needed for optimal results in various topic areas (disciplines). The second point of convergence is technical content knowledge (TCK), which is generated when technology and content are combined. This highlights the crucial significance of grasping how technology affects certain content or subject matter, and vice versa. In essence, some types of material may limit or enhance the types of technologies that may be

employed, and certain technologies may restrict or improve the material and subject to facilitate comprehension (Mishra & Koehler, 2006).

Technological Pedagogical Knowledge (TPK) is the third nexus created by the merging of technology and education (TPK). This interaction illustrates the potential impact of some technologies on teaching and learning (Mishra & Koehler, 2006, 2008). Diverse technologies may make it easier to use and create a variety of teaching techniques. On the other hand, various educational techniques will need the employment of different technologies. Integration of material, pedagogy, and technology in tandem has a positive effect on accomplishing educational technology investment goals.

In relation to the purpose of this study, the TPCK theory posits that effective teaching requires the dynamic interaction of these three knowledge components. In the context of the study, technological knowledge encompasses the understanding of how tutors use technology tools, pedagogical knowledge involves their teaching methods, and content knowledge pertains to their subject matter expertise. The study seeks to explore whether a higher level of TPACK among tutors corresponds to lower turnover intentions, indicating that a well-balanced integration of technology, pedagogy, and content knowledge positively impacts their commitment to teaching roles. The theoretical framework of TPCK provides a lens through which the study can analyse and interpret the complex relationship between these knowledge components and turnover intentions among tutors.

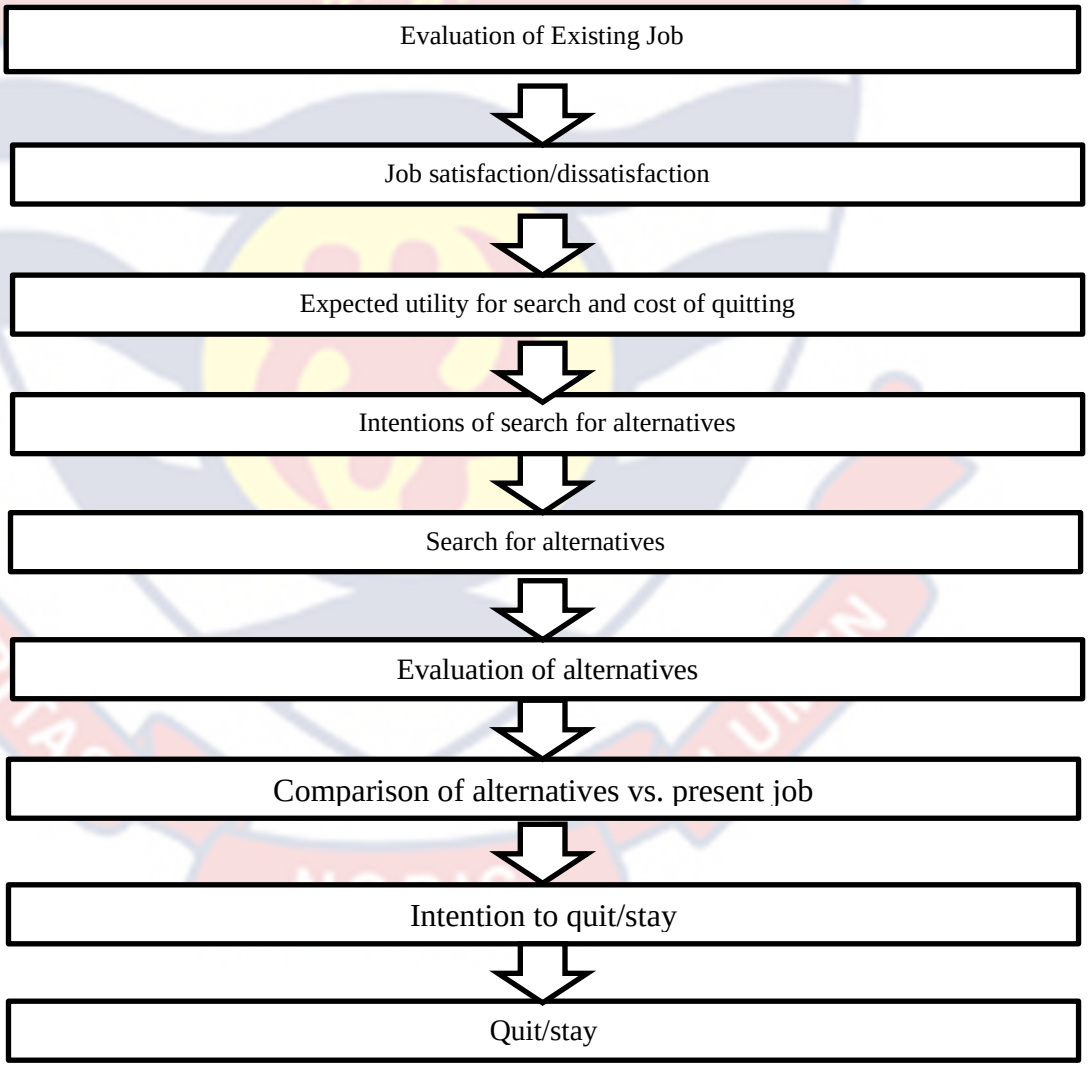
Sequential Turnover Model (Mobley, 1977)

The concept of employee turnover has been studied for some time, but Mobley (1977) presented the first psychological approach to the model. Based

on many hypotheses establishing a correlation between job satisfaction and leaving a certain profession, he constructed a model of employee turnover, as shown in Figure 2. Some people think of it as a series of mental steps, with the first one being an assessment of the worker's existing position within the company. The progression of mental processes that take place in the heads of educators as they carry out their jobs will be analysed with the help of this model. In Ghana, it is commonly said that "the reward of the teacher is in heaven," in light of which educators frequently evaluate their profession in relation to others. This model predicts that teachers, in particular, will be more likely to consider abandoning the profession if they experience negative feelings about their work. Because of this, many teachers in Ghana are dissatisfied with their jobs because they believe that their profession is underpaid and lacks status in today's society. In recent times, this perception has become especially prevalent. According to Mobley (1982), work discontent is a common factor that leads an individual to start looking for other employment opportunities. However, before making this decision, the person should conduct an analysis of the financial implications of leaving their current position. The following is a list of some of the concerns that will occupy the thoughts of the individual, as well as those of the instructors: Is there a more rewarding line of work (like teaching, for example) that this individual may pursue? Where is it possible to get steady employment? If you are currently jobless, how much time, effort, and money do you anticipate investing in your job search? Is there a more desirable position that this person could apply for somewhere else? These concepts will, in turn, direct the individual's search intent, which will be followed by a searching and a

comparing of the existing employment (the teaching profession) to the numerous career opportunities that have been identified. In practice, persons make a clear decision about whether or not they want to leave the company, which leads to either real turnover or retention.

Mobley (1982) further postulate that once people learn the high price of quitting, they will stop giving the idea of quitting much thought and instead take a more passive approach to their activity. Mobley, on the other hand, thinks that this circumstance will cause a turnover intention and turnover if the cost of resigning is not significant and there are positions available. Mobley says that the presence of job openings is a necessary condition for a turnover intention among employees and for a turnover to actually occur. Thus, Mobley (1977) provides intention of major advance in connecting job unhappiness to voluntary turnover.



F*igure 2*: Sequential Turnover Model

The model predicts that teachers, particularly those experiencing negative feelings about their work, are more likely to consider leaving the profession. Dissatisfaction with job conditions, such as feeling underpaid and lacking status, contributes to work discontent, a significant factor leading individuals to explore alternative employment opportunities. This aligns with the purpose of the study, which seeks to investigate whether TPACK predicts turnover intentions among tutors. In the Ghanaian educational landscape, teachers may assess if there is a more rewarding line of work, consider the availability of steady employment, and evaluate the time, effort, and financial implications of a job search. These considerations, as outlined in Mobley's model, directly influence the individual's search intent. For educators, this involves comparing the teaching profession to various career opportunities. The study, in examining the role of TPACK in turnover intentions, contributes to understanding the psychological processes outlined in Mobley's Sequential Turnover Model within the specific context of tutors in Colleges of Education in Ghana.

Conceptual Review

Technology

At its core, technology encompasses human-crafted entities that enhance human capabilities and enable the accomplishment of tasks that would otherwise be challenging or impossible (Ahammed, Patgiri, & Nayak, 2023). These tangible manifestations, commonly referred to as hardware or artifacts, include tools like axes, arrowheads, pots, and buildings (Grübler, 2003). However, technological advancements extend beyond the physical artifacts themselves (Foith, 2013). The creation and development of these

artifacts require a comprehensive system that involves not only the hardware or equipment but also various factor inputs such as labor, energy, raw materials, and capital (Foith, 2013). This broader perspective highlights the importance of the knowledge base or "software" that guides the manufacturing process. Understanding the relationship between technological knowledge and the likelihood of turnover intentions among tutors in the College of Education in Ghana can provide insights into the impact of technological expertise on workforce stability in educational institutions. This knowledge base, often referred to as technique, encompasses the know-how, human knowledge, and skills involved in the creation and utilization of technology (Rudtsch et al., 2014).

It can be said that, technology consists of both the physical entities or artifacts that are manufactured and the intangible aspects such as the knowledge, skills, and techniques associated with their creation and use. It is the combination of hardware and software that drives technological progress and empowers individuals to achieve greater feats.

Knowledge and methodology are vital for the creation and utilization of artifacts. Whether it's driving a vehicle or opening a bank account, knowledge is a prerequisite (Kohli, & Melville, 2019). At every level of society, from individuals to complex organizations and society as a whole, knowledge is indispensable. A typewriter, without a user capable of typing and reading, becomes a useless and cumbersome machine. Technological hardware and the accompanying "software" required for its functionality vary in size and complexity (McLuhan, 2016). These two components are mutually dependent and rely on physical and intangible environments, such as spatial

structures and social institutions. Institutions like governments, businesses, and markets, along with societal norms and attitudes, play a crucial role in defining the emergence and operation of systems for creating and consuming objects (McLuhan, 2016). They determine the processes by which specific objects and combinations of artifacts are developed, rejected, or successful, as well as the speed at which successful artifacts and combinations are integrated into the economy and society. This final stage is known as the dissemination of technology (Gomes et al., 2013).

Numerous twentieth-century technology studies all agree on one thing: it is simply incorrect to understand technological progress in terms of a simple linear model, regardless of how seductive the simplification may be. The progress of technology is neither simple nor linear. Instead, its four main characteristics are that it is unpredictable, dynamic, systemic, and cumulative, and these are the things that make it unique (Brynjolfsson & McAfee, 2014).

Uncertainty is a fundamental characteristic of existence, and technology is no exception. The first cause of technical uncertainty stems from the fortunate reality that there are always several ways to do a job. It is never clear which option is "better" when technological, economic, and social variables are considered (Eoyang & Holladay, 2013). Throughout the process of making new technology, there is a lot of room for error. This includes decisions about how to make the technology, how it will be used, and how it will affect the environment and other people who use it (Eoyang & Holladay, 2013).

Technology is dynamic; it is always evolving. Change entails the on-going introduction of new kinds, or "species," as well as the constant development and modification of existing ones (Nelson, 2020). The fluctuating rate of these combined changes is a continual source of both joy (and over optimism) and frustration (or pessimism). In general, technology's material components change considerably more rapidly and readily than either its nonmaterial components or society at large (Nelson, 2020). The primary determinants of technological dynamics are, first, the continual replacement of capital stock as economies grow and, second, and most importantly, new innovations.

Other characteristic of technological is that it occurs in a systematic fashion. It cannot be considered a separate, independent occurrence involving a single item. Not only must new technologies be conceived and designed, but they must also be manufactured (Érdi et al., 2013). This demands a slew of other technologies. Additionally, it necessitates infrastructure. A telephone requires a telephone network; a vehicle requires both a road network and a fuel delivery system, and each of these requires whole "bundles" of distinct technologies. This technological interconnectedness creates huge obstacles when it comes to executing large-scale reforms (Adner, & Lieberman, 2021). However, it is also what explains why technological advancements have such broad and lasting effects once they are applied.

Finally, technological progress is a cumulative process. Changes are cumulative in nature and are based on prior experience and knowledge. Only in exceptional circumstances can information become unreproducible. A new artefact, like a new species, is seldom created from the ground up. (The

inception of the space program is significant as an exception.) As a result, technical knowledge and the inventory of technologies in use continue to develop.

In sum, technology consists of physical and intangible aspects, including hardware and software, which drive progress and enable individuals to achieve greater feats. Knowledge and methodology are crucial for creating and utilizing artifacts. The relationship between technological knowledge and turnover intentions among tutors in Ghana's College of Education is essential for understanding the impact of technological expertise on workforce stability. Technology is dynamic, characterized by unpredictability and systemic interconnections, with continuous evolution and new types introduced through capital stock replacement and on-going innovations. It operates systematically, requiring conception, design, manufacturing, and infrastructure. Technological progress is cumulative, building upon prior knowledge and experience, impacting various societal aspects, including the educational sector in Ghana.

The use of Technology in Education

Educators at every level, from primary to secondary to postsecondary should be providing their students with increased exposure to a variety of technologies in the classroom. However, many institutions may not be providing this exposure to the fullest extent possible (Bolkan, 2012). A large number of pupils have been found to be tech savvy and to have access to the tools they need at home. It has been decided by the stakeholders that those in positions of responsibility within educational institutions are liable for establishing the necessary conditions for the application of technology. Nevertheless, significant discrepancies were found among the institutions that

took part in the study regarding the amount of technology being employed in their classes. The diverse patterns of student and teacher use observed in different schools are closely related to the integrating culture itself. An uptick in the usage of technology in classrooms was the result of a more optimistic outlook on its value held by both students and educators, who reached a consensus.

It is important for teachers of the future to know how to teach in the best way possible. College is the first step in becoming a teacher. Even though more and more schools and institutions are using electronic learning or "e-learning", there hasn't been much research done on how well students can adapt (Sung Youl Park, 2009). It was found that teachers who didn't use technology often had a hard time incorporating it into their lessons, but teachers who used technology often felt like they were able to build a classroom that was supported by technology (Meyer, Abrami, Wade & Scherzer, 2011). As Erlich, Sporte, Sebring, and the Consortium on Chicago Schools' (2013) revealed that if pre-service teachers developed a strong culture of technology integration, it continued over into the classroom. In our various classrooms, Information technology has become more and more common making it easier to improve and replace old teaching methods and giving educators the competence to plan out instructional content in advance so that it can be tailored to each student's needs (Mulrine, 2007). The prevalence and nature of technology in the classroom; even if not designed with education in mind, many educators have found creative uses for non-traditional tools (Zimlich, 2015). Zimlich (2015) conducted an investigation into the efficacy of the incorporation of technology into the classrooms of six recent graduates

of the University of Alabama's master's level certification program. It was determined that the availability of gadgets in the classroom was not the primary determinant of how well technology was received by students. Instead, what really mattered was how well the educator put the technology to use in the classroom. Their students remember them for this distinctive trait (Zimlich, 2015).

However, students have the opportunity to collaborate with their peers using various user-friendly tools and technology. They can utilize Google Drive and Google Docs to work together on shared documents, even when they are physically apart. Blogs, also known as weblogs, offer a platform for students to express and discuss their personal thoughts on various topics. Thanks to modern technology, students can engage in meaningful discussions about their learning, simulating the interactions that take place in a traditional classroom environment (Eckstein, 2009).

In sum, technology in education is said to be crucial, but there are discrepancies in exposure, leading to varied patterns of use by students and teachers. A positive outlook on technology's value is linked to increased classroom integration. Future teachers must incorporate technology into lessons, as challenges arise for those infrequently using it. Pre-service teachers who develop a strong technology integration culture carry this practice into their classrooms. Information technology has become commonplace, facilitating improved teaching methods and personalized content. Effective technology integration depends on skillful implementation.

Technological, Pedagogical and Content Knowledge

How can technology be integrated into the teaching process? TPACK is a way of thinking about education that highlights the relationship between teachers' topic knowledge and how they adapt that knowledge to the unique situations they face in the classroom. There is no "optimal" strategy to integrate technology into the classroom. To appreciate approaches to successful technology integration, it is suggested that educators must learn new skills to perceive and adapt to the complexity of teaching with technology. Content, pedagogy, and technology, together with their interrelationships, form the foundation of effective technology-based instruction. The interactions between and among the three components play out differently depending on the situation, which may explain why the degree and quality of instructional technology integration varies so widely. The pedagogical, technical, and content knowledge framework (TPACK) is built on these three areas of competence (content, pedagogy, and technology).

While additional comprehensive explanations of the framework are available in other sources, the subsequent paragraph presents a summary (e.g., Koehler & Koehler, 2008; Mishra & Koehler, 2006). This perspective aligns with the views of other researchers and approaches that aim to combine advancements in educational technology with Shulman's concept of pedagogical content knowledge (PCK).

Koehler and Mishra came up with the phrase "technological pedagogical content knowledge" (TPCK) in 2005 as a means to characterize the knowledge foundation that instructors need to have in order to use technology to educate effectively. Pierson (2001) first used the term to refer to

how a teacher interacted with students while using technology. Others have used terminology that is very similar to this, such as technology-enhanced PCK or information and communication technology (ICT)-related PCK (Angeli & Valanides, 2005). The well-known work that Shulman did in 1986 and 1987 on PCK served as the foundation for TPCK. It is widely acknowledged that PCK is a defining characteristic of the teaching profession. In order to assist students in comprehending the material at hand, teachers are able to integrate their expertise of the subject area in question with the appropriate instructional strategies. In the same way as PCK emphasizes the significance of content knowledge, TPCK places a strong emphasis on technical knowledge (TK).

The concept is currently known as "Technology, Pedagogy, and Content Knowledge" following a rebranding attempt in 2007. (TPACK). To effectively integrate technology into the classroom, educators require the "Total Package," or TPACK, which stands for "Technology, Pedagogy, and Content Knowledge" (Thompson & Mishra 2007). The authors, Mishra and Koehler, found that TPACK (Technological Pedagogical Content Knowledge) was easier to explain and more accurately represented the interconnectedness of the three knowledge domains (content knowledge, pedagogical knowledge, and technological knowledge) compared to TPCK (Technological Pedagogical Content Knowledge). Since its inception in 2005, the term "technological pedagogical content knowledge" (TPACK) has quickly gained traction in the sectors of professional development and technology integration.

In essence, TPACK encompasses the "Total Package" required for educators to integrate technology successfully into their teaching practices.

The framework underscores the holistic understanding needed to navigate the complexities of teaching with technology, acknowledging that expertise in content, pedagogy, and technology is essential for effective educational outcomes.

Importance of Technology in Education

Schools can ensure round-the-clock availability of course materials by creating their own websites. Additionally, certain institutions allow students to access these resources without the need for physical attendance. As the number of people who have access to the internet has expanded, so has the popularity of online courses. In today's ubiquitous online lecture halls, distance and time are no longer impediments. However, the benefits of using ICT in the classroom are dependent on how well it is integrated (Condie, Munro, Seagraves, & Kenesson, 2007). Dawes (2001) contends that emerging technologies have the potential to improve education worldwide by providing novel platforms for meaningful conversation. Without a doubt, educational technology has the ability to change classroom practices. According to Condie and Munro (2007), the use of technology has been beneficial in several areas, including supporting students who have been excluded due to personal or familial challenges.

According to Wishart and Blease (1999), technological developments have opened up new possibilities for children to receive immediate praise and acknowledgment. In today's educational landscape, software programs have been designed to cater to the diverse intelligences identified by Gardner (1993) in his Multiple Intelligences Theory. These programs utilize speech, animation, video, and interactivity to engage learners. Building on this, Kozma

(2005) highlights the transformative potential of technology in education. Not only can it enhance the quality of education, but it also has the power to make education more accessible and widely available. In essence, technology has the capacity to significantly improve and expand educational opportunities, as noted by Kozma (2005).

Students and teachers now have easier access to real-world courses, quality improvement tools, feedback and reflection opportunities, and more as a result of technological advancements. Instead of just giving students facts, teachers using the social constructivist methodology work with students to help them find answers (Vygotsky, 1978). According to Schoepp (2005), constructivist pedagogy must be the dominant form of instruction in the classroom for technology to have an impact on education. The integration of technology into educational settings is still in its infancy. Although there are some skeptics (Cuban, 2001), the majority of studies point to the positive impact that technology has on classroom education. According to Heinecke, Blasi, Ivliman, and Washington (1999), as cited in Mubashir-Ahmed (2009), computer-assisted instruction or computer-based learning can enhance student learning so long as fundamental skills and content are not lost.

Gray and Souter (2004) conducted research on one facet of the adoption and utilization of technology in the classroom by American secondary school science instructors. Putting scientific educators in context with other types of educators because the sample size of the study was insufficient for analysing particular subjects like biology, the researchers decided to investigate Biology, Chemistry, and Physics from a more holistic perspective.

According to Pilli and Aksu (2013), computer-assisted learning or instruction has transformed education in advanced countries since it uses computers as pedagogical tools. Ertmer and Ottenbreit-Leftwich (2013) stress that computers aid student drills and practice. Tutorials, directed discovery, intellectual structures, data retrieval and manipulation. Computers are powerful tools that enhance brainpower. As mentioned by Kozma (1994), the company's software has the ability to improve human cognition. They assist users in various cognitive aspects related to tasks, while ensuring that learners maintain full control over their performance, as pointed out by Fouche (1995). This transformative impact of technology on education has been described as a learning revolution by Todd (1997). It envisions educators using digital technologies to provide students with unique learning experiences that differ from those of previous generations. In line with this, Bigum (1997) advocates for the integration of technology as one of the instruments for teaching content and skills. Despite the educational benefits they offer, it is important to note Todd's (1997) cautionary advice. He recommends having a strong understanding of computers and information technology, as well as a methodology that develops students' knowledge and skills to effectively manage, process, and utilize the vast amount of information provided by technology. Following Todd's recommendations becomes crucial in harnessing the full potential of computers in education.

Hawkridge (1990) believes that computers have become catalysts for education, helping pupils become less reliant on teachers and improving their ability to collaborate. However, Thapisa and Baribwa (1998) argue that developing nations need electronic data interchange-capable communications

networks to innovate and produce knowledge and information using technology.

Dankwa (1997) and Parthemore (2003) report that many Ghanaian secondary schools have computer labs where pupils can learn computer literacy. While there is a positive aspect to this, an in-depth examination of the documentation provided by NGOs involved in implementing technology in Ghanaian schools reveals that the majority of secondary schools that benefit from technology are either located in urban areas or are considered top-tier schools (Hawkins, 2002; Parthemore, 2003). According to Parthemore (2003), "computer literacy instruction is given priority in most of Ghana's major urban regions." To bridge the gap with urban schools, certain exceptional rural schools have formed partnerships with local businesses to enhance computer training.

