

**UNIVERSITY OF GHANA**

**(College of Humanities)**



**ACCOUNTING EDUCATION: ASSESSING THE POTENTIAL FOR  
AND THE BARRIERS TO DEPLOYING VIRTUAL WORLDS IN  
LEARNING AND TEACHING OF ACCOUNTING**

**BY**

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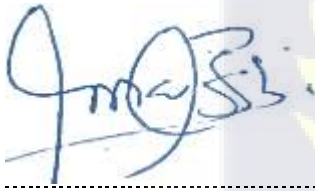
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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,  
LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT  
FOR THE AWARD OF PHD IN ACCOUNTING DEGREE.**

**DECEMBER, 2023**

## DECLARATION

I, the undersigned, hereby declare that this thesis is the product of my own original research and has not been previously submitted, by either myself or any other individual, for the conferment of a degree at any university. All references cited within this thesis have been duly acknowledged. I accept full responsibility for any errors, omissions, or inaccuracies that may be present in this research.



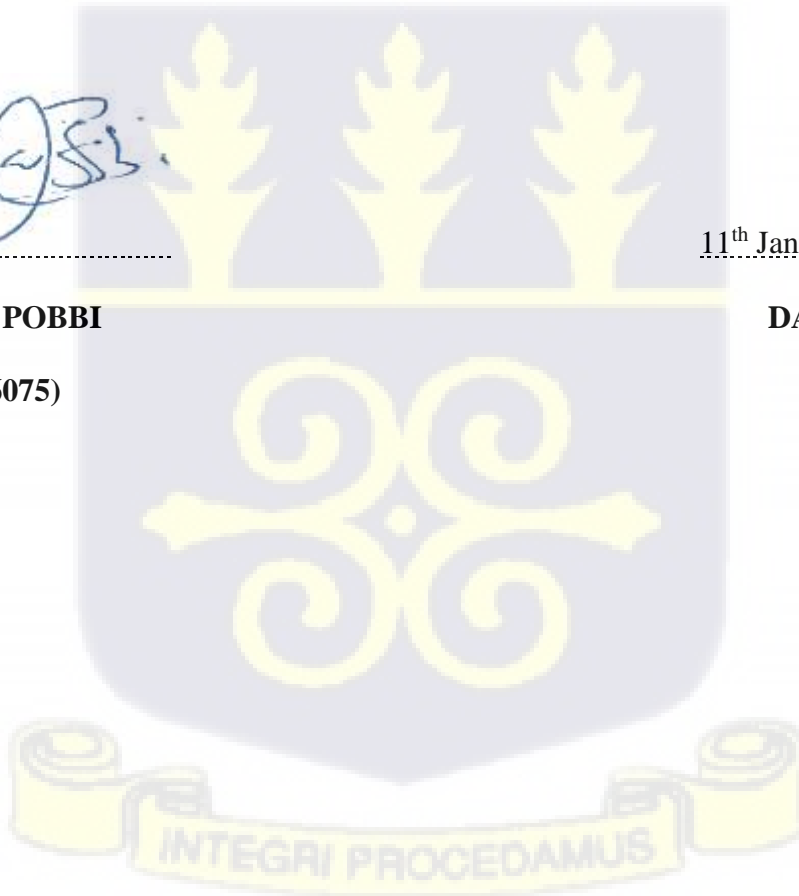
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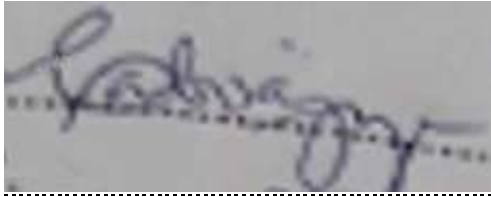
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## CERTIFICATION

I, the undersigned, hereby certify that this thesis was supervised in accordance with the guidelines laid down by the University.



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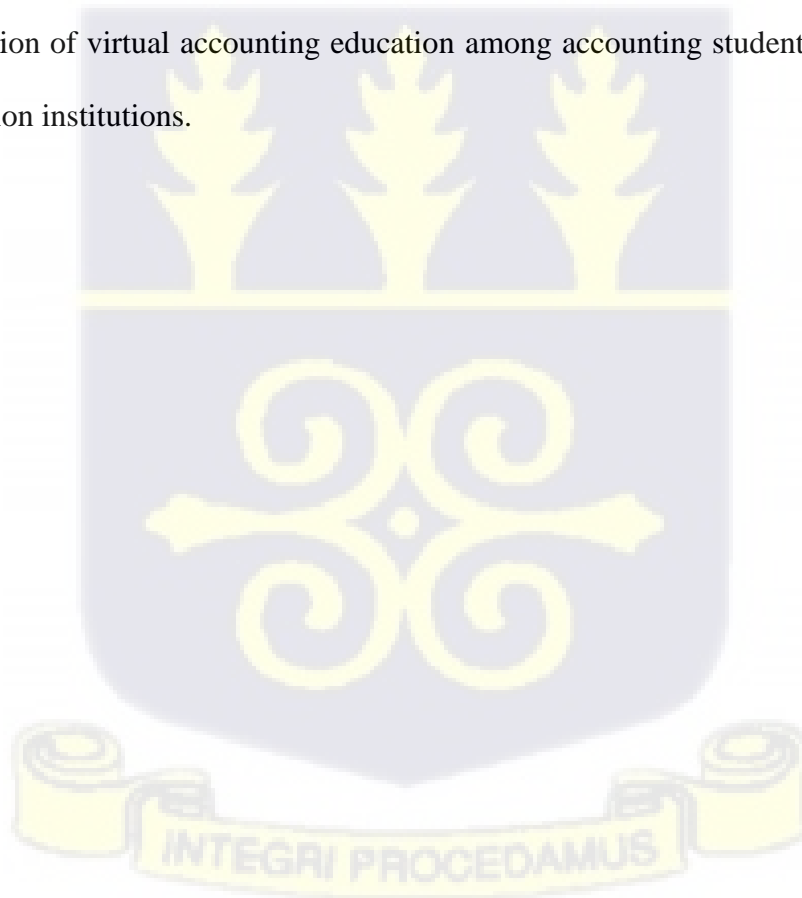
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## ABSTRACT

Information and Communication Technology (ICT), with a specific attention on virtual learning, has emerged as a transformative approach to teaching and learning in higher education. This approach is significantly influencing the educational practices across disciplines, including accounting, a profession essential for training of accountants with necessary skills and competencies to ensure sustainable economic growth. Despite the increasing prominence of virtual accounting education, a significant gap remains in the academic literature on the factors influencing the effective adoption of innovations within higher educational institutions in developing economies. This study aimed at providing a comprehensive understanding of virtual accounting education, by exploring the potential benefits and challenges associated with its implementation in Ghanaian universities. Additionally, the study examined the main factors influencing the adoption of virtual accounting education to develop an advanced framework for innovation adoption among accounting students and lecturers. The study was grounded in an integrated theoretical framework that synthesizes the Theory of Planned Behavior (TPB), the Diffusion of Innovations Theory (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT). A cross-sectional and sequential explanatory mixed-methods design, which combined surveys of accounting students and lecturers with interviews of academic administrators were employed in the collection of the primary data from the four public universities. The quantitative data were analysed using descriptive statistics and structural equation modeling, while the qualitative data from the interviews were analysed using the thematic analysis. The findings revealed a generally positive attitude among accounting students and lecturers on the adoption of virtual accounting education, in spite of significant

challenges including inadequate physical infrastructure, resistance to change, and limited literacy. This study also found that the adoption behaviour of accounting students in public universities is significantly influenced by key factors including the course, individual characteristics, social influence of instructors, and facilitating conditions in the various institutions. Based on the findings, the study recommends to management of universities to prioritize the development of the necessary physical infrastructure, ensure reliable internet access, and address the digital divide between students and lecturers. In addition, this study emphasised on the importance of providing ongoing training and technical support for all stakeholders as well as implementing various incentive and reward schemes, to facilitate the successful adoption of virtual accounting education among accounting students and lecturers in higher education institutions.



## DEDICATION

This thesis is dedicated to my beloved parents, Apostle Joseph Asamani Poggi and Mrs. Cordelia Poggi, whose immense support and prayers have been invaluable throughout my academic journey. I also dedicate this work to my siblings and my dear children, Patrick and Patricia Kumah,



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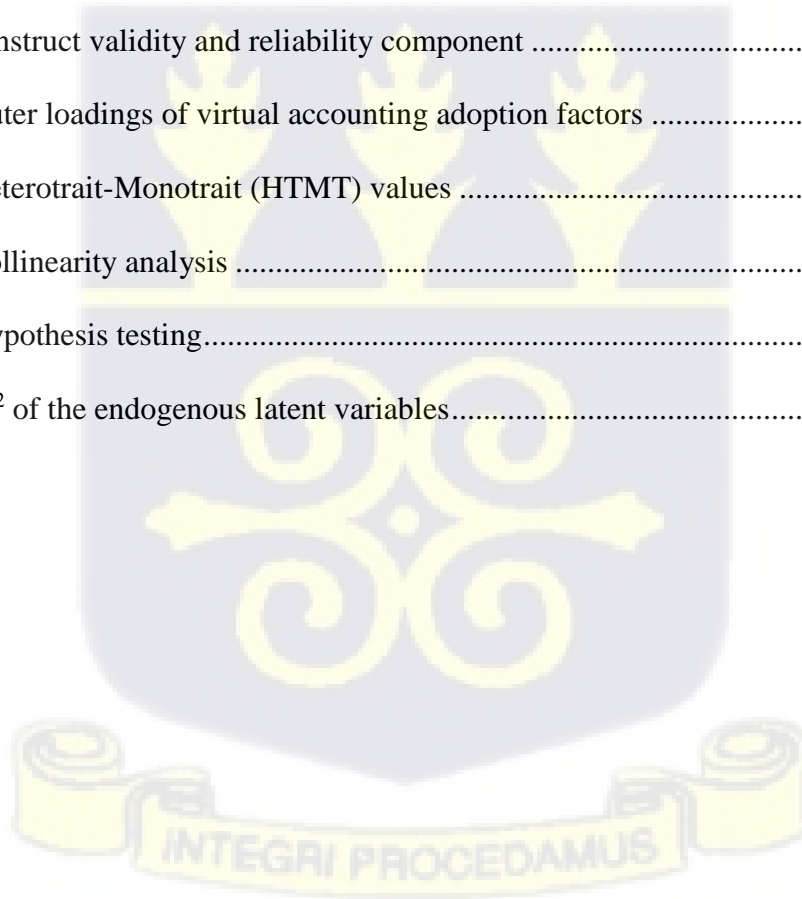
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## LIST OF ABBREVIATIONS

ACCA	Association of Chartered Certified Accountants
AVL	Adoption of Virtual Learning
AVE	Average Variance Extracted
CD	Course Dimension
COVID-19	Coronavirus Disease
DOI	Diffusion of Innovation Theory
E-learning	Electronic Learning
GALOP	Ghana Accountability for Learning Outcomes Project
(HTMT)	Heterotrait - Monotrait
ICT	Information Communication Technology
ID	Individual Dimension
IFAC	International Federation of Accountants
IND	Instructor Dimension
ISD	Institutional Dimension
LMS	Learning Management Systems
MoE	Ministry of Education
NFI	Normed Fit Index
OCM	Online Course Materials
OECD	Organisation for Economic Co-operations and Development
PLS	Partial Least Square
R <sup>2</sup>	Coefficient of Determination
SD	Standard Deviation

SE	Standard Error
SEM	Structural Equation Modeling
SPSS	Statistical Package for Social Science
SRMR	Standard Root Mean Square Residual
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UCC	University of Cape Coast
UEW	University of Education, Winneba
UG	University of Ghana
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPSA	University of Professional Studies
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
VL	Virtual Learning
VLM	Virtual Learning Mode



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

Over the past few decades, the world has experienced significant technological advancements, with the internet emerging as the most transformative technological innovation (Kamal et al., 2020). The significant development of information technologies, such as Artificial Intelligence (AI), robotics, blockchain and cloud-computing has shifted the global economies from an industrial model based on manufacturing to one increasingly driven by information. According to a report by H-UTokyo Lab. (2020), communication technologies and digital information have become indispensable in both professional and personal domains, enabling collaboration, the exchange of ideas, and the creation of new business opportunities. In the education sector, information technologies are driving a profound transformation in the teaching and learning process, reshaping both the content and delivery of tertiary education and leading to significant shifts in teaching practices (Omar & Hamada, 2022). In this context, many universities and colleges are embracing modern technologies, particularly the internet, and increasingly adopting virtual learning platforms to enhance the instruction of accounting courses.

The COVID-19 pandemic has also played a significant role in accelerating the adoption and implementation of online learning. The academic literature has shown that, the pandemic caused the largest disruption in the history of education, affecting students and faculty members worldwide. As reported by the UNESCO (2020), the education of over

1.5 billion students was disrupted by COVID-19 pandemic, with more than 110 countries forced by the pandemic to implement various remote and online learning programs as a necessary measure to contain the spread of the virus. In a similar study, Hill et al., (2023) argued that the transition to online education during the pandemic was both abrupt and inevitable, as educators had no option than quickly embracing digital technologies to ensure continuity of teaching and learning amidst lockdowns and social distancing.

In the literature, numerous researchers and scholars have presented different and varying definitions to virtual or online education. For example, Imran & Cheikh (2012) described the virtual learning process as an approach to learning and instruction that leverages digital technologies to facilitate communication and collaboration in an educational environment. The OECD (2010) explained the concept of virtual learning to involve a dynamic application of innovative technologies within the pedagogical practices to augment and facilitate learning in school organisations. Furthermore, other interrelated terms, which include distance education, online learning, e-learning, computer-based and electronic learning have been utilised in defining the process of virtual education. The online learning process can also be accomplished either through blended learning, which combines computer-mediated instruction with traditional classroom teaching, or completely through the Internet as a form of education (Barbour, et al., 2011).

The growing enthusiasm for virtual learning among both accounting students and educators is mostly associated with the numerous benefits and opportunities it offers to individuals and institutions. Eze et al., (2020) indicated that, the advantages of virtual learning included the prompt sharing of educational resources, fostering collaborative

learning, and promoting greater autonomy in students' learning processes. This aligns with the broader literature suggesting that digital technologies have the ability to enhance engagement and support deeper learning through experiential activities (Hwang & Chien, 2022; Salloum et al., 2024). Online education also promotes a significant improvement in students' attitudes toward learning, boosting both engagement and learning outcomes (Karaoglan-Yilmaz et al., 2023). There is also a unique opportunity for innovative technologies to create interactive, immersive learning experiences, which transcend the limitations of traditional face-to-face education (Siham et al., 2024).

Even though virtual education presents significant possibilities and benefits, its adoption and implementation in higher education institutions have been a daunting task with serious challenges and obstacles. These limitations as reported by Siham et al., (2024) stemmed from the attempt by educators to merely replicate the traditional teaching methods in an online format, without fully leveraging the capabilities of virtual learning technologies. Cloete (2017) also found that, the implementation of innovative technologies within the classroom settings was a very complex activity, particularly, for higher education institutions in the Sub-Saharan African Region. The region is confronted with several challenges, including the lack of physical resources and infrastructure, which not only increases existing inequalities but also promoting new forms of exclusion and leading to greater risk to both students and faculty members in the Sub-Saharan African Region. Additionally, Aristovnik et al., (2020) reported that students faced greater difficulty concentration during virtual classes compared to in-person sessions, resulting in a decline in academic performance. Singh & Meena (2024) also emphasised on the difficulty in ensuring accessibility for all students, maintaining consistent quality

standards, and addressing cognitive dissonance experienced by learners as the challenges constraining the effective integration of online education into higher education in India

To address the challenges associated with adopting innovation within the educational sector, the Ghanaian government in collaboration with academic institutions have undertaken important policy and infrastructural investments, to improve on the digital literacy among educators and students. For instance, the Ghana ICT for Accelerated Development (ICT4AD) Policy, launched in March 2003 was to serve as a national framework, which established the Ghanaian government's commitment to transitioning the nation into a knowledge-based economy while ensuring that citizens benefit from advancements in educational innovation (MoE, 2015). Additionally, the government implemented a policy to distribute one laptop per student, aiming to increase access to digital resources for students and educators across diverse academic disciplines nationwide (MoE, 2012).

Despite, the various initiatives and policy efforts by the government, most academic institutions in the country continue to experience sustainability related issues as a results of the increasing challenges associated with the integration of virtual learning technologies in the classrooms. An empirical study conducted by Antwi et al., (2018) revealed that, online education was still at an early stage of implementation in Ghana with most school organizations experiencing many challenges with its adoption and usage. The broader literature have also suggested that implementation educational technologies were not fully embraced before the COVID-19 pandemic, which compelled academic institutions to transition into the virtual mode of education. In addition, Almaiah et al.,

(2020) argued that, many universities have only implemented the online teaching and learning methodologies to facilitate academic activities during the period of closures of school organisations and universities.

The above-mentioned limitations of online learning are significantly influencing the quality of accounting education across the globe. The accounting education literature have shown that, as rapid advancements in virtual learning have transformed the accounting profession, creating a greater requirements for a workforce skilled in advanced learning technologies. However, the adoption of these innovations into accounting curricula has been relatively slow, resulting in graduates who are inadequately equipped and trained to meet the evolving demands of the industry (Zin et al., 2024). This aligns with the findings by Letica et al., (2022), who argued that accounting education required for contemporary business world, should significantly concentrate on the practical application of accounting standards and legal frameworks, under the guidance of an instructor. However, shifting this approach of education to online mode of education promotes significant challenges in terms of organization, creativity, and execution, thereby making it important to ensure that students acquire the same depth of knowledge as they would in the conventional mode of education. In this regard, Asonitou (2020) suggested for accounting educators to ensure the adequate training of the next generation of accounting professionals by bridging the gap between the current issues, accounting curriculum design and instruction of accounting programmes in academic institutions.

To improve on the quality of accounting education, it is necessary to evaluate the feasibility and effectiveness of integrating innovative technologies into teaching and learning processes. Therefore, this study sought to gain in-depth understanding of the potential benefits and limitations of virtual accounting education, while evaluating the significant factors that contribute to its successful adoption in higher education institutions. To achieve the objectives of the study, the perspectives and attitudes of accounting students and lecturers from various public universities actively involved in the virtual learning process were examined. This insight is expected to guide the development of comprehensive strategies and interventions to improve the quality of accounting education. Furthermore, the study is aimed at guiding policy decisions on integrating technology into accounting curricula, ensuring that educational institutions remain aligned with the evolving demands of the industry.

## **1.2 Motivation for the Study**

In recent years, the introduction of innovative technologies into accounting education have received significant academic attention from researchers and educational practitioners, with several empirical studies such as (Muthuprasad, 2021; Mellieon & Robinson, 2020; Baczek et al., 2021; Bali, 2018; Abdelmola et al., 2021; and Parsons et al., 2019) investigating several dimensions related to virtual accounting education in higher education. For instance, Muthuprasad (2021) investigated the perceptions of students in Indian universities towards the adoption of online learning technologies in accounting education, while Mellieon & Robinson (2020) also examined the perceptions and attitudes of faculty members in academic institutions towards the integration of instructional technologies into the teaching and learning process in the United States of

America. Similarly, Abdelmola et al., (2021) investigated experiences and perspectives of faculty members on the potential advantages and limitations to the adoption and implementation of online accounting education.