Contrary to the optimistic perception of technology as a means to generate knowledge, numerous academics have acknowledged the necessity to address the numerous issues it will bring about. Consequently, this recognition has resulted in insufficient preparation for the implementation of technology (Mooij & Smeets, 2001), inadequate training of teachers (Webb, 2002), disparities in the distribution of technology (Sutherland-Smith, Snyder & Angus, 2003), a lack of information regarding technology distribution, limited literacy levels, and a dearth of appropriate content and technological applications to cater to the diverse needs of societies (Mooij & Smeets, 2001; Hakkarainen et al., 2000). According to Hartviksen and Akselsen, (2002), there is a correlation between the prevalence of technology in schools and the existence of a digital gap between urban and rural schools.

According to Parthemore, (2003), Schools in urban areas and those identified as "top schools" have a distinct advantage when it comes to the availability of cutting-edge educational resources. Since the beginning of Ghana's system of formal education, educational resources have been dispersed in an unequal manner throughout the country's school system (Folson, 1995). It is essential that decision-makers in Ghana's education system take precautions to prevent the use of new technologies as yet another instrument for maintaining existing educational disparities. The implementation of technology in Ghanaian classrooms is currently being driven by a concerted effort on the part of education policymakers, NGOs, multinational and bilateral donors, and educational administrators.

However, the implementation of technology in Ghanaian classrooms is a collaborative effort involving education policymakers, NGOs, donors, and administrators. It is crucial for decision-makers to ensure that technology does not perpetuate existing educational disparities but rather serves as a tool for bridging gaps and improving access to quality education.

In sum, despite these challenges, the implementation of technology in Ghanaian classrooms is a collaborative effort involving policymakers, NGOs, donors, and administrators. The key imperative is to ensure that technology serves as a tool for bridging educational gaps and improving access to quality education rather than perpetuating existing disparities. This summary underscores the dual potential of technology in education offering opportunities for improvement while requiring careful consideration of challenges and disparities in its implementation.

Policy on Technology Education in Ghana

The Ghanaian Government is utilizing information and communications technology to transform the country's agricultural-based economy into a knowledge-based economy and society. In a way to improve on the quality of education offered to students in primary schools, secondary schools, colleges, and universities, the government of Ghana acknowledges the need of providing technology training and instruction. Technological advancements offer opportunities for students and teachers to gather and analyse material in innovative ways, leading to an enhanced quality of education. Therefore, in order to improve the quality of life for the people of this country, the government has dedicated itself to an extensive program that emphasizes the fast growth of the application of technology in educational settings. The government wants schools to put more emphasis on critical thinking and creative problem-solving so that students are better prepared for the challenges of the 21st century (C21). According to a 2006 draft of the government's ICT strategy, the aim is to foster collaboration between the public and private sectors in order to provide Ghanaian children with a top-quality education. This education aims to cultivate individuals who possess strong ICT proficiency, enabling them to confidently and creatively utilize information and communication technologies to achieve personal goals and actively participate in the global, knowledge-based economy. These individuals will possess the adaptability necessary to navigate a rapidly evolving world driven by scientific and technological advancements. These skills will enable individuals to effectively respond to the changing demands of a technology-driven world (Draft Copy of ICT Policy, 2006).

In line with our dedication to promoting national engagement and global acknowledgment, we are fully devoted to educating every Ghanaian, irrespective of their educational background, about poverty-related concerns, nurturing national progress and development, and expediting development for the betterment of all Ghanaians. This remains our objective, as stated in the preliminary version of the ICT policy in 2006.

The Ministry of ICT's policy statement on the use of information and communication technologies is a perfect representation of this overarching aim. To that end, it intends to serve as a visual reference to the steps involved in rolling out and capitalizing on technology within the context of the country's overall ICT infrastructure. The Ministry of Education and its subordinate organizations, like the Ghana Education Service at the regional and district levels, are in charge of planning, coordinating, and carrying out education and training in Ghana.

It can be concluded that, the policy on technology education in Ghana underscores the government's commitment to transforming the country's economy and society through the utilization of information and communications technology. By prioritizing technology training and instruction in schools, the government aims to improve the quality of education and enhance the lives of the Ghanaian people. The policy emphasizes the importance of critical thinking, problem-solving, and ICT proficiency to prepare students for the challenges of the 21st century. Collaboration between the public and private sectors is sought to provide top-quality education and equip individuals with the skills needed to thrive in a technology-driven world. The Ministry of ICT's policy statement serves as a

guide for implementing and maximizing the use of technology within Ghana's broader ICT infrastructure, with the Ministry of Education and its affiliated organizations playing a key role in education planning and implementation.

In summing up, the Ghanaian government's technology education policy aims to transform the economy into a knowledge-based society through strategic use of information and communications technology (ICT). It emphasizes fostering critical thinking, creative problem-solving, and ICT proficiency among students to prepare them for the 21st century challenges. The policy involves collaboration between public and private sectors to deliver high-quality education and equip individuals with the skills needed for a technology-driven world. The Ministry of ICT and regional and district-level counterparts play a pivotal role in planning and executing education initiatives.

Turnover

Researchers have defined "turnover" in a number of different ways. Thwala et al., (2012) define turnover as “the movement of employees outside the boundaries of a company”. On the other hand, Petriglieri (2011) recognizes it as a result of the coping mechanisms used by the employees for quitting their current employment. Voluntary turnover, according to Morrell, LoanClarke, and Wilkinson (2001), is an employee's voluntary termination of participation in an organization. On the other hand, "involuntary turnover" is described as movement across an organization's membership border that is not initiated by the employee (Perez, 2008). Kirpal (2004) believes that turnover may be either permanent, occurring when workers quit their employment institution, or horizontal, when workers actively seek for and accept transfers

to other departments. Turnover occurs when workers are unsatisfied with the organization's rules, lack organizational commitment, and the quality of the organization's learning culture and Leader-Member Exchange (Joo, 2010).

Aspects of Turn Over

The issue of employee turnover is a critical aspect of organizational management that has significant implications for businesses across various industries. Turnover refers to the rate at which employees leave a company and need to be replaced. It encompasses both voluntary departures, such as resignations, and involuntary separations, such as terminations. Aspects of turnover encompass a wide range of factors and considerations that influence why employees choose to leave an organization and how their departure impacts the company as a whole. Understanding and effectively managing turnover is crucial for maintaining a stable and productive workforce, as well as ensuring long-term organizational success. In this review, I will delve into the key aspects of turnover, exploring its various aspects.

Withdrawal behaviour

The term "withdrawal behaviour" refers to specific types of behaviour that employees engage in when leaving the organization either psychologically or physically. This disconnect might occur either physically or mentally. Presents, complacency, and burnout are examples of psychological behaviours. Physical behaviours, on the other hand, contribute to tardiness, absenteeism, and job turnover (Carraher & Buckley, 2008). Turnover intentions or behaviour is the consequence of members of an organization's shared cognition having an impact on their job migration choices. According to Abelson's (1993) research, a high turnover culture fosters an environment in

which individuals changing employment frequently is regarded as appropriate behaviour. He thinks that social effects make it more likely that an employee will want to leave the company after a long time.

Turnover intention

According to Ike, Omeje, Okonkwo, and Eze (2020), turnover intention has three components: attitudinal; contemplating leaving; decisional; intending to depart; and behavioural; seeking new work after purposeful turnover. Lee (2008) also defines "turnover intentions" as an organizational member's subjective desire to leave his or her present position in search of better chances, while Lee and Jimenez (2011) define the turn over intention as the relative strength of an individual's desire to leave the company. Actual turnover often happens before people have the desire to leave, which could be to leave the company they work for or to leave their job and start a new one.

However, Kim, Lee, and Carlson (2010) define "turnover intent as "an individual's intention to exit an organization voluntarily" (p. 592). Garrison, Wakefield, Harvey, and Kim (2010) describe “turnover intent as the cognitive processes contributing to an individual's desire or incentive to exit an organization" (p. 110). “According to Cho, Johanson, and Guchait (2009), turnover intent refers to a deliberate and thoughtful choice to resign from an organization in the coming period (p. 374).

As a result, the intention to leave existing firm has been described as a purposeful desire to look for employment elsewhere (Tett & Meyer, 1993), which is considered detrimental to the organization (Chen et al., 2011). This study calls "turnover intention" the intention to leave GES and stop teaching.

Evidently employee turnover encompasses various aspects with significant implications for organizations. Withdrawal behaviour, such as disengagement and leaving the job, is a key component. Turnover intention, the desire to leave the organization, is also crucial. Understanding and managing turnover is vital for organizations to maintain a stable and productive workforce.

Empirical Review

Technological Knowledge among Tutors

Bauer (2013) conducted a study with the aim of developing and utilizing a tool to assess the Technological Pedagogical and Content Knowledge (TPACK) of music teachers. The study also sought to determine how these teachers acquire their TPACK and whether there is a correlation between their TPACK and the extent of technology usage in the classroom. A total of 284 music teachers participated in the study and completed two questionnaires: the Musical TPACK Questionnaire (MTPACK-Q), which assessed their TPACK, and the classroom Technology Integration Level Questionnaire, which measured their technology usage. The findings revealed that the scores for the technological aspects of the TPACK model were lower compared to those for the content, pedagogy, and pedagogical content dimensions.

Norstrom (2014) conducted a study to explore the perspectives of Swedish technology educators regarding technological literacy. The investigation involved a written survey and in-depth interviews. The results indicate that the educators' understanding of the nature of technological knowledge and the criteria for its justification display more diversity and less

strength than previously assumed. Furthermore, they were unaware of the extensive philosophical debates that had taken place on this subject. Consequently, their curriculum and the evaluation of their students' knowledge might be influenced by their lack of knowledge regarding the definition and justification of technological knowledge.

In recent years, research has shown that effective integration of information and communication technologies (ICT) requires teachers to have TPACK (Archambault, & Crippen, 2009). Nordin, Davis, and Ariffin (2013) investigated the following questions: 1) how do pre-service teachers rate their TPACK mastery before and after fieldwork? 2) Does school fieldwork affect TPACK? The Schmidt et al. (2009) and Archambault and Crippen (2009) TPACK survey was administered to 107 pre-service teachers in a research-intensive university program in New Zealand before and after a field experience. Three student teachers were interviewed before and after fieldwork. Before and after their field experiences, these future educators scored best in Content Knowledge (CK) and lowest in Technology Knowledge (TK) in the TPACK framework.

Tseng et al. (2020) undertook a critical examination of TPACK research specific to language teachers' lack of technology-related skills. To bridge the research gap, this review study examined language instructor TPACK studies from 2011 to 2019. The investigation discovered 51 studies that peaked in 2015. Asian and Middle Eastern countries conducted most of these studies. The collection of fifty-one papers was categorized into four sections based on the different aspects of TPACK: exploration, evaluation, development, and application. In particular, the research on TPACK revealed

that teachers exhibited different degrees of confidence in their TPACK skills and that their TPACK knowledge primarily aligned with the traditional teacher-centered approach to technology integration.

Luik, Taimalu, and Suviste (2018) looked at how to make a practical tool for assessing TPACK. The goal of this study was to validate the instrument that was made and find out how pre-service teachers in Estonia, a technologically advanced country where technology is widely used in general education, see their own technological, pedagogical, and content knowledge in relation to the TPACK framework. During the factor analysis process, all of the parts, including technology, were put together into one factor. The results showed that teachers-to-be were not well-prepared in terms of pedagogical skills, but they are confident in their ability to use technology in their teaching. There were also differences in how people saw things based on their gender, age, and level of education.

The review of these studies highlights several key findings. Firstly, teachers' TPACK knowledge and skills in relation to technology integration vary across different dimensions. The technological aspects of TPACK were generally rated lower compared to content and pedagogy dimensions (Bauer, 2013). Additionally, the understanding of technological knowledge among educators appears to be diverse and lacking in strong justification criteria (Norstrom, 2014). Pre-service teachers showed varying levels of TPACK mastery, with higher scores in content knowledge and lower scores in technology knowledge (Nordin et al., 2013). Furthermore, language teachers' TPACK skills tended to align with traditional, teacher-centered approaches to technology integration (Tseng et al., 2020). Finally, pre-service teachers in a

technologically advanced country demonstrated confidence in their ability to use technology but lacked adequate pedagogical skills (Luik et al., 2018).

The empirical review offers a comprehensive overview of technological knowledge among tutors, based on studies from various countries and educational contexts. However, it is primarily quantitative and overlooks the temporal dimension, focusing on how rapid technological advancements may affect tutors' Technological Pedagogical and Content Knowledge (TPACK) and turnover intentions. The review also overlooks demographic factors like gender, age, and education level, which could be explored more deeply. Additionally, the review could benefit from identifying gaps in the literature and integrating findings across studies to provide a more comprehensive understanding of technological knowledge among tutors and its impact on turnover intentions in Ghanaian Colleges of Education.

Pedagogical Knowledge among Tutors

Aksal (2009) researched and developed an EUA-based quality improvement action plan for the Distance Education Institute of Eastern Mediterranean University. This work-based learning study aims to improve online pedagogy and tutoring. This study examined how tutors promoted dialogue to overcome social obstacles throughout the knowledge-building phase of online learning and teaching. Inductive action research was used to change professional practices through collaboration. Thus, this qualitative study collected data through focus groups, trainings, in-depth interviews, and a research journal. The research found that tutors were unaware of the importance of communication and socialization in helping pupils learn.

Again, the extensive involvement of librarians in the instruction of information literacy has prompted worries regarding their development as instructors; nevertheless, there is little study on the acquisition and application of pedagogical knowledge by librarians. On the basis of this, Bewick and Corrall (2010) employed a questionnaire to collect primarily quantitative data regarding the teaching duties, pedagogical knowledge, and professional growth of subject librarians working in 82 different higher education institutions located in the United Kingdom. The design was guided by two interviews with industry experts as well as a review of the relevant literature to contextualize the findings. According to the results of the poll, people holding these posts participated in a wide variety of teaching-related activities, which were considered essential to their profession. The Majority of respondents expressed optimism regarding their roles as educators and believed that they possessed an adequate level of knowledge, providing illustrations of how the pedagogical theory they had acquired through their coursework informed their actual classroom practices. Even though learning on the job was very prevalent.

Lauermann and Konig (2016) in a study examined teachers' professional competence—their knowledge, skills, beliefs, and motivation. The study examined gender and teaching experience effects on these dimensions. 119 in-service teachers were studied. The results revealed a negative linear correlation between teaching experience and self-efficacy, a curvilinear relationship between GPK and teaching experience, and no significant relationship between teaching experience and burnout. Mediation analyses showed that general pedagogical knowledge negatively affected

teacher burnout directly and indirectly through its favourable association with teaching self-efficacy.

Kihoza, Zlotnikova, Bada, and Kalegele (2016) examined classroom ICT integration opportunities and obstacles in relation to TPACK and SAMR (Substitute, Augmentation, Modification, and Redefinition) models. A total of 206 teacher training college instructors and trainees were included in the research. The Majority of the respondents exhibited poor levels of pedagogical ICT competency. Although tutors had a strong understanding of all of the TPACK and SAMR components, teacher trainees lacked sufficient knowledge of ICT and received insufficient guidance (hardware, software, and associated peripherals). The TPACK and SAMR models had an impact on the process of planning how to employ technology and redesigning learning tasks. The primary obstacles consisted of a lack of adequate infrastructure, an unwillingness to adapt, and insufficient pedagogical ICT application abilities.

König, Bremerich-Vos, Buchholtz, and Glutsch (2020) developed a standardized method for analysing demonstration lesson ideas. Their research sought to match lesson assignments to students' cognitive levels to guide them toward their zone of proximal development König, Bremerich-Vos, Buchholtz, and Glutsch used data from 172 German pre-service teachers for their first induction lecture. A high degree of declarative general pedagogical knowledge of adaptation (measured by a standardized exam) predicted situation-specific pedagogical adaptability in written lesson plans. The study also showed that pre-service teachers' knowledge is important for pedagogical adaptation.

In summary, the reviewed studies shed light on various aspects of pedagogical knowledge among different groups of educators. Aksal (2009) focused on tutors in online learning environments and highlighted the importance of effective communication and socialization for student learning. Bewick and Corrall (2010) investigated the acquisition and application of pedagogical knowledge by librarians, finding that subject librarians were actively engaged in teaching-related activities and believed in their own pedagogical competence. Lauermann and Konig (2016) examined teachers' professional competence and identified relationships between teaching experience, self-efficacy, and burnout. Kihoza et al. (2016) explored the integration of ICT in classrooms and found that while tutors demonstrated good understanding of pedagogical models, teacher trainees lacked sufficient ICT knowledge and support. Finally, König et al. (2020) developed a method to analyze lesson plans and emphasized the importance of pre-service teachers' pedagogical knowledge for effective adaptation in teaching. Overall, these studies highlight the significance of pedagogical knowledge and its impact on teaching practices and student outcomes in various educational contexts.

The empirical review examines pedagogical knowledge among various educators, including tutors, librarians, in-service teachers, teacher training college instructors, and pre-service teachers. It captures the varied dimensions of pedagogical knowledge, focusing on awareness, understanding, and practical application in different educational settings. The review also explores the relationship between pedagogical knowledge, teaching experience, and burnout, providing a nuanced view of the challenges educators face and how their knowledge influences their well-being. However, it does not explicitly

discuss potential gaps or inconsistencies in existing literature. In conclusion, the review effectively captures the multifaceted nature of pedagogical knowledge and its implications for educators across different educational settings. However, a more critical synthesis and broader scope could enhance the review's depth and relevance, providing a more holistic understanding of pedagogical knowledge in education.

Content Knowledge among Tutors

The knowledge of the teacher's subject matter takes precedence and is of utmost importance. According to the No Child Left Behind Act (NCLB), specifically under Act number 107-110, a highly trained educator must exhibit a high level of expertise and familiarity with the subject matter they are teaching to students. According to the United States Department of Education (2004), teachers in middle and high school must establish that they know the subject they teach by having a major in the subject that they teach. This requirement applies to instructors in all subjects. According to Ahtee and Johnston (2006), insufficient familiarity with the topic area might contribute to classroom issues. Hill, Rowan, and Ball (2005) claim that expanding one's knowledge on a given subject is the primary goal of most professional development programs. This is because previous studies have shown that pupils learn more when their teachers have a firm grasp of the subject matter.

Teaching gives people new knowledge, skills, and ways of thinking. Teachers use what they know about their subjects in many ways. Moats and Foorman (2003) looked at research and surveys and found that what teachers know about a subject affects how students learn in the classroom. Even while it seems obvious that teachers should know what they are teaching, not

everyone agrees. King (2021) wrote this book to get people interested in the topic again and encourage more research that can show how much subject matter expertise affects teaching and learning. A survey was done based on a review of the literature. Subject matter knowledge was clear, and it was decided that a teacher's understanding of a subject means that they can teach the main points of the subject to students and clear up misconceptions. This affects learning when students can use what they've learned in class to take part in their environment (King, 2021).

A 2019 study conducted by Nixon, Smith, and Sudweeks examined the science knowledge and teaching background of elementary teachers (referred to as SMK). In order to gain a deeper understanding of this phenomenon, the researchers administered a scientific assessment to 231 fifth-grade teachers, 208 sixth-grade teachers, and 169 pre-service teachers. They then compared the average scores of educators at different stages of their careers using one-way and two-way ANOVA. Additionally, they investigated the correlation between SMK scores and teaching experience through regression analysis. The findings indicated that as teachers progressed in their careers, their SMK scores declined for both science subjects they had not taught before and those they were responsible for teaching. Furthermore, the outcomes varied for fifth and sixth grade students. This study highlights two important points: (i) teachers' mastery of specific science topics was associated with years of teaching experience in those areas, and (ii) teaching experience, encompassing instructors' daily practices, can serve as an effective self-directed learning tool for teachers.

In 2016, Karal and Alev conducted a study exploring physics and math fields. They emphasized the importance of pre-service physics teachers improving their pedagogical content knowledge (PCK) specifically in the area of electricity and magnetism, with a focus on understanding how this knowledge evolves over time. The study involved 13 pre-service teachers who had completed their subject area courses by the fall term of 2007-2008. These teachers had finished their topic studies by the end of that term. Six of them were selected for further investigation of PCK evolution over the next three periods. Data collection included a PCK test, observations, lesson plans, and informal interviews. The findings indicated a decrease in subject matter knowledge, an increase in representation diversity, changes in orientations, and an increased awareness of field-based difficulties. The growth of PCK was found to be influenced by the nature of the subject, previous experience, on-the-job exposure, field experience, teacher training, written materials, mentor teachers, and the school culture. Despite the continuous demonstration of the importance of teachers' science subject matter knowledge (SMK), limited opportunities exist for teachers to enhance their scientific literacy once they begin teaching. Therefore, it is crucial for teachers to gain teaching experience in order to expand their subject matter knowledge.

In a study conducted by Nixon, Hill, and Luft in 2017, the changes in SMK of new secondary school teachers over time were examined by comparing concept maps created in their first year of teaching with those made in their fifth year. The study proposed a grading system that considered both the organization of knowledge and the strength of connections between information. Based on the data, it was concluded that these newly hired

chemistry teachers possessed a high level of SMK, and this level did not significantly change from the start of their teaching careers until their fifth year.

In their comparative study, Schmidt et al. (2011) explored the relationship between teachers' content knowledge and the quality of mathematics instruction across multiple countries. Their findings highlighted the significant impact of teachers' content knowledge on student achievement in mathematics. The study revealed that countries with teachers who possessed a more extensive understanding of mathematics content exhibited higher levels of student achievement in the subject. This suggests that teachers' depth of knowledge in mathematics plays a crucial role in delivering high-quality instruction. The results of the study underscore the importance of prioritizing and enhancing teachers' content knowledge in mathematics education. By equipping teachers with a strong foundation in mathematical concepts, countries can potentially improve the overall quality of mathematics instruction and subsequently enhance student achievement in the subject.

Numerous studies have emphasized the importance of content knowledge among teachers and its impact on teaching and learning outcomes. The No Child Left Behind Act (NCLB) and the United States Department of Education have recognized the significance of teachers possessing expertise and familiarity with the subjects they teach. Research has shown that teachers' subject matter knowledge positively affects classroom instruction and student learning. Studies have explored various aspects of content knowledge among teachers, including subject-specific knowledge, pedagogical content knowledge (PCK), and science knowledge. Findings have highlighted the

relationship between content knowledge and effective instruction, the decline in content knowledge over time without continued learning opportunities, and the positive correlation between content knowledge and student achievement. These studies underscore the need for ongoing professional development to enhance teachers' content knowledge and its implications for improving educational outcomes. By prioritizing and supporting teachers in developing their subject matter expertise, we can strive towards providing high-quality instruction and fostering student success.

The review examines content knowledge among tutors, focusing on subject-specific knowledge, pedagogical content knowledge, and science knowledge. It mainly examines US studies, but has limitations such as a limited generalizability, lack of comprehensive exploration of PCK, and a lack of contemporary strategies to address content knowledge decline. Despite these, the review provides valuable insights into the importance of content knowledge in teaching.

Technology Knowledge and Tutor Turnover Intentions

There has been some focus on studying the effects of digital stress on students in elementary through high school, but empirical research on the topic is still scarce. Several "tentative" sources of technostress were identified by Al-Fudail and Mellar (2008) in a small study of elementary school teachers. These sources included a lack of technical knowledge about how to deal with technological errors, increased work demands induced by the technology, and an absence of pedagogic preparation. Similarly, Joo et al. (2016) found that technostress negatively correlates with teachers' intentions to leave their current position.

With K–12 education as their focus, Califf and Brooks (2020) conducted and empirically tested a model of technostress. Conceptually, technostress is viewed as a process involving technostressors, strain, and results, as well as devices that can mitigate the former two. A total of 416 American elementary and secondary school teachers were surveyed. Five technological stressors, technological complexity, technological insecurity, technological invasion, technological overload, and technological uncertainty were examined in terms of the strain they caused and the effect that strain had on burnout and the likelihood a person leaving their current position. There is also an examination of whether or not improving literacy can alleviate the negative effects of the five technological stressors and burnout. The study revealed that the feelings of technological inadequacy, invasion, or overload considerably raise burnout, and that burnout itself significantly positively affects intentions to leave a firm.

Fernández-Batanero et al., (2021) conducted a study to determine the status of the investigation into the tension and anxiety experienced by teachers who are knowledgeable about using educational technology. Their goal was to determine how far along the investigation had progressed. A systematic review that followed the "Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards was carried out with the use of the bibliographic databases PubMed, Web of Science, and Scopus". The investigation uncovered a total of sixteen articles. The most important findings revealed that teachers felt high levels of worry or stress as a result of utilizing instructional technology in the classroom which may impact on their intentions to leave their current job.

In a descriptive correlational study conducted by Otache and Inekwe (2021), the focus was on the performance, turnover intentions, and job satisfaction of instructors with PhD degrees working at polytechnics in Nigeria. The researchers collected primary data by administering an online self-reported questionnaire to 167 PhD-holding instructors from Nigerian polytechnics. The descriptive statistics revealed that these instructors had low job satisfaction, a high intention to leave their positions, and average performance. A structural model indicated a positive correlation between job satisfaction and productivity among PhD-holding instructors at Nigerian polytechnics. Further investigation highlighted significant negative associations between job satisfaction, turnover intentions, and effectiveness among PhD-holding academics at Nigerian polytechnics. The study also emphasized the impact of technological understanding on turnover intentions, shedding light on important factors, such as technological integration, that contribute to faculty attrition in higher education institutions, particularly in developing nations.

In conclusion, several studies have shed light on the relationship between technology knowledge and various outcomes such as tutor turnover intentions, burnout, job satisfaction, and performance. Al-Fudail and Mellar (2008) identified sources of technostress among elementary school teachers, including a lack of technical knowledge and increased work demands induced by technology. Joo et al. (2016) found that technostress negatively correlates with teachers' intentions to leave their current positions. Califf and Brooks (2020) conducted a comprehensive study on technostress among American elementary and secondary school teachers, revealing that technological

stressors such as complexity, insecurity, invasion, overload, and uncertainty significantly contribute to burnout and intentions to leave. They also explored the potential role of literacy in mitigating the negative effects of technological stressors. Fernández-Batanero et al. (2021) conducted a systematic review and found that teachers experienced high levels of worry or stress when utilizing instructional technology, which may impact their intentions to leave their current jobs. Otache and Inekwe (2021) focused on PhD-holding instructors at Nigerian polytechnics and found a positive correlation between job satisfaction and productivity, as well as significant negative associations between job satisfaction, turnover intentions, and effectiveness. Technological understanding was highlighted as an important factor contributing to faculty attrition in higher education institutions.

The review provides insights into technology knowledge's impact on tutor turnover, burnout, job satisfaction, and performance. However, its focus on specific regions and K-12 education may limit its applicability to diverse settings. Future research should diversify geographic representation, expand to higher education, explore technostressors, incorporate longitudinal studies, and use qualitative methods.

Pedagogical Knowledge and Tutor Turnover Intentions

Tiplic, Brandmo, and Elstad (2015) explored variety of personal, organizational, and contextual elements that may influence new teachers who want to quit within two years. Out of 227 newly hired teachers, 69% were female and 31% were male. These new teachers were from 133 schools around Norway. According to the findings, there were four important factors that contribute to beginning teachers' intentions to leave their jobs: collective

teacher efficacy, which encompasses teachers' pedagogical knowledge, trust between teachers and principals, job stress, and affective commitment all, had a significant influence on beginning teachers' intentions to leave their jobs.

In his study conducted in 2014, Hassan examined the key factors influencing the desire of Technical staff in a hypothetical organization to leave and seek alternative employment. The researcher looked at 103 people. Organizational commitment, job stress, job features, advancement opportunities, pay level and rewards, quality of work life, and job satisfaction were all looked at in relation to turnover intention. The regression analysis of organizational commitment, job features, promotion opportunities, pay level and rewards, quality of work life, and job satisfaction showed a negative and significant relationship with the intention to leave the job. Only job stress affected the decision to quit in a positive and significant way. This showed that a previous study by Tiplic et al., (2015) was right when it said that these factors affect plans to leave. This study also found that job stress had the most effect on whether or not someone wanted to leave their job.

In 2017, Heikonen et al. examined early career teachers' plans to leave the profession, how they felt about their interactions with students, and their perception of classroom control. The study included 284 teachers with less than five years of experience. Early-career teachers' sentiments of inadequacy in teaching and learning entirely mitigated the unfavourable relationship between their plans to leave their employment and their professional agency. The two variables had a negative connection. The results showed that teachers in their first few years on the job were more likely to quit if they felt like they

didn’t have enough skills to deal with pedagogically and socially difficult student situations.

Aslami's (2013) conducted a study on public high schools in Kabul, the capital of Afghanistan. It focused on what made teachers leave their jobs or wanted to go on leave. Interviews, questionnaires, and observations were used to get information from 71 teachers who took part in the study. The study showed that the lack of effective and ongoing programs was a big reason why many new teachers leave their jobs. More research showed that 56% of people who used to teach leave because they weren't ready for what it was like in the classroom. This suggests that if new teachers didn’t understand how to teach, they might get frustrated and may want to quit.

According to Muhangi's (2017) research, various factors such as gender, age, religion, marital status, and years of teaching experience impact teachers' self-efficacy and job satisfaction. Chi-square analysis, regression analysis, and the Kruskal Wallis test are employed as additional factors in the study. The research indicates that job satisfaction and teacher self-efficacy are associated with the intention of secondary school teachers to leave their positions. Moreover, among instructors, plans to leave are predicted by their self-efficacy in terms of their knowledge in delivery within the school context. Given the issue of teacher turnover, it is crucial to utilize teachers' feelings of self-efficacy and job satisfaction to address this problem.

Several studies have shed light on the factors that contribute to teachers' turnover intentions. Tiplic, Brandmo, and Elstad (2015) found that collective teacher efficacy, trust between teachers and principals, job stress, and affective commitment significantly influence new teachers' intentions to

leave their jobs. Hassan (2014) identified organizational commitment, job stress, job features, advancement opportunities, pay level and rewards, quality of work life, and job satisfaction as factors influencing turnover intentions among technical staff. Heikonen et al. (2017) discovered that early career teachers' feelings of inadequacy in teaching and learning were associated with their plans to leave the profession. Aslami (2013) highlighted the lack of effective and ongoing programs and inadequate preparation for classroom realities as reasons for teachers leaving their jobs. Additionally, Muhangi's (2017) research emphasized the impact of factors such as gender, age, religion, marital status, and years of teaching experience on teachers' self-efficacy and job satisfaction, which in turn influence their intention to leave. Addressing these factors and promoting teachers' self-efficacy and job satisfaction are crucial in tackling the issue of teacher turnover.

The empirical review explores factors influencing teacher turnover intentions, incorporating research from Norway and Afghanistan. It provides a nuanced understanding of the multifaceted nature of teacher turnover. However, the review lacks a chronological order or thematic organization of the studies, making it difficult for readers to discern a logical flow. The synthesis of findings could be strengthened by highlighting common themes or divergent perspectives across the studies. The review emphasizes the significance of factors like job stress, organizational commitment, and self-efficacy, but a more explicit connection to the specific context of technology integration and TPACK could enhance its relevance.

Content knowledge and Tutor Turnover Intentions

In their 2015 study, Tiplic, Brandmo, and Elstad looked at variety of personal, organizational, and environmental elements that might influence whether or not new teachers decide to stay in the profession after their first few years. The impact of these variables on turnover rates was investigated by the researchers. Out of 227 new instructors from 133 Norwegian schools, 31% were men and 69% were women. Starting teachers' intentions to leave the profession are predicted by collective teacher efficacy, trust between teachers and principals, role conflict, and emotional commitment. They found those organizational and contextual factors, and competency level, impacted beginning teachers' career decisions.

In Kakamega Central District, Emoja (2016) looked at job satisfaction and teacher turnover in secondary schools. Teachers at public secondary schools in Kakamega Central District were the target. In this investigation, questionnaires were used. Using descriptive statistics, the work satisfaction and intention to leave the teaching profession of secondary school teachers in Kakamega Central District were assessed. Out of the total study population 143 professors (75.3%) expressed dissatisfaction with their jobs, and 90 instructors (57%) reported high to extremely high intentions to leave their jobs, according to this study. The intention to change teachers was affected by subject expertise.

In a study conducted by Yoon and Kim (2022), the relationship between teacher subject matter knowledge and turnover intentions was examined, with a particular focus on professional development opportunities. The study revealed that teachers who had access to specialized professional

development programs aimed at enhancing their subject-specific knowledge demonstrated lower turnover intentions compared to those who did not have such opportunities. These findings emphasize the significance of providing targeted professional development initiatives that enhance teachers' subject matter knowledge. By doing so, the intention of teachers to leave their positions can be effectively reduced, highlighting the value of investing in subject-specific professional development programs as a strategy to retain experienced and knowledgeable educators.

Tiplic, Lejonberg, and Elstad (2016) examined factors that might foretell whether or not newly certified educators will stay in the field. Data from a cross-sectional survey was analysed using structural equation modeling, with the sample size being 249 recently certified Swedish educators. According to the findings, there were three key indicators that could be used to predict whether or not a newly certified educator would leave their position. At the outset, it's crucial that educators have a foundation of trust with one another. Finally, a teacher's perceived topic mastery had a major impact on their intention to leave the profession.

Several studies have investigated the factors influencing turnover intentions among educators in different contexts. Tiplic, Brandmo, and Elstad (2015) found that collective teacher efficacy, trust between teachers and principals, role conflict, and emotional commitment influenced new teachers' intentions to leave the profession. Emoja (2016) focused on job satisfaction and teacher turnover in secondary schools and found that dissatisfaction with the job and subject expertise played a role in teachers' intentions to leave. Chen and Wang (2019) highlighted the importance of subject-specific

professional development programs in reducing turnover intentions by enhancing teachers' subject matter knowledge. Finally, Tiplic, Lejonberg, and Elstad (2016) identified trust among educators and perceived topic mastery as predictors of newly certified teachers' intention to leave their positions. These findings underscore the significance of fostering supportive environments, providing targeted professional development, and enhancing subject-specific knowledge to mitigate turnover intentions among educators.

The review provides insights into factors influencing turnover intentions among educators, focusing on collective teacher efficacy, trust, role conflict, emotional commitment, job satisfaction, and subject expertise. However, it lacks a comprehensive exploration of other variables and is influenced by sample size, geographic locations, and methodologies. The review emphasizes the importance of creating supportive environments, offering professional development, and addressing knowledge gaps to mitigate turnover intentions among educators. Further discussion on limitations and contextual nuances could enhance the critique's depth.

Impact of Technological, Pedagogical and Content Knowledge on Tutor Turnover Intentions

Lachner et al. (2021) conducted a study examining the impact of Technological Pedagogical Content Knowledge (TPACK) on teacher turnover intentions among primary school teachers. The study found that teachers who possessed higher levels of TPACK, indicating their proficiency in integrating technology, pedagogy, and subject matter knowledge, exhibited lower turnover intentions. This suggests that a strong TPACK positively influenced their commitment to the teaching profession, potentially reducing the

likelihood of leaving their positions. These findings highlight the importance of developing and enhancing teachers' TPACK as a means to foster job satisfaction and retention in the field of education.

Siddiqui, Arif, and Hinduja, (2023) examined the influence of Technological Pedagogical Content Knowledge (TPACK) on turnover intentions among secondary school teachers was examined. The findings revealed that teachers with strong TPACK skills had lower intentions to leave their positions compared to those with weaker TPACK skills. This study emphasized the significance of offering professional development opportunities that enhance teachers' TPACK competencies. By equipping teachers with effective technology integration skills, pedagogical knowledge, and subject matter expertise, the study suggested that turnover rates could be reduced. These findings underscored the importance of investing in TPACK-focused professional development programs to improve teacher retention in secondary schools.

In a longitudinal study conducted by Hsu, Liang, and Tsai (2020), the relationship between Technological Pedagogical Content Knowledge (TPACK) and teacher turnover intentions was investigated over a three-year period. The study aimed to understand how the continuous development of TPACK knowledge and skills influenced teachers' intentions to leave their positions. The findings revealed a significant association between ongoing TPACK development and lower turnover intentions. Teachers who actively invested in improving their TPACK competencies were more likely to demonstrate a stronger commitment to their profession and were less inclined to consider leaving their jobs. These results emphasized the long-term impact

of TPACK development on teacher retention and highlighted the importance of providing continuous professional development opportunities that focus on enhancing teachers' TPACK knowledge and skills.

Huang and Su, (2016) investigated mediating role of job satisfaction in the relationship between Technological Pedagogical Content Knowledge (TPACK) and turnover intentions among teachers was investigated. The study aimed to examine whether job satisfaction played a role in the association between TPACK and teachers' intentions to leave their positions. The findings revealed that TPACK had both direct and indirect effects on turnover intentions, with job satisfaction partially mediating this relationship. This means that TPACK not only directly influenced turnover intentions but also indirectly influenced them through its impact on job satisfaction. The study underscored the importance of promoting TPACK among teachers and fostering job satisfaction as key strategies to mitigate teacher turnover. By enhancing teachers' TPACK competencies and ensuring job satisfaction, educational institutions can work towards retaining talented educators and reducing turnover rates.

Multiple studies have highlighted the significant impact of Technological Pedagogical Content Knowledge (TPACK) on teacher turnover intentions. Lachner et al. (2021) and Siddiqui et al. (2023) found that teachers with higher levels of TPACK exhibited lower intentions to leave their positions. These findings emphasize the importance of offering professional development opportunities that enhance teachers' TPACK competencies to reduce turnover rates in both primary and secondary schools. Furthermore, Hsu et al. (2020) conducted a longitudinal study demonstrating that

continuous development of TPACK knowledge and skills is associated with lower turnover intentions. This highlights the long-term impact of TPACK on teacher retention and emphasizes the need for ongoing professional development initiatives that enhance teachers' TPACK competencies. Moreover, Huang and Su (2016) investigated the mediating role of job satisfaction in the relationship between TPACK and turnover intentions. The study revealed that TPACK had both direct and indirect effects on turnover intentions, with job satisfaction partially mediating this relationship. This suggests that promoting TPACK and fostering job satisfaction are crucial strategies for mitigating teacher turnover. In summary, the collective findings emphasize the importance of enhancing teachers' TPACK competencies through professional development, as it positively influences job satisfaction and reduces turnover intentions.

The review examines the impact of Technological Pedagogical Content Knowledge (TPACK) on teacher turnover intentions. It includes studies by Lachner et al., Siddiqui et al., Hsu et al., and Huang and Su (2016). The findings show that teachers with higher TPACK levels have lower turnover intentions, highlighting the importance of TPACK in promoting job satisfaction and commitment to the teaching profession. However, the review acknowledges the need for more diversity in educational contexts, suggesting a focus on higher education or specialized settings.

Moderating Role of Gender on The Relationship Between TPACK And Tutor Turnover Intentions

Guided by the technological pedagogical content knowledge (TPACK) framework, Li et al., (2021) investigated how teachers' digital competence

affected their turnover behaviour based on Chinese primary and secondary teachers. A total of 1833 teachers completed self-report scales measuring digital competence, turnover behaviour, the intention of online teaching, and students' online learning difficulties using the online platform questionnaire. The results indicated that the level of online teaching intentions mediated the relationship between teachers' digital competence and turnover behaviour. Teacher gender also moderated the relationship between teachers' digital competence and their turnover behaviour.

Musgrove et al., (2021) also examined the role that technological pedagogical content knowledge (TPACK) plays in elementary teachers' adoption of one to one computing for instruction across the subject areas of mathematics, science, English language arts, and social studies. In particular, the research explored whether there was a relationship between teachers' perceived ease of use (PEOU) and perceived usefulness (PU) of one to one computing for instruction in each of the subject areas. The results indicated that, there was a relationship between perceived ease of use (PEOU) and perceived usefulness and perceived usefulness. Gender was also found to moderate the relationship between PEOU of one to one and perceived usefulness.

Gómez-Trigueros, & Yáñez de Aldecoa (2021) explored whether there were any differences by gender regarding the Digital Competence of Teachers (DCT), both in-training and in-service. Simultaneously, the specific goals of the research were to analyse which were the methodologies, including technological, that were being implemented in university classrooms and to evaluate possible new interventions to reduce the digital gender gap. They

relied on three instruments that have been validated by experts: a questionnaire to collect teachers' in-training perception, a second questionnaire to show in-service teachers' perception regarding their knowledge of technologies, and how their perception regarding knowledge of technologies affected their turnover behaviour. Over three academic years, data were collected from a sample of 914 trainee teachers and 194 professors from several Spanish universities. The results showed that, concerning males to females, female participants has a very poor self-perception in terms of their Digital Teaching Competence, and that gender moderates the relationship between knowledge of technologies, their turnover behaviour.

Zhao et al., (2018) conducted a study examining the moderating role of gender in the relationship between Technological Pedagogical Content Knowledge (TPACK) and turnover intentions among teachers in Chinese primary schools was examined. The findings indicated that TPACK was negatively correlated with turnover intentions for both male and female teachers. Importantly, the study found that gender did not moderate this relationship, indicating that the impact of TPACK in reducing turnover intentions was consistent across genders. This suggests that the positive influence of TPACK on reducing turnover intentions is applicable to both male and female teachers in the Chinese primary school context.

Several studies have explored the moderating role of gender on the relationship between Technological Pedagogical Content Knowledge (TPACK) and turnover intentions among teachers. Li et al. (2021) found that teachers' digital competence influenced turnover behaviour, and the level of online teaching intentions mediated this relationship. Additionally, teacher

gender moderated the association between digital competence and turnover behaviour. Musgrove et al. (2021) investigated the relationship between perceived ease of use (PEOU) and perceived usefulness (PU) of one-to-one computing for instruction, revealing that gender moderated this relationship. Gómez-Trigueros and Yáñez de Aldecoa (2021) examined the gender differences in Digital Competence of Teachers (DCT) and its impact on turnover behaviour, highlighting that gender moderated the relationship between knowledge of technologies and turnover behaviour. Similarly, Zhao et al. (2018) found that TPACK was negatively correlated with turnover intentions for both male and female teachers, and gender did not moderate this relationship. In all, these studies demonstrate the importance of considering gender as a factor in the association between TPACK, turnover intentions, and digital competence among teachers.

The empirical review explores the moderating role of gender in the relationship between Technological Pedagogical Content Knowledge (TPACK) and turnover intentions among teachers. However, the studies are diverse in methodologies and contexts, making it difficult to draw universal conclusions. The specific mechanisms through which gender influences the relationship between TPACK and turnover intentions are not consistently explored. Further research is needed to understand the nuanced aspects of gender dynamics and its impact on teachers' technological competencies and turnover intentions.

Moderating Role of Teacher Experience on the Relationship Between TPACK And Their Turnover Intentions

Herlina, (2022) measured Islamic university mathematics and science lecturers perception of technological pedagogical content knowledge (TPACK) and their intentions to leave their jobs. His research utilized a quantitative method derived from a descriptive survey collected from 48 lecturers at a single university. Confirmatory factor analysis (CFA) and alpha Cronbach methods were applied to determine the quality of the instruments used in this study. Furthermore, descriptive statistics and ANOVA were used to analyse the data obtained, while correlations were used to test the hypotheses. The results showed there was a relationship between knowledge on TPACK and their intentions to leave their jobs. In addition, teaching experience did not moderate the relationship between TPACK and teaching ability with TPACK.

Bauwens et al., (2020) examined how technology acceptance related to work-related ICT use after hours (WIA) and work attrition, as well as the moderating effect on technology acceptance and work-related ICT use after hours (WIA) and work attrition. Data was collected among 288 secondary school teachers in Flanders (Belgium) concerning their use of digital learning environments (DLE) beyond school grounds and school hours. Structural equation modelling showed that social influence reduced teachers' work attrition and mediated by WIA. Again a moderating role of teaching experience was found in the relationship between technology acceptance and work-related ICT use after hours (WIA) and work attrition.

Yucel, and Bektas, (2012) also investigated the relationship between teachers' TPACK knowledge and organizational commitment and evaluated whether teachers' teaching experience moderated the relationship between their TPACK knowledge and organizational commitment in Turkey. All constructs were measured using instruments sourced from the extant literature and the questionnaire used in this study was designed to examine the relationships between TPACK knowledge, organizational commitment and teaching experiences among teachers. The study specifically targeted teachers in secondary schools. About 173 participants were used for the study. The study found that, differences in teaching experience among teachers had a moderating effect on the relationships between their TPACK knowledge and organizational commitment.

The empirical review explores the link between teachers' Technological Pedagogical Content Knowledge (TPACK) and turnover intentions, based on multiple studies. However, it suggests that further research is needed to understand the complex relationship between TPACK and turnover intentions, particularly in the context of Turkish secondary schools. The study by Herlina (2022) and Bauwens et al. (2020) provides a nuanced perspective on the relationship between TPACK knowledge and organizational commitment, but it may require a broader sample for generalizability.