Although the empirical literature on the integration of technologies into teaching and learning have grown in recent years, a significant literature gap remains in research examining the perspectives of expert evaluators and academic administrators, a key stakeholder group in higher education that is mainly responsible for the design, development, and evaluation of these technologies. Most prior research has predominantly focused on the perceptions of students and faculty, often neglecting the insights of expert evaluators, whose involvement is essential for ensuring the quality, effectiveness, and long-term sustainability of virtual learning systems. In an empirical study by Mtebe (2020), it was revealed that the focus on students and lecturers, as the primary users of online accounting education, often overlooked the fact that accounting students and lecturers lacked the necessary expertise to identify and address critical instructional challenges associated with these technologies. The study suggested for the conducting of empirical studies to investigate the views and experiences of expert evaluators, who are represented by individuals with the specialized knowledge and competencies needed to address the systemic issues in adopting virtual accounting education. Similarly, Dayagbil et al., (2021) argued for the utilization of a multi-stakeholder approach to investigating the complexities of innovation adoption, while suggesting that this research approach is important for a successful adoption of virtual accounting instruction in academic institutions.

In addition, a significant number of studies conducted by researchers, including (Basioudis et al., 2012; Al-Okaily et al., 2023; and Corbeil & Corbeil 2015) have established that the obstacles to the adoption and implementation of virtual accounting education are particularly due to socio-economic, political, resource availability, and socio-cultural differences between and within societies. In a study examining the socio-cultural factors influencing e-learning delivery in Saudi Arabia, Luppicini & Walabe (2021) argued that the challenges to online learning is related to the difficulty in separating individual factors from the societal values and norms that impact the organizational practices within specific cultural settings. Therefore, given the unique context of the educational sector in Ghana with the difference outlook in terms of the social, economic and cultural influences, there is a strong need to investigate the significant factors influencing stakeholders' intention to adopting virtual accounting education in tertiary institutions.

Finally, most studies on the adoption of virtual accounting education have relied on rigorous quantitative methodologies, such as regression, analysis of variance, and path analysis, to reproduce empirical results in different contexts, without delving into and understanding the underlying causes of the observed outcomes. Based on this, Apostolou et al., (2018) suggested for studies that employ an exploratory design to examine the various factors influencing the adoption of virtual learning systems in accounting education in different geographical settings. Similarly, Sarea et al., (2021) argued for academic studies to employ qualitative methods to identify the significant factors influencing online education. In examining the perceptions of undergraduate accounting students towards the transition to virtual education, Mardini & Mah'd (2022) also

recommended for empirical studies that employ qualitative approaches, such as interviews as well as focus group discussions, to provide deeper insights and understanding into factors influencing the adoption of online learning in academic institutions.

In relations to the above arguments, this study was aimed at addressing gaps in the literature by examining the potential benefits and challenges of virtual accounting education from the diverse perspectives of relevant stakeholder groups in higher education. Furthermore, the existing technology adoption frameworks often fail to account for the unique socio-economic, infrastructural, and institutional contexts of developing economies such as Ghana. The academic literature has shown that, in the absence of a context-specific adoption model, educational decision-makers would be confronted with significant challenges in designing effective strategies for a successful adoption of virtual accounting education in developing economies. Therefore, this study sought to examine the key factors to the adoption of virtual accounting education and further come out with a tailored framework that provides practical, context-sensitive strategies and measures for successful adoption of virtual accounting education in academic institutions across Ghana.

### **1.3 Research Purpose**

This study was aimed at investigating the salient factors influencing the adoption of virtual accounting education and assessing the significant impact of these factors on the technology adoption behaviours of the key stakeholders of tertiary education. Through the holistic understanding of the diverse perceptions and attitudes of the students,

lecturers, and academic administrators, the current study is aimed at designing and validating a research model for the successful adoption and implementation of virtual accounting education in higher educational institutions across Ghana.

### **1.3.1 The Objectives of the Study**

The following were the specific objectives, guiding the current study:

- To evaluate the current interactivity and engagement with the virtual learning systems among accounting students and lecturers in Ghanaian tertiary institutions.
- To examine the viewpoints and attitudes of both accounting students and lecturers regarding the adoption of virtual accounting education in Ghanaian tertiary institutions.
- To investigate the salient factors influencing the adoption of virtual accounting education among accounting students and lecturers in Ghanaian tertiary institutions.
- To explore the important strategies and measures to facilitate a successful adoption of virtual accounting education among accounting students and lecturers in Ghanaian tertiary institutions.



#### 1.4 Research Questions

The following research questions were developed to guide the achievement of the research objectives:

- What is the current level of interactivity or engagement with virtual learning systems among the accounting students and lecturers in Ghanaian tertiary institutions?
- Does the level of interactivity and engagement with virtual learning systems significantly differ based on the age, gender, and professional experience of accounting students and lecturers?
- What are the viewpoints and attitudes of accounting students and lecturers towards the adoption and implementation of virtual accounting education in Ghanaian tertiary institutions?
- What are the key factors influencing the behavioural intentions of accounting students and lecturers towards the adoption of virtual accounting education in Ghanaian tertiary institutions?
- What are the key strategies and measures to be implemented to promote a successful adoption and implementation of virtual accounting education among accounting students and lecturers in Ghanaian tertiary institutions?

### **1.5 The Significance of the Study**

The findings of this study have significant implications for both theory and practice. It makes important contribution to the growing body of literature on virtual accounting education, a field still in its infant stages and characterized by several unresolved challenges regarding its implementation in developing economies (Segbenya et al., 2023; Buabeng-Andoh, 2021). The accounting education literature have stressed on the need for further research to examine the implementation of virtual learning and the factors shaping the perceptions of students and faculty members toward the adoption of educational innovation in higher education institutions within the distinctive context of developing economies. In response to this gap, the present study investigates the salient factors promoting or hindering the acceptance and adoption of virtual accounting education, in various academic institutions in Ghana.

This study extends the existing literature on virtual accounting education by employing an integrated theoretical framework that combines three well-established theoretical frameworks including the Theory of Planned Behaviour (TPB), which explores how attitudes, subjective norms, and perceived behavioural control influence individuals' behavioural intentions. The Diffusion of Innovations Theory (DOI) investigating ways the characteristics of an innovation systems including the relative advantage, compatibility, complexity, trialability, and observability significant influence the adoption process of the system. Additionally, the Unified Theory of Acceptance and Use of Technology (UTAUT), which recognises the performance expectancy, effort expectancy, social influence, and facilitating conditions as main determinants of stakeholder's acceptance and adoption of new technologies. This research further examines how demographic factors,

such as age, gender, and years of instruction for both students and faculty members, significantly influence engagement and interactivity with online learning systems, making a novel contribution to the literature on virtual accounting education in developing economies.

This study also contributes to the literature by employing a research methodology that deviates from the predominantly quantitative approaches traditionally employed by studies on virtual accounting education (Liu & Zainuddin, 2021; Wen & Wang, 2022; Sarea et al., 2021). This study, situated within the pragmatist paradigm and employing a sequential explanatory mixed-methods design, provides a comprehensive investigation of the key factors that affect the effectiveness of online accounting education. Additionally, the study contributes to the literature by identifying potential strategies and interventions to enhancing the adoption of virtual accounting education in the institutions of higher education.

This study also provides important contributions to practice and policymaking in higher education by presenting in-depth insights into the potential benefits and challenges associated with the implementation and adoption of virtual accounting education. The findings are intended to provide university management with critical information to developing targeted interventions that facilitate the integration of technology into accounting education, while equipping accounting graduates with the skills and competencies required to function in the contemporary world of business. Furthermore, the outcomes of this study have potential applications in the implementation of innovative technologies within other organizations that share similar characteristics with the selected universities. Finally, the study is expected to make a meaningful contribution to the

emerging literature on virtual accounting education by providing insightful recommendations to both researchers and accounting students who are interested in exploring and understanding the factors impacting the adoption and implementation of virtual accounting education.

### **1.6 The Scope of the Study**

This study aimed to examine the key factors influencing the adoption of virtual accounting education in Ghanaian universities. To achieve this, primary data was collected from a diverse range of participants, including accounting students, faculty members, and academic administrators from public universities that have actively incorporated virtual learning technologies into their academic curricula. The selected public universities were located in the Greater Accra and Central Regions of Ghana, which are recognized as having the highest concentration of public educational institutions offering accounting programmes at the undergraduate and post-graduate levels of education.

The study specifically targeted public universities that were actively implementing educational innovations in the teaching and learning process. This focus was driven by the fact that most private universities in the country operate under the supervision of public universities, limiting their autonomy in important areas including curriculum development, teaching methodologies, and the introduction of virtual learning technologies into educational practices. In contrast, public universities have greater autonomy and authority making them more suitable for this study because of the

flexibility in implementing innovative teaching approaches, including the adoption of virtual accounting education.

Finally, the selection of four public universities for this study was informed by Yin's (2018) recommendation, which suggests that multi-case research achieves an optimal balance in relations to in-depth data collection and practical manageability of the data, when limited to between two - four case institutions. The public universities including the University of Education, Winneba (UEW), University of Ghana (UG), University of Cape Coast (UCC), and University of Professional Studies, Accra (UPSA) were further selected based on the extensive range of undergraduate and postgraduate accounting programs, as well as their proactive approach to implementing virtual accounting education. In other words, the scope of this study aimed to facilitate a comprehensive understanding of the research phenomenon across diverse academic settings, providing valuable insights for other educational institutions, including private universities, interested in the adoption and implementation of innovative technologies in higher education.

### **1.7 Delimitations of the Study**

This cross-sectional study is delimited by several factors, including time period, geographical, and disciplinary constraints, with a specific attention on accounting education. The participants of the study were exclusively drawn from accounting students, faculty members, and academic administrators within public universities in Ghana. Consequently, the limited scope of the research necessitates caution in generalizing its findings to other contexts, as the results may not comprehensively

represent the perspectives and attitudes of stakeholders across diverse geographical or academic settings.

Furthermore, the study's methodology relied mainly on survey instrument for data collection, which may have limited its ability to fully capture in-depth views and experiences of participants in relations to the adoption and implementation of virtual accounting education, the following steps were taken to address these limitations. A multi-stage data collection approach was implemented, combining closed-ended and open-ended survey questions with semi-structured interviews conducted with administrators. In addition, an analysis of institutional documents and publications was undertaken to corroborate and enrich the quantitative findings, ensuring a better understanding of the adoption of virtual accounting education within the Ghanaian context.

Finally, while the study assumes that the research purpose and questions were not sensitive or controversial, it acknowledges the potential for some interview responses to be influenced by participants' personal beliefs, cultural norms, and societal values. However, through the consistent triangulation of interview and survey data, complemented by the analysis of institutional documents, the study ensured that the gathered information offers a valid and reliable representation of the issue under investigation.

### **1.8 Chapter Disposition**

The thesis is organized into six main chapters. Chapter one presented a detailed introduction to the study, providing the background information, defining the research

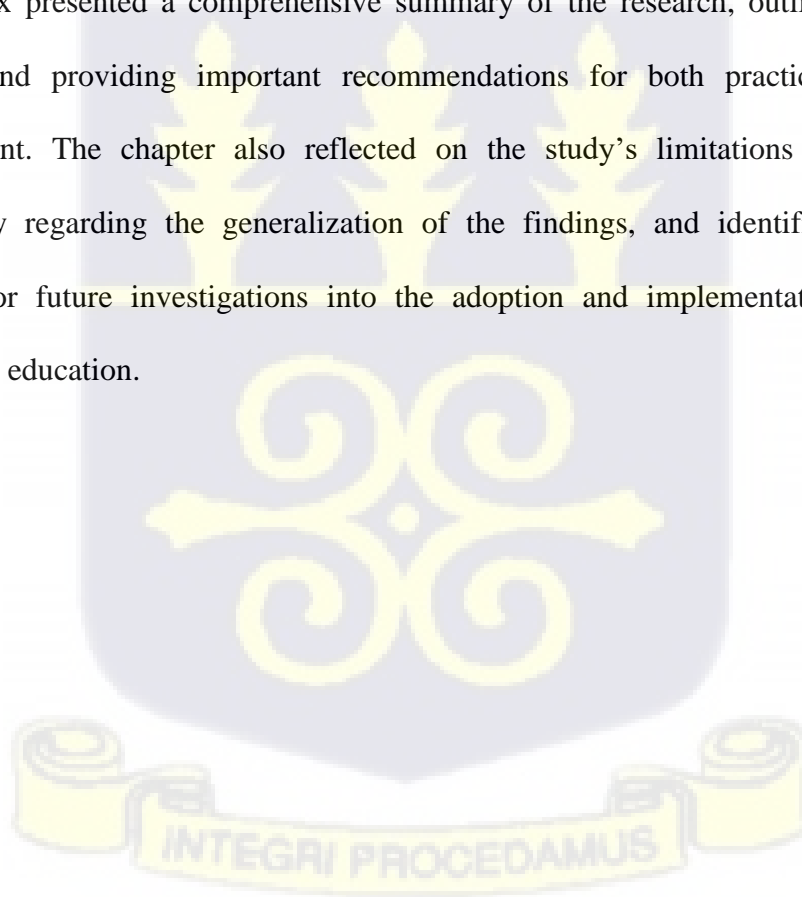
purpose, and articulating the significance of the study. It also outlines the research objectives and questions that guided the research. Chapter two also presented a comprehensive review of the empirical literature, while also developing the conceptual framework upon which the research is grounded. This chapter explores the nature and scope of virtual accounting education, examines the benefits and challenges associated with the adoption of innovative technologies, and critically reviews related academic studies. It also identifies the existing knowledge gaps that the current study seeks to address and investigate further.

Chapter three was dedicated to providing a justification and explanation of the key theoretical models and frameworks selected for this study. It provided an in-depth understanding of the Theory of Planned Behaviour (TPB), the Diffusion of Innovation (DOI) theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT). Additionally, the chapter examined how these theories collectively informed and supported the investigation into the adoption of innovative technologies in higher education.

Chapter four presented a detailed discussion of the methodological approaches and research designs employed in the study. It outlined the primary research paradigms and justified the adoption of a pragmatic worldview for this research. The chapter further explained the selected research approaches, providing a rationale for the choice of a sequential explanatory mixed-methods approach. Additionally, the chapter addressed the population of the study, sampling methods, and techniques for data collection and analysis.

Chapter five presented a comprehensive analysis of the findings of the research, discussing the outcomes in relations to both theoretical and empirical literature. The chapter commenced with an analysis of the demographic characteristics of student and faculty participants, followed by the statistical findings from testing of the model, which examined the significant relationships among the various constructs in the proposed research framework from the perspectives of both student and faculty participants. The chapter also explored the perspectives of academic administrators in relations to the adoption and implementation of virtual accounting education in Ghanaian universities.

Chapter six presented a comprehensive summary of the research, outlining the main findings and providing important recommendations for both practice and policy development. The chapter also reflected on the study's limitations of the study, particularly regarding the generalization of the findings, and identified significant avenues for future investigations into the adoption and implementation of virtual accounting education.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter was aimed at reviewing the empirical literature on the adoption of virtual accounting education in tertiary institutions. It provided an in-depth discussion on the nature of virtual education, the innovation adoption process, and the factors influencing stakeholders' acceptance and adoption of new technologies. The chapter commenced with a discussion of the evolution of the implementation of innovative technologies in higher education, followed by an analysis of the various definitions, dimensions, and terminologies associated with virtual innovations. Additionally, the chapter examined the benefits and challenges associated with the implementation of online learning, with a focus on the key factors influencing the adoption of virtual learning technologies. The chapter concluded with a synthesis of empirical studies on the adoption of online accounting education, while identifying significant avenues for future research.

#### 2.1 Global Challenges for Accounting Education

A key force driving the expansion of virtual accounting education is the ongoing change in the global business landscape. As the world becomes increasingly interconnected, businesses are presented with both greater opportunities and heightened competition. These global shifts necessitate a transformation in the structure of higher education, as corporate entities and institutions face a growing demand for professional accountants who possess advanced skills and competence. These accountants are required not only for traditional roles in the areas of financial reporting, taxation, and auditing, but also for

increasingly complex international assurance engagements that extend beyond these domains (Pretorius, 2003).

The introduction of digital technologies over the past two decades has been a significant driver of transformation in the global economy. The internet, along with its associated technologies, has expanded the information base, reduced the costs of obtaining information, and enhanced the availability of quality information across various economies. According to the World Bank (2016), this shift serves as the foundation for the future global market, enabling individuals to search for, match, and disseminate high-quality information, thereby fostering greater cooperation among economic participants. Furthermore, the Canadian Institute of Chartered Accountants (2012) emphasized the transformative impact of innovative technologies, noting that information technologies have been crucial enablers of the rapid development of capital markets, with many related financial arrangements being unattainable without these technological advancements.

There is also increasingly demand for higher education institutions to keep pace with technological advancements and to equip students with the essential skills, knowledge, and competencies required to understand and promote the usage of these innovative systems in both their personal and professional lives (UNESCO, 2020a). Supporting this view, Tucker (2014) argued that contemporary accounting students must be prepared to navigate a “multifaceted, multi-tasking, technology-driven world, stressing on the significance of ensuring that every students, regardless of their economic background, have equal to the tools and resources necessary for success in this digital era”

It is therefore important for students training to become professional accountants to engage in online learning classes and gain practical experience through hands-on technological projects, webinars, and discussions that proactively embrace the evolving opportunities within the accounting profession (Kokina & Davenport, 2017). The future of the accountancy profession is thus closely associated with the integration of information technologies into educational curricula at both professional and university levels. In this regard, IFAC (2004) emphasized the importance of developing a range of skills and competencies to address real-world business problems by applying both theoretical knowledge and IT capabilities, which should be the main objectives in professional accounting education.

## **2.2 Development of Virtual Learning**

The institutional development of online learning is deeply rooted in the long history of distance education. While the origins of online education may seem recent, the practice of distance education dates back to the 19th century, with the introduction of the “Penny Post” (a service that allowed letters to be sent anywhere within the UK for just one penny) and the shorthand courses pioneered by Isaac Pitman (Simpson & Anderson, 2012). Educational literature has identified and documented four major technologies: films, television, computers, and the internet, which have significantly shaped and transformed the landscape of education. In the 1940s, cinematic technologies were already being applied in educational settings in advanced countries such as the USA, UK, France, and Canada. For instance, in the USA, the military used film technologies as part of troop training (Rosenberg, 2001). Soon after, television was employed to educate students

across international borders, and by the 1950s and 1960s, educational videos became a prominent feature in public school curricula (Ellington et al., 1993).

Starting in the 1970s, a significant number of empirical studies were designed to investigate the integration of microcomputers for educational purposes. As various application software, such as word processing and spreadsheet programs, emerged, microcomputers became central to the design of academic curricula in higher education institutions. By the late 1990s, the advent of the internet and the World Wide Web dramatically accelerated the adoption and implementation of instructional technologies. During this pivotal era, individuals gained the ability to connect with multiple electronic devices through computer-mediated communication channels, such as emails and chat rooms, further enhancing the reach and impact of educational technologies.

In recent years, the internet has promoted a paradigm shift in education, giving rise to virtual learning, a form of education that has emerged from the development of the internet and incorporates a wide-range of preceding computer-based technologies (Koh & Lim, 2012). As a results, virtual accounting education is fundamentally intertwined with the adoption of innovative technologies, the establishment of robust network infrastructures, human engagement, multimedia technologies, knowledge management frameworks within accounting curricula, as well as the implementation of security protocols and the integration of information technology (Zhang & Nunamaker, 2003).

### **2.2.1 Technology in the Education System of Ghana**

Nations around the world have recognized the immense significance of information and communication technologies (ICT) in promoting socio-economic development. These

cutting-edge technologies play a crucial role in achieving the sustainable development goal of providing equal access to education, a goal particularly critical for developing countries where efforts to bridge economic disparities require substantial innovation, investment, and commitment to education (Sachs et al., 2016). In this regard, the government of Ghana has shown a strong commitment to enhancing its educational system by integrating information technology into teaching and learning processes. To support this integration, the government has developed and implemented two key policy frameworks: the ICT for Accelerated Development (ICT4AD) Policy and the National Telecom Policy, which guide the nation's efforts toward incorporating innovative technologies into education and school administration.

The ICT for Accelerated Development (ICT4AD) Policy, formulated in 2003, outlines the vision and strategic agenda of government of Ghana in transforming the country into an information and knowledge-based society. The policy aims to introduce information technologies to drive economic development across fourteen key sectors, including improving the quality of education, promoting equitable healthcare access, enhancing agricultural productivity, and advancing e-governance. This policy has undergone two significant revisions, in 2006 and 2009, before being finalized in 2015 (Taddes, 2020; MoE, 2015).

The government has demonstrated a strong commitment to the implementation of ICT in education by implementing several national and international policy initiatives. In 2006, Ghana joined other African countries' education ministries in a meeting where they agreed on a ten-year plan to transform the teaching of science and technology across the continent (African Union, 2006). In line with this commitment, the Ministry of Education

launched the “One Laptop per Student” project, initially distributing one thousand laptops to thirty basic schools nationwide. Building on this effort, the government later acquired an additional sixty thousand laptops, which were distributed to junior high schools throughout the country (MoE, 2015).

The global spread of the COVID-19 pandemic led to the closure of schools in Ghana for ten months in 2020, impacting an estimated 9.7 million students across basic, senior high and tertiary levels (The World Bank, 2022). In response to this unprecedented disruption, the Ministry of Education (MoE) and the Ghana Education Service (GES) quickly launched several remote and distance-learning programs, utilizing electronic platforms such as radio, television, and online systems to provide continuous educational opportunities. With financial support from the International Development Association (IDA), the government introduced the Ghana Accountability for Learning Outcomes Project (GALOP), a strategic initiative aimed at mitigating learning losses during school closures. GALOP involved the development and implementation of a Learning Management System, alongside efforts to facilitate virtual education. Given the strong evidence supporting the effectiveness and feasibility of integrating technology into education, the government has expressed its commitment to incorporating innovative technologies across all sectors of the Ghanaian economy.



### 2.3 Conceptual Definitions for Virtual Learning

Virtual learning is mostly associated with the use of networked information and interactive technologies to promote the teaching and learning process. In the educational literature, several related terms have been used to describe this mode of instruction, including computer-based learning, e-learning, web-based learning, collaborative learning, tele-learning, blended learning, and online learning. An early definition provided by the European Commission (2001) described virtual learning as the use of multimedia and network technologies to enhance access to education, improve its quality, and foster the sharing of learning resources, remote exchanges, and collaboration among students. Similarly, O'Malley et al., (2005) defined virtual learning as any learning experience that occurs when individuals are not situated in a predetermined physical location, or when learners take advantage of the opportunities and benefits offered by digital technologies.

Badiee & Kaufman (2014) also expanded on this concept, by defining virtual learning as an innovative method for disseminating knowledge and delivering education through computer-aided electronic technologies, including the internet, email, websites, and CD-ROMs. Similarly, Martin et al., (2022) argued that virtual learning involves a software-based environment designed to manage and facilitate the delivery of educational content and resources. This environment fosters interaction and communication between students and instructors, offering systems that enable immediate feedback on assignments and quizzes.

Pelet & Lacarte (2013) described virtual learning as an open system that enables interaction among participants and provides access to diverse educational resources. In addition, Khan (2005) characterized virtual learning as an innovative approach that utilizes network technologies and learning materials to create a well-designed, student-centered, interactive, and facilitated learning environment. In essence, virtual learning represents a transformative educational model that harnesses technology to manage and deliver instructional content and resources while promoting interaction between instructors and students and ensuring access to a broad array of learning materials within an open system.

#### **2.4 Classification of Virtual Learning**

Virtual education is broadly classified into two categories based on the scheduling of learning events and the nature of user interaction. Hrastinski (2009) posits that virtual learning incorporates both asynchronous and synchronous modalities, often delivered across diverse geographical locations and accommodating varying time constraints. Asynchronous virtual learning, as described by Piskurich (2015), involves self-directed study, allowing learners to interact with educational content at their own pace without requiring the immediate presence of an instructor to provide guidance or clarification. This mode of online education typically employs tools such as emails and discussion boards, enabling collaborative engagement between students and instructors even in the absence of simultaneous online interaction. As a result, students can access learning platforms at their convenience to retrieve instructional materials or communicate with teachers and peers (Hrastinski, 2009).

Synchronous virtual learning is mainly characterized by real-time instruction, where programs are delivered with all participants present online simultaneously. This mode of virtual education enables instructors to facilitate live discussions using network technologies, fostering active engagement between students and instructors. The pedagogical approach often incorporates a range of audio-visual teaching aids; including text, audio, and graphics, to enhance the learning experience (McBrien et al., 2009). Unlike asynchronous learning, synchronous environments offer the advantage of immediate, concurrent interaction among learners and instructors. Moore & Kearsley (1996) indicated that live classroom sessions promotes a sense of excitement and spontaneity absent in delayed interactions. Moreover, synchronous environments allow instructors to provide instant feedback and adapt dynamically to address the evolving needs of students.

## **2.5 Learning Management Systems**

The usage of Learning Management Systems (LMS) in various academic institutions reflects the increasing trend towards integrating technology in education and underscores the numerous benefits of virtual learning technologies in enhancing students' learning experiences and academic outcomes. Abdullateef et al., (2016) define LMS, as web-based applications designed to facilitate the organization, implementation, and assessment of educational activities. These systems, often referred to as distance-learning telematics systems or integrated learning platforms, provide significant advantages. Among their key benefits, LMS enable continuous online interaction and communication between students and faculty, while also offering tools that support learning, course management, collaboration, and resource sharing within an educational setting (Damian et al., 2009).

Academic institutions have access to a wide range of software solutions, broadly classified as either proprietary or open-source systems. Proprietary software are developed and licensed by commercial entities and often require that users to pay a fee for access and usage of the software. The developers of proprietary software focus on ensuring its functionality, feature richness, and adaptability in order to meet the diverse needs of their clientele. Before installation, users are required to accept an End-User License Agreement (EULA), a legally binding contract designed to prevent copyright infringement and outline the terms of use (Hiong, 2005). The examples of widely utilized proprietary software in the market include Blackboard, Desire2Learn, PowerSchool, Litmos, and SchoolWires.

Open-source software contributes significantly to the implementation of virtual education by operating under an “open-source model”, wherein the source code is made publicly accessible and could be redistributed freely, provided appropriate acknowledgment is accorded to the original developers (Pillai & Kevin, 2013). These platforms enable users to modify the source code to meet specific institutional or individual requirements, thereby fostering high levels of customization and adaptability (Sharifov & Mustafa, 2020). This system permits software developers to authorize modifications and redistribution, as long as such adaptations remain non-commercial and do not impede others from further altering the software. The most common examples of the open-source platforms utilized in virtual education include Moodle, Sakai, ATutor, WordPress, and Drupal.

## **2. 6 Innovations Adoption Process**

The introduction of innovative technologies into classroom settings necessitates a structured approach to its effective implementation in institutions of education. The success of any technological innovation is contingent upon its acceptance within an organization and the sustained commitment of users to its application over time (Bhattacharjee, 1998, as cited in Takukder, 2014). To achieve the successful implementation of innovative technologies higher education, it is essential that all stakeholders, including students and faculty, engage in a systematic five-stage implementation process, as outlined by Hopper & Reiber (1995). This integrated process of adoption involves the familiarization, utilization, integration, reorientation, and evolution stages to an effective implementation and usage of educational technologies.

The familiarization stage represents the initial exposure to information systems, where users become acquainted with the innovative technologies, their functionalities, and potential applications within the educational context. The next stage of technology adoption is the utilization phase, which relates to using technology as a supplement to traditional in-person teaching and administrative processes. During this phase, students and faculty may engage with the technology sporadically, often testing its features but without sustained usage beyond initial encounters. Hopper & Reiber (1995) indicated that, the utilization stage usually represents the highest level of adoption for many users of computer-based technologies.

The integration stage, which the third phase of technology adoption, generally occurs when stakeholders intentionally incorporate computer-based technologies into their instructional practices and professional development. At this stage, the technology

becomes a central element of the teaching and learning process, with instructors transitioning to the role of facilitators. Without the use of computers, instructors would face significant challenges in adapting their lessons to other methods of delivery (Rogers, 1999). The fourth stage of the process of adoption, known as reorientation, is a critical phase where instructors are required to reassess and redefine their roles within the classroom. During this stage, computer-based technologies transition from being viewed as supplementary tools to being recognized as essential, integrated components of the teaching and learning process.

The final stage of innovation adoption, known as evolution, is characterized by the continuous growth and adaptation to the evolving needs of both students and faculty within the academic environment. Faculty members reach this stage when they demonstrate a willingness and readiness to adapt their teaching methods and practices to enhance the teaching and learning experience (Jonassen et al., 1994). In this stage, there is a marked increase in engagement and interactivity with the innovative systems, showing a complete integration of these technologies into the teaching and learning process.

### **2.7 The Advantages of Virtual Learning**

The significance of virtual accounting education is widely recognized in academic literature with Dhawan (2020) emphasizing that, technology-enhanced learning that is centered on the student provide increased flexibility in terms of time and location. This flexibility allows students to move beyond the constraints of attending traditional in-person classes at fixed times, which is particularly advantageous for those studying off-

campus (Zahariadis & Voliotis, 2003). Similarly, Casey et al., (2018) highlight that the integration of educational technologies enhances the quality of education by introducing more active and innovative learning methods. In the online learning environment, course content and resources are shared through multimedia tools, enabling students to progress at their own pace and revisit materials as needed. Maatuk et al., (2022) also emphasized on the role of virtual learning in facilitating the global dissemination of new processes and techniques, overcoming geographical barriers. Additionally, the reduction in travel time contributes to the conservation of time and a decrease in educational costs.

The issues of sustainability have also gained increasing prominence in light of global austerity and climate change. Roy et al., (2008) argued that, online and distance learning programmes are more sustainable than traditional classroom-based education, particularly in terms of energy consumption, which is only 13% of that required for in-person education, and carbon dioxide production, which is 18% of that generated by conventional methods. Additionally, virtual learning provides significant financial advantages, such as reduced costs for estate maintenance, as virtual universities do not require the upkeep of physical campuses. The availability of online learning materials also fosters a paperless educational environment, contributing to lower costs and promoting a safer, more environmentally friendly approach to education (Pradhan et al., 2021).

Several studies have also demonstrated the importance of adopting virtual technologies in providing students with the necessary skills to thrive in the information age. For example, Holtzblatt & Tschakert (2011) conducted an empirical study examining the experiences of accounting students using digital learning clips in the instruction of

International Financial Reporting Standards (IFRS) in the United States. The study found that the integration of digital technologies significantly enhanced student engagement and attention in the classroom. Similarly, Muruthy & Yamin (2017) investigated the impact of Learning Management Systems (LMS) on students' learning processes. Their findings indicated that LMS facilitated increased collaboration between instructors and students, while also supporting centralized learning, simplifying upgrades, and streamlining the overall learning experience.

Marriott et al., (2004) also investigated the adoption of computerized business and spreadsheet models within an operational unit for accounting students. The empirical study revealed that, an experiential learning approach, which emphasized active student participation, fostered an “enjoyable, challenging, and rewarding learning experience”. This educational approach do not only provided students with a comprehensive understanding of real business processes but also enhanced their spreadsheet skills. Similarly, Osgerby (2013) investigated the integration of Moodle into the Financial Management course at higher education institutions in the U.K. The study found that accounting students gained significant improvements in both knowledge and skill development when they actively engage in the virtual learning process.

In addition, online instruction provides faculty members a highly rewarding experience, with many faculty members providing that, the constructive and timely feedback received from students as one of its most gratifying aspects of online education. Kukulska-Hulme et al., (2007) indicated that, online educations has the potential of greatly improving the quality of student support and instruction, while also promoting course design and

management. The online mode of instruction also presents access to a wide range of resources, such as videos, photos, and eBooks, which the instructors could integrate into classroom discussion forums to enrich their lessons. In a study involving 300 classroom teachers in Canada, Peterson & McClay (2012) found that virtual education has the potential of ensuring an effective design and adaptation of lessons in order to achieve better learning outcomes. Similarly, Aisbitt & Sangster (2005) investigated the integration of Internet-based online assessments (OLA) in the Certified Accounting Course at the Open University in the U.K., establishing that faculty members experienced time-savings in the administration and evaluation of assessments.

From the institutional perspective, virtual education is a crucial element of their long-term strategic goals. It offers significant advantages by enabling the expansion of curricula and the introduction of new academic programs (Pallof & Pratt, 2010). In the online learning environments, institutions have the flexibility of exploring new income streams without the requirements for additional physical infrastructure. The resources saved from not expanding physical facilities on campus could be redirected into improving the quality of education through the implementation of virtual instruction approaches (Allen & Seaman, 2013; Maguire, 2005).

The World Bank (2016) further identifies several key benefits of virtual education, such as the enhancement of institutional reputation, reduction of time and costs, support for continuous professional development, improvement of learning outcomes, and increased teaching efficiency. Through the promotion of educational programmes to a wider audience, academic institutions could expand access to educational opportunities for a growing number of students from less deprived communities. Furthermore, virtual

learning provides the benefits to educational institutions grappling with declining student enrolment, as they are able to extend their reach beyond local communities, thereby attracting and engaging with a more diverse student population. The integration of technologies within the academic setting also allows institutions to capitalize on their brand identity, expanding their global presence, and responding to the excess demand within international educational markets (Benta et al., 2015).

## **2.8 Challenges and Barriers to the Adoption of Virtual learning**

The integration of technology into educational settings is a multifaceted process that is characterized by numerous complexities and challenges. A challenge, as defined by WordNet (1997, cited in Bingimlas, 2009), constitutes any condition or circumstance that obstructs progress or impedes the attainment of a desired objective. Extensive research, including the seminal work of Ertmer et al., (2012), has systematically examined the underlying factors contributing to the limited and suboptimal adoption of technology in education. This body of research has categorized the barriers to effective technology integration into two overarching domains: extrinsic and intrinsic challenges.

The extrinsic or first-order challenges in technology integration relates to the factors, which are beyond the immediate control of individual users. These challenges are frequently attributed to resource inadequacies, such as limited access to essential technological tools, reliable network infrastructure, digital educational resources, and specialized instructional software. Furthermore, the absence of sufficient support systems exacerbates these issues, manifesting as inadequate technical assistance and restricted opportunities for professional development. Institutional barriers such as the lack of a

coherent strategic vision, poorly articulated plans for technology integration, and insufficient prioritization by administrators and key decision-makers also hinders the integration of technologies in institutions (Ertmer et al., 2012).

The intrinsic or second-order barriers to technology integration are internal factors associated with users' knowledge, skills, and personal beliefs. Knowledge is typically characterized as a consensual construct, systematically organized in a logical and coherent manner. Skills, by contrast, refer to an individual's proficiency in utilizing instructional technologies and applying them effectively within the framework of sound pedagogical principles (Hew & Brush, 2007). Personal beliefs, distinct from knowledge and skills, are shaped over an extended period and are deeply influenced by emotional factors. These beliefs are often entrenched within a loosely structured system of values and attitudes, rendering them less amenable to change (Ertmer & Ottenbriet-Leftwich, 2010).

Several studies have explored the significant barriers and challenges related to the adoption of virtual learning in higher education. For instance, Karkar-Esperat (2018) investigated the learning experiences and challenges of international graduate students participating in asynchronous online courses in the United States. The study revealed several obstacles, including inadequate experience among instructors, feelings of isolation, and reduced motivation to engage in an online learning environment. Similarly, Farooq et al., (2020) examined the difficulties faced by medical students in Pakistan during the COVID-19 pandemic. These challenges included a lack of understanding of virtual learning dynamics, unreliable internet connectivity, low levels of engagement, issues with assessment, inadequate training of instructors and institutional support.

In the context of Jordan, Al-Shboul (2019) identified critical challenges with the integration of technology in teaching and learning, including insufficient technological proficiency and pedagogical training among educators, low levels of self-efficacy, an outdated educational infrastructure, and rigid curricular frameworks. Similarly, Barrot et al., (2021) conducted an empirical investigation into the challenges faced by college students in the Philippines within an online learning environment. Their findings showed a broad range of obstacles, including heightened anxiety due to social and physical restrictions, limited familiarity with new digital learning platforms, persistent technical issues, and financial constraints that further exacerbated the learning difficulties.

In Sub-Saharan Africa, research consistently demonstrates that resource constraints significantly hinder the effective implementation of virtual learning. For example, Tarus et al., (2015) identified eight primary challenges to the adoption of virtual education in Kenya, including inadequate technological infrastructure, financial limitations, a shortage of technical expertise in e-learning development, and a general lack of interest and commitment to virtual education. Similarly, Omidinia (2011) argued that online education in many developing nations is impeded by difficulties in acquiring essential infrastructure, such as computers and reliable internet access, and by a lack of qualified personnel to install and maintain technological systems. Aboagye et al., (2021) identified multiple barriers to the implementation of virtual education within educational institutions across Ghana. These challenges included issues related to student engagement, faculty preparedness, and the development of generic skills, socio-cultural factors, as well as concerns with the accessibility of online learning resources. Adarkwah (2021) further emphasized that inadequate access to electricity and reliable internet

connectivity, combined with lack of foundational knowledge and skills among stakeholders, represents a significant impediment to the widespread adoption and effective adoption and implementation of educational technologies in Ghana.

## **2.9 Pedagogies of Virtual Learning**

The primary goal of any educational system is to promote active learning. To achieve this, educators requires a deep understanding of the various learning theories that influence student outcomes (Anderson, 2008). These theories have evolved over time, beginning with behaviourism, which focused on describing and guiding the learning process. Behaviourism is structured as a systems theory, with a clear sequence and interconnected elements. Later, the cognitive theory of information processing emerged, shifting the focus to how the mind organizes and processes information. This is then followed by constructivism, which emphasizes how learners actively build knowledge and make meaning through cognitive processes in response to their environment (Duffy et al., 1996). This section of the study aims to review the three foundational learning theories, examining how learning occurs and how these theories can support the virtual learning of accounting courses.