Conceptual Framework

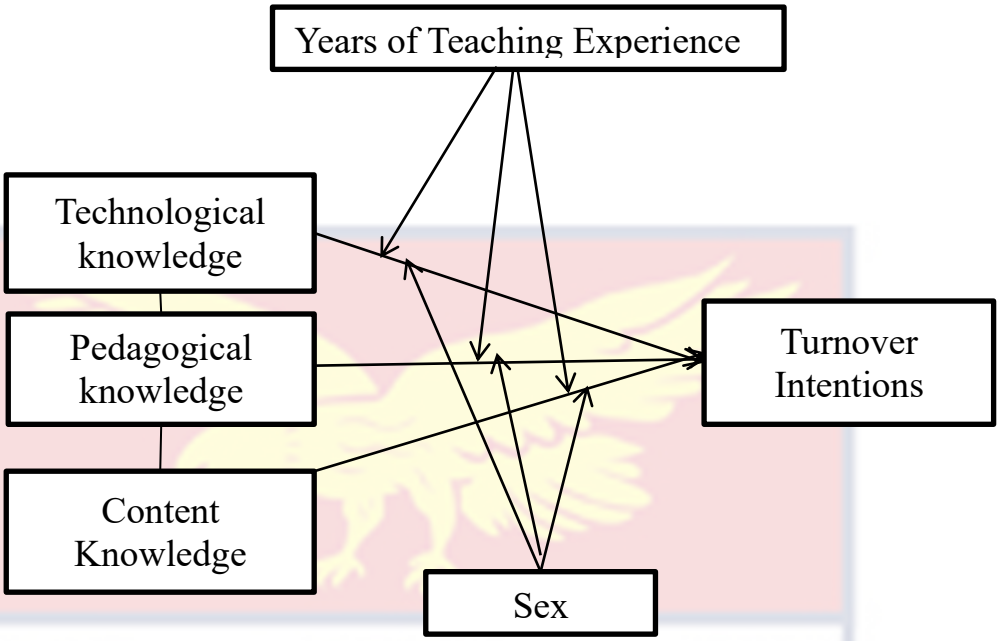


Figure 3: Conceptual Framework of TPACK as Predictor of Turnover Intentions

Source: Author Construct

A conceptual framework is a tool that is meant to aid a researcher in developing awareness and comprehension of the issue that is being investigated. The research is aided by this in its effort to explain the relationship between ideas that are intertwined, such as the dependent and independent variables (Bryman, 2013). The objective of this study is to determine whether the independent variable, Technological Pedagogical Content Knowledge (TPACK), accurately predicts the dependent variable, turnover intentions, among College of Education tutors in Ghana. The framework considers the potential moderating effects of two variables: years of teaching experience and sex. Based on the framework, it is hypothesized that technological, pedagogical and content knowledge (TPACK) can predict the turnover intentions of tutors in Colleges of Education. Additionally, the variables of years of teaching experience and sex are expected to act as

moderators, potentially strengthening or weakening the relationship between TPACK and turnover intentions, or even altering its direction. By considering the moderating effects of years of teaching experience and sex, this study aim to gain a deeper understanding of the complex dynamics that contribute to turnover intentions in the context of College of Education tutors.

Chapter Summary

The study explores the interplay between technology, pedagogy, and content knowledge in college of education tutors. It uses Mishra and Koehler's Technological, Pedagogic Content Knowledge theory (TPCK) and the Sequential Turnover Model to examine employee turnover. The conceptual review explores the role of technology in education, Ghana's policies on technology education, and the implications of turnover in education. The empirical review critically examines existing studies on technological knowledge among college of education tutors, examining the levels of technological, pedagogical, and content knowledge among tutors and their influence on turnover intentions. The study also investigates the moderating roles of gender and teaching experience on the relationship between tutors' Technological Pedagogical Content Knowledge (TPACK) and turnover intentions. The review highlights the need for broader samples, in-depth analyses, and diverse educational contexts to enhance the applicability of findings. The review provided a comprehensive understanding of factors influencing turnover intentions among college of education tutors, emphasizing the need for more expansive and context-specific investigations in this critical area of educational research.

CHAPTER THREE

RESEARCH METHODS

Introduction

The study examined technological pedagogy and content Knowledge as predictors of turnover intentions among tutors in the central region of Ghana. This chapter therefore, outlines the methodology employed in carrying out the study. It described the approach, procedures and techniques that were used in conducting the study. These included the research paradigm, the design, population, sample and sampling techniques, and data processing and analysis.

Research Paradigm

Research paradigms are philosophical assumptions that guide researchers in choosing methods and advancing knowledge in a field (Wahyuni, 2012 p. 49). They are based on core principles reflecting a position in the world and possible associations with it. The chosen paradigm determines the researcher's questions and answers, altering the shape of what is perceived. It is crucial to situate a study within its theoretical context, as research paradigms can alter the shape of what is perceived (Guba and Lincoln, 1994; Kankam, 2019; Krauss, 2005). In social science research, there are three common paradigms: interpretivist, pragmatist, and positivist (Neuman, 2014; Babbie, 2011; Creswell, 2009).

In the context of this study, the chosen research paradigm is the positivist paradigm. Seale (2000) defines the positivist paradigm as a method of collaboratively creating meaning. Positivist social scientists, as highlighted by Seale (2000), emphasize quantitative, statistically measurable, objective,

and observable factors to establish laws of causality. The decision to adopt the positivist paradigm aligns with the study's aim of investigating how Technological Pedagogical Content Knowledge (TPACK) predicts turnover intentions among college of education tutors in the central region of Ghana. The positivist paradigm is deemed suitable as it allows the researcher to maintain objectivity without exerting direct influence on the process of measuring how the predictor variable (TPACK) correlates with the criterion variable (Turnover Intention). However, it is essential to acknowledge the limitations of the positivist paradigm, such as its potential oversimplification of complex social phenomena and its tendency to overlook subjective experiences and qualitative aspects that may be integral to understanding the research context.

Research Design

Research design is a researcher's comprehensive plan for answering research questions or testing hypotheses (Cobbinah & Amoako, 2021). It provides a framework for the entire research activity and varies in types depending on the nature of the problem, research questions, hypotheses, and study group (Ormston, et al., 2014).

Considering the study's objectives, a quantitative approach was deemed most suitable, leading to the collection and analysis of exclusively quantitative data. The chosen research design for this study was a cross-sectional descriptive approach. This design was selected due to its capacity to examine individuals from diverse backgrounds at a specific point in time, aligning with the research aim (Creswell & Creswell, 2017). The cross-sectional design was preferred for its advanced capability to represent a large

population, offering a high degree of generalizability (Kothari, 2017; Walter, 2019). Compared to alternative data collection methods, cross-sectional designs excel in generating data closely reflective of the broader population's characteristics (Gravetter & Forzano, 2018). Moreover, their high representativeness contributes to enhanced statistical significance, facilitating the identification of statistically meaningful findings and improving overall validity and reliability (Cohen, Manion & Morrison, 2017; Faulkner & Faulkner, 2018).

While the cross-sectional design offers valuable insights into a specific point in time, it inherently lacks the ability to capture changes and developments over time. The snapshot nature of the design may limit the depth of understanding regarding the dynamic aspects of the variables under investigation. Additionally, reliance solely on quantitative data may overlook nuanced qualitative insights that could enrich the overall comprehension of the research phenomenon.

Study Area

This research centres on the Central Region of Ghana, one of the sixteen administrative regions in the country. Bordered by the Ashanti and Eastern regions to the north, and the Western region to the west, the Central Region stands out for its unique characteristics in the realm of education. Recognized for hosting some of the country's leading educational institutions, it serves as a significant hub for academic pursuits. The economy of the Central Region is marked by a dominance of services, supplemented by mining and fishing activities. Importantly for this study, the Central Region is home to three (3) public universities, four (4) private universities, three (3)

colleges of education, and numerous senior high schools. These educational institutions contribute to the region's distinctive character, making it an ideal setting for exploring the intricacies of teacher turnover intentions within the context of Colleges of Education.

Population

The target population for this study was all tutors in College of Education in the Central Region of Ghana. These tutors numbered 159 with males of 108 and females of 51, adding up to a total of 159. The accessible population was all tutors in college of education within Central region. The accessible population was made up of all (3) College of Education namely: Komenda College of education, Ola College of education and Fosu college of education. The accessible population was the same as the target population, with 108 male tutors and 51 female tutors, making a total of 159.

Sample and Sampling Procedure

The study employed the census method as the researcher aimed to assess every individual in the population without the need for sampling techniques. This was done to ensure a comprehensive understanding of the subjects under study. Due to the relatively small population being examined, the census method was deemed suitable as it enables more precise data gathering. These three (3) colleges of education schools are Komenda College of education, Ola College of Education and Fosu College of Education. The number of tutors in each sampled Colleges is displayed in Table 1.

Table 1: Number of Tutors in Selected Schools

School	Number of tutors	Males	Females
Komenda College of Education	57	41	16
Ola College of Education	50	31	19
Fosu college of education	52	36	16
Total	**159**	**108**	**51**

Data Collection Instrument

In this research, a well-structured questionnaire was used as the data collection instrument. To achieve the objectives the study, participants must read, comprehend, and respond in writing, therefore questionnaires were used (Krosnick, 2018). The reason for using the questionnaire was that, it is less expensive and offers more anonymity or privacy, which is important when dealing with sensitive topics. It is also useful and relatively cost effective when studying with a large sample (Williams, Brick, Edwards & Giambo, 2020).

The Technological, Pedagogical and Content Knowledge (TPACK) Scale by Schmidt et al., (2009) was adopted and the Turnover Intention scale by Bothma and Roodt (2013) was adapted for the study. The TPACK scale is a multi-dimension scale with an internal consistency of .82 and a sum of 19 items. The turnover scale has 6 items with an internal consistency of .80. However, this study's questionnaire was made up of three sections. Section A had three items that assessed demographic (sex, years of teaching experience)

characteristics of the respondents. Section B had 19 items that assessed the level of technological, pedagogical and content knowledge in teaching and learning among College of Education tutors and section C had 6 items that assessed the turnover intentions of tutors.

Pilot-Testing of Instrument

For reliability of the data collection instrument, both the adapted TPACK and the adopted Turnover intention scale was pilot-tested at Ada College of Education in the Greater Accra region. Connelly (2008) suggests that a pilot study sample should ideally be 10% of the anticipated sample size for the broader parent study. Given the study's population of 159, the researcher employed 32 participants for the pilot study and was deemed sufficient. Ada College of Education was chosen for the study because the college offers the same programmes as the selected colleges for the study. Ada College of Education in the Greater Accra region was selected as the pilot-testing site for the data collection instrument in order to ensure the reliability of the instrument. 32 This choice was justified by the fact that Ada College of Education offers the same programs as the selected colleges for the study. By conducting the pilot test at Ada College of Education, any potential issues or flaws with the instrument could be identified and rectified before its implementation in the actual study, thus increasing the overall reliability of the data collection process.

Validity and Reliability

It is essential to ensure validity and reliability in all study. According to Spence (2017), an instrument's content validity reveals that its items are representative and comprehensive enough to describe and measure a presumed

objective and variable. Because the chosen scales has previously been validated and their reliability established, the scales was presented to my supervisor for review and suggestions. Again, Wallen and Fraenkel (2013) assert that reliability implies that a measurement can be made over and over again. However, with the aid of pilot testing, the study's instruments Cronbach's alpha coefficient was established. Face and content validity was assessed by my supervisor and confirmatory factor analysis was used to assess the construct validity of TPACK instrument because that instrument was adapted and was modified. The original, and pilot testing reliability were assessed and presented in table 1.

Reliability Test

One of the preliminary checks or test every researcher conducts before running the actual analysis of the study is reliability. The reliability testing is used to establish whether the items that were employed in the development of the scale can produce reliable results or otherwise for the researcher. Consequently, the study found it very important to check for the reliability scores of the items used to measure all four variables using the Cronbach Alpha statistical technique. A generally accepted rule is that alpha of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater is a very good level (Ursachi, Horodnic, & Zait, 2015). However, values higher than 0.95 are not necessarily good, since they might be an indication of redundancy (Hulin, Netemeyer, & Cudeck, 2001). Hence, the original pilot testing and main data reliability values are presented in Table 1 below.

Table 2: Internal Consistency of Original, Pilot-Testing and Main Data

Scales	Number of items	Original value	Pilot-testing value
Technological knowledge	7	.82	.89
Pedagogical knowledge	7	.84	.89
Content knowledge	5	.85	.86
Overall TPARK	13	N/A	.88
Turnover Intentions	6	.82	.86
Total/overall	25		.88

Table 1 presents the internal consistencies of the original scales and pilot testing. From the table, the internal consistencies rage from .76 to .89. The original scales show an internal consistency of .82 and above and the pilot testing also shows an internal consistency of .86 and above with an overall value of .88. This shows that, all the values for each internal consistency are within the acceptable range as recommended by Ursachi, Horodnic, and Zait, 2015.

Confirmatory Factor Analysis

This section presents results on validation of the constructs used in the study. These constructs include: Technological knowledge, Pedagogical knowledge, and Content knowledge. Using a sample of **32** tutors, the variance-based confirmatory factor analysis was performed using SmartPLS. Table 2 summaries the results of the item indicators and internal consistencies.

Table 3: Item Loading, Internal Consistency, and AVE

Scale/items	Loading	Alpha	CR	AVE
Technological		0.906	1.006	0.586
B1T	0.658			
B2T	0.768			
B3T	0.887			
B4T	0.588			
B5T	0.802			
B6T	0.767			
B7T	0.845			
Pedagogical		0.891	0.951	0.589
B8P	0.460			
B9P	0.795			
B10P	0.908			
B11P	0.869			
B12P	0.845			
B13P	0.779			
B14P	0.614			
Content		0.861	0.878	0.645
B15C	0.707			
B16C	0.849			
B17C	0.777			
B18C	0.921			
B19C	0.745			

**Item to be discarded; CR – Composite Reliability; AVE – Average Variance Extracted

As shown in Table 2, the factor loadings for all items ranged from 0.460 to 0.921. The internal consistency for all constructs were either 0.8 or above as suggested by Pallant, (2010). Finally, the AVEs for all the scales

were greater than 0.50, suggesting good convergent validity (Fornell & Larcker, 1981; Hair, Ringle, & Sarstedt, 2011). This was expected since these sub scales all form the TPACK scale developed by Schmidt et al., (2009) and were therefore expected to converge. Table 3 presents the discriminant validity.

Table 4: Heterotrait-Monotrait Ratio of Correlations (HTMT) for Discriminant Validity

	Construct	1	2	3
1	Content			
2	Pedagogical	0.590		
3	Technological	0.376	0.262	

Source: Field Survey (2022)

If the Heterotrait-Monotrait Ratio of Correlations (HTMT) value is more than 0.90 (Gold, Malhotra, & Segars, 2001), then discriminant validity is a problem. From Table 3, all the values were below .90. this shows that the discriminant validity was very high. Figure 1 shows the final measurement model.

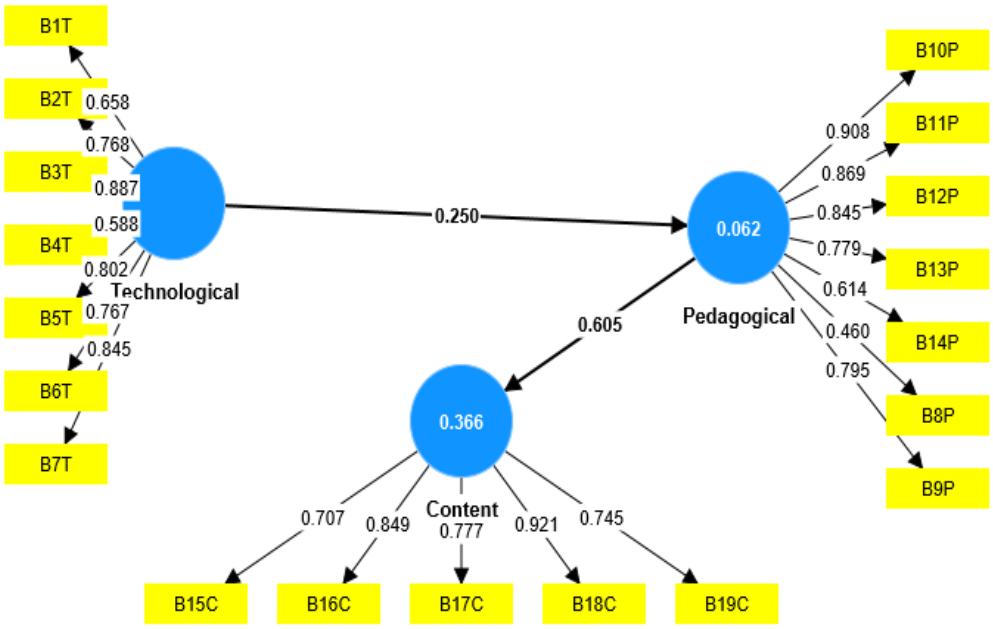


Figure 4: Final measurement mode

Data Collection Procedure

An introductory letter and ethical clearance were collected from the Department of Education and Psychology, and the Institutional Review Board of the University of Cape Coast and delivered to the Principal Colleges used for the study. Following the completion of the necessary protocols, the researcher obtain permission from heads of the different colleges in order perform the survey with their tutors. The researcher provided a brief overview of the intent and significance of the research to the tutors. The participants were assured of confidentiality and given the free will to participate in the study. The questionnaires were distributed among the tutors in their various schools.

The respondents took approximately 15 to 20 minutes to complete the questionnaires. The data collection period lasted for four (4) weeks and was done personally.

Ethical Considerations

Ethical considerations were diligently addressed in the research to safeguard the rights and well-being of the participants. Anonymity and confidentiality were assured by not requiring respondents to disclose their identities, and their views were treated with the highest level of care and confidentiality. Informed consent was obtained from participants, outlining the nature of the study and explicitly stating their right to decline participation without facing any adverse consequences. Emphasizing voluntary participation, participants were clearly informed that their involvement was entirely optional. These ethical safeguards were integral to the research design, underscoring the commitment to conducting the study with the utmost respect for ethical standards and the rights of the participants.

Data Processing and Analysis

Data analysis entails examining the collected data to determine how respondents responded to the issue being investigated. The data collected from the questionnaires was analysed quantitatively using descriptive statistical tools. Research questions 1, 2 and 3 were analysed quantitatively using frequencies and percentages. Hypothesis 1, 2 and 3 were tested using Pearson Product-Moment Correlation Coefficient. Hypothesis four (4) was tested using multiple linear regressions, and hypothesis 5 and 6 were tested using Smart PLS.

Chapter Summary

This chapter examined the research methodology employed in the study. The chapter looked at the research design, population, sample and sampling procedure, instruments, data collection procedure and data analysis.

The study used the cross-sectional descriptive research design. The estimated accessible population was 159 tutors of all three college of Education, namely, Komenda College of Education, Ola Collage of Education and Fosu College of Education. The study employed the census method which involved all tutors in the colleges used for the study. The instrument used was questionnaire which comprises of two inventories. These are the Technological, Pedagogical and Content Knowledge (TPACK) Scale by Schmidt et al., (2009) and the Turnover Intention scale by Bothma and Roodt (2013). The TPACK scale is a multi-dimension scale with the least internal consistency of .82 and a sum of 19 items. The turnover scale has 6 items with an internal consistency of .80. Frequencies and percentages, Pearson Product-Moment Correlation Coefficient, Multiple linear regression, and Smart PLS were used to analyse and test the research questions and hypotheses.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This study sought to find out whether technological, pedagogical and content knowledge (TPACK) predicted turnover intentions among tutors in the College of Education in Ghana. The study focused on examining their level of technological, pedagogical, and content knowledge and how these predict their turnover intentions. The study also looked at how their sex and years of teaching experience moderate the relationship between (TPACK) and turnover intentions. The previous chapter dealt with the study's research methodology and this chapter presents the findings from analysis of the field data gathered.

Out of 159 questionnaires administered, 153 were duly completed and returned, representing 96.2% return rate. This return rate was considered sufficient for analyses in this study (Saunders & Thornhill, 2007). The results from the analyses of data are presented in Sections A, B and C. Section A, looks at demographic information provided by respondents, Section B deals with answering the three research question of the study while Section C presents the results from the analyses of data on the six research hypotheses. The results are presented in tables.

Section A: Demographic Information (Description of sample)

This section describes the demographic information of the respondents. This information includes: sex, age, and years of teaching experience of the respondents.

Sex of Respondents

The Sex distribution of respondents is shown in Table 5 below.

Table 5: Sex Distribution of Respondents

Sex	Frequency	Percentage
Male	104	68.0
Female	49	32.0
Total	153	100.0

Source: Field Survey (2022)

The data in table 5 above shows that majority of the respondents were males, representing (104, 68.0%) of the sample.

Age of respondents

The age of respondents was thought to be important to the study therefore the researcher sought to establish the age ranges of the respondents. This is presented in Table 6.

Table 6: Age Distribution of Respondent

Age	Frequency	Percentage
20-30	6	3.9
31-40	75	49.1
41-50	51	33.3
Above 50	21	13.7
Total	153	100.0

Source: Field Survey (2022)

Table 6 represents the age distribution of respondents. The Table shows that majority of the respondents where within the age rage 31-40, representing (75, 49%) of the sample, followed by the age range 41-50,

representing (51, 33.3%) of the sample, with the least of (6, 3.9%) found within 20-30 years.

Years of Teaching Experience

The distribution of years of teaching experience of the tutors is presented in table 7 below.

Table 7: Respondent's Years of Teaching Experience

Years of teaching experience	Frequency	Percentage
Less than 1 year	13	8.5
1-5 years	60	39.2
6-10 years	24	15.7
11-15 years	23	15.0
16-20	17	11.1
More than 20 years	16	10.5
Total	153	100.0

Source: Field Survey (2022**)**

Table 7 shows the distribution of tutor's years of teaching experience. From the distribution, majority (60, 39.2%) of the respondents had between 1-5 years teaching experience, followed by the next majority (24, 15.0%) who also had between 6-10years teaching experience. However, (16, 10.0%) tutors had more than 20 years of teaching experience and (13, 8.5%) had less than 1 year of teaching experience. It can be concluded that most tutors involved in the study had between 1 and 5 years of teaching experience. This is important for the study because years of teaching experience may have an effect on tutor TPACK knowledge and turnover intentions.

Section B: Analysis of Data on Research Questions

This section presents the analysis of data on the three research questions that guided the study.

Research Question 1: What is the level of technological knowledge of tutors of Colleges of Education?

Research question one aimed at assessing the level of technological knowledge among tutors of College of Education. A total of (7 items) were used to measure the technological knowledge of the respondent. They were scored on a scale of 1 to 4, with 1 representing Strongly Disagree, 2 for Disagree, 3 for Agree and 4 Strongly Agree. Data on this research question was analysed using means and standard deviations and frequencies and percentages. Table 8 below shows the mean and standard deviations for each item on the technological knowledge scale. Because the scoring of the items were on a scale of 1 to 4, a mean score above 2.5 indicated that respondents agreed to the statements while a mean score below 2.5 indicated that respondents disagreed with the statement.