### **2.9.1 Behaviourism**

Behaviorism is an important theory that emphasizes observable behaviour and the influence of the environment in shaping and modifying it. This theory emerged in the early 20th century through the work of various psychologists including Thorndike (1913), Pavlov (1927), and Skinner (1974), who demonstrated that behaviour could be conditioned through environmental manipulations (Kaplan, 2018). According to the

behaviourist paradigm, learning is considered successful when a learner associates stimuli with desired responses via conditioning, while the human mind is viewed as a “black box”. In this view, responses to stimuli may be measured quantitatively, with little regard for the cognitive processes occurring within the mind (Arghode et al., 2017; Alzaghoul, 2012).

Davidson-Shivers & Rasmussen (2006) argued that behaviourist principles may be effectively applied in the design and implementation of virtual learning environments. For example, positive and negative reinforcement could be utilized to promote desired behaviours and discourage undesirable ones. Additionally, formative assessments including online quizzes and assignments provide timely feedback, reinforcing positive behaviours and addressing misconceptions. By incorporating these behaviourist strategies, instructors can construct virtual learning environments that facilitate meaningful learning and enhance the academic achievements of students.

### **2.9.2 Cognitivism**

The cognitivism theory emerged as a response to the limitations of behaviourism in explaining how learners process and internalize information through mental processes, drawing on the foundational contributions of scholars such as Tolman (1948), Piaget (1964), Gagné (1970), Vygotsky (1978), and Bruner (1973). According to Ertmer and Newby (1993), cognitivism involves the construction of meaning through the integration of new information with existing cognitive frameworks. Therefore, instructional design should account for the prior knowledge and experiences of students to ensure better learning outcomes and academic achievements. The depth of the learner’s prior

knowledge shapes the ability to perceive, interpret, and assimilate new information, thereby influencing the capacity to apply newly acquired knowledge (Arghode, 2017). Consequently, cognitivist theory emphasizes the need for instruction that promotes active engagement and enhances the learning process through motivating, stimulating, and contextually relevant content.

Cognitivist perspectives also recognize the importance of engaging online learners through the deliberate design of online learning activities, multimedia resources, and interactive forums that align with learners' interests and cognitive needs (Arghode, 2017). Online instructional materials should be structured to encourage active participation and critical thinking, which in turn deepens understanding and promotes learning, which is more meaningful. Asynchronous discussion activities, in particular, facilitate collaboration, feedback, and reflective thinking, consistent with cognitivist principles. Sinclair (2009) emphasised the significance of employing a challenging and thought-provoking teaching and learning approaches in online environments to promote a sense of community among learners. By encouraging critical thinking and collaboration, this learning approach helps create a dynamic and engaging learning environment that promotes deeper learning and fosters a sense of community and belonging in the virtual learning environment.

### **2.9.3 Constructivism**

Constructivism is a learning theory with historical roots in the works of many scholars including Dewey (1929), Bruner (1961), Vygotsky (1962), and Piaget (1980). This learning theory posits that individuals actively construct knowledge based on their prior

experiences, perceptions, imaginations, and social and cognitive frameworks (Jonassen et al., 2007). The theory asserts that learners integrate external information into their existing cognitive structures, which are shaped by their mental models. When learners encounter new or conflicting experiences, it can create cognitive dissonance, disrupting their existing understanding of the world. This dissonance serves as a catalyst, prompting learners to seek out new information and engage in a process of sense-making (Glynn & Duit, 1995).

The influence of constructivism on online learning has been well-recognized in both theoretical and empirical research. Huang (2002) suggests that effective social constructivist pedagogy for adult learners in online settings should incorporate strategies such as interactive learning, collaborative learning, facilitated learning, authentic learning, and student-centered learning. This learning approach creates a dynamic, responsive learning environment that meets the specific needs and interests of adult learners. Additionally, Ruey (2010) stated that constructivist pedagogy in online learning offers several benefits, including the introduction of diverse perspectives through online discussions, increased learner confidence, and peer support in overcoming technology-related challenges. In conclusion, constructivist theory asserts that learning is most meaningful and effective when it involves active participation, application, and practice, rather than passive acquisition of knowledge.

## **2.10 The Determinants of Virtual Learning**

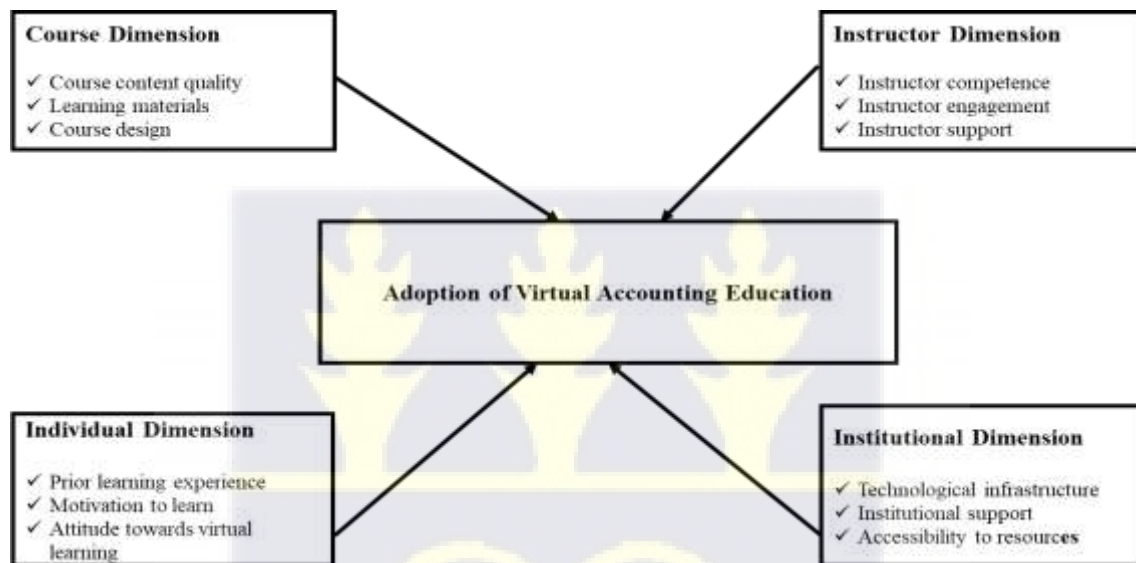
The effectiveness of virtual learning depends on the implantation of strategic learning approaches that ensures a seamless integration of digital innovations into educational

practices. The empirical literature presents various models and frameworks that are recommended as important guides for a successful adoption and implementation of virtual education programs. For example, Basak et al., (2016) investigated the factors influencing the effectiveness of virtual learning design in higher education institutions and proposed a conceptual model encompassing dimensions related to technology, institutional support, pedagogy, management, evaluation, resources, social interaction, and ethical considerations. Similarly, Bhuasiri et al., (2012) proposed a learning framework consisting of several dimensions relating to technology awareness, motivation, and learner behaviour in order to facilitate the design and adoption of web-based technologies.

Aguti et al., (2014) proposed a framework that involves three interrelated dimensions: innovative technology (accessibility, interaction, navigation, and interface), the instructor's role (attitudes, instructional mode, and technical proficiency), and the learner's prior experience with technology. Similarly, Darab & Montazer (2011) identified the significant factors in Iranian universities to include law and regulation readiness and management, in the design and adoption of innovative technologies. Jung (2012) developed a conceptual model of online education quality, based on data from students in Asian countries, which includes components like learner support, institutional technology infrastructure, and learner-instructor support. In addition, Barbera & Linder-VanBerschot (2011) formulated and validated a holistic adoption framework for online education based on multi-cultural and socio-constructivist perspectives, emphasizing the demographic characteristics of students, faculty, and institutional variables as key determinants of online education quality. The above empirical studies collectively

highlight that the successful implementation of technology in education is shaped by several interconnected factors, including course-related elements, instructor characteristics, individual learner attributes, and institutional components. Each of these factors presents distinct challenges, as illustrated in the comprehensive research framework shown in Figure 2.1.

**Figure 2. 1: Research Framework**



### 2.10.1 Course Dimension

The course dimension relates to the quality of information or output produced by the virtual learning system. It involves courses managed by an instructor and evaluates the degree to which these courses facilitate meaningful learning experiences for students (Almaiah & Alyoussef, 2019). A well-designed course or curriculum should feature rich content, regular updates, and be assessed based on criteria such as accuracy, completeness, timeliness, ease of understanding, relevance, and presentation format (Ma et al., 2015). In a related study, Al Mulhem (2020) argued that giving regular access to

course content and materials through virtual learning systems significantly improves satisfaction and learning outcomes of students. This finding highlights the critical importance of thoughtfully addressing the course content dimension in the design and implementation of online learning systems in higher education to maximize the potential benefits of virtual learning.

### **2.10.2 Instructor Dimension**

The role of an instructor is fundamental to the successful adoption of virtual learning, as students often associate enthusiastic and approachable instructors with a more positive outlook on online education (Haw et al., 2015). Several studies have underscored the significant role of instructors in virtual learning environments, extending their responsibilities beyond subject matter facilitation to actively fostering student engagement through diverse teaching strategies and the effective utilization of online tools.

Martin et al., (2018) argued that the instructor dimension encompasses students' perceptions of the support they receive from faculty in online education. This support includes timely and constructive feedback, access to relevant resources, clear and concise explanations, and the correction of misconceptions. Furthermore, Yu (2022) identified critical factors influencing student engagement in virtual learning, such as instructors' attitudes toward online education, their subject matter expertise, and proficiency in instructional design, organizational skills, and their ability to maintain meaningful interactions with students. Similarly, Liu et al., (2015) emphasized that the instructor's competencies are a vital determinant of students' learning experiences and play an essential role in ensuring the effective adoption of virtual education

### 2.10.3 Individual Dimension

The successful implementation of virtual education greatly relies on individual support and acceptance. According to Buabeng-Andoh (2021), individuals are more likely to reject innovative programmes in education when they perceive these programmes as failing to meet their individual needs. The adoption of online education by stakeholders is significantly influenced by the combination of intrinsic and extrinsic motivational factors (de Barba et al., 2016). Intrinsic motivations are associated with the perceived benefits and superiority of instructional technologies compared to traditional educational methods, whereas extrinsic motivations pertain to the degree of stakeholder involvement, particularly students, in the decision-making processes preceding the implementation of online systems.

In addition, individual-level factors influencing the adoption of virtual learning involves variables such as age, gender, attitudes, educational background, prior experience, and the technological proficiency of both students and instructors. Bollinger & Erichsen (2013) argued that, personality traits play a crucial role in determining preferences for educational modalities, with some individuals inclined toward traditional face-to-face instruction, while others favour virtual learning environments. Furthermore, these personality traits profoundly influence key outcomes such as satisfaction, retention rates, academic achievement, and motivation for both students and faculty members (Pawlowska et al., 2014).

#### **2.10.4 Institutional Dimension**

Institutional factors are important for the advancement of virtual education, as they provide the necessary infrastructure and support systems required for the effective facilitation of teaching, learning, and assessment. To ensure the successful implementation of online learning programs, institutions must proactively address challenges related to physical infrastructure and support services, which can hinder the achievement of educational objectives and undermine the overall quality of education (Jafari & Amoozegar, 2017).

Physical infrastructure relates to both internal and external systems crucial for the successful integration of innovative technologies in virtual learning environments. These elements include the provision of robust computer hardware and software, efficient communication networks, careful infrastructural planning, and equitable access to technological resources. The adoption of digital tools, platforms, and applications improves communication and interaction between learners and instructors, while promoting a greater flexibility and efficiency in the learning process. Therefore, it is essential to ensure reliable and consistent access to network systems for all stakeholders when choosing the most effective delivery formats. Additionally, a comprehensive evaluation of the capacity, reliability, and connectivity of the technological infrastructure is important to ensuring the optimal performance of the technology in supporting virtual education process (FAO, 2022).

Institutional factors also refers to both structural and operational dimensions, including organizational frameworks, leadership strategies, participatory governance, policies, and

strategic planning, all of which are essential for the successful implementation and sustained viability of online education programs. A critical component of institutional support involves expanding access to online learning for all educational stakeholders. Furthermore, institutions must establish comprehensive support programs, guidelines, and standards to ensure the quality, effectiveness, and pedagogical integrity of online teaching and learning practices (Fisser, 2001, as cited in Nihuka, 2013; McLean et al., 2015).

### **2.11 Learning Outcomes in an Online and Traditional Education**

The widespread use of computer-enhanced education is undeniable, yet its effectiveness in improving the learning outcomes of students remains unclear. As a result, significant research have been conducted to compare the outcomes of virtual learning with those of traditional face-to-face courses. The findings from these studies are mixed, with some indicating that virtual learning approaches lead to better student experiences and improved academic performance, while others show no difference or even a decline in learning outcomes. This section reviews empirical studies that compare the learning outcomes of students in traditional face-to-face modes with those in virtual learning modes

Previous empirical research has demonstrated the effectiveness of virtual learning in accounting education. For example, a systematic review conducted by the Stanford Research Institute International, covering studies from 1996 to 2008, examined the effectiveness of virtual learning with the traditional classroom-based education. The review found that students in online learning environments typically achieved slightly

better overall outcomes than those in traditional classroom settings (Means et al., 2010). Similarly, McCarthy et al., (2019) reported that students enrolled in online Intermediate Accounting III and Auditing courses outperformed their peers in face-to-face courses, further supporting the positive and significant impact of virtual learning on student performance.

Jones & Chen (2008) found that, accounting students had a greater satisfaction with virtual learning compared to traditional face-to-face instruction across several dimensions. They also suggested that the online delivery of MBA Accounting programs could effectively bridge the gaps between traditional and asynchronous instructional modes. Similarly, Zheng et al., (2021) assessed the impact of online learning on dental students' course performance during the COVID-19 pandemic. Their findings revealed that students generally held a positive attitude toward online education during the pandemic, with their acceptance of online courses largely driven by the perceived engagement with lectures and interaction with classmates.

In a study comparing the impact of online and traditional learning environments on student achievement, Olelewe & Agomuo (2016) found that online learning was more effective than face-to-face instruction in enhancing student performance in QBASIC programming. Tang et al., (2021) discovered also that, students enrolled in online courses performed significantly better than those in traditional counterparts of the same programmes. These findings suggest that online accounting education can serve as a viable and effective alternative to traditional classroom instruction.

However, other empirical studies have reported no significant differences in student performance between online and face-to-face instruction. For example, Fortin et al. (2019) conducted a study comparing student performance and satisfaction in an Advanced Financial Accounting course delivered through both modes. Their findings revealed a non-significant difference in student performance, and the satisfaction of students was comparable across both virtual and traditional learning approaches. Similarly, Aly (2013) examined learning outcomes in an introductory managerial accounting course offered in both online and traditional classroom settings. The study found no significant differences in student performance, suggesting that instructional strategies had a greater impact on learning outcomes than the mode of instructional delivery.

Consistent with the above findings, Paul & Jefferson (2019) examined the academic performance of students in a course taught by the same instructor from 2009 to 2016. The findings of the study revealed no significant differences in performance between online and face-to-face instruction. Similarly, Means et al., (2013) found that both online and traditional classroom learning were equally effective in promoting student achievement. Ni (2013) also conducted a study comparing the performance of graduate students enrolled in the virtual and face-to-face classes, where the courses was facilitated by the same instructor, and found that the mode of instruction was not a significant influence on student's academic performance.

Fendler et al., (2018) provided additional evidence, arguing that while no significant differences were detected between instructional modes at an aggregate level, the choice

between online and traditional classroom instruction could yield differential impacts at the individual level. Similarly, Nguyen (2015) argued that, while the mode of instruction did not significantly affect learning outcomes, individual characteristics such as age, gender, and race or ethnicity played a crucial role in shaping students' learning experiences and outcomes in online education.

Contrary to the positive results on virtual learning, some studies have shown that traditional learning environments often produce better student outcomes than online education. For instance, Xing & Saghaian (2022) investigated the causal effects of different learning modes on undergraduate students in China and concluded that traditional classroom settings produced more favorable learning outcomes when compared to those achieved in the online education mode. Similarly, Bosshardt & Chiang (2018) observed that students enrolled in online courses performed less effectively in subsequent Principles of Macroeconomics courses, achieving lower overall grades. These findings showed that students in online learning environments may face difficulties in understanding course content and applying foundational concepts, which contributes to their comparatively poorer examination performance relative to students in traditional classroom settings.

Bettinger & Loeb (2017) presented compelling evidence showing that students enrolled in asynchronous courses exhibited significantly poorer performance compared to their counterparts in traditional face-to-face courses, with the disparity being particularly pronounced among students with lower prior GPAs. Similarly, Ebaid (2023) investigated student satisfaction with online learning in Saudi Arabia and found that accounting students derived limited benefits from virtual education relative to traditional instruction.

The study highlighted a preference for traditional teaching methods, as they offered a more effective platform for students to engage with instructors and seek clarification on challenging topics. Further supporting these findings, Fiadley (2018) compared student outcomes in two Principles of Accounting courses delivered asynchronously and in face-to-face settings. The results demonstrated that students in face-to-face sessions outperformed those in online classes, underscoring the advantages of traditional instructional modes.

In a related study, Crain & Ragan (2017) examined student performance in an Intermediate Financial Management course, comparing the effectiveness of online and traditional learning formats. The findings indicated that students in online courses performed less effectively than those in the traditional classroom settings. Similarly, Darkwa & Antwi (2021) provided empirical evidence on the academic performance of students in both classroom and online learning environments. Although the difference in performance was not statistically significant, the study found that students performed better in classroom settings than in online environments. In a final study, Tanyel & Griffin (2014) conducted a decade-long empirical study examining learning outcomes of students. The results revealed that students who received face-to-face instruction achieved significantly higher final grades compared to those who were taught in an online format.

## **2.12 Empirical Studies on Virtual Accounting Education**

This section provide a comprehensive review of empirical research on the adoption of virtual accounting education in academic institutions. The main aim of the review is to

critically evaluate the potential benefits, challenges, and key factors influencing technology-driven accounting education, drawing on insights from existing studies to identify areas that require further academic investigation.

**Table 2. 1: Summary of the literature related to the adoption of virtual education**

The table below provides a comprehensive literature matrix of academic studies related to virtual accounting education. It systematically outlines the objectives, research methodologies, key findings, as well as the identified research gap in the empirical studies.

Authors	Research Aim	Methodology	Key Findings	Research Gaps
Tawfik & Elmaasrawy (2023)	The study was aimed at investigating the factors influencing the adoption of cloud-based accounting in Oman Universities	Quantitative (Partial least squares (PLS))	The research showed that factors including human, cultural and social elements had a significant and positive effect on the adoption of DCBAE	The viewpoints and experiences of faculty members were not encompassed within the scope of the survey.
Wen & Wang (2022)	The study investigated the significant influences of deploying online meetings with educational coaches on the perceived learning outcomes of students	Quantitative (Quasi-experimental design)	It was found that the adoption of online meeting with educational coaches were significantly related to the perceived learning outcomes of students	Future research should focus on the inclusion of more online accounting courses.