Table 8: Technological Knowledge

Statement	M	SD
I know how to solve my own technical problems	1.55	.549
I can learn technology easily.	1.56	.572
I keep up with important new technologies.	1.52	.563
I frequently play around with the technology.	1.43	.535
I know about a lot of different technologies.	1.47	.539
I have the technical skills I need to use technology.	1.38	.538
I have had sufficient opportunities to work with different technologies	1.41	.555
Mean of Means	1.47	.550

Source: Field Survey (2022)

Table 8 presents the means and standard deviations of technological knowledge of tutors. The results revealed that, the tutors had low technological knowledge (M=1.47, SD=.550). All the 7 items had mean scores

below 2.5, an indication that the tutors had low technological knowledge. Tutors with mean score below 2.5 indicated that, they did not know how to solve their own technical problems (M=1.55, SD=.549) they could not learn technology easily (M=1.56, SD=.572), they did not keep up with important new technologies (M=1.52, SD=563), they did not have the technical skills they need to use technology (M=1.38, SD=.538).

Further tutor's scores were computed, to find out the percentage of tutors who had low, moderate and high level of technological knowledge. There were 7 items on a 4 point likert scale. The lowest score was 7 and the highest score was 28. Therefore, the highest score was divided into 3, representing low, moderate and high. Scores of 9.3 and below was considered low, scores 9.4 to 18.6 was considered moderate and scores from 18.7 to 28 was also considered high. The choice to set the threshold for low at 9.3 and below, moderate at 9.4 to 18.6, and high at 18.7 to 28 aims to create distinct categories that capture a range of responses. This approach ensures a balanced distribution of participants across the categories, allowing for meaningful comparisons and interpretations of the data. This procedure was applied to address research questions 2 and 3 as well. The results are presented in table 9 below.

Table 9: level of Technological Knowledge

Category	Score	Frequency	Percentage
low	9.3 and below	54	35.3
Moderate	9.4 to 18.6	99	64.7
High	18.7 to 28	0	00.0
Total		153	100

Source: Field Survey (2022); maximum=7, minimum=28

Table 9 presents the level of Technological knowledge of tutors in Colleges of Educations tutors used for the study. From the table, 64.7% of the tutors had moderate technological knowledge, while 35.3.5% had low technological knowledge. None of the tutors had a high technological knowledge. From the table it can be concluded that most of the tutors did not have enough technological knowledge for teaching.

Research Question 2: What is the level of pedagogical knowledge of tutors of College of Education?

Research question 2 aimed at examining the level of pedagogical knowledge of tutors of College of Education. A total of (7 items) used to measure pedagogical knowledge. The items were scored on a scale of 1 to 4, with 1 representing Strongly Disagree, 2 for Disagree, 3 for Agree and 4 Strongly Agree. Data on this research question was analysed using means and standard deviations, and frequencies and percentages. Table 10 below shows the means and standard deviations for each item on the pedagogical knowledge scale. A mean score above 2.5 indicated that respondents agreed to the statements while mean score below 2.5 indicated respondents disagreed with the statements.

Table 10: Pedagogical Knowledge

Statement	M	SD
I know how to assess student performance in a classroom.	2.63	.760
I can adapt my teaching based upon what students currently understand or do not understand.	2.77	.774
I can adapt my teaching style to different learners.	2.84	.804
I can use a wide range of teaching approaches in a classroom setting.	2.83	.768
I can assess student learning in multiple ways.	2.89	.816
I am familiar with common student understandings and misconceptions.	2.92	.794
I know how to organize and maintain classroom management	2.89	.878
Mean of Means	2.82	0.799

Source: Field Survey (2022)

Table 10 presents the means and standard deviations of pedagogical knowledge among tutors used for the study. The results revealed that, the tutors had a high pedagogical knowledge (M=2.82, SD=0.799). All 7 items had mean scores above 2.5, an indication that tutors had high pedagogical knowledge. Tutors with mean scores above 2.5 indicated that, they knew how to assess students' performance in a classroom (M=2.63, SD=.760), they can adapt their teaching based upon what students currently understand or do not understand (M=2.77, SD=.774), they could adapt their teaching style to different learners (M=2.84, SD=804), they could use a wide range of teaching approaches in a classroom setting (M=2.83, SD=.768), and that they knew how to organize and maintain classroom management (M=2.89, SD=.878).

Further tutor's scores were computed, to find out the percentage of tutors who had low, moderate and high level of pedagogical knowledge. There

were 7 items on a 4 point Likert scale. The lowest score was 7 and the highest score was 28. Therefore, the highest score was divided into 3, representing low, moderate and high. Scores of 9.3 and below was considered low, scores 9.4 to 18.6 was considered moderate and scores from 18.7 to 28 was also considered high.

Table 11: level of Pedagogical Knowledge

Category	Score	Frequency	Percentage
low	9.3 and below	1	0.7
Moderate	9.4 to 18.6	53	34.6
High	18.7 to 28	99	64.7
Total		153	100

Source: Field Survey (2022); maximum=7, minimum=28

Table 11 presents the level of pedagogical knowledge of tutors in Colleges of Education used for the study. From the table, 64.7% of the tutors had high pedagogical knowledge, while 34.6% had moderate pedagogical knowledge. Only 0.7% of tutors had low pedagogical knowledge. It can be concluded from the results that, a majority of the tutors involved in the study had an acceptable level of pedagogical knowledge for teaching.

Research Question 3: What is the level of content knowledge of tutors of College of Education?

Research question 3 examined the level of content knowledge of tutors in Colleges of Education used for the study. A total of (5 items) were to measure the content knowledge of the respondents. The items were scored on a scale of 1 to 4, with 1 representing Strongly Disagree, 2 for Disagree, 3 for Agree and 4 Strongly Agree. Data on this research question was analysed using means and standard deviations, and frequencies and percentages. Table

12 below shows the mean and standard deviations for each item on the content knowledge scale. A mean score above 2.5 indicated that respondents agreed to the statements while a mean score below 2.5 indicated that respondents disagreed with the statements.

Table 12: Content Knowledge

Statement	M	SD
I have a deep and wide understanding of the component in the subject I teach	3.07	.650
I know about various examples in my subject area that applies in the real world.	3.19	.646
I have sufficient knowledge about the subject I teach	3.25	.613
I can reason in my subject area	3.20	.589
I have various ways and strategies of developing my understanding in my subject area	3.32	.655
Mean of Means	3.20	0.630

Source: Field Survey (2022)

Table 12 presents the mean and standard deviations of content knowledge of tutors. The results revealed that, the tutors had high content knowledge (M=3.20, SD=.630). All 5 items had mean scores above 2.5, an indication that tutors had high content knowledge. Tutors with mean score above 2.5 indicated that, they had an indepth and wide understanding of the content in the subject they teach (M=3.07, SD=.650), they had sufficient knowledge about the subject of specification (M=3.25, SD=.613), they could reason in their subject area (M=3.20, SD=.589) and then also they had various ways and strategies of developing their understanding of the subject area (M=3.32, SD=.655).

Further, tutor's scores were computed, to find out the percentage of tutors who had low, moderate and high level of pedagogical knowledge. There

were 7 items on a 4 point likert scale. The lowest score was 5 and the highest score was 20. Therefore, the highest score was divided into 3, representing low, moderate and high. Scores of 6.7 and below was considered low, scores 6.8 to 13.4 was considered moderate and scores from 13.5 to 20 was also considered high.

Table 13: level of Content Knowledge

Category	Score	Frequency	Percentage
low	6.7 and below	0	0.00
Moderate	6.8 to 13.4	34	22.22
High	13.5 to 20	119	77.78
Total		153	100

Source: Field Survey (2022); maximum=20, minimum=5

Table 13 presents the level of content knowledge of College of Education tutors. From the table, 22.22% of the tutors had moderate content knowledge, with 77.78% having high content knowledge. None of the tutors had low content knowledge. Based on the results, it can be concluded that the tutors involved in the study had a good content knowledge in their subject of specialization.

Section C: Analysis of Data on Research Hypotheses

The study was guided by six research hypotheses. This section presents the results from the testing of these research hypotheses. Prior to these hypotheses testing, the normality assumption, which is fundamental of all parametric assumptions, was tested. This was tested using mean, 5% trimmed, median skewness, and the normal Q-Q plot. Details of the results are presented in Table 15.

Normality Test

This section presents results on the normality distribution of the variables under study. Normality was tested by comparing the mean, 5% trimmed mean median and skewness. The normality (P- P) plot and histogram were also checked whether the data was normal or not. Mean, 5% trimmed mean, median, and skewness are presented in table 14. Normality (P- P) plot and histogram can also be found in the Appendix B.

Table 14: Test for Normality

Descriptives			
		Statistics	Std. Error
Technological Knowledge	Mean	10.32	.178
	5% Trimmed Mean	10.26	
	Median	10.00	
	Skewness	.402	.196
Pedagogical Knowledge	Mean	19.76	.350
	5% Trimmed Mean	19.86	
	Median	20.00	
	Skewness	-.305	.196
Content Knowledge	Mean	16.03	
	5% Trimmed Mean	16.03	
	Median	16.00	
	Skewness	-.026	.196
Turnover Intention	Mean	19.48	.355
	5% Trimmed Mean	19.57	
	Median	20.00	
	Skewness	-.248	.196

In relation to TK, PK, CK and TI, the mean, 5% trimmed mean and median are approximately the same. Hence normality was assumed. Also, the skewness coefficient for the subscales were between +3.29 to -3.29 as

suggested per Tabachnick and Fidell (2007). This means that the data was assumed normal. To support these statistics, the histogram and normality p-p plots were placed in the Appendix B section.

Additionally, the normal Q-Q plots for all the variables were examined. The normal Q-Q plot for skills showed that the distribution was normal (see Appendix B). From Appendix, the normal Q-Q plots for all the variables showed that the distribution of all the scores were closer to the straight line (see Appendix B).

Hypothesis 1

H_0 **T**here is no statistically significant relationship between the Technological knowledge and turnover intentions of tutors in Colleges of Education

H_1. **T**here is a statistically significant relationship between the Technological knowledge and turnover intentions of tutors in Colleges of Education

Hypothesis 1 sought to determine if technological knowledge among college tutors was associated with their turnover intentions. This hypothesis was tested using a Pearson correlation coefficient moment. Table 15 presents the results of Pearson correlation coefficient moment analysis.

Table 15: Correlation between Technological Knowledge and Turnover Intentions

		Technological Pedagogy	Turnover Intentions
Technological Pedagogy	Pearson Correlation	1	-.200*
	Sig. (2-tailed)		.013
	N	153	153
Turnover Intentions	Pearson Correlation	-.200*	1
	Sig. (2-tailed)	.013	
	N	153	153

Source: Field Survey (2022) p<.05

Table 15 shows that there is a statistically significant negative weak relationship between technological knowledge and turnover intentions (r = -.200, p < .05). The results suggest that an increase in technological knowledge of tutors had a corresponding decrease in their turnover intentions. Similarly, a decrease in the technological knowledge could be associated with higher turnover intentions among the tutors. Based on these findings, the null hypothesis "there is no statistically significant relationship between the technological knowledge and turnover intentions" was rejected.

Hypothesis 2

H_0. **T**here is no statistically significant relationship between the Pedagogical Knowledge and turnover intentions of tutors in Colleges of Education

H_1. **T**here is a statistically significant relationship between the Pedagogical Knowledge turnover intentions of tutors in Colleges of Education

Hypothesis 2 sought to determine if pedagogical knowledge of tutors in Colleges of Education was associated with their turnover intentions. The

hypothesis was tested using a Pearson correlation coefficient moment. The results are presented in Table 16.

Table 16: Correlation between Pedagogical Knowledge and Turnover Intentions

		Pedagogical Knowledge	Turnover Intentions
Pedagogical Knowledge	Pearson Correlation	1	-.128
	Sig. (2-tailed)		.115
	N	153	153
Turnover Intentions	Pearson Correlation	-.128	1
	Sig. (2-tailed)	.115	
	N	153	153

Source: Field Survey (2022) p.>.05

Table 16 shows that there was no statistically significant relationship between pedagogical knowledge and Turnover intentions ($r = -.123$, $p > .05$). This implies that pedagogical knowledge does not correlate with turnover intentions. On account of these findings, the null hypothesis "there is no statistically significant relationship between the pedagogical knowledge and turnover intentions" was accepted.

Hypothesis 3

H_0 There is no statistically significant relationship between the Content Knowledge and turnover intentions of tutors in Colleges of Education

H_1 There is a statistically significant relationship between tutor's Content Knowledge and turnover intentions.

This hypothesis sought to determine whether content knowledge of tutors in Colleges of education was associated with their turnover intentions.

This hypothesis was tested using Pearson correlation coefficient moment. The results were presented in Table 17.

Table 17: Correlation between Content Knowledge and Turnover Intentions

		Content Knowledge	Turnover Intentions
Content Knowledge	Pearson Correlation	1	.077
	Sig. (2-tailed)		.345
	N	153	153
Turnover Intentions	Pearson Correlation	.077	1
	Sig. (2-tailed)	.345	
	N	153	153

Source: Field Survey (2022) p.>.05

Table 17 shows that there was no statistically significant relationship between content knowledge and Turnover intentions ($r = .77$, $p > .05$). This implies that content knowledge did not have a relationship with turnover intentions. Based on the findings, the null hypothesis "there is no statistically significant relationship between the Content Knowledge and turnover intentions" was accepted.

Hypothesis 4:

H_0. Technological, Pedagogical and content knowledge will not predict turnover intentions among tutors of Colleges of Education

H_1. Technological, Pedagogical and content knowledge will predict turnover intentions among tutors in the Colleges of Education

Hypothesis 4 sought to determine whether technological, pedagogical and content knowledge of college tutors predicted their turnover intentions. This hypothesis was tested using a multiple regression. Before testing the

hypothesis, Multi-Collinearity and Autocorrelation test was conducted to check whether the predictor variables are not correlating among themselves. The results are presented in table 18.

Table 18: Test for Multi-Collinearity

Variable	Collinearity Statistics	
	Tolerance	VIF
Technological Knowledge	.949	1.053
Pedagogical Knowledge	.960	1.042
Content Knowledge	.986	1.015

Dependent Variable: Turnover Intentions

In multicollinearity a VIF above 4 or tolerance below 0.25 indicates that multicollinearity might exist, and further investigation is required (Miles, 2014). When VIF is higher than 10 or tolerance is lower than 0.1, there is a significant multicollinearity that needs to be corrected (Miles, 2014). Looking at the Tolerance (.949, .960, .986) and VIF (1.053, 1.042, 1.015) statistics from the above table, it indicates that there is no multicollinearity existing among the independent variables.

Table 19: Test for Autocorrelation

Model	R	R Square	Durbin-Watson
1	.232	0.54	1.289

a. Predictors: (Constant), Technological Knowledge, Pedagogical Knowledge, Content Knowledge.
b. Dependent Variable: Turnover Intention

The Durbin-Watson statistic is commonly used to test for autocorrelation. A Durbin-Watson value below 1 or above 3 could render an analysis invalid as it indicates the presence of autocorrelation (Kenton, 2021).

From table 18, it can be observed that there is no indication of autocorrelation (1.289). Tables 19 present the results on regression analysis.

Table 19: Multiple Regression of the Impact of Technological, Pedagogical and Content Knowledge on Turnover Intentions

Variables	B	R Squared (R^2)	*SE B*	β	*t*	*p*
Constant	22.451	.054	3.258		6.891	.000
Technological knowledge	-.354		.162	-.178	-2.190	.030
Pedagogical knowledge	-.099		.083	-.098	-1.195	.234
Content knowledge	.165		.161	.082	1.025	.307

Source: Field Survey (2022) P=.040 r=.232 F=2.832 df= (3, 149)

A multiple regression model was calculated to predict turnover intentions based on technological, pedagogical and content knowledge. Table 20 shows that a significant regression equation was found F (3, 149) = 2.832, $p<.05$, with an r^2 of .054. Therefore the null hypothesis was rejected. This shows that, the model accounted for 5.4% of the variation in turnover intentions. Thus technological knowledge, pedagogical, and content knowledge was responsible for 5.4% of the variance in turnover intentions. Individually, only technological knowledge was a significant predictor of turnover intentions (B= -.354, p=.030). From the result, a unit increase in technological knowledge leads to a -.354 decrease in turnover intentions. However, pedagogical knowledge (B= -.099, p=.234) and content knowledge (B=.165, p=.307) was not a significant predictor of turnover intentions.

Research Hypothesis 5:

H_0. Sex will not moderate the relationship between TPACK and turnover intentions among tutors of Colleges of Education.

H_1. Sex will moderate the relationship between TPACK and turnover intentions among tutors of Colleges of Education.

This hypothesis sought to determine whether Sex moderated the relationship between TPACK and turnover intentions. A moderation analysis was conducted to explore the moderating role of sex in the relationship between TPARK and turnover intentions. In the moderation analysis, the predictor was TPACK, the moderator was sex (male and female) and the outcome variable was turnover intentions. The moderation analysis was conducted using SMART PLS. Results of the analysis are presented in figure 5.

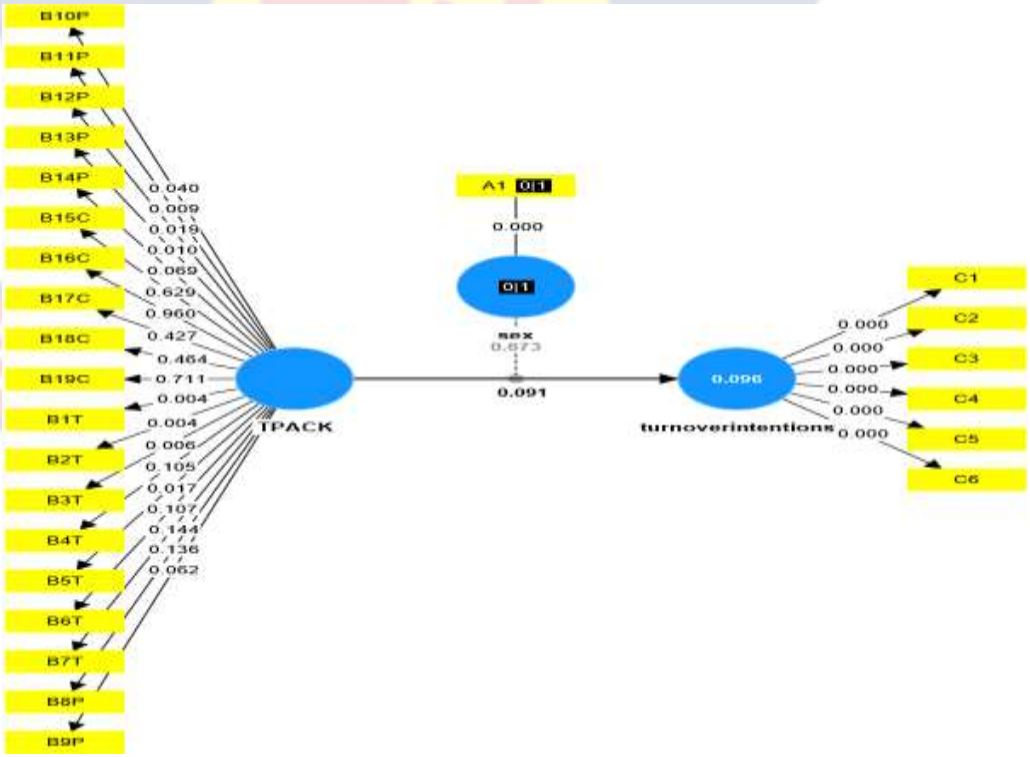


Figure 5: The Moderating Role of Sex on the Relationship between TPACK and Turnover Intentions

Table 20: Coefficients of the Moderating Role of Sex in the Relationship between TPACK and Turnover Intentions

	B	t-value	LLCI	ULCI	P
TPACK > Turnover intentions	-0.260	1.691	-0.485	0.308	0.091
Sex > turnover intentions	0.235	1.367	-0.102	0.572	0.172
sex*TPACK > turnover intentions	-0.079	0.422	-0.486	0.250	0.673

Source: Field survey (2022), N = 153, $R^2 = 0.096$ $F^2 = 0.106$

The results show that TPACK was not a significant predictor of turnover intentions, B= -.0260, t=-1.691, boot 95% CI (-0.485, 0.308), p>0.05, when sex was controlled. Further, the study revealed that sex does not have a significant impact on turnover intentions, B= -0.235, t=-1.367, boot 95% CI (-0.102, 0.572), p >0.05. This indicates that sex does not have an effect on turnover intentions. In the moderation analysis, the result showed that sex was not a significant moderator in the relationship between TPACK and turnover intentions B= -0.079, t= 0.422, boot 95% CI (-0.486, 0.250), p>0.05. Therefore, the null hypothesis "sex will not moderate the relationship between TPACK and turnover intentions" was not rejected. This means that the sex of tutors, whether being a male or female do not have an effect on the relationship between TPACK and turnover intentions.

Research Hypothesis 6:

H_0. Number of years of teaching will not moderate the relationship between TPACK and turnover intentions among tutors of Colleges of Education.

H_1. Number of years of teaching will moderate the relationship between TPACK and turnover intentions among tutors of Colleges of Education

This hypothesis examined whether years of teaching experience moderated the relationship between TPACK and turnover intentions. A moderation analysis was conducted to find out the moderating role of years of teaching experience in the relationship between TPARK and turnover intentions. In the moderation analysis, the predictor was TPACK, the moderator was Years of Teaching Experience (less than 1 year, 1-5years, 6-10 years, 11-15 years, 16-20, More than 20 years) and the outcome variable was turnover intentions. The moderation analysis was conducted using SMART PLS. Results of the analysis are presented in figure 6 below.

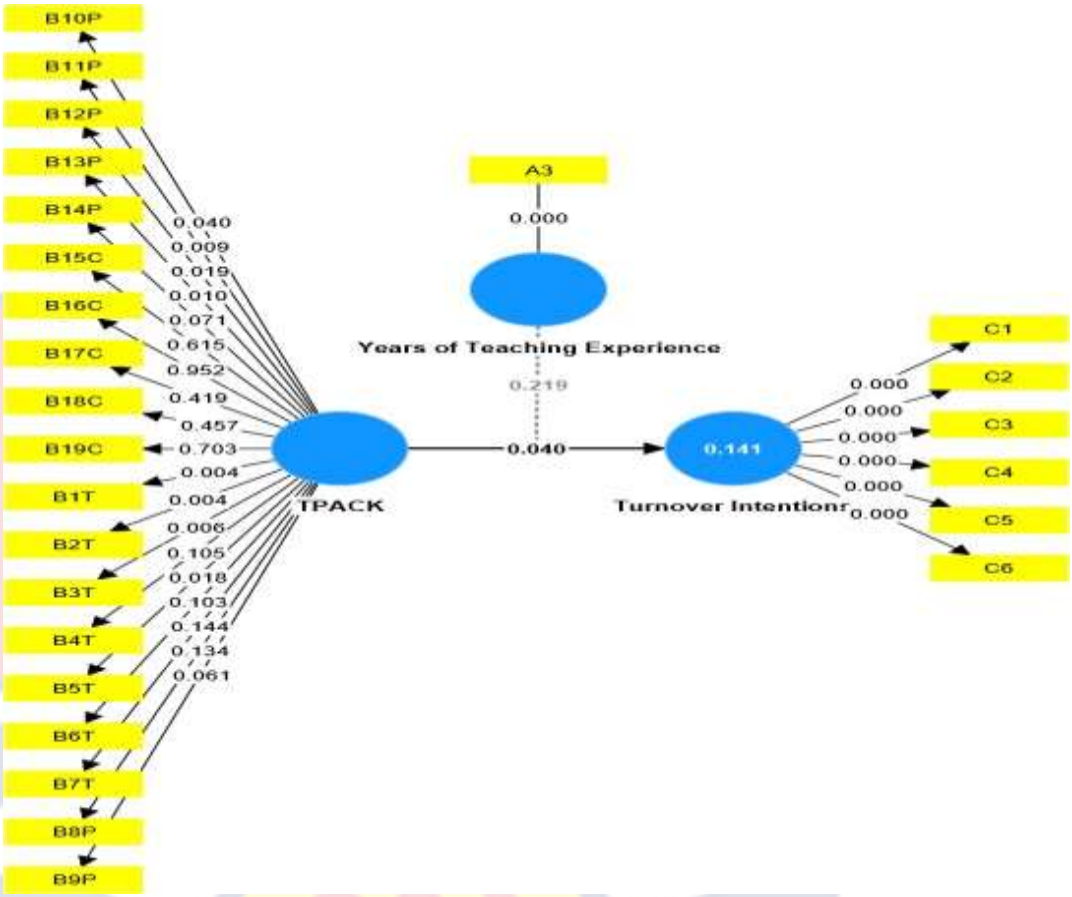


Figure 6: The Moderating Role of Years of Teaching Experience on the Relationship between TPACK and Turnover Intentions

Table21: Coefficients of the Moderating Role of Years of Teaching Experience in the Relationship between TPACK and Turnover Intentions

	B	t-value	LLCI	ULCI	P
TPACK > Turnover intentions	-0.325	2.050	-0.515	0.342	0.040
Years of Teaching experiences > turnover intentions	-0.226	3.493	-0.347	-0.092	0.000
Years of teaching experience *TPACK > turnover intentions	-0.100	1.229	-0.224	0.094	0.219

Source: Field survey (2022), N = 153, $R^2 = 0.141$ $F^2 = 0.164$

The results show that TPACK was a significant predictor of turnover intentions, B= -.0325, t= 2.050, boot 95% CI (-0.515, 0.342), p<0.05, when years of teaching experience was controlled. This means that, when TPACK goes up, it causes turnover intentions to go down and vice versa. Further, the study revealed that years of teaching experience had a significant impact on turnover intentions, B= -0.226, t= 3.493, boot 95% CI (-0.347, -0.092), p< 0.05. This implies that, when years of teaching experience goes up, it causes turnover intentions to go down and vice versa. This indicates that years of teaching experience had an effect on turnover intentions. In the moderation analysis, the result showed that years of teaching experience was not a significant moderator in the relationship between TPACK and turnover intentions B = -0.100, t= 1.229, boot 95% CI (-0.224, 0.094), p>0.05. Therefore, the null hypothesis "number of years of teaching will not moderate the relationship between TPACK and turnover intentions" was not rejected. This implies that the years teaching experience of tutors, did not have an effect on the relationship between TPACK and turnover intentions.

Discussion of Research Findings

The research findings of the study are discussed in relation to the empirical literature reviewed. It outlines areas where the findings from this study are in support of other research findings as well as areas where there are inconsistencies.

Level of Technological Knowledge among College of Education Tutors

The findings derived from this study shed light on the prevailing issue of insufficient technological knowledge among college of education tutors. The results suggest that these tutors exhibit a limited understanding of various

technologies, face challenges in acquiring technological skills, fail to keep pace with crucial advancements in technology, and lack the necessary expertise to effectively incorporate technology into their teaching practices.

These findings align with the research conducted by Norström (2014), which delved into the perspectives of Swedish teachers regarding technological knowledge. The study revealed significant disparities in teachers' perceptions of what constitutes technological knowledge and how it should be justified. This lack of consensus on the definition and justification of technological knowledge appears to be widespread among the teaching community, potentially affecting both curriculum development and the evaluation of students' knowledge acquisition.

Moreover, the outcomes of this study are consistent with the findings of Nordin, Davis, and Ariffin (2013), who specifically examined pre-service teachers' perceptions of their mastery level of Technological Pedagogical Content Knowledge (TPACK) before and after field experience. The TPACK survey questionnaire, adapted from Schmidt et al. (2009), was administered to 107 pre-service teachers in a research-intensive university program in New Zealand. The results indicated that these aspiring teachers exhibited higher proficiency in Content Knowledge (CK) but struggled with Technology Knowledge (TK) categories of TPACK both before and after their field experience.

While these findings converge with Norström (2014) and Nordin, Davis, and Ariffin's (2013) studies, they diverge from the research conducted by Luik, Taimalu, and Suviste (2018). Luik et al. aimed to validate the TPACK instrument and explore pre-service teachers' perceptions of their

technological, pedagogical, and content knowledge within the TPACK framework in Estonia. Their findings revealed that pre-service teachers exhibited a deficit in pedagogical knowledge but believed they possessed proficient skills in integrating technology into their teaching practices. Moreover, disparities in perceptions were identified based on factors such as gender, age, and curricula.

In summary, this study's findings underscore the pressing concern of insufficient technological knowledge among college of education tutors. The results align with prior research, emphasizing the need for comprehensive understanding and justification of technological knowledge among teachers. While there is congruence with previous studies, discrepancies also exist, indicating the complexity of the issue and the importance of considering contextual factors when examining teachers' perceptions and competencies in technology integration.

Level of Pedagogical Knowledge among College of Education Tutors

This study discovered that tutors in the College of Education exhibited a notable level of proficiency in pedagogical knowledge. Nearly all the tutors demonstrated a moderate to high degree of pedagogical knowledge, showcasing their ability to employ a diverse array of teaching approaches within their classroom settings. Furthermore, these tutors displayed adaptability in their instructional techniques, tailoring their teaching style to accommodate the diverse learning needs of their students. They skillfully assessed student learning through multiple assessment methods and demonstrated their aptitude in organizing and maintaining an optimal classroom environment conducive to effective teaching and learning.

The findings of this study both supported and diverged from previous research conducted in related areas. In agreement with the present study, Bewick and Corrall's (2010) work, which utilized questionnaires to collect predominantly quantitative data on the teaching roles, pedagogical knowledge, and professional development of subject librarians in 82 higher education institutions in the UK, yielded consistent results? Post holders in their study were actively engaged in a variety of teaching-related practices, considering them integral to their professional responsibilities. Moreover, these librarians expressed confidence in their teaching abilities, perceiving their pedagogical knowledge as sufficient, often drawing upon pedagogical theories acquired through relevant courses to inform their instructional practices.

Similarly, Lauermann and König (2016) examined the critical predictors of teachers' professional wellbeing and success, focusing on teachers' professional competence, including their professional knowledge, skills, beliefs, and motivation. Their study, involving a sample of 119 in-service teachers, explored the associations between two aspects of teachers' professional competence: general pedagogical knowledge (GPK) and self-efficacy. The findings from mediation analyses suggested that GPK negatively predicted teacher burnout, both through its direct impact and indirectly via its positive association with teaching self-efficacy. Thus, it can be inferred that general pedagogical knowledge poses no significant obstacle to teachers' overall professional wellbeing.

In an innovative approach to measurement, König, Bremerich-Vos, Buchholtz, and Glutsch (2020) developed a standardized method for analyzing written plans of demonstration lessons, with a specific focus on the demand

for pedagogical adaptability. Their study examined the extent to which lesson assignments align with the cognitive level of learners, facilitating their progress within the zone of proximal development. Drawing upon data from 172 pre-service teachers in Germany who conducted their initial demonstration lessons during the induction phase, the findings revealed a notably high level of declarative general pedagogical knowledge among these novice educators.

In conclusion, this study unveiled the high level of pedagogical knowledge among tutors in the College of Education. Their adeptness in utilizing diverse teaching approaches, adaptability to cater to individual learners, proficient assessment practices, and maintenance of a conducive classroom environment were evident. While the findings aligned with some previous research, such as Bewick and Corrall's (2010) work, they also provided new insights, like the association between general pedagogical knowledge and teacher burnout highlighted by Lauermann and König (2016). Furthermore, the innovative measurement approach employed by König, Bremerich-Vos, Buchholtz, and Glutsch (2020) shed light on the high level of declarative general pedagogical knowledge among pre-service teachers.

Level of Content Knowledge among College of Education Tutors

This study conducted on Colleges of Education tutors revealed that they possessed high levels of content knowledge in the subjects they taught, indicating a strong command and expertise in their respective fields. These tutors demonstrated a deep and wide understanding of the subject matter, showcasing their ability to navigate and effectively communicate complex concepts to students. They exhibited a comprehensive knowledge base,

supported by various examples and applications that connected the subject matter to real-world contexts. This level of content knowledge among tutors is crucial as it forms the foundation for effective teaching and learning experiences.

These findings collaborate with previous research conducted by Moats and Foorman (2003), who explored the impact of subject matter knowledge on teaching and learning. Through an analysis of literature and surveys, they found evidence that teachers' subject matter knowledge significantly influences the instructional process in schools. Teachers with a strong grasp of the subject matter are better equipped to teach the key concepts, address misconceptions, and facilitate meaningful learning experiences for their students. When teachers possess a deep understanding of the subject matter, they can effectively guide students' learning, provide accurate and relevant explanations, and engage students in critical thinking and problem-solving activities.

Furthermore, a longitudinal study conducted by Nixon, Hill, and Luft (2017) delved into the development of new secondary science teachers' subject matter knowledge (SMK) over a five-year period. By analyzing concept maps constructed by the teachers in their first and fifth years of teaching, the researchers assessed the growth and stability of SMK. The findings indicated that the new chemistry teachers maintained a high level of SMK from their first year to their fifth year of teaching. This suggests that these teachers had a strong foundation of subject matter knowledge that remained consistent and continued to support their teaching practices over time.

However, it is important to consider that there can be inconsistencies in subject matter knowledge development among teachers, as highlighted by Karal and Alev's (2016) study. Their research focused on the development of pre-service physics teachers' pedagogical content knowledge (PCK) specifically in the subject of electricity and magnetism. The findings indicated a decline in subject matter knowledge among the participants after the completion of physics and mathematics courses. The study identified various factors, including past experience, field-based experience, teacher training, written materials, mentor teachers, school context, and the nature of the subject matter that influenced the development of PCK among the pre-service teachers.

In conclusion, the study on Colleges of Education tutors confirms the presence of high levels of content knowledge among these educators. This finding aligns with previous research emphasizing the significant impact of subject matter knowledge on teaching and learning. While the longitudinal study demonstrated the stability of subject matter knowledge among new chemistry teachers, the study on pre-service physics teachers highlighted the need to consider various factors that can influence subject matter knowledge development. These findings collectively emphasize the importance of fostering and continuously enhancing subject matter knowledge among teachers to promote effective instruction and student learning outcomes.

Relationship between Technological Knowledge and Turnover Intentions

The relationship between technological knowledge and turnover intentions was examined, revealing a statistically significant negative weak correlation ($r = -.200$, $p < .05$). This implies that as teachers' technological

knowledge decreases, their intentions to leave their positions increase, and vice versa. In other words, teachers with higher levels of technological knowledge are less likely to have turnover intentions. This finding aligns with previous research that has explored the impact of technological factors on teachers' job satisfaction and commitment to the profession.

For instance, Al-Fudail and Mellar (2008) conducted a small-scale study on elementary school teachers and identified several potential sources of technostress that can contribute to turnover intentions. These sources included a lack of technical knowledge in dealing with technological errors, increased work demands resulting from the integration of technology, and insufficient pedagogical preparation to effectively utilize technology in the classroom. The presence of these stressors can lead to dissatisfaction and ultimately influence teachers' decisions to leave their positions.

Similarly, Joo et al. (2016) conducted an empirical study that examined the structural relationships between various factors influencing teachers' use of technology and their intentions to leave the profession. The findings indicated that as teachers' perceived ease of use of technology increased, their intentions to use technology decreased. Interestingly, this decrease in intentions to use technology was positively related to turnover intentions. This suggests that when teachers perceive technology as easier to use, they may feel less inclined to use it and may also be more likely to consider leaving their positions.

Furthermore, Fernández-Batanero, Román-Graván, Reyes-Rebollo, and Montenegro-Rueda (2021) conducted a systematic review on teacher stress and anxiety associated with their knowledge and use of educational technology. The review synthesized findings from sixteen articles and

revealed that teachers often experienced high levels of anxiety and stress due to the use of educational technology in their classrooms. The presence of these negative emotions and the associated challenges can contribute to job dissatisfaction and ultimately increase turnover intentions among teachers.

Additionally, Otache and Inekwe (2021) conducted a study that examined the relationship between job satisfaction, turnover intentions, and performance among Nigerian polytechnic lecturers with PhDs. The findings indicated a significantly positive link between job satisfaction and performance, suggesting that higher levels of job satisfaction are associated with better performance. Moreover, the study found significantly negative relationships between job satisfaction and turnover intentions, as well as between turnover intentions and performance. This implies that higher levels of job satisfaction are related to lower turnover intentions, and lower turnover intentions are associated with better performance among Nigerian polytechnic lecturers with PhDs.

In summary, the research highlights the negative relationship between teachers' technological knowledge and their turnover intentions. Insufficient technological knowledge and the associated stress and anxiety can contribute to increased intentions to leave the teaching profession. Moreover, job satisfaction has been consistently identified as a key factor influencing turnover intentions among educators. By addressing technological knowledge gaps, reducing technostress, and promoting job satisfaction, educational institutions and policymakers can work towards mitigating turnover intentions and fostering a supportive and engaging environment for teachers, ultimately enhancing their professional commitment and performance.

Relationship between Pedagogical Knowledge and Turnover Intentions

In the present study, the analysis revealed no statistically significant relationship between pedagogical knowledge and turnover intentions ($r = -.123$, $p > .05$). This suggests that there was no clear association between teachers' pedagogical knowledge and their intentions to leave their positions. These findings, however, diverge from previous research conducted in similar contexts.

For instance, Tiplic, Brandmo, and Elstad (2015) examined the factors influencing turnover intentions among beginning teachers in Norway. Their study, which included 227 new teachers from 133 schools, identified several important predictors of turnover intentions. One of the key findings was the role of collective teacher efficacy, which encompasses teachers' shared beliefs in their ability to positively impact student learning. The study also highlighted the significance of trust between teachers and principals, role conflict experienced by teachers, and affective commitment to the teaching profession as influential factors in shaping turnover intentions among beginning teachers. These results suggest that pedagogical knowledge, as a component of collective teacher efficacy, may indirectly affect turnover intentions through its interaction with other factors.

Similarly, Heikonen et al. (2017) explored the interrelationships between turnover intentions, perceived inadequacy in teacher-student interaction, and professional agency among early career teachers. Their study included 284 in-service teachers with up to 5 years of experience and employed structural equation modeling for data analysis. The findings demonstrated a negative relationship between turnover intentions and early

career teachers' sense of professional agency, which refers to their perceived ability to make effective decisions and take control of their classroom practices. This negative association was found to be completely mediated by the perceived inadequacy in teaching and learning. In other words, when early career teachers experienced difficulties in effectively managing challenging student situations, it significantly influenced their intention to leave the profession. These results suggest that pedagogical knowledge, particularly in the context of managing student interactions, can indirectly impact turnover intentions through its influence on teachers' perceived adequacy in their teaching practices.

Furthermore, Aslami (2013) conducted a study focusing on teachers in public secondary schools in Kabul, Afghanistan, to investigate the factors contributing to teachers leaving or intending to leave the profession. The study utilized a combination of interviews, questionnaires, and observations with a sample of 71 teachers. The findings revealed that new teachers faced high attrition rates due to the absence of effective and continuous support programs. Additionally, the study highlighted that the lack of preparedness for the realities of the classroom resulted in 56% of former teachers leaving the profession. These findings suggest that a lack of pedagogical knowledge and support can lead to frustrations among teachers, ultimately influencing their intentions to leave.

However, while the present study did not find a significant relationship between pedagogical knowledge and turnover intentions, it is important to consider the broader context and the specific career stage of the teachers being studied. The findings from previous research, particularly studies involving

beginning teachers and early career teachers, highlight the multifaceted nature of turnover intentions. Factors such as collective teacher efficacy, trust, role conflict, professional agency, and support programs appear to play crucial roles in shaping teachers' decisions to leave the profession. Therefore, it is important for future research and educational institutions to consider these factors when developing strategies to support teachers and mitigate turnover intentions.

Relationship between Content Knowledge and Turnover Intentions

The main findings of the present study reveal that there was no statistically significant correlation between content knowledge and turnover intentions ($r = .77$, $p > .05$). This implies that content knowledge did not have an impact on turnover intentions. This result is in contrast to the findings of previous studies discussed in the literature review.

In the study conducted by Tiplic, Brandmo, and Elstad (2015), they identified several factors that influenced new teachers' intentions to leave the profession. These factors included collective teacher efficacy, trust between teachers and principals, role conflict, and emotional commitment. The findings suggested that organizational and contextual factors, as well as competency level, influenced the career decisions of beginning teachers. In contrast, the present study did not find a significant relationship between content knowledge and turnover intentions, suggesting a difference in the factors affecting turnover in the two studies.

Emoja (2016) examined job satisfaction and teacher turnover in secondary schools and found that dissatisfaction with the job and subject expertise played a role in teachers' intentions to leave. This study highlighted

the importance of subject expertise in influencing turnover intentions, which contrasts with the present study's findings. The present study did not find a significant correlation between content knowledge and turnover intentions, suggesting that subject expertise may not be a determining factor in turnover intentions in this context.

Yoon and Kim (2022) focused on the relationship between teacher subject matter knowledge and turnover intentions, particularly in the context of professional development opportunities. Their study revealed that teachers who had access to specialized professional development programs aimed at enhancing subject-specific knowledge demonstrated lower turnover intentions. This finding emphasizes the value of investing in subject-specific professional development to retain experienced and knowledgeable educators. In contrast, the present study did not find a significant correlation between content knowledge and turnover intentions, suggesting that professional development opportunities may not have played a significant role in the studied context.

Tiplic, Lejonberg, and Elstad (2016) examined factors predicting the retention of newly certified educators. They found that trust among educators and perceived topic mastery were key indicators that influenced newly certified teachers' intentions to leave the profession. This finding did not aligns with the present study's result of no significant relationship between content knowledge and turnover intentions. Tiplic, Lejonberg, and Elstad's studies suggest that content knowledge or topic mastery is primary drivers of turnover intentions among educators.

In summary, the present study's findings differ from previous studies discussed in the literature review. While previous studies highlighted the influence of factors such as organizational and contextual factors, subject expertise, and professional development opportunities on turnover intentions, the present study did not find a significant correlation between content knowledge and turnover intentions. These differences suggest that the relationship between content knowledge and turnover intentions may vary across different contexts and that other factors may play a more prominent role in determining turnover intentions among educators.

Impact of Technological, Pedagogical and Content Knowledge on Turnover Intentions

The main study findings revealed that technological, pedagogical, and content knowledge (TPACK) predicted turnover intentions among the sample studied, accounting for 5.4% of the variations in turnover intentions. This aligns with the findings of the previous studies, which also identified a positive relationship between TPACK and reduced turnover intentions among teachers.

The findings of Lachner et al. align with this study's findings. Lachner et al. (2021) found that primary school teachers with higher levels of TPACK exhibited lower turnover intentions. This suggests that teachers who possess strong integration of technology, pedagogy, and subject matter knowledge are more committed to the teaching profession and less likely to leave their positions. These findings imply that investing in the development of TPACK competencies can contribute to job satisfaction and retention among primary school teachers.

Similarly, Siddiqui, Arif, and Hinduja (2023) examined the influence of TPACK on turnover intentions among secondary school teachers and found that those with stronger TPACK skills had lower intentions to leave their positions. This emphasizes the importance of offering professional development opportunities that enhance teachers' TPACK competencies in secondary schools. By equipping teachers with effective technology integration skills, pedagogical knowledge, and subject matter expertise, secondary schools can reduce turnover rates and retain experienced teachers.

The longitudinal study by Hsu, Liang, and Tsai (2020) investigated the relationship between TPACK development and teacher turnover intentions over a three-year period. The findings revealed that continuous development of TPACK knowledge and skills was associated with lower turnover intentions. Teachers who actively invested in improving their TPACK competencies demonstrated a stronger commitment to their profession and were less inclined to consider leaving their jobs. These results highlight the long-term impact of TPACK development on teacher retention and emphasize the importance of providing ongoing professional development opportunities focused on enhancing TPACK knowledge and skills.

Furthermore, Huang and Su (2016) examined the mediating role of job satisfaction in the relationship between TPACK and turnover intentions. They found that TPACK had both direct and indirect effects on turnover intentions, with job satisfaction partially mediating this relationship. This means that TPACK not only directly influenced turnover intentions but also indirectly influenced them through its impact on job satisfaction. These findings underscore the importance of promoting TPACK among teachers and

fostering job satisfaction as key strategies to mitigate teacher turnover. By enhancing teachers' TPACK competencies and ensuring job satisfaction, educational institutions can work towards retaining talented educators and reducing turnover rates. The similarity in findings underscores the importance of promoting TPACK and fostering job satisfaction as strategies to mitigate teacher turnover.

The consistent findings across these studies highlight the importance of TPACK in reducing turnover intentions among teachers. They emphasize that a strong integration of technological, pedagogical, and content knowledge is beneficial for teachers' commitment to the teaching profession and their retention in educational roles. Professional development programs focusing on TPACK enhancement can play a crucial role in fostering job satisfaction and reducing teacher turnover rates. Moreover, the mediating role of job satisfaction suggests that efforts to improve TPACK and enhance overall job satisfaction can work synergistically to create a positive work environment and retain experienced teachers in the field of education.

Moderating Role of Gender on the Relationship between TPACK and Tutor Turnover Intentions

The study focused on the relationship between Technological Pedagogical Content Knowledge (TPACK) and turnover intentions, specifically examining the potential moderating effect of sex or gender. The results revealed that gender did not significantly moderate the relationship between TPACK and turnover intentions. This finding is consistent with Zhao et al. (2018), who also examined the moderating role of gender in the relationship between TPACK and turnover intentions among teachers in

Chinese primary schools. They found that TPACK was negatively correlated with turnover intentions for both male and female teachers, and gender did not moderate this relationship. Therefore, both studies suggest that TPACK has a consistent positive influence on reducing turnover intentions across genders.

On the other hand, the study by Li et al. (2021) found that gender did moderate the relationship between digital competence (a component of TPACK) and turnover behaviour among Chinese primary and secondary teachers. They reported that the level of online teaching intentions mediated this relationship, indicating that gender differences in digital competence affected the intentions to engage in online teaching, which, in turn, influenced turnover behaviour. This finding diverges from the main study, which did not find a moderating effect of gender on the relationship between TPACK and turnover intentions. These contrasting results suggest that the impact of technology-related factors on turnover behaviour may differ depending on the specific components or aspects being examined (i.e., TPACK vs. digital competence) and the context in which they are studied.