Sarea et al., (2021)	The study was aimed at investigating the impact of COVID-19 on the learning outcomes of accounting courses in the Gulf Cooperation Council.	Quantitative (Survey approach)	The study found that accounting lecturers had changed their teaching methods and expressed that the future of accounting begins with this pandemic.	The study suggested for future studies with qualitative methodologies that use open-ended questions to further explore the issues.
Makhlouf & Alani (2022)	The study examined the perspectives of faculty members in relations to the influence of E-learning on accounting education in Jordanian universities.	Quantitative (Survey methodology)	The study revealed that the challenges associated with E-learning has an adverse effect on the adoption of virtual accounting education.	The study suggested for research to examine the moderating effects of age, gender, and academic achievement.
Richardson et al., (2013)	The study examine the benefits of integrating mobile devices on the virtual learning experiences of students and investigated the degree to which these perceived benefits correlate with their learning styles	Quantitative (Survey methodology)	It was shown that iPods was significant to enhancing the learning experiences of students, especially to those who prioritise the planning and management of their time.	It was suggested for studies that focuses on the potential influence of instructor's pedagogy, which is presumed to remain consistent in the study.
Basioudis et al., (2012)	To investigate student perceptions on the design features included in an "off the shelf" Learning Management System (LMS) in teaching undergraduate accounting students.	Quantitative (Survey approach)	The study found that satisfaction with the use of an LMS was positively related to the usefulness of lecture notes, bulletin boards and discussion forums, and other LMS tools.	Future studies should generate ethnicity data to allow for an analysis of cultural influence on student perceptions of the LMS.
Halabi & Larkins (2016)	To examine the academic performances of first-year accounting	Quantitative (Multiple Regression)	Students who post to the discussion board have greater marks even after	Further research to validate these findings may involve a full

	students using a discussion board.		controlling for academic ability.	thematic analysis of the content of posts.
Al-Okaily et al., (2023)	The study was aimed at investigating the influencing factors to the usage of cloud-based AIS, where UTAUT was expanded with new related critical factors	Quantitative approach (cross-sectional study)	It was revealed that the elements of social motivation, performance expectancy, trust and COVID-19, significantly influenced the behaviour intention towards the usage of cloud-based AIS	The study suggested for the use of a larger and culturally diverse samples to enhance the study's overall representativeness.
Mtebe (2020)	The study aimed at investigating the factors influencing user experience (UX) with e-learning systems in Tanzania	Mixed approach (Questionnaire survey and focused group discussions)	It was found that, user experiences relating to the instructor skills, was not directly linked with the acceptance of eLearning systems	The study proposed the incorporation of expert evaluators in collaborations with learners to identify didactic breaches in e-learning systems
Wong et al., (2014)	The study aimed to propose a framework and examine attitudes towards blended learning.	Quantitative (Survey approach)	It was revealed that, there was a strong support for face-to-face delivery methods	The study suggested for the investigation of students readiness to adopting the blended learning options.
Ali et al., (2022)	The study was aimed at investigating the perspectives on the potential benefits and obstacles in transforming online accounting assessment.	Reflective commentary and document analysis	The study found the online assessment could replace in-person assessment and improve on learning outcomes	The study suggested for a comparative study with other educational institutions to overcome the challenges with online learning assessment.

Varma et al., (2022)	The study sought to develop and evaluate a conceptual model for predicting digital loyalty in online accounting courses.	Quantitative (Survey approach)	It was shown that, perceived learning significantly mediates relationship between learning performance and digital loyalty	The study suggested using a larger sample size and targeting different population segments.
Matee et al., (2021)	The study was aimed at exploring the viewpoints and obstacles to the adoption of virtual collaborative learning.	Qualitative case study	Most students reported benefiting from virtual collaborative learning but faced challenges with resource limitations, unclear instructions, and cooperation.	The research suggested for future studies with more extensive samples, while using established thematic frameworks.
Tran (2022)	The study assessed the factors influencing online accounting education amid the COVID-19 pandemic in Vietnamese universities	Quantitative (Survey approach)	It was found that the primary factors influencing online accounting education were infrastructure, working and living conditions and the timing of lectures.	The study suggested for the investigation of additional factors influencing the digitalization of accounting education.
Weil et al., (2014)	The study examined students involvement and participation in stage-2 management accounting course, while considering the benefits to students	Mixed-Method Approach	It was revealed that, students valued online learning but were unwilling to sacrifice in-person interactions with their peers and faculty members.	The study suggested for a thorough reflection on both process and outcomes of implementing blended accounting education.
Liu & Zainuddin (2021)	The study explored the motivational factors influencing student's acceptance of online learning during the COVID-19 pandemic.	Quantitative (Survey approach)	The findings revealed that, perceived value was the most influencing factor to the acceptance of online learning.	The study suggested for future research to employ a larger and more diverse sample groups.

Weil et al., (2013)	The study investigated the emerging perspectives and challenges with virtual collaborative learning	Quantitative (Survey approach)	The students identified several advantages with online discussion forums, which included the opportunities to learn from the experiences of their peers.	The study suggested for further insight into the impact of assessment weighting and required contributions on the perceptions of students.
El-sayed et al., (2023)	The study sought to examine the perceptions of students on their performance after completing mini-audit simulation in a distance-learning environment.	mixed-methods approach	The study found significant improvement in students' understanding and performance after mini-AS, evidence of engagement and positive recognition of AS value	The study suggested for the use of a larger sample size and a comparison with non-accounting students.
Kamarudin & Hanefah (2022)	The study examined the possible benefits and barriers to implementing a professional Sharia auditing training program through the online learning mode.	Quantitative (Survey approach)	The study revealed the inadequacy for using online-learning approaches in facilitating auditing programs and also provided for increased hands-on and group activities.	The study suggested for the examination of the viewpoints of practitioners and regulators, while investigating the phenomenon in other countries.
El- Sayed (2021)	The study explored accounting students' opinions on e-learning as an alternative to the traditional education system in Saudi universities during COVID-19 pandemic.	Quantitative approach (cross-sectional survey)	It was revealed that most accounting students were not experiencing the full benefits of implementing online learning systems.	The study recommended for the utilization of a representative sample and examining the perspectives of teachers in a

				comparative manner,
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### 2.12.1 Summary of the Empirical Findings

The empirical studies that were reviewed have provided valuable insights into the adoption of virtual learning as an alternative to traditional classroom instruction. For example, Tawfik & Elmaasrawy (2023) examined the factors influencing the adoption of cloud-based accounting education and its impact on academic achievement among university students in Oman. Their findings highlighted that human and socio-cultural factors positively influenced both the adoption of cloud-based education and academic performance. However, the study was limited by its reliance solely on students' perceptions, without considering faculty perspectives on the implementation of cloud-based education. Similarly, Wen & Wang (2022) explored the impact of online meetings with academic coaches on students' perceived learning outcomes. They found that these interactions enhanced students' perceptions of instructor effectiveness. However, their study was constrained by a small sample size and a quasi-experimental design.

Sarea et al., (2021) conducted a quantitative survey to investigate the emerging issues associated with digital accounting education in the Gulf Cooperation Council (GCC). The study had revealed that the pandemic had forced educators and institutions to adapt by embracing the opportunities of online learning while addressing its challenges. However, the study's methodological limitations led the authors to recommend the inclusion of qualitative interviews and global studies to improve generalizability. Similarly, Makhoulouf & Alani (2022) investigated the impact of e-learning on accounting education in

Jordanian universities from the perspective of faculty members. The results showed the importance of providing adequate training and support to faculty for the effective use of digital technologies in teaching accounting. The study also suggested that future research should consider student perspectives and demographic factors to ensure the successful implementation of virtual accounting education.

Richardson et al., (2013) explored the advantages of using mobile devices as a virtual learning tool in graduate accounting programs, while also examining the relationship between perceived benefits and learning styles. The findings showed that the primary benefit of mobile devices in virtual learning environments was their portability, with students rating the iPod as particularly valuable in promoting greater flexibility and accessibility in online education. However, the study's small sample size of 23 participants limited the generalizability of its conclusions. Similarly, Basioudis et al., (2012) investigated accounting the perceptions of accounting students towards off-the-shelf Learning Management Systems (LMS). The study found that student satisfaction with LMS was positively related to the usefulness of lecture notes, bulletin boards, discussion forums, and other LMS tools. The authors suggested that future research should consider the impact of cultural influences on student perceptions of LMS.

Halabi & Larkins (2016) investigated the impact of discussion board usage on the academic performance of first-year accounting students. The study's use of a multiple regression analysis revealed that, students who actively participated in discussion boards performed better than those who did not, even after controlling for academic ability. The study highlighted that discussion boards could foster greater student engagement,

voluntary participation, and improved academic outcomes. However, the research was limited by its focus on a single university and subject area, as well as the potential for self-selection bias. Similarly, Al-Okaily et al., (2023) employed a quantitative approach to examine the factors influencing the adoption of cloud-based accounting information systems during the COVID-19 pandemic. Their findings indicated that performance expectancy, social motivation, COVID-19 risk, and trust significantly influenced users' behavioural intentions, while usage behaviour influenced communication and decision quality. The study suggested for research focusing on a comparative analysis across different cloud-based systems and the inclusion of additional theories related to the adoption of innovative technologies.

Mtebe (2020) conducted a study to identify the factors influencing the user experience (UX) of e-learning systems in Tanzanian universities. Using a questionnaire based on Nielsen's heuristics and didactic metrics, followed by focus group discussions with students, the study revealed several UX issues with the systems, alongside positive UX hedonic quality in certain areas. However, the study's reliance on learner feedback rather than expert evaluators limited its potential to provide actionable insights for improving e-learning systems. Similarly, in a case study by Wong et al., (2014), a proposed framework for assessing the readiness, adoption intensity, and impact of blended learning offerings was tested with first-year undergraduate accounting students at Victoria University in Australia. The findings showed that, despite the availability of online options, students preferred face-to-face delivery methods, suggesting that several aspects of online accounting education required in-depth investigation within university settings.

Ali et al., (2022) examined the significant challenges and opportunities associated with transitioning to technology-based assessment methods in accounting education, highlighting that well-designed online assessments could significantly enhance the learning outcomes of students. However, the study's reliance on the experiences of three academics from a single university was a limitation to the generalizability of the findings. The scholars recommended conducting comparative research across institutions and incorporating interviews with both academic staff and students to better understand the challenges and opportunities of online assessments and improve their effectiveness. Similarly, Varma et al., (2022) explored the potential of online education to promote inclusive societal development in emerging countries with limited investment in education. The study suggested that online education could foster an open society with opportunities for all, advocating for online service providers to prioritize the delivery of updated, cross-functional, and integrated skills. However, the study's small sample size and limited scope reduce its applicability to other contexts.

Matee et al., (2021) explored the important benefits and challenges associated with the virtual collaborative learning at an accredited higher education institution in Lesotho, involving 35 students and 11 faculty members across various departments. The study found that, while students recognized the benefits of virtual collaborative learning, they were encountered several challenges, including limited resources, unclear instructions, lack of cooperation, internet connectivity issues, and high data costs. The research suggested for future studies to incorporate qualitative methods, such as face-to-face interviews and classroom observations, rather than relying on only online surveys. In a similar research, Tran (2022) examined the key factors influencing online accounting

education in Vietnamese universities during the COVID-19 pandemic. The quantitative study relied on a sample of teaching staff and students from both public and private universities, identified infrastructure, living or working conditions during the pandemic, and lecture timing as the top factors influencing online accounting education. However, the scope of the study was constrained by time and resources, which limited the exploration of other key factors that could influence the digitization of accounting education.

Weil et al., (2014) examined the adoption and integration of a blended learning approach in a Stage 2 management accounting course at a New Zealand university. The findings revealed that while the students appreciated the online learning activities, they still preferred face-to-face interactions with peers and faculty. However, the study's small sample size of 30 students limited the generalizability of the results, and the absence of input from the academic institutions responsible for implementing the blended learning approach further constrained the findings of the research. Similarly, Liu & Zainuddin (2021) investigated the several motivational factors influencing accounting students' acceptance of the online component of blended learning (OCBL) during the COVID-19 pandemic. Based on a sample of 354 students from a Malaysian public university, the study found that perceived value was the most significant factor, with postgraduate students showing a greater likelihood of accepting the online component than undergraduates. However, the practical implication of the study was constrained by the use of a small sample size, limiting the broader applicability of its findings to a more diverse student population and institutional contexts.

Weil et al., (2013) examined the perceptions of students towards online accounting discussion forums and assessed whether these views were significantly influenced by demographic characteristics. The findings indicated that students recognized various benefits of engaging in discussion forums, such as peer learning and the enhancement of critical thinking skills. Specifically, older male domestic students whose first language was English were the most likely to express favourable opinions about online discussions. The study suggested that future research should investigate the potential impact of assessment weighting and compulsory contributions on students' perceptions of discussion forums. In a related study, El-Sayed et al., (2023) evaluated the significant impact of a mini-audit simulation (AS) on student performance in an online environment, using a mixed-methods approach with data from 176 students at Gulf Cooperation Council University. The findings showed significant improvements in students' understanding and performance, along with increased engagement and recognition of the AS's value. It also suggested enhancing deep learning through online platforms, informing professional accounting bodies, and improving student outcomes through simulations in electronic learning environments (ELAs). The study presented a suggestion for employing of a representative sample and incorporating teachers' perspectives in comparative studies.

In a cross-sectional survey, El-Sayed (2021) explored the perceptions of accounting students toward e-learning in Saudi Arabia and established that most accounting students perceived significant benefits from e-learning, such as increased flexibility, improved communication with peers and instructors, or enhanced problem-solving abilities. The study also identified significant challenges, including limited human contact, technical

issues, and an overreliance on computers. While the study offered valuable insights, the authors acknowledged that the findings might have been influenced by the respondents' inexperience with e-learning due to the sudden shift from traditional classroom learning. They recommended further validation as virtual learning becomes more prevalent in higher education. Similarly, Kamaruddin & Hanefah (2022) investigated the main challenges and opportunities of delivering a professional Sariah audit-training program via e-learning during the COVID-19 pandemic, using a sample of 296 final-year students from Malaysian public universities. The study found that the inability to conduct hands-on activities, academic background differences, and technical issues were significant challenges. The study suggested for the allocating more time for content preparation, facilitating discussions on practical exercises, and ensuring trainer competency in order to enhance the effectiveness of online learning.

### **2.12.2 The Identified Research Gaps**

The reviewed empirical evidences on the adoption of virtual accounting education have highlighted the following research gaps, which requires for further understanding in academic institutions.

Firstly, many accounting research (Tawfik & Elmaasrawy, 2023; El-Sayed, 2021; Liu & Zainuddin, 2021) on the impact of innovative technologies on the outcomes of accounting education, have been limited in their generalizability of the study's findings due to the use of small sample sizes or data from a single institution. Additionally, while these studies often focus on student perspectives, they frequently overlook the insights and experiences of faculty members. To gain a more comprehensive understanding of the

factors influencing the successful implementation of virtual accounting education, the broader literature have suggested for future research to concentrate on comparative studies across different academic institutions or countries, as well as examining the perceptions and experiences of accounting students and faculty members in higher education.

Furthermore, empirical studies including (Luppicini & Walabe, 2021; Al-Okaily et al., 2023; Corbeil & Corbeil, 2015) have demonstrated that, socio-economic, political, resource, and cultural disparities are significant in influencing the adoption of virtual accounting education. Despite the significant impact of geographical and contextual factors on the adoption of virtual accounting education, research on virtual accounting education is mostly limited in the context of developing nations. Most existing studies have focused primarily on developed countries, leaving a crucial gap in understanding the unique challenges confronting educational institutions in developing countries. Additionally, most existing studies (Mah'd & Mardini, 2022; Sarea et al., 2021; Apostolou et al., 2018) were constrained by methodological limitations, as they mainly rely on quantitative approaches, such as regression and variance analysis, without exploring the underlying factors driving the observed outcomes. To address these gaps, future research, it is suggested for future research that employs a more comprehensive methodologies, such as qualitative or mixed-method approaches, to gain deeper insights into the factors shaping the adoption of virtual accounting education in the context of developing economies.

Finally, prior studies (Mtebe, 2020; Dayagbil et al., 2021) have primarily relied on self-reported data from learners and faculty members, which often lacked an in-depth understanding of wide-range factors influencing the effectiveness of virtual learning systems. These empirical studies have not considered the perceptions of expert evaluators, whose viewpoints and experiences are important for evaluating and enhancing the quality, usability, and overall impact of virtual learning systems. To address this limitation, a multi-stakeholder approach is needed to explore the various dimensions of innovation adoption, which is critical for the effective implementation of virtual accounting education in the universities.

## **2.13 Conclusion**

This chapter provided an in-depth review of the literature and empirical foundations in relations the adoption and implementation innovation adoption in the classroom environment. The chapter commenced with an examination of key conceptual issues related to virtual learning, including its definitions, historical development, and the economic and social impacts on higher education institutions. The discussion then explored the factors that contributed to the success of online accounting education, comparing student learning outcomes and achievements between online and traditional face-to-face learning models, as highlighted in previous empirical studies. The chapter concluded with a review of the adoption of technological innovations in accounting education, identifying gaps in the existing literature and establishing the significance of the current study.

## CHAPTER THREE

### THEORETICAL REVIEW

#### 3.0 Introduction

This chapter is aimed at reviewing the main models and frameworks that provide understanding into the successful integration of technology in the educational settings. The Theory of Reasoned Action (TRA) was discussed in order to explore individual attitudes and behavioural intentions toward the adoption of innovative technologies. Additionally, the Theory of Planned Behaviour (TPB) was reviewed, expanding on the TRA by incorporating perceived behavioural control as a predictor of individual intentions. The Diffusion of Innovation Adoption Model was also considered, outlining how innovations are communicated and adopted across different stakeholders groups. Furthermore, the Unified Theory of Acceptance and Use of Technology (UTAUT) was examined to explain the technology acceptance and usage behaviours of accounting students and lecturers. These models and frameworks established the theoretical foundation for this research, which examined the significant factors that influence the adoption of virtual accounting education within Ghanaian tertiary institutions.

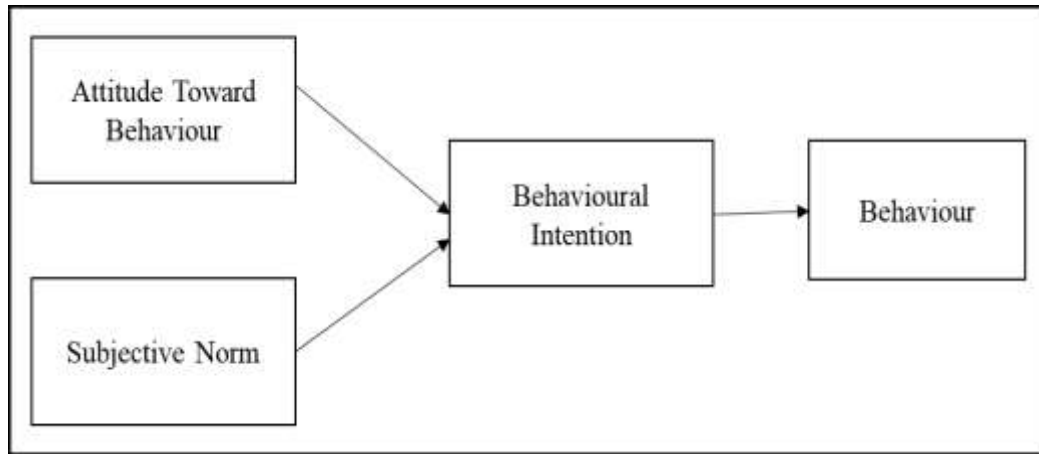
#### 3.1 Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA), originally developed by Martin Fishbein in 1967 and subsequently refined by Fishbein and Ajzen in 1975, is a cognitive model designed to predict and explain behavior that is under an individual's volitional control (Fishbein & Middlestadt, 1989). According to the TRA, a person's behavior can be predicted by their intention to engage or refrain from engaging in a specific action, with behavioral

intention determined by two key factors: the individual's attitude and the subjective norm (Hostler et al., 2011). Behavioral intention, which reflects an individual's predisposition and motivation to act in a particular way, serves as a direct antecedent of behavior (Ajzen, 1991, p. 181). The theory posits a positive correlation between an individual's behavioral intention and the likelihood of performing the specified behavior.