Furthermore, Musgrove et al. (2021) explored the relationship between perceived ease of use (PEOU) and perceived usefulness (PU) of one-to-one computing for instruction in different subject areas. They found that gender moderated the relationship between PEOU and PU, indicating that gender differences influenced how teachers perceived the ease of using technology for instruction and its usefulness across subject areas. This finding highlights the role of gender in shaping teachers' attitudes and perceptions towards technology adoption. In contrast, the main study did not examine the specific dimensions of perceived ease of use or perceived usefulness, focusing instead

on the broader construct of TPACK. Therefore, the difference in findings suggests that the impact of gender on the relationship between technology-related factors and attitudes may vary depending on the specific aspects of technology use that are being considered.

Additionally, Gómez-Trigueros and Yáñez de Aldecoa (2021) investigated gender differences in digital competence and its impact on turnover behaviour among in-training and in-service teachers. Their study revealed that female participants had a poorer self-perception of their Digital Teaching Competence compared to males. They also found that gender moderated the relationship between knowledge of technologies and turnover behavior. These findings emphasize the significance of gender differences in digital competence and their influence on teachers' turnover behaviour. In contrast, the main study did not directly assess digital competence but focused on the broader construct of TPACK. Thus, the discrepancy in findings suggests that the specific aspects of technology competence being examined (e.g., TPACK vs. digital competence) and the measurement approaches employed may contribute to differences in results.

In conclusion, the main study's findings regarding the non-significant moderating effect of gender on the relationship between TPACK and turnover intentions align with the study by Zhao et al. (2018). However, they differ from Li et al. (2021), Musgrove et al. (2021), and Gómez-Trigueros and Yáñez de Aldecoa (2021) regarding the role of gender in relation to digital competence, attitudes towards technology, and turnover behavior. These differences highlight the complex and context-dependent nature of the relationship between gender, technology-related factors

Moderating Role of Years of Teaching Experience on the Relationship between TPACK and Tutor Turnover Intentions

The main study focused on investigating the moderating effect of years of teaching experience on the relationship between Technological Pedagogical Content Knowledge (TPACK) and turnover intentions. The findings indicated that years of teaching experience did not significantly moderate this relationship. This aligns with the study by Herlina (2022), which also found that teaching experience did not moderate the relationship between TPACK and teaching ability (TA). In both studies, the duration of teaching experience was not found to have an impact on the relationship between TPACK and job-related outcomes.

On the other hand, Bauwens et al. (2020) examined the relationship between technology acceptance, work-related ICT use after hours (WIA), and work attrition, while considering the moderating effect of teaching experience. Their findings suggested that teaching experience played a moderating role in the relationship between technology acceptance, WIA, and work attrition. Specifically, they found that social influence, as mediated by WIA, reduced teachers' work attrition. This moderating effect of teaching experience indicates that the relationship between technology-related factors and work outcomes may differ depending on the number of years of teaching experience.

Similarly, Yucel and Bektas (2012) explored the relationship between teachers' TPACK knowledge, organizational commitment, and teaching experience. Their study revealed that teaching experience moderated the relationship between TPACK knowledge and organizational commitment. The

differences in teaching experience among teachers were found to have a moderating effect on the relationship between TPACK knowledge and organizational commitment. This suggests that the impact of TPACK knowledge on teachers' commitment to their organization may vary depending on their years of teaching experience.

In summary, the main study's findings and the study by Herlina (2022) indicate that years of teaching experience did not significantly moderate the relationship between TPACK and job-related outcomes. On the other hand, Bauwens et al. (2020) and Yucel and Bektas (2012) found that teaching experience played a moderating role in the relationship between technology-related factors (such as technology acceptance and TPACK knowledge) and work-related outcomes (such as work attrition and organizational commitment). These contrasting findings suggest that the influence of teaching experience on the relationship between TPACK and job-related outcomes may depend on specific factors being examined, such as technology acceptance or organizational commitment, and the context in which they are studied.

However, it is important to consider these variations in findings when interpreting the results. The differences in methodologies, sample sizes, and contextual factors across these studies may contribute to the discrepancies observed. Further research is needed to explore the complex interplay between teaching experience, TPACK, and job-related outcomes in different educational settings to gain a comprehensive understanding of these relationships.

Expanding on the connection between these results and theoretical frameworks, it is noteworthy that the discovery indicating a lower level of technological knowledge among tutors, coupled with higher levels of pedagogical and content knowledge, is consistent with the TPACK framework. It suggests gaps exist specifically around technology skills rather than teaching or subject expertise. This highlights the importance of the interplay between technological, pedagogical and content knowledge as emphasized by TPACK theory. Strengthening technology knowledge could strengthen overall TPACK.

The discovery that lower technology knowledge predicts greater turnover intention provides some confirmation to key relationships in Mobley's turnover model. The framework presents linkages between job satisfaction, thoughts of quitting, intent to search/quit, and actual turnover behavior. Similarly, frustration or inadequacy with technology integration could undermine job satisfaction and ultimately influence turnover considerations, as the findings indicate.

Additionally, the lack of moderating impact from demographic factors like sex and years of experience further validates Mobley's model which focuses more on the psychological decision-making process leading to turnover rather than individual differences. Overall there is alignment between the turnover model mechanics and the influence of TPACK elements on retention revealed in the analysis.

In summary, the results found resonance with both Mishra & Koehler's framework emphasizing connections between knowledge areas, and Mobley's sequence regarding how attitudes shape behavioural outcomes like turnover.

The theories help explicate the interplay uncovered between tutors' TPACK and their retention intentions.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview

The overall purpose of this study was to examine whether technological, pedagogical and content knowledge (TPACK) predict turnover intentions, specifically focusing on tutors in the college of education Ghana. The study also focused on exploring the relationship between technological, pedagogical and turnover intentions. Specifically, the study sought to examine:

1. the level of technological knowledge among college of education tutors.
2. the level of pedagogical knowledge among college of education tutors.
3. the level of content knowledge among college of education tutors.
4. the relationship between tutors technology knowledge and their turnover intentions.
5. the relationship between tutors pedagogical Knowledge and their turnover intentions.
6. the relationship between tutors content knowledge and their turnover intentions.
7. whether technological, pedagogical and content knowledge predict turnover intentions among tutors of Colleges of Education
8. the moderating role of gender on the relationship between TPACK and their turnover intentions of tutors in Colleges of Education

9. the moderating role of teacher experience (in terms of years of teaching) on the relationship between TPACK and their turnover intentions of tutors of Colleges of Education.

"The study was purely quantitative and specifically employed the descriptive survey design. The survey was used to obtain 159 participants from the study. Tutors in all three college of education in the Central region (Komenda College of Education, Ola College of Education, and Fosu College of Education) were participants of the study. Participants were required to answer 25 item questionnaire that measures the various construct (variables) in the study. The study made use of both descriptive and inferential approach to data analysis".

Summary of Key Findings

From the analysis of the data, the results revealed that, technological knowledge among college of education tutors was very low, with an overall mean of (M=1.47, SD=.550). It was evident that tutors of the college of education could not learn technology easily, they did not know about the different technologies, and lack the skill needed to use technology.

Again, the study found that, college of education tutors had high pedagogical knowledge with a mean of means of (M=2.82, SD=0.799). College tutors were found to be able adapt to their teaching based methods upon what students currently understand or do not understand, able to use a wide range of teaching approaches in a classroom setting, able to adapt their teaching style to different learners, and are able to organize and maintain a good classroom environment.

Further, college of education tutors were found to have high content knowledge in the various subjects taught. An overall mean of (M=3.20, SD=0.630) on their content knowledge showed how these tutors are masters in the subject they teach. The tutors were found to have a deep and wide understanding of the subject taught, had various ways and strategies for developing understanding in the subject area, knew about various examples in their subject area that apply in the real world, and above all, they were found to have sufficient knowledge about the subject they teach.

Furthermore, there was a statistically significant negative weak relationship between technological knowledge and turnover intentions ($r = -.200$, $p < .05$).

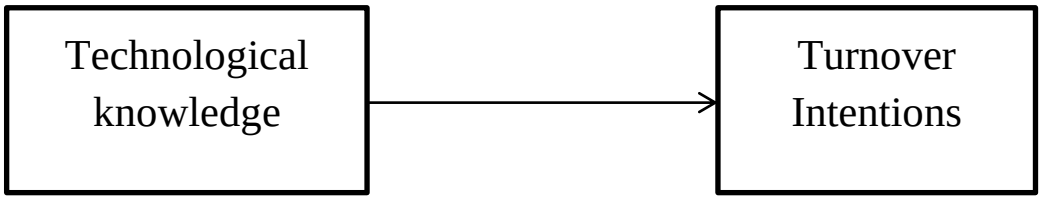
The results of the study did not reveal a statistical significant relationship between pedagogical knowledge and turnover intentions ($r = -.123$, $p > .05$). Similarly no statistically significant relation was found between content knowledge and turnover intentions ($r = .77$, $p > .05$). Implying that content knowledge did not correlate with turnover intentions.

In addition, technological, pedagogical and content knowledge were found to predict turnover intentions among college tutors F (3, 149) = 2.832, $p<.05$, with an r^2 of .054.

Moreover, sex was not a significant moderator in the relationship between TPACK and turnover intentions.

Lastly the study revealed that years of teaching experience did not moderator in the relationship between TPACK and turnover intentions. This means that of tutor's years of teaching did not have an effect on the relationship between TPACK and turnover intentions.

Confirmed Framework



Conclusions

Based on the research findings, it was evident that, among the three independent construct, (Technological Knowledge, Pedagogical Knowledge, and Content Knowledge), tutors were found to have high pedagogical and content knowledge, with low technological knowledge. It can be concluded that, because tutors do not mostly use technology in teaching, they are not equip with the necessary knowledge and skill in using technology in teaching, that is why among the three construct necessary for effecting teaching, technology was found to be low.

Similarly, in relation to tutor's technological knowledge, pedagogical knowledge and content knowledge and their relationship with turnover intentions, only technological knowledge has an inverse relationship with turnover intentions. It can be concluded that, because these tutors has low knowledge in technology, they tend to have the intentions to leave their current Job because they might feel they cannot cope with the demands it brings.

Again, the research analysis revealed that, tutor TPACK was found to predict their turnover intentions. It can be concluded that, because TPACK has an aspect of technology that is low in college tutors, it can be said that, they might feel incapable which is psychologically good for these tutors. This may

act as a threat to their job satisfaction, and this might be the reason for TPACK predicting turnover intentions.

Although, tutor's sex and years of teaching experience did not moderate the relationship between TPACK and turnover intentions, the moderation analysis revealed that years of teaching experience is a significant predictor of turnover intention, therefore although there it was not a significant moderator, it is an important factor and in tutors turnover intentions and cannot be overlooked.

Recommendations

Based on the findings of this study, it is then recommended that:

1. The Ghana tertiary education commission (GTEC) should implement comprehensive training programmes like workshops, Webinars, Hands-on Training Sessions etc. to enhance technological knowledge among college of education tutors, ensuring they acquire the skills necessary for effective technology use in education.
2. College managements should encourage by reinforcing college tutors' existing pedagogical and content knowledge, emphasizing subject mastery for enhanced learning experiences and adaptive teaching methods.
3. College management should develop strategies to address turnover intentions by focusing on improving tutors' technological knowledge though short courses and Technology Tool Workshops.
4. Ministry of education should formulate policies on training programs that integrate technological, pedagogical, and content knowledge. This can be a key strategy in positively influencing turnover intentions.

5. Principals of colleges of education should bring up support programs and initiatives such as Mentorship Programs, Professional development Programs, Collaborative Learning Communities etc. that aimed at improving TPACK and addressing turnover intentions are designed without specific gender and across all levels of teaching experience.

By implementing these recommendations, educational institutions can promote the professional growth and job satisfaction of college of education tutors, ultimately improving the quality of education they deliver and reducing turnover intentions.

Recommendation for Further Studies

To further expand the literature on TPACK among tutors and it impact on their turnover intentions, the following suggestions for further research studies are made:

1. Investigating into how students benefit from tutor technological knowledge and its integration into their teaching and learning processes.
2. A replication of this study to run in other college of education institutions for comparism of findings
3. The follow-up study can employ various research methods, such as surveys, interviews, and observation of classroom practices. By collecting data on tutors' perceptions, self-reported technological skills, and actual integration of technology in their teaching, the study can assess the extent to which the initiatives have been successful in improving tutors' technological knowledge.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FOR TUTORS

UNIVERSITY OF CAPE COAST

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

The purpose of this study is to examine technological, pedagogical, and content knowledge as predicts of turnover intentions among college tutors in the central region, Ghana. Kindly spend some minutes to supply information on each item of this questionnaire as honestly as possible. All information gathered will be treated confidentially and would be used for the purpose of research only. That is why your name is not required.

Instruction:

Please indicate your response by writing or ticking [√] the most appropriate option.

Section A

1. Sex:

   Male ( )

   Female ( )

2. Age: ……..

3. Years of teaching experience: less than 1 year ( ) 1-5years ( ) 6-10 years ( )

   11-15 years ( ) 16-20 ( ) More than 20 years ( )

Section B

TECHNOLOGICAL, PEDAGOGICAL, AND CONTENT KNOWLEDGE

Please read each statement and tick the letters SD, D, A or SA which indicates how much the statement applied to you. There are no right or wrong answers.

The rating scale is as follows: Strongly Disagree (SD); Disagree (D); Agree (A); Strongly Agree (SA)

TECHNOLOGICAL PEDAGOGICAL, AND CONTENT KNOWLEDGE

TECHNOLOGICAL KNOWLEDGE

	Statements	**SD**	**D**	**A**	**SA**
1	I know how to solve my own technical problems				
2	I can learn technology easily.				
3	I keep up with important new technologies.				
4	I frequently play around with the technology.				
5	I know about a lot of different technologies.				
6	I have the technical skills I need to use technology.				
7	I have had sufficient opportunities to work with different technologies				

PEDAGOGICAL KNOWLEDGE

	Statements	**SD**	**D**	**A**	**SA**
8	I know how to assess student performance in a classroom.				
9	I can adapt my teaching based upon what students currently understand or do not understand.				
10	I can adapt my teaching style to different learners.				
11	I can use a wide range of teaching approaches in a classroom setting.				
12	I can assess student learning in multiple ways.				
13	I am familiar with common student understandings and misconceptions.				
14	I know how to organize and maintain classroom management				

CONTENT KNOWLEDGE

	Statement	**SD**	**D**	**A**	**SA**
15	I have a deep and wide understanding of the component in the subject I teach				

16 I know about various examples in my subject area that applies in the real world.

17 I have sufficient knowledge about the subject I teach

18 I can reason in my subject area

19 I have various ways and strategies of developing my understanding in my subject area

Section C

TURNOVER INTENTIONS AMONG COLLEGE TUTORS

Please read each statement and tick the numbers 1,2,3,4 or 5 which indicates how much the statement applied to you. There are no right or wrong answers.

The rating scale is as follows: **1 = Highly Unlikely; 2 = Unlikely; 3 = Likely; 4= Most Likely; 5 = Highly Likely**

No.	Statement	1	2	3	4	5
1	How often have you considered leaving your job?					
2	To what extent is your current job satisfying your personal needs?					
3	How often are you frustrated when not given the opportunity at work to achieve your personal work-related goals?					

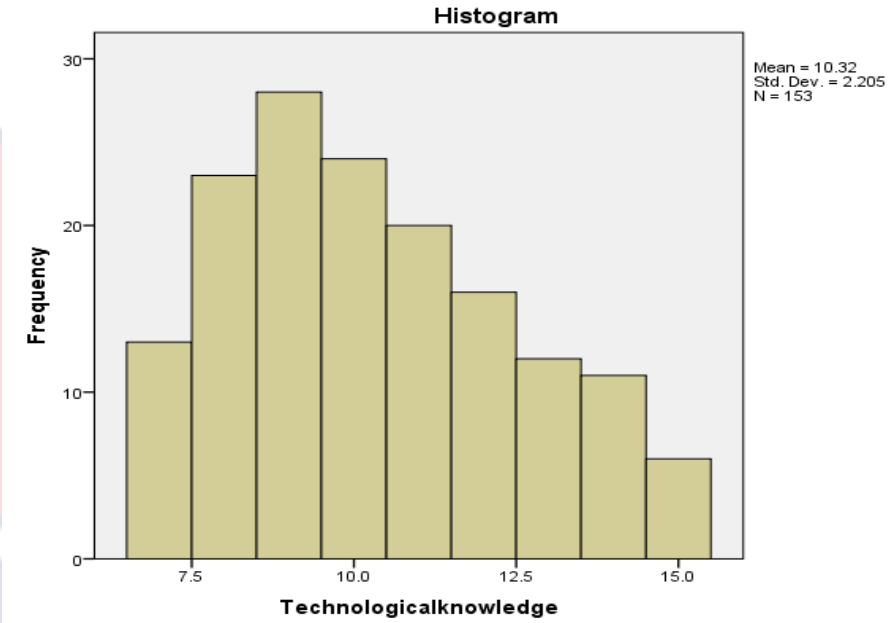
4 How often do you dream about getting another job that will better suit your personal needs?

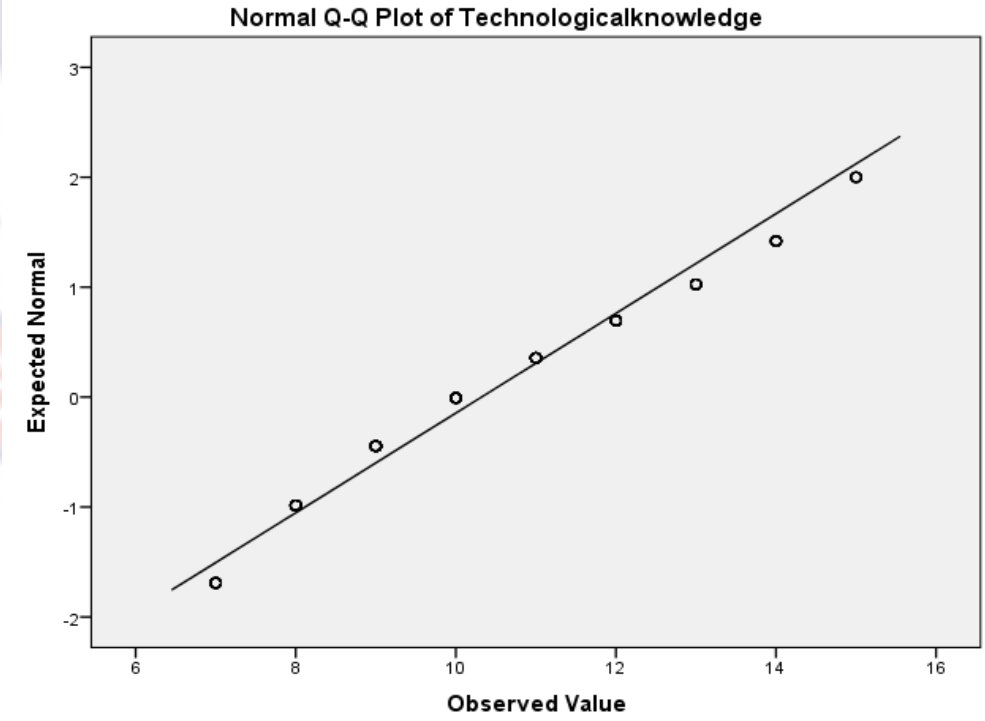
5 How likely would you accept another job at the same compensation level should it be offered to you?

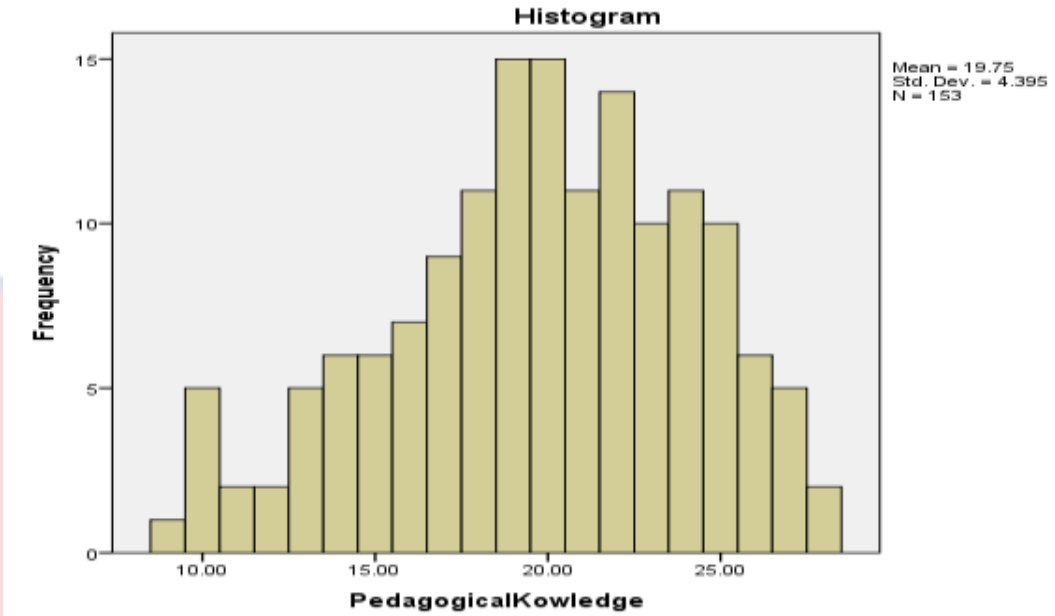
6 How often do you look forward to another day at work?