Attitudes are conceptualized as an individual's evaluative disposition, reflecting favorable or unfavorable perceptions toward engaging in a specific behavior (Lam et al., 2007). A positive attitude is associated with a greater likelihood of favorable engagement, whereas a negative attitude corresponds to a higher probability of unfavorable responses (Ajzen et al., 2004). Complementing this, subjective norm emerges as a pivotal determinant of behavioral intention, which subsequently informs the actual performance of a behavior. Subjective norm is defined as the perceived social pressure exerted by significant referent individuals or groups to either perform or abstain from a given behavior (Shin, 2009). Such pressures are often influenced by the perceived expectations or judgments of family and friends concerning the anticipated outcomes of the behavior and the degree to which these social perceptions shape individual actions (Khaled et al., 2014). Thus, subjective norms are predicated on two dimensions: normative beliefs, which reflect the perceived expectations of others, and the individual's motivation to align with these expectations (Trafimow, 2009). The theoretical construct of the TRA framework is depicted in Figure 3.1, providing a visual representation of these interrelationships.

**Figure 3. 1: Theory of Reasoned Action (TRA)**



**Source: Fishbein & Ajzen (1975)**

The Theory of Reasoned Action has been widely applied in research to assess human behavior concerning the acceptance and adoption of innovations. For example, Lam et al. (2007) explored the interplay between IT-related beliefs, attitudes, subjective norms, self-efficacy, and behavioral intention in shaping hotel employees' perceptions of innovative technology adoption in China. Similarly, Ramayah et al., (2010) examined the motivational constructs of the theory, highlighting the role of values and attitudes in influencing the purchasing intentions for green products within developing countries. Additionally, Shih & Fang (2006) utilized the TRA framework to analyze how attitudes and subjective norms affect the adoption intention of internet banking services, further demonstrating the model's applicability in diverse contexts.

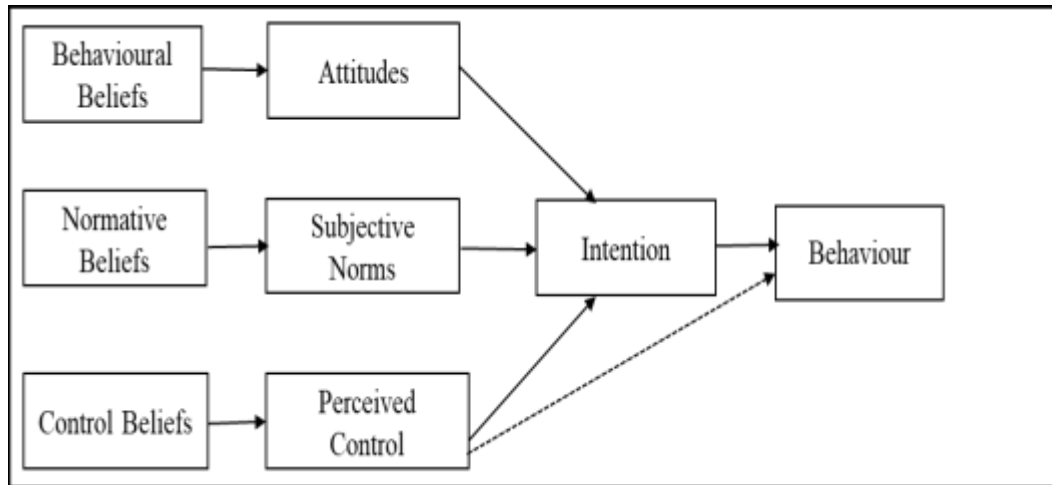
Despite its extensive application, several scholars including Ajzen (2004) and Warshaw & Davis (1985), have highlighted the limitations of the Theory of Reasoned Action (TRA) in predicting behaviors and actions that fall outside an individual's volitional control. The theory does not sufficiently address intentions or behaviors influenced by

factors beyond personal volition. Furthermore, the TRA posits that external variables do not exert a direct influence on behavior but impact it only indirectly through their effects on attitudes or subjective norms (Ajzen & Fishbein, 1980). However, this perspective has been contested by numerous empirical studies demonstrating that certain external variables can directly influence behavior. To address these limitations, Ajzen (1991) introduced the Theory of Planned Behavior (TPB), an extension of the TRA, which incorporates the construct of perceived behavioral control to enhance its explanatory power.

### **3.2 Theory of Planned Behaviour (TPB)**

The Theory of Planned Behavior (TPB) is a widely recognized framework for predicting human behavior and was developed as an extension of the Theory of Reasoned Action through the inclusion of a new construct: perceived behavioral control. According to the TPB model, an individual's intention to perform a specific behavior is determined by three primary factors: their attitude toward the behavior, the subjective norm, and perceived behavioral control (Ajzen, 2005). Perceived behavioral control encompasses control beliefs, which reflect the barriers and facilitators present in an individual's environment, as well as the perceived power of these factors to enable or hinder the behavior (Glanz et al., 2015). Additionally, perceived behavioural control relates to the extent to which individuals believe they can exert control over personal or external factors influencing their ability to perform the behavior. This construct is theorized to have a direct impact on both behavioral intention and the actual behavior (Ajzen, 1991). Figure 3.2 illustrates the theoretical relationships among the components of the TPB model.

**Figure 3. 2: The Theory of Planned Behaviour**



**Source: Ajzen (2005).**

A growing body of empirical research has provided strong evidence to support and validate the utility of the Theory of Planned Behavior (TPB) in investigating the underlying beliefs that influence an individual's intention to adopt technology in educational settings. For instance, Chu & Chen (2016) constructed a theoretical framework grounded in TPB to evaluate students' acceptance of virtual learning technologies. Their study demonstrated that attitudes, subjective norms, and perceived behavioral control exhibited significant and positive relationships with students' intentions to adopt virtual learning. Similarly, Chiang et al., (2009) examined the determinants of technology-integrated learning adoption and identified attitudes and subjective norms as the most salient predictors of individuals' intentions to engage with educational innovations.

Mouloudj et al., (2021) applied the Theory of Planned Behavior (TPB) to examine Algerian university students' intentions to adopt online learning platforms. Their findings

confirmed that all three core constructs of the TPB: attitudes, subjective norms, and perceived behavioral control—significantly influenced students' intentions to engage with online learning systems. Similarly, Tagoe & Abakah (2014) employed the TPB framework to investigate the role of students' beliefs in shaping their intentions to adopt mobile technologies in classroom settings. Their analysis identified attitudes, subjective norms, and perceived behavioral control as key factors driving the adoption of mobile learning in higher education institutions. Collectively, these studies provide compelling evidence supporting the TPB as a robust framework for understanding the determinants of technology adoption intentions in educational contexts.

The Theory of Planned Behavior (TPB) presents a highly relevant and robust framework for this study, given its demonstrated effectiveness in predicting the factors that influence technology adoption in educational settings, particularly among students and lecturers. By examining the interactions between attitudes, subjective norms, and perceived behavioral control, the TPB provides critical insights into the potential benefits and barriers that influences the adoption and implementation of educational technologies. In addition, the TPB's adaptability and versatility allow for the integration of complementary constructs from other well-established technology acceptance models. For example, when integrated with Rogers' (2003) Theory of Innovation Diffusion and the Unified Theory of Acceptance and Use of Technology (UTAUT), the TPB facilitates the development of a more comprehensive framework, which provides a deeper understanding of the various determinants influencing the adoption of virtual learning technologies in higher education. This inherent flexibility and compatibility with other theories makes the TPB as an ideal framework for this study, since it allows for the

incorporation of additional constructs that significantly enhance the explanatory power and predictive accuracy of the theory.

### **3.3 Diffusion of Innovations Theory (DOI)**

The Diffusion of Innovations Theory (DOI), formulated by Everett Rogers in 1962, is a foundational framework for analysing the adoption of new technologies. This theory emerged from the integration of research and theoretical perspectives drawn from diverse fields, including communication studies, agronomy, and sociology. The primary objective of the DOI theory is to elucidate the processes, underlying determinants, and rate of accepting and adopting technological innovations by individuals or other social entities. Within this theoretical framework, diffusion is conceptualized as the process through which an innovation is communicated over time through various channels within a social system (Rogers, 2003). In effect, Diffusion of Innovation theory measures the rate at which technological innovations are adopted and spread across different social systems .

#### **3.3.1 Main Elements in the Diffusion of Innovation**

The diffusion process is comprised of four fundamental components: innovation, communication channels, time, and social systems. Each of these elements is integral to the spread of new ideas and technologies in a social system. This section provides a comprehensive review of these components, exploring their individual and collective impact on the diffusion process.

- 1. Innovation:** An innovation is defined as the introduction of something new, whether it be an idea, practice, or product within a social system. The individual

perceptions of what constitutes novelty is inherently subjective and can vary across individuals or groups. As a result, the rate at which members of a social system adopt an innovation can differ considerably, with the characteristics of the innovation itself playing a significant role in shaping this adoption rate (Rogers, 2010).

**2. Communication Channel:** Communication channels are essential for the diffusion of innovation, enabling the effective transmission of information across individuals. Rogers (2010) asserts that the nature of the relationship between the source and receiver of information plays a critical role in determining how the innovation is communicated and its subsequent impact. Communication channels can be broadly classified into mass communication and interpersonal communication. Mass media channels, including television, radio, and newspapers, are designed to reach large audiences and disseminate information widely. In contrast, interpersonal communication involves direct, face-to-face interactions between individuals or small groups, fostering more personalized exchanges of information.

**3. Time:** The time dimension of the diffusion process is evident when an individual or entity decides to adopt a technological innovation. Spence & Sekercioglu (2022) argued that a time lag often exists before an innovation fully saturates a population, and the speed of this process can substantially affect the adoption rate. The rate at which members of a social system adopt or reject an innovation is

influenced by this temporal factor, which can vary across different innovations and cultural contexts (Ekong, 2003).

4. **Social Systems:** The social system constitutes the fourth element of Rogers' framework and is defined as a network of interconnected units engaged in collective problem-solving to achieve a shared objective. It provides the environment within which the diffusion process unfolds, encompassing cultural norms, social structures, and value systems. Within this context, opinion leaders act as change agents, exerting informal influence on attitudes and behaviors. When a social system is predisposed to change, opinion leaders are typically more innovative and receptive to new ideas. Conversely, when the prevailing norms of the system resist change, the behaviors of opinion leaders tend to align with these normative expectations (Rogers, 2010).

### 3.3.2 Innovation Decision Process

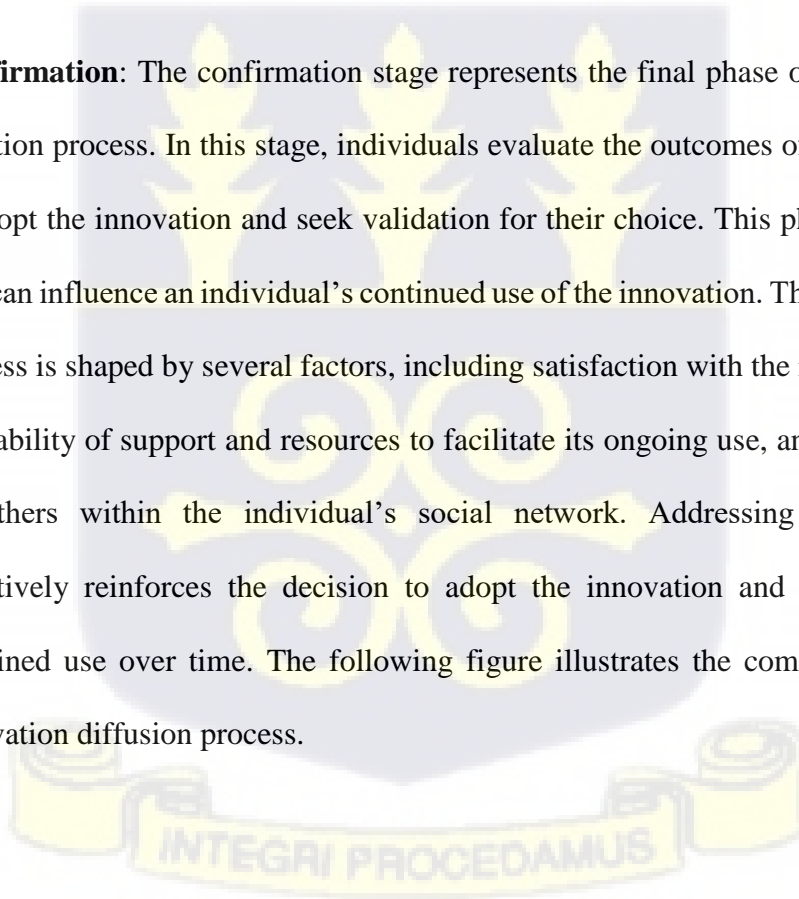
The diffusion adoption process consists of five distinct stages: knowledge, persuasion, decision, implementation, and confirmation. These stages outline the progression individuals or entities undergo as they move from awareness of an innovation to its eventual adoption and continued usage. A detailed examination of the five stages of innovation adoption is presented in the following section.

- **Knowledge:** The knowledge stage represents a fundamental phase in the diffusion adoption process. During this stage, potential adopters become aware of the innovation's existence and begin to acquire a comprehensive understanding of its purpose, features, and functionality. This stage serves as the foundation for the

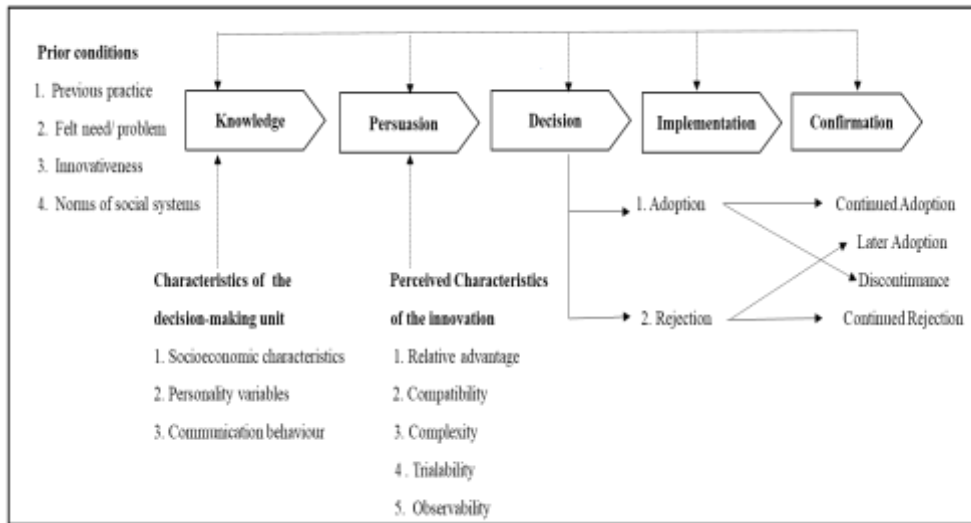
subsequent stages of adoption, as it provides individuals with the necessary information to make well-informed decisions regarding the potential adoption of the innovation. Without a thorough understanding of the innovation, including its advantages and limitations, individuals may display reluctance or hesitancy in adopting the system.

- **Persuasion:** The persuasion stage constitutes the second phase of the diffusion adoption process. In this stage, individuals develop an attitude toward the innovation based on the information acquired in the knowledge stage. This phase is pivotal, as it significantly influences an individual's decision to adopt or reject the innovation. Persuasion can originate from various sources, including mass media channels, interpersonal communication with individuals who have expertise about the innovation, or first-hand experience with the innovation itself. By effectively presenting the innovation's potential benefits and drawbacks, individuals may be persuaded to adopt the technological innovation.
- **Decision:** The decision stage is an important phase in the diffusion adoption process. In this stage, individuals assess the potential benefits and drawbacks of the innovation and determine whether to adopt it. The decision-making process is influenced by a wide-range of factors, including personal needs and values, perceived risks and benefits, and the opinions of important individuals within the social network. By thoughtfully considering these elements, individuals are able to make informed decisions regarding the acceptance and implementation of the innovation.

- **Implementation:** The implementation stage is a crucial phase in the diffusion of new ideas, practices, and innovations. During this stage, individuals begin to use the innovation and integrate it into their daily routines, marking the actual adoption of the innovation. The success of this stage is influenced by several factors, including an individual's ability to effectively utilize the innovation, the availability of adequate support and resources to facilitate its use, and the compatibility of the innovation with existing practices and routines. By overcoming these challenges, individuals can successfully incorporate the innovation into their everyday activities.
- **Confirmation:** The confirmation stage represents the final phase of the diffusion adoption process. In this stage, individuals evaluate the outcomes of their decision to adopt the innovation and seek validation for their choice. This phase is critical, as it can influence an individual's continued use of the innovation. The confirmation process is shaped by several factors, including satisfaction with the innovation, the availability of support and resources to facilitate its ongoing use, and the opinions of others within the individual's social network. Addressing these factors effectively reinforces the decision to adopt the innovation and encourages its sustained use over time. The following figure illustrates the components of the innovation diffusion process.



**Figure 3. 3: Innovation Diffusion Process**



**Source: Rogers (1983)**

### 3.3.3 Attributes of an Innovation

The diffusion of innovation theory identifies five key characteristics that significantly influence the adoption of innovations, each of these characteristics is important in determining the decision of individuals to accepting and embracing educational technologies or innovations.

- **Relative advantage** is arguably the most critical characteristic influencing adoption. It relates to the degree to which an innovation is perceived as superior to existing alternatives, based on factors such as economic benefits, social status, convenience, or satisfaction. As Rogers (2003) asserts, the greater the perceived relative advantage of an innovation, the faster its adoption is most likely to occur within a social system.

- **Compatibility** is another important characteristic that influences the diffusion process. It refers to the degree to which an innovation aligns with the values, experiences, and needs of potential adopters. Innovations that are consistent with the existing values, norms, and practices of individuals are more likely to be rapidly adopted, as they facilitate a smoother integration into established systems.
- **Complexity** is a significant determinant in the rate of adoption. It refers to the degree to which an innovation is perceived as difficult to understand or use. The more complex an innovation is perceived to be, the slower its adoption, as potential adopters may hesitate to engage with technologies they perceive as difficult to comprehend or implement effectively.
- **Trialability** is another key characteristic in the adoption process. It describes the extent to which an innovation can be experimented with on a limited basis prior to full-scale adoption. The opportunity to test an innovation allows potential adopters to assess its relevance and suitability to their needs, thereby increasing the likelihood of its adoption.
- **Observability** is the final characteristic in the diffusion of innovation theory. It refers to the extent to which the outcomes and benefits of an innovation are visible to others. Rogers (2003) argues that, the greater the observability of an innovation's results, the more likely it is to be adopted. When potential adopters can clearly see the tangible benefits and positive outcomes of an innovation, they are more likely to perceive its value and embrace it.