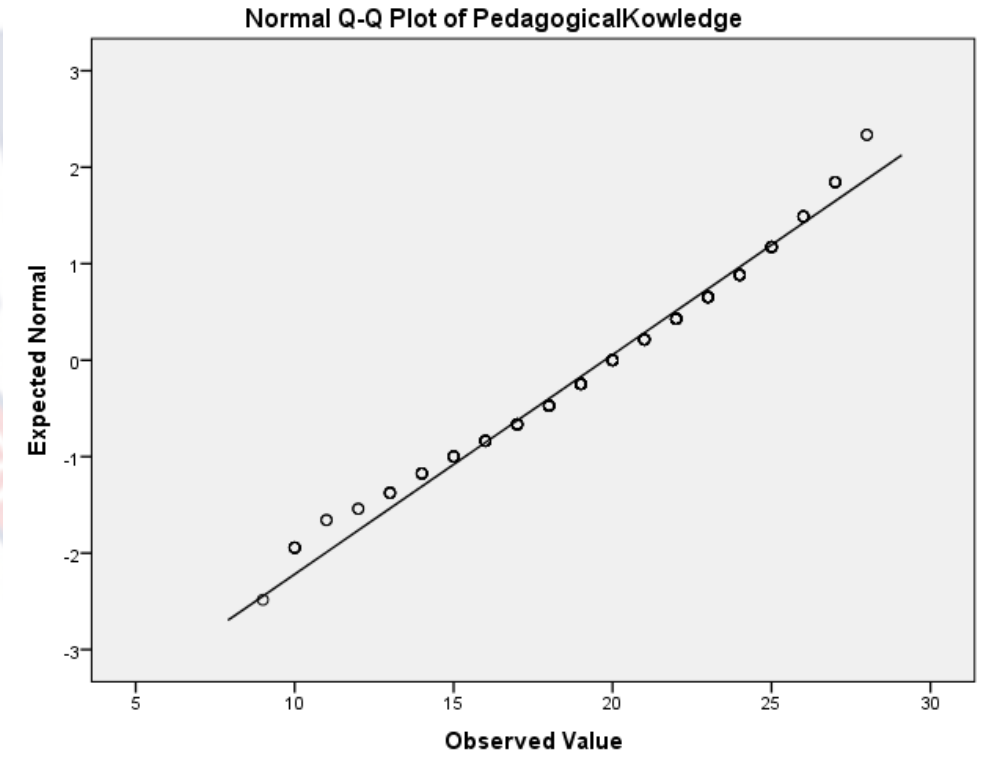
APENDIX B

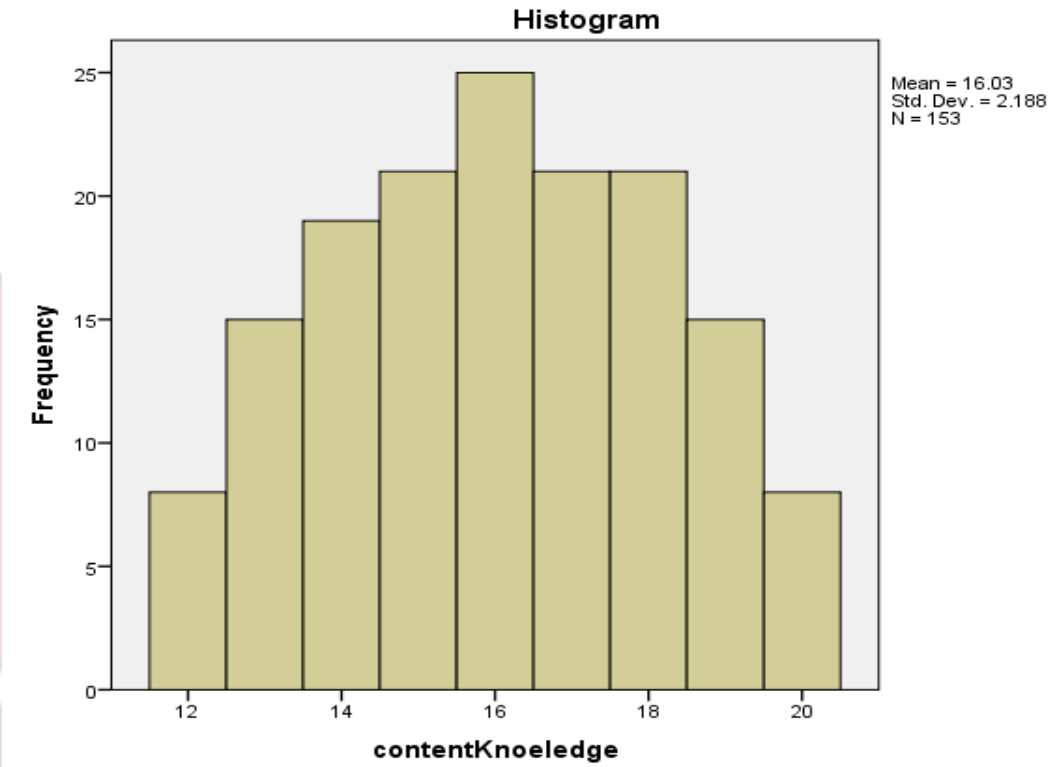
NORMAL Q – Q PLOT AND HISTOGRAM

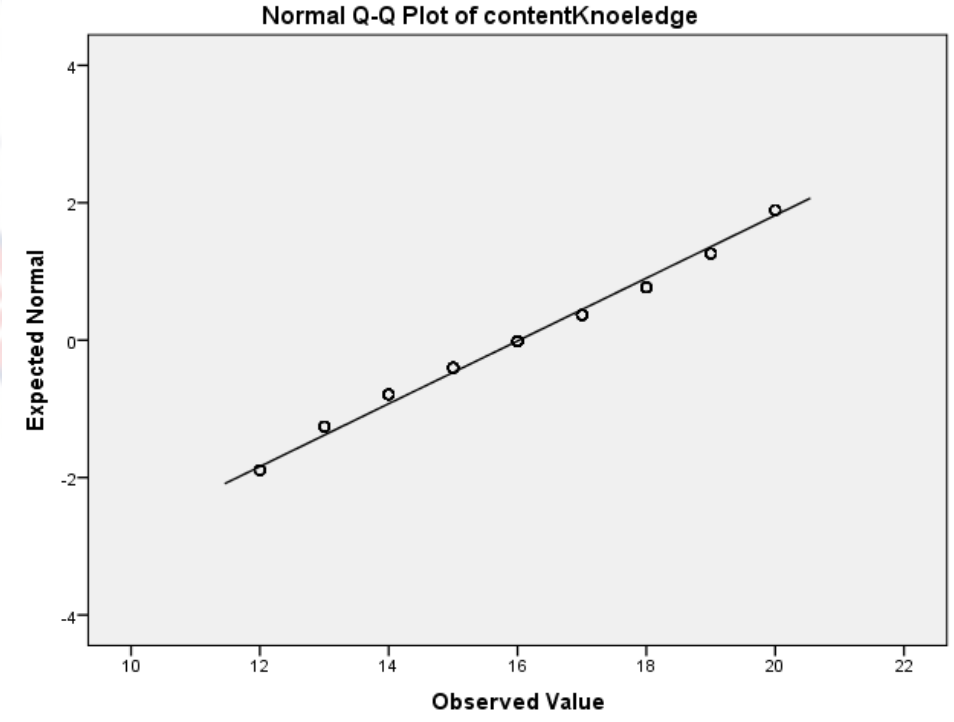


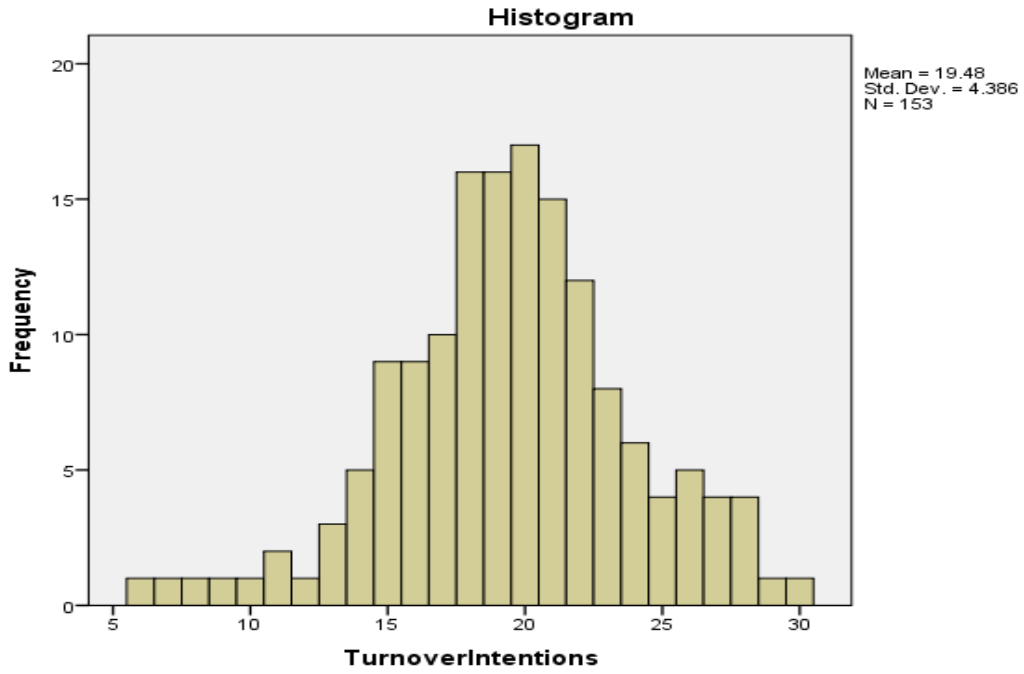


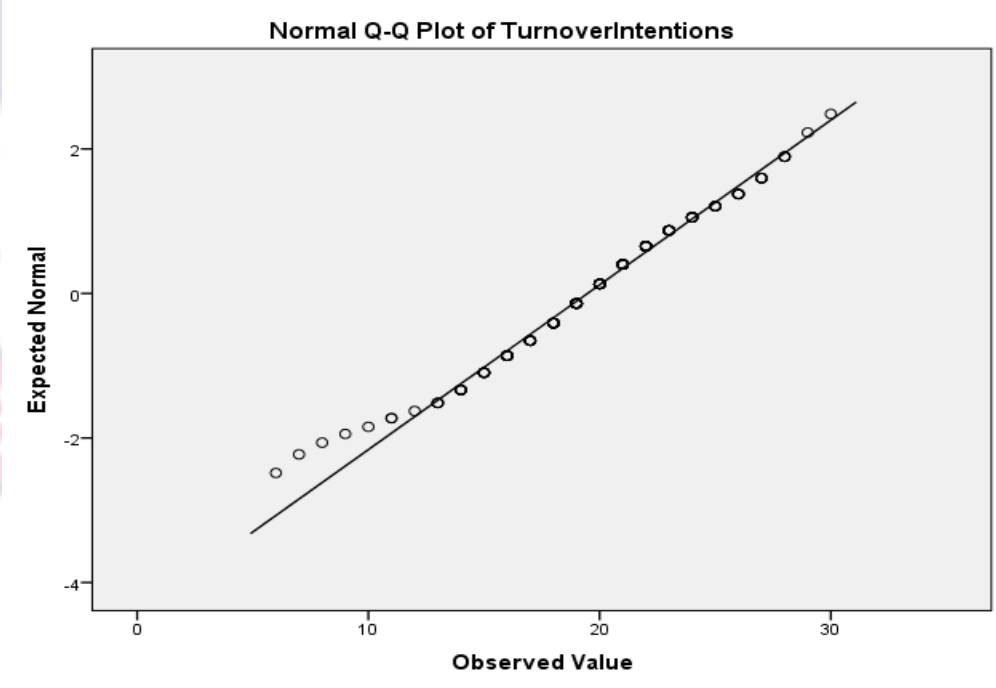












APENDIX C

RELIABILITY TEST OF PILOT TESTING

Reliability

Scale: Technological

Reliability Statistics

Cronbach's Alpha	N of Items
.897	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I know how to solve my own technical problems	18.81	17.770	.556	.901
I can learn technology easily.	18.63	18.242	.809	.875
I keep up with important new technologies.	18.56	18.190	.682	.885
I frequently play around with the technology.	18.69	17.641	.651	.888
I know about a lot of different technologies.	18.75	17.419	.854	.868
I have the technical skills I need to use technology.	18.88	15.597	.803	.870
I have had sufficient opportunities to work with different technologies	18.94	17.222	.663	.887

Scale: Pedagogical

Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.891	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I know how to assess student performance in a classroom.	19.91	12.539	.522	.893
I can adapt my teaching based upon what students currently understand or do not understand.	19.97	11.064	.732	.870
I can adapt my teaching style to different learners.	19.88	11.016	.768	.866
I can use a wide range of teaching approaches in a classroom setting.	19.88	11.532	.704	.874
I can assess student learning in multiple ways.	19.75	10.968	.652	.881
I am familiar with common student understandings and misconceptions.	20.09	10.604	.799	.861
I know how to organize and maintain classroom management	19.84	11.233	.652	.880

Reliability

Scale: Content

Reliability Statistics

Cronbach's Alpha	N of Items
.861	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I have a deep and wide understanding of the component in the subject I teach	13.41	5.991	.593	.852
I know about various examples in my subject area that applies in the real world.	13.41	5.152	.713	.824
I have sufficient knowledge about the subject I teach	13.44	5.996	.667	.836
I can reason in my subject area	13.41	5.088	.855	.784
I have various ways and strategies of developing my understanding in my subject area	13.34	5.975	.584	.854

Reliability

Overall TPARK

Reliability Statistics

Cronbach's Alpha	N of Items
.886	19

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I know how to solve my own technical problems	58.78	65.660	.363	.887
I can learn technology easily.	58.59	66.894	.459	.882
I keep up with important new technologies.	58.53	63.999	.624	.877
I frequently play around with the technology.	58.66	64.555	.489	.882
I know about a lot of different technologies.	58.72	65.951	.482	.882
I have the technical skills I need to use technology.	58.84	61.878	.572	.879
I have had sufficient opportunities to work with different technologies	58.91	62.346	.611	.877
I know how to assess student performance in a classroom.	58.53	68.644	.346	.885

I can adapt my teaching based upon what students currently understand or do not understand.	58.59	67.926	.334	.886
I can adapt my teaching style to different learners.	58.50	64.452	.662	.876
I can use a wide range of teaching approaches in a classroom setting.	58.50	66.323	.531	.880
I can assess student learning in multiple ways.	58.38	63.855	.616	.877
I am familiar with common student understandings and misconceptions.	58.72	65.047	.560	.879
I know how to organize and maintain classroom management	58.47	67.676	.336	.886
I have a deep and wide understanding of the component in the subject I teach	58.50	64.581	.650	.877
I know about various examples in my subject area that applies in the real world.	58.50	63.871	.593	.878
I have sufficient knowledge about the subject I teach	58.53	66.644	.507	.881
I can reason in my subject area	58.50	65.290	.544	.880
I have various ways and strategies of developing my understanding in my subject area	58.44	66.706	.445	.883

Reliability

Scale: Turnover Intentions

Reliability Statistics

Cronbach's Alpha	N of Items
.867	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
How often have you considered leaving your job?	16.44	23.931	.717	.835
To what extent is your current job satisfying your personal needs?	16.63	26.629	.662	.846
How often are you frustrated when not given the opportunity at work to achieve your personal work-related goals?	16.41	24.959	.706	.838
How often do you dream about getting another job that will better suit your personal needs?	16.03	23.451	.759	.827

How likely would you accept another job at the same compensation level should it be offered to you?	16.03	25.322	.661	.845
How often do you look forward to another day at work?	15.97	28.031	.489	.873

Reliability

Scale: Overall Instrument

Reliability Statistics

Cronbach's Alpha	N of Items
.887	25

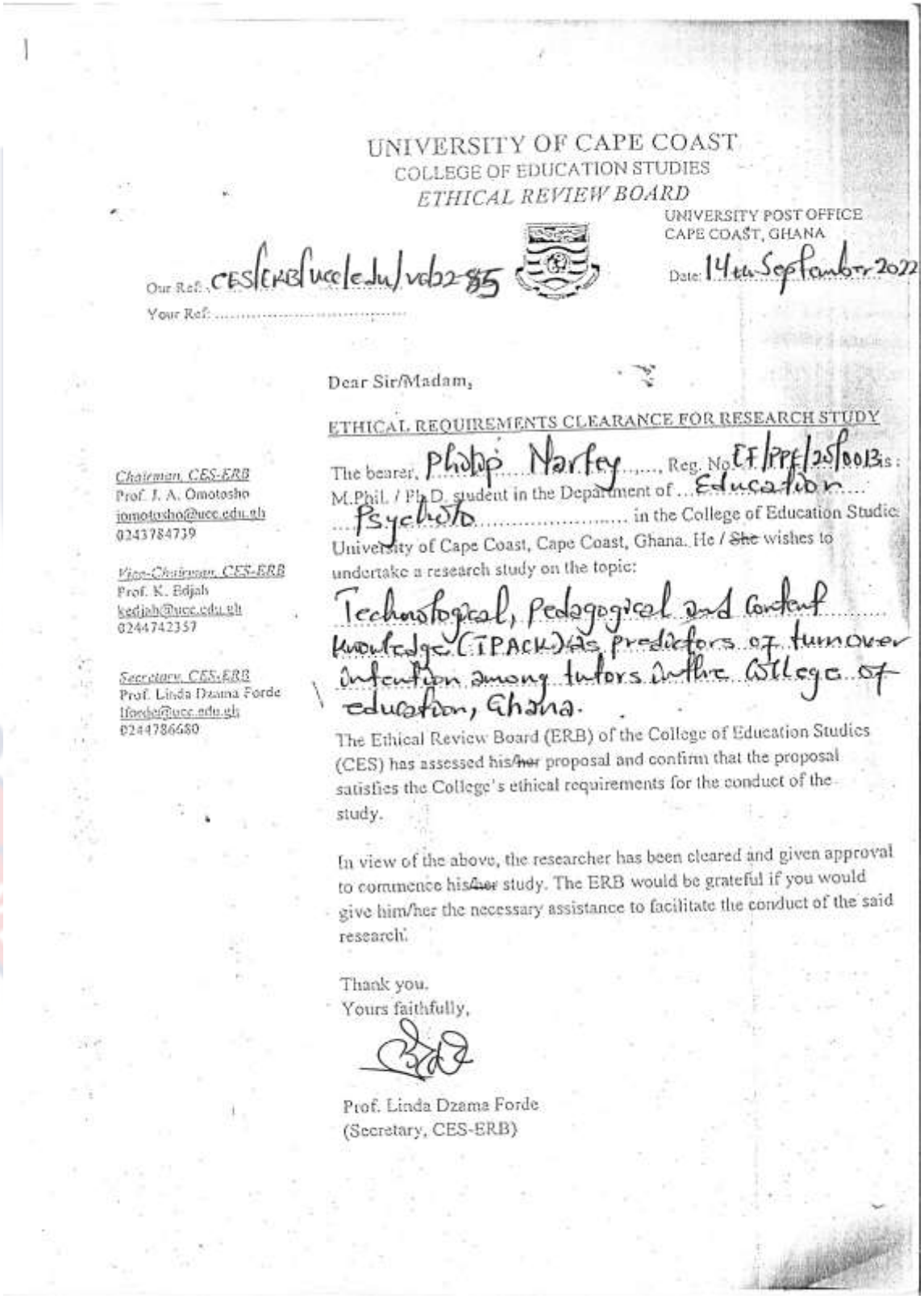
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I know how to solve my own technical problems	78.28	136.338	.319	.887
I can learn technology easily.	78.09	136.668	.477	.883
I keep up with important new technologies.	78.03	133.515	.582	.880
I frequently play around with the technology.	78.16	134.846	.431	.884
I know about a lot of different technologies.	78.22	136.757	.415	.884
I have the technical skills I need to use technology.	78.34	131.717	.491	.882
I have had sufficient opportunities to work with different technologies	78.41	133.926	.446	.883
I know how to assess student performance in a classroom.	78.03	137.967	.453	.884

I can adapt my teaching based upon what students currently understand or do not understand.	78.09	136.668	.443	.884
I can adapt my teaching style to different learners.	78.00	134.194	.612	.880
I can use a wide range of teaching approaches in a classroom setting.	78.00	136.581	.499	.883
I can assess student learning in multiple ways.	77.88	132.887	.599	.880
I am familiar with common student understandings and misconceptions.	78.22	134.176	.568	.881
I know how to organize and maintain classroom management	77.97	136.741	.416	.884
I have a deep and wide understanding of the component in the subject I teach	78.00	138.000	.372	.885
I know about various examples in my subject area that applies in the real world.	78.00	134.516	.491	.882
I have sufficient knowledge about the subject I teach	78.03	139.386	.317	.886
I can reason in my subject area	78.00	136.516	.433	.884
I have various ways and strategies of developing my understanding in my subject area	77.94	136.577	.453	.883

How often have you considered leaving your job?	78.28	128.209	.460	.884
To what extent is your current job satisfying your personal needs?	78.47	128.257	.590	.879
How often are you frustrated when not given the opportunity at work to achieve your personal work-related goals?	78.25	124.065	.664	.877
How often do you dream about getting another job that will better suit your personal needs?	77.88	129.468	.418	.886
How likely would you accept another job at the same compensation level should it be offered to you?	77.88	131.597	.382	.887
How often do you look forward to another day at work?	77.81	128.157	.558	.880

APENDIX D: ETHICAL CLEARANCE



UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
ETHICAL REVIEW BOARD

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: CES/ERB/ucc/edu/vol2/85 Date: 14th September 2022

Your Ref: .....

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY

The bearer, Philip Narfey ..... Reg. No. EF/PPE/25/0013 is a M.Phil. / Ph.D. student in the Department of ... Education ... ... Psychology ..... in the College of Education Studies, University of Cape Coast, Cape Coast, Ghana. He / ~~She~~ wishes to undertake a research study on the topic:

Technological, Pedagogical and Content Knowledge (TPACK) as predictors of turnover intention among tutors in the College of education, Ghana.

The Ethical Review Board (ERB) of the College of Education Studies (CES) has assessed his/~~her~~ proposal and confirm that the proposal satisfies the College's ethical requirements for the conduct of the study.

In view of the above, the researcher has been cleared and given approval to commence his/~~her~~ study. The ERB would be grateful if you would give him/her the necessary assistance to facilitate the conduct of the said research.

Thank you.
Yours faithfully,

Prof. Linda Dzama Forde
(Secretary, CES-ERB)

Chairman, CES-ERB
Prof. J. A. Omotosho
jomotosho@ucc.edu.gh
0243784739

Vice-Chairman, CES-ERB
Prof. K. Edjah
kedjah@ucc.edu.gh
0244742357

Secretary, CES-ERB
Prof. Linda Dzama Forde
lforde@ucc.edu.gh
0244786680

APPENDIX E : LETTER OF INTRODUCTION

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS
DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Telephone: 0332091697
Email: dep@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref:

Your Ref:

15Th September, 2022

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

THESIS WORK
LETTER OF INTRODUCTION
MR. PHILIP NARTEY

We introduce to you Mr. Nartey, a student from the University of Cape Coast, Department of Education and Psychology. He is pursuing a Master of Philosophy Degree in Educational Psychology and he is currently at the thesis stage.

Mr. Nartey is researching on the topic: **"TECHNOLOGICAL, PEDAGOGICAL AND CONTENT KNOWLEDGE AS PREDICTORS OF TURNOVER INTENTIONS AMONG TUTORS IN THE COLLEGE OF EDUCATION, GHANA."**

He has opted to collect or gather data at your institution/establishment for his thesis work. We would be most grateful if you could provide him with the opportunity and assistance for the study. Any information provided would be treated strictly as confidential.

We sincerely appreciate your co-operation and assistance in this direction.

Thank you.

Yours faithfully,

Gloria Sagoe (Ms.)
Chief Administrative Assistant
For: **Head**