In the literature, the Diffusion of Innovations theory has been extensively employed to investigate the adoption and diffusion of innovative technologies in university settings. For instance, Mourad (2010) applied this theory to examine students' adoption of online education programmes in higher education, focusing on their perceptions of the innovation's attributes within an emerging market. The findings highlighted that the adoption process was influenced by both internal and external factors within the university, as well as the perceived characteristics of the innovation itself. Similarly, Pinho et al., (2021) conducted an empirical study to explore the factors affecting the adoption of Moodle as a learning management system within an educational context, drawing on the Diffusion of Innovations theory. The results demonstrated that the characteristics of the learning management system, as outlined in Rogers' theory, were significant predictors of Moodle usage among students in Portuguese universities.

Uğur & Koç (2016) developed a standardized instrument that was based on the five constructs of the Diffusion of Innovations framework to examine the use of mobile learning technologies among college students in Turkey. Their empirical findings revealed that the relative advantage and compatibility of the innovation were key factors influencing the adoption of mobile learning technology. Similarly, Chen et al., (2009) applied the innovation attributes dimension to assess participants' perceptions of a new quality control framework for online learning. The study showed that the positive attributes, including the relative advantage, compatibility, and observability, played a crucial role in facilitating and sustaining the adoption of online learning

Even though, the Diffusion of Innovation theory has been criticised for the limited concentration on factors related to the technological infrastructure, neglecting the environmental and social factors that may influence innovation adoption, it remains a crucial framework for this study. The framework provides insight into the broader contextual factor, such as the social, economic, political, and infrastructural conditions, alongside awareness and sensitization efforts, which influence both accounting students and faculty member's decisions to adopt and implement virtual accounting education. Furthermore, it elucidates the processes and institutional structures that facilitate the dissemination of knowledge, enabling informed decisions regarding the adoption of educational innovations in academic institutions.

### **3.4 Unified Theory of Acceptance and Use of Technology (UTAUT)**

The Unified Theory of Acceptance and Use of Technology (UTAUT), which was proposed by Venkatesh, Morris, Davis, and Davis in 2003, represents a comprehensive theoretical framework aimed at offering a unified understanding of the determinants influencing individuals' technology acceptance and usage behavior. This theory synthesizes and extends eight pre-existing models and theories related to technology adoption, with the objective of providing a more integrated and robust explanation of the factors that drive technology adoption. The eight models and theories integrated into the formulation of the UTAUT framework are presented as follows.

1. Theory of Reasoned Action (TRA): This theory argues that an individual's behavioral intentions are primarily influenced by two factors: their attitudes toward the behavior and the subjective norms, which reflect the social pressures

or expectations from significant others. The theory asserts that individuals make decisions based on a rational assessment of the behavior, where their intention to engage in a particular behavior is a function of their personal evaluation of the behavior and the perceived social expectations surrounding it (Fishbein & Ajzen, 1975).

2. **Theory of Planned Behavior (TPB):** The TPB extends the TRA by incorporating the constructs of perceived behavioral control, which acknowledges that individuals' intentions and actions are influenced not only by their attitudes and subjective norms but also by their perceptions of their ability to perform the behavior. This framework underscores the importance of perceived control over the behavior, emphasizing that an individual's intention to act is influenced by both internal factors, such as self-efficacy, and external factors, such as resources and opportunities available to facilitate the behavior (Ajzen, 1991).
3. **Technology Acceptance Model (TAM):** This model acknowledges the significant role of an individual's perceptions of the perceived usefulness and ease of use of technology in shaping their adoption behavior. According to TAM, an individual is more likely to adopt and continue using a technology if they perceive that it will enhance their performance or help them achieve their goals, and if it is easy to use and does not require significant effort (Davis, 1989).
4. **Motivational Model (MM):** The MM highlights the dual influence of intrinsic and extrinsic motivators in shaping an individual's decision to adopt and utilize technology. Intrinsic motivation refers to the inherent enjoyment and satisfaction

derived from engaging in a behavior, while extrinsic motivation involves external rewards or incentives associated with the behavior. The MM posits that both intrinsic desires and extrinsic rewards play pivotal roles in influencing an individual's intention to adopt and use new technologies (Davis et al., 1992).

5. **Combined TAM-TPB (C-TAM-TPB):** This integrated framework provides that an individual's acceptance and use of technology is influenced not only by perceptions of its usefulness and ease of use, as outlined in the Technology Acceptance Model (TAM), but also by the social pressures and norms present within the individual's environment, as emphasized in the Theory of Planned Behavior (TPB). In essence, the decision to adopt and use technology is shaped by a dynamic interaction between personal beliefs and the social context in which the individual is situated. This combined model provides a comprehensive understanding of technology adoption behavior, acknowledging the critical roles of both individual attitudes and social influences in the decision-making process (Taylor & Todd, 1995).
6. **Model of PC Utilization (MPCU):** The MPCU model underscores the significance of individuals' beliefs regarding their own capabilities and the anticipated outcomes of using technology in shaping their adoption behavior. It highlights the roles of self-efficacy and outcome expectations as key determinants of technology usage. Self-efficacy refers to an individual's confidence in their ability to effectively use innovative technologies, while outcome expectations

pertain to their beliefs about the potential consequences or benefits derived from utilizing the technology (Thompson et al., 1991).

7. **Diffusion of Innovations Theory (DOI):** This theory offers a comprehensive framework for understanding the intricate process of spreading and adopting innovations within a social system. It examines a range of factors that influence innovation adoption, including the inherent characteristics of the innovation, the communication channels through which information is disseminated, and the attributes of the social system. In essence, the theory provides an insightful perspective on the dynamics that drive the diffusion of innovations within a social context (Rogers, 1962).

8. **Social Cognitive Theory (SCT):** This theory provides that an individual's behavior is influenced by a combination of cognitive, behavioral, and environmental factors, including self-efficacy, outcome expectations, and observational learning. Specifically, an individual's decision to engage in a behavior is based on the confidence in their ability to perform the task (self-efficacy), their expectations regarding the potential outcomes of the behavior, and the observations of others' actions. These factors interact in complex ways to guide the individual's decision-making process and ultimately determine their behavior (Compeau & Higgins, 1995).

#### **3.4.1. The Constructs of UTAUT**

The Unified Theory of Acceptance and Use of Technology (UTAUT) asserts that the adoption and utilization of technology by individuals are primarily influenced by four

core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. Additionally, the effect of these constructs is moderated by four contextual factors: age, gender, voluntariness of use, and prior experience with the technology.

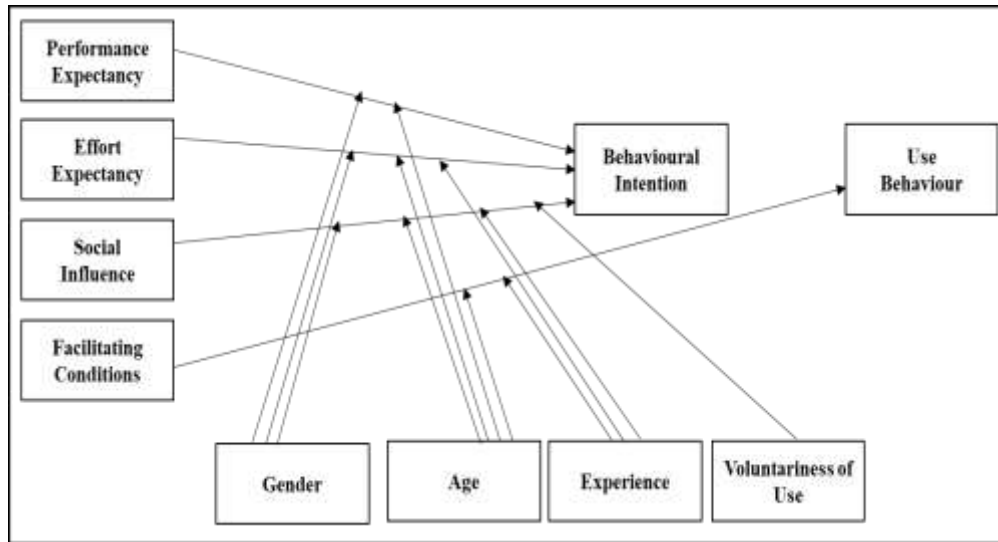
1. Performance expectancy refers to the strong belief that adopting a particular technology would enhance an individual's ability to perform tasks more effectively. This belief is shaped by several factors, including perceived usefulness, extrinsic motivation, job fit, relative advantage, and expected outcomes. This construct argues that, individuals are most likely to adopt and implement educational technologies when they perceive it as beneficial for achieving their goals.
2. Effort expectancy, reflects the degree to which an individual believes that using an innovative technology will require minimal effort. It incorporates sub-constructs such as perceived ease of use, complexity, and the overall ease of interaction with the system. The impact of effort expectancy on adoption and usage behavior is influenced by demographic factors such as age, gender, and prior experience with similar technologies. Thus, an individual's perception of the effort required to use a technology may differ based on their personal characteristics and past exposure to related systems.
3. Social influence concerns the extent to which an individual perceives that significant others believe they should adopt a technology. This construct involves social norms, peer influence, and the perceived social image associated with

technology use. Social influence on technology adoption is also moderated by factors like age, gender, voluntariness of use, and prior experience. In other words, the level of social pressure an individual feels to adopt technology can vary based on demographic variables, the degree of choice in adopting the technology, and their previous experiences with similar tools.

4. Facilitating conditions relates to an individual's perception of the availability of necessary technical and organizational support for using a particular system. This construct includes perceived behavioral control, the availability of resources, and compatibility with existing systems. The effect of facilitating conditions on adoption and usage is influenced by variables such as age and experience with the technology. Consequently, an individual's perception of available support and resources may differ depending on their demographic background and familiarity with similar technologies (Venkatesh et al., 2012). The following figure offers a visual representation of these four key constructs and their moderators within the UTAUT model.



**Figure 3. 4: The Unified Theory of Acceptance and Use of Technology**



**Source: Venkatesh et al. (2003)**

The UTAUT has been widely applied in academic research to examine and predict technology adoption behaviors across various fields. For instance, Manhande & Malango (2019) employed the UTAUT framework to assess e-learning acceptance in Indonesia. The study found that facilitating conditions and behavioral intentions had a significant positive impact on e-learning adoption among the postgraduate students. Similarly, Almaiah et al., (2019) employed the UTAUT model to investigate the key factors to a successful adoption of mobile learning applications among higher education students in Malaysia. The study’s findings established the major role of perceived information quality, compatibility, trust, awareness, and resource availability in promoting the acceptance and adoption of educational innovations among various students in higher education.

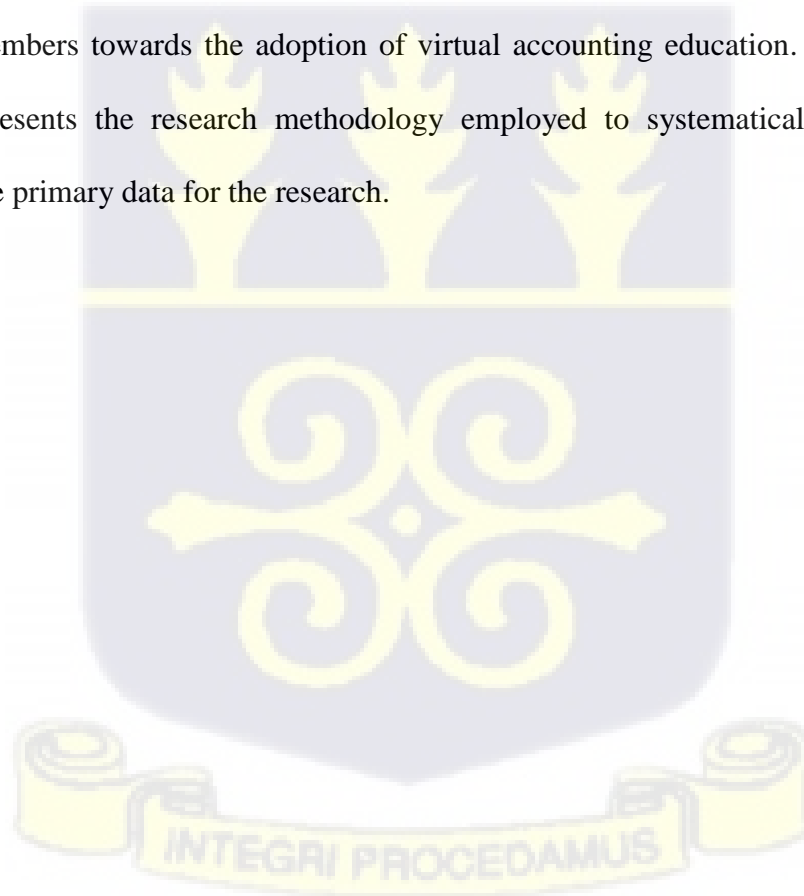
In a related research, Abbad (2021) explored the factors influencing the intention of students to adopt Moodle as a learning management system in public universities in

Jordan. With the use of the UTAUT model, the study collected data from 370 undergraduate students and analysed the data using structural equation modeling techniques. The findings revealed that performance expectancy and effort expectancy significantly influenced behavioral intention, whereas social influence did not exhibit a statistically significant effect. Similarly, Zandi et al., (2022) examined the factors influencing the adoption of e-learning systems among students in Libyan universities. The empirical analysis revealed that performance expectancy, effort expectancy, facilitating conditions, habit, and trust all exerted significant and positive effects on the behavioral intention to embrace and implement e-learning systems among university students.

The Unified Theory of Acceptance and Use of Technology (UTAUT) is relevant and provides a comprehensive framework for this study, having undergone extensive validation across diverse academic domains, including education and information systems. Previous empirical research consistently demonstrates the model's superior capacity to predict and explain technology acceptance behavior compared to other theories. In addition, the UTAUT framework's inherent flexibility allows for the integration of additional constructs, enhancing its explanatory power. Considering the established effectiveness and adaptability of the theory, the UTAUT model is most appropriate for investigating the facilitating conditions essential for the successful adoption and implementation of virtual accounting education within Ghanaian public universities.

### 3.5 Conclusion

This chapter provided a comprehensive discussion of key models and frameworks that guides the study on effective adoption and integration of educational innovations, reviewing their application in existing literature to develop a conceptual research model aimed at understanding the factors influencing the adoption of virtual accounting education in Ghanaian universities. The study recognised the importance of this adoption process by integrating the Theory of Planned Behaviour (TPB), Diffusion of Innovation theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT). This integration was to better understand the views and attitudes of accounting students and faculty members towards the adoption of virtual accounting education. The following chapter presents the research methodology employed to systematically collect and analyse the primary data for the research.



## **CHAPTER FOUR**

### **METHODOLOGY**

#### **4.0 Introduction**

This chapter presents a comprehensive review of the methodology employed to investigate the factors influencing the adoption of virtual learning within public universities in Ghana. The chapter commenced with a critical examination of the philosophical underpinnings that inform the methodological framework of the study, offering insights into the paradigmatic worldview adopted. This is followed by an elaboration of the research design and approaches employed in the study, including a description of the target population, the sampling techniques utilized, and the rationale for determining the sample size. Additionally, the chapter outlines the data collection procedures and the strategies employed to address issues related to missing data and the detection of outliers. The chapter concludes with a comprehensive discussion of the ethical protocols observed, emphasizing the measures implemented to safeguard the rights, dignity, and well-being of participants throughout the research process.

#### **4.1 Research Paradigm**

The concept of a research paradigm is integral to understanding the diverse orientations toward research and the processes of knowledge acquisition. A research paradigm is defined as a cohesive set of ontological and epistemological assumptions shared by a scholarly community, which serves to guide and inform the research process (Prasad, 2017). These underlying principles form the foundation of a researcher's worldview, shaping their interpretation of phenomena and directing their methodological choices

(Mackenzie & Knipe, 2006). According to Nguyen (2019), the adoption of a philosophical worldview enables researchers to critically appraise and align the methodological components of their investigations with the objectives of their study. This process includes the selection of an appropriate research method and development of a coherent framework for the analysis and interpretation of the data for the study. By grounding academic work in such a philosophical framework, researchers are able to ensure that their conclusions are derived through rigorous and systematic evaluation of evidence, thereby enhancing the epistemic validity and reliability of their findings.

#### **4.1.1 Accounting Research Paradigms**

The conceptual framework advanced by Burrell and Morgan (1979) has profoundly influenced sociological inquiry, providing a foundational basis for numerous scholars, including Hopper and Powell (1985), Chua (1986), and Laughlin (1995), in their critical examinations of alternative methodological paradigms in accounting research. This section presents a detailed discussion of the philosophical underpinnings of various research, with a particular focus on the three dominant paradigms: positivism, Interpretivism, and pragmatism.

#### **4.1.2 Positivist Paradigm**

Positivism as a fundamental research paradigm, originates from Plato's realist philosophy, which indicates that knowledge must be certain, universal, and immutable (Shand, 1993). Achieving such knowledge necessitates adherence to systematic and rigorous methodology, modelled on those employed in the natural sciences. Ontologically, positivism emphasized that reality must exist as an objective and

independent entity, unaffected by social actors or practices (Tinker et al., 1982). The epistemological stance is characterized by objectivism, which mandates researchers to engage with phenomena through observation alone, without exerting influence on the research process (Cohen et al., 2013). The proponents of positivism postulate that authentic knowledge emerges from the empirical collection of observable facts, which serve as a foundation for deriving universal laws. The principal objective of positivist inquiry is to generate hypotheses that are empirically testable and capable of advancing theoretical knowledge (Collis & Hussey, 2009). Through its focus on uncovering causal relationships, positivism aims to provide explanations and predictions grounded in measurable and quantifiable outcomes (Ugwu et al., 2021). Methodologically, this paradigm employs quantitative techniques to collect and analyse data, facilitating the deduction of causal linkages and the systematic exploration of phenomena.

#### **4.1.3 Interpretivist Paradigm**

Interpretivism involves a broad range of methodologies, including phenomenology, constructionism, relativism, hermeneutics, and idealism, all of which seek to explore the nature of individual agency and engagement within social and cultural contexts (Elster, 2007; Grix, 2010). Philosophically, interpretivism is rooted in an anti-positivist stance, underpinned by a relativist ontology that posits the existence of multiple, context-dependent realities for any given phenomenon. Its epistemological foundation is subjective, emphasizing the co-construction of knowledge through the interactive relationship between the researcher and participants (Edmonds & Kennedy, 2013). Rather than focusing on the development of new theories, interpretivism prioritizes the re-

evaluation and refinement of existing theoretical frameworks related to the research phenomenon (Walsham, 1995).

The Interpretivist paradigm contends that knowledge and meaning emerge from interpretive processes, explicitly rejecting the objectivist view of knowledge as detached or universal. Researchers within this paradigm adopt a subjective perspective to deeply engage with the lived experiences and perspectives of individuals, which serve as the principal source of knowledge for inquiry (Chen & Hirschheim, 2004). Interpretivist investigations are conducted within the natural context of the phenomena being examined, acknowledging the influence of the researcher's presence on the research process and outcomes. Data collection in this paradigm relies on methods such as interviews, discourse analysis, textual interpretation, and reflective sessions, with researchers often adopting the role of participant observers. In other words, the primary purpose of interpretivist research is to provide a richly contextualized understanding of specific phenomena, while recognizing that the insights generated may be context-bound and not readily generalizable to other settings.

#### **4.1.4 Pragmatism Paradigm**

This section examines the philosophical paradigm that underpins this research and justifies its relevance in addressing the study's objectives.

This study adopts a pragmatic research paradigm, a philosophical foundation that conceptualizes reality through multiple perspectives. It acknowledges the existence of diverse ways of interpreting the world and conducting research. In this framework, researchers recognize the limitations of achieving complete objectivity or subjectivity

and, instead, focus on employing the most effective philosophical or methodological approaches to address the specific research problem (Tashakkori & Teddlie, 2009). As a pragmatic philosophy, it offers the flexibility to select methods and strategies that are most suitable for answering the research questions, without being confined to rigid categorizations of knowledge forms (Denscombe, 2021).

The adoption of the pragmatic worldview for this research is particularly well-suited, given its emphasis on methodological flexibility. This approach permits the researcher to strategically select the most appropriate methods and approaches that addresses the research objectives. In this study, a qualitative approach, such as semi-structured interviews, was employed to gain deeper insights into the perceptions and attitudes of expert evaluators on the adoption and implementation of educational innovations. In addition, quantitative methods, particularly surveys, were employed to examine the behavioural intentions and attitudes of both accounting students and faculty members towards the adoption of technological innovations. By integrating these qualitative and quantitative approaches, the study comprehensively investigates the key factors influencing the adoption and implementation of virtual accounting education in public universities in Ghana.

#### **4. 2 Research Design**

A research design is a well-organized set of principles and procedures that guide researchers in addressing the problem of the research. It serves as a strategic framework, which provides an alignment of the research questions with the overall execution of the study, and providing a clear roadmap to follow throughout the research process

(Durrheim, 2006). In the academic literature, research design is mainly categorized into three types: descriptive, exploratory, and explanatory studies. Each of these categories performs a unique role in shaping the approach to understanding and developing the research topic (Yin, 2014).

#### **4.2.1 Descriptive Research**

A descriptive research design aims to provide a detailed and comprehensive understanding of a specific research issue within an established theoretical framework. As argued by Rubin & Babbie (2016), this design is particularly well-suited for addressing research questions that seek to uncover the “who, what, when, where, and how” of a subject. Salaria (2012) further asserted that, descriptive research goes beyond the mere collection and tabulation of data, incorporating systematic analysis, interpretation, and comparison of information to identify trends and relationships. According to Shi (2007), researchers employing methods such as interviews, observations, and surveys would provide a more in-depth exploration of the characteristics of a population or phenomenon, thereby enhancing the depth and breadth of understanding in the study.

#### **4.2.2 Exploratory Research**

The exploratory research design is a significant methodological approach, particularly valuable when there is limited existing knowledge regarding the phenomenon under investigation. This design facilitates a deeper understanding of the subject matter and fosters the generation of new insights and ideas. In contrast, to other research designs focusing on hypothesis testing and examining causal relationships between variables,

exploratory research mainly seeks to examine the nature of the research problem and to formulate hypotheses for subsequent testing (Shi, 2007). Exploratory designs provides the foundational framework for more definitive research and plays an essential role in shaping the initial research design, sampling strategies, and data collection techniques (Singh, 2007). In exploratory studies, a range of research methods, including literature reviews, surveys, focus groups, and case studies, are often employed to enhance the understanding of the phenomenon under investigation (Doyle et al., 2020).

#### **4.2.3 Explanatory Research**

Explanatory research is a design primarily focused on investigating the impact of an independent variable on a dependent variable. This design seeks to establish causal relationships between variables and serves as a foundation for hypothesis testing. In contrast to descriptive and exploratory research, which allow for flexibility and potential shifts in direction, explanatory studies follow a structured and methodologically rigorous sequence of controlled steps (Gratton & Jones, 2010). The principal objective of explanatory research is to provide a deeper understanding of the underlying mechanisms governing natural phenomena and to clarify the systematic relationships between variables. Given the necessity of generalizing findings to the broader population from which the sample is drawn, probability sampling is an essential component of explanatory research (Singh, 2007).

#### **4.3.0 Research Approaches**

Following the determination of the research design, it is imperative to select the most appropriate approach or strategy for data collection to effectively address the research

questions. A research approach refers to the set of techniques and procedures employed to gather data that align with the research objectives and provide answers to the research questions (Saunders et al., 2009). In relations to scientific inquiry, researchers have the option to choose between quantitative, qualitative, or mixed-methods approaches, each providing distinct advantages depending on the nature of the research problem and the objectives of the study (Yin, 2014).

#### **4.3.1 Quantitative Research Approach**

Quantitative research represents a predominant methodological approach within the natural sciences, emphasizing numerical analysis, hypothesis testing, behavioral observation, and the collection of empirically measurable data (Mohajen, 2020). Its methodological framework is grounded in the use of standardized and structured instruments, such as questionnaires, coupled with statistical techniques to analyze numerical datasets. Central to this approach is the assumption that researchers maintain strict objectivity and detachment from the subjects under study, thereby ensuring that data interpretation is devoid of subjective influences. The overarching aim of quantitative research is to produce findings that are both replicable and generalizable to broader populations and diverse contexts (Morgan et al., 2006).

Quantitative research is commonly categorized into four primary types: descriptive, correlational, experimental, and single-subject designs (Khaldi, 2017). Descriptive research seeks to observe, document, and analyse phenomena in their natural contexts without intervening or manipulating variables. Generally, conducted in real-world settings with large sample sizes, this approach enables researchers to uncover novel

insights, characterize existing phenomena, determine their frequency, and organize information systematically (Montero & León, 2007). In contrast, correlational research investigates the relationships between two or more variables without exerting any influence on them. Often termed “associational research”, this methodology aims to identify patterns of covariance or interdependence among variables, thereby providing empirical evidence of their relationships (Asamoah, 2014).

Experimental studies are represented by a rigorous research design, which aims at establishing causal relationships between an intervention and an observed outcome. This methodology involves administering a treatment to two or more groups and systematically comparing their outcomes to evaluate the effect of the intervention (Ajimotokan, 2022). In contrast, single-subject designs focus on a detailed quantitative analysis of individual participants or small groups subjected to varying conditions. This approach examines changes in dependent variables, such as human behavior, before and after the introduction of an intervention to assess its impact. By closely tracking behavioral or outcome variations over time, single-subject designs provide nuanced insights into the efficacy of the intervention (Horner et al., 2005).

The quantitative approach provides many significant advantages in social science research. The primary strength lies in the ability to systematically measure the responses of large samples to a limited set of variables, enabling comparisons and statistical aggregation of data. This approach enables the generation of findings that are both broad in scope and generalizable, while also being concise and analytically precise (Yilmaz, 2013). The use of statistical tools also enhances efficiency of academic research by

minimizing the time and resources required for data collection and analysis (Bryman et al., 2008)

Despite its numerous advantages, the quantitative approach in social research has been subject to criticism for its limited scope, which often overlooks essential dimensions of human and social inquiry, such as meaning-making, conceptual exploration, discovery, deep understanding, and shared interpretation (Blaikie, 2007). Furthermore, its reliance on the assumption of objective measurement can lead to a detached relationship between the researcher and the subject, thereby failing to account for the interactive and co-constructive processes that are intrinsic to data collection involving human participants (Lincoln & Guba, 1985).

#### **4.3.2 Qualitative Research Approach**

Qualitative research approach represents a methodological approach aimed at understanding social and human phenomena by constructing a comprehensive and holistic perspective through detailed narratives and rich descriptions obtained from participants in their natural contexts (Creswell et al., 2016). This research approach promotes the development of an in-depth understanding by capturing participants' perspectives and interpreting their experiences within real-world settings (Mohajan, 2018). In contrast with the quantitative methods, qualitative research focuses on generating new insights and understanding by identifying emergent patterns within the dataset, rather than relying on predetermined models, hypotheses, or theories (Taylor et al., 2015). Through a rigorous analysis of textual or visual data, this approach aims to

reveal a deeper meaning and uncovers relational dynamics that might otherwise remain obscured (Flick, 2018).

Within qualitative research, several foundational traditions are recognized, including phenomenology, grounded theory, ethnography, and historical research (Burns & Grove, 2010). Phenomenology seeks to explore and understand the essence of a phenomenon by examining the lived experiences of individuals, focusing on the meaning and contextual dimensions of their experiences (Teherani et al., 2015). Grounded theory, by contrast, employs an inductive approach where data collection and analysis occur concurrently, allowing a theory to emerge organically from the data itself. This iterative process ensures that the resulting theory is firmly rooted in empirical evidence (Strauss & Corbin, 1994; DePoy & Gitlin, 2019).

Historical research is a methodological approach that examines past events in a chronological sequence, focusing on specific periods to provide an in-depth understanding of the events, ideologies, and figures that shaped them (Morse & Field, 1995). This research approach seeks to contextualize and interpret the complexities and underlying factors that influenced historical developments. In contrast, ethnography is a research methodology designed to explore how human groups form, maintain, and evolve their cultural practices. By engaging in long-term immersion within the settings of these groups, ethnographers investigate interactions, roles, rituals, and ceremonies to understand the social dynamics of research (Rossman & Rallis, 2003; Marshall & Rossman, 2011). Academic researchers employing this approach seek to describe and analyse patterns of human behavior and cultural expressions within communities,

organizations, or groups, aiming to uncover the cultural narratives that shape these interactions (Marshall & Rossman, 2011).

The primary objective of qualitative research is to enable scholars to study events, behaviors, and phenomena within their natural contexts. This approach provides a robust framework for exploring the underlying meanings, motivations, beliefs, attitudes, values, and aspirations that influence social relationships, processes, and events (Maxwell, 2013). However, qualitative research is not without its limitations. One such limitation is external validity: due to concerns related to reliability and generalizability, it can be difficult to extend the findings of qualitative studies to larger populations (Lewis et al., 2003). In addition, various ethical concerns arise when handling highly specific or sensitive data, as researchers must ensure the protection of participants' privacy and confidentiality (Cohen et al., 2017). In spite of these challenges, qualitative research serves as a critical approach for gaining a deeper and contextualized understanding of complex social phenomena, offering valuable insights into the lived experiences and perspectives of participants.

#### **4.3.3 Mixed Methods Approach**

Mixed research methods involves an integration of distinct quantitative and qualitative research strategies in the collection, interpretation, and analysis of data. Johnson et al., (2007) defined the mixed research methods as an approach in academic research where elements of both quantitative and qualitative methodologies are combined to gain deeper insights into a research phenomenon. Johnson & Onwuegbuzie (2004) argue that, the mixed methods are particularly valuable in contemporary research, as they require a

comprehensive understanding of various methods employed by scholars across interdisciplinary, complex, and dynamic contexts. The scholars also emphasized the necessity of integrating different methodological approaches to address specific research questions. By adopting an integrative approach, researchers can select the most appropriate research design components that best align with the objectives of their research.

The legitimacy of the mixed-methods approach is grounded in its potential to produce outcomes that are more robust and offers deeper insights than singular quantitative or qualitative methodologies. When a research is carefully designed and executed, this approach ensures a more holistic understanding by facilitating the comparison of results and the identification of correlations between diverse data sets (Leech & Onwuegbuzie, 2009). Furthermore, the mixed-research methods enriches the understanding of a phenomenon by offering divergent and complementary perspectives, which can stimulate further reflection and open avenues for future research (Teddlie & Tashakkori, 2009). Mertens (2019) also asserts that, the use of mixed methods allows researchers to identify discrepancies, anomalies, and contradictions within the research data, contributing to a more nuanced interpretation of the findings.

For this study, the decision to adopt the mixed methods approach was specifically motivated by its capacity to integrate both qualitative and quantitative data collection techniques, enabling the triangulation and validation of insights from each methodological perspective (Creswell, 2009). By integrating these complementary methods, the researcher aimed to construct a more comprehensive evidence base,

achieved through the juxtaposition and in-depth analysis of the research data collected from both the quantitative and qualitative processes. This approach was also selected for its efficacy in evaluating the convergence of perspectives, validating findings, and ensuring the consistency of results across diverse participant groups, thereby strengthening the credibility and depth of the study's conclusions.

Mixed methods research encompasses several key variations, including sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation, concurrent nested, and concurrent transformative designs (Baumgartner et al., 2019). This study mainly employed the sequential explanatory mixed methods design, wherein the first phase of the study involved the systematic collection and analysis of quantitative data, followed by a qualitative phase, which sought for a deeper and broaden understanding of the initial findings from the quantitative study. Creswell et al., (2008) argues that, the sequential explanatory design is inherently structured to leverage qualitative data to elucidate and interpret the outcomes of a predominantly quantitative investigation. This methodological approach allows the researcher to begin with a quantitative analysis and use the qualitative methods to gain deeper insights, especially when addressing unexpected or unusual findings. It also provides a comprehensive interpretive understanding of research findings through the process of qualitative exploration.

#### **4.4.0 The Research Settings**

Delamont (2012) emphasized the importance of selecting a research setting, which provides relevant and meaningful insights before data collection. To gain a thorough

understanding of the main factors influencing the adoption of virtual accounting education, this study focused on four public universities running various accounting programmes at the undergraduate and postgraduate levels. These educational institutions were selected based on their autonomy and capacity to implement innovative teaching methods, including virtual accounting education, in contrast to private universities in Ghana, which operate under the supervision of public institutions and lack independent charters. Furthermore, the selection of these four public institutions was informed by shared characteristics, such as standardized regulations, organizational structure, degree offerings, appropriate size, and a well-established history of integrating virtual learning systems into their teaching and learning processes. A brief overview of these universities and their academic programs, derived from their official websites, is presented below:

#### **4.4.1 The University of Education, Winneba (UEW)**

The University of Education, Winneba (UEW), established in 1992, is a leading institution dedicated to training teachers and administrators for Ghana's educational system. With its main campus in Winneba and a satellite campus in Ajumako, UEW offers a wide array of academic programs, including accounting and other business-related courses, through flexible study modes such as regular, part-time, sandwich, and distance learning. Achieving the university status in 2004, the institution has since focused on producing graduates capable of making meaningful contributions to the economic and social development of Ghana. Renowned for its academic rigor and commitment to innovative teaching methodologies, UEW has built a strong reputation for producing graduates who have excelled in various fields and promoting the mission of

the university to drive socio-economic development through the provision of quality education.

#### **4.4.2 The University of Ghana (UG)**

The University of Ghana (UG), founded in 1948, is a prestigious academic institution with a rich legacy of transformation, establishing itself as one of the largest and most respected universities in Ghana. The university offers a comprehensive array of programs across diverse disciplines, including business, health sciences, humanities, and education, and serves a student population exceeding 138,000. Organized into four colleges within a collegiate system, UG is renowned for its emphasis on research, with its faculty and staff engaged in a broad spectrum of research initiatives aimed at addressing both local and global challenges. The university's enduring commitment to academic excellence has attracted a diverse body of students, scholars, and researchers from across the globe, solidifying its standing as a key contributor to human resource development in Ghana and internationally.

#### **4.4.3 The University of Cape Coast (UCC)**

The University of Cape Coast (UCC), established in 1962, is a prominent public institution in Ghana, with a core mission centered on education and the professional development of graduate teachers. UCC is committed to delivering a comprehensive, interdisciplinary curriculum that promotes creativity, critical thinking, and responsible citizenship among its students. The university operates under a collegiate structure, comprising five colleges: the College of Education Studies, the College of Humanities and Legal Studies, the College of Distance Education, the College of Health and Allied

Sciences, and the College of Agriculture and Natural Resources. Currently, the institution serves a diverse student population exceeding 70,000, and offers undergraduate and postgraduate programs across multiple delivery modes, including regular, sandwich, distance, and continuous education. The university's enduring commitment to academic excellence as well as the development of skilled, globally competitive graduates has positioned it as a leading educational institution within the country.

#### **4.4.4 The University of Professional Studies (UPSA)**

The University of Professional Studies (UPSA) in Ghana is a highly reputable public institution that specializes in both academic and professional business education. Established in 1965 as a private entity, UPSA transitioned to public status in 1978 under the Institute of Professional Studies Decree (SMCD 200). Over the past five decades, UPSA has become the leading institution in the country for professional accounting education. The university has built a strong reputation for producing graduates who excel in leadership positions both within Ghana and internationally. With a diverse range of undergraduate and Master's degree programs, UPSA serves a student body of approximately 20,000, maintaining its role as a key contributor to the development of skilled professionals in Ghana's business sector.

#### **4.5 Population and Sampling**

This section outlines the population, sampling procedures, sample size, and the distribution of respondents within the sample.

#### 4.5.1 Population

The population for this study comprised accounting students, lecturers, and academic administrators from public universities in Ghana, all of whom possess substantial knowledge and experience with virtual learning systems. The selection of public universities was primarily driven by their accessibility and greater familiarity with virtual accounting education, in contrast to private institutions. By focusing on this specific target population, the study aims to gain a deeper and more comprehensive understanding of the factors influencing the adoption of virtual accounting education in Ghana.

**Table 4. 1: Target Population**

University	Students	Faculty Members	Virtual Learning Experts	Total
UEW	1,250	13	4	1,267
UG	2,800	15	6	2,821
UPSA	3,200	24	5	3,230
UCC	2,850	11	4	2,865
<b>Total</b>	<b>10,100</b>	<b>63</b>	<b>19</b>	<b>10,182</b>

**Source: (Field Study, 2023)**

#### 4.5.2 Sampling Technique

Sampling is a critical aspect of research, involving strategic decisions regarding the selection of data and the identification of appropriate sources. As outlined by

Dhivyadeepa (2015), sampling entails the application of specific methods to draw inferences about the characteristics of a broader population. In general, a sample is a carefully chosen subset of the entire population, whose attributes are then generalized to reflect those of the larger group under investigation (Creswell, 2009).

Sampling in research is generally categorized into two primary approaches: probability sampling and non-probability sampling. Probability sampling guarantees that every member of the population has an equal and known chance of being selected, and includes methods such as simple random sampling, stratified sampling, cluster sampling, and systematic sampling (Johnson et al., 2014). Conversely, non-probability sampling does not provide equal selection opportunities for all population members, with the choice of sampling units often based on the researcher's discretion, expertise, or judgment (Hair et al., 2003). The most common non-probability sampling techniques include quota sampling, snowball sampling, convenience sampling, and purposive sampling, as detailed by Yin (2014).

For this study, after the purposive selection of tertiary institutions involved in virtual accounting education, purposive sampling was employed to identify e-learning experts, technicians, and academic administrators for the qualitative component. This approach enabled the selection of participants based on their professional roles, specialized knowledge, and expertise in the implementation of virtual learning systems. In addition, to promote a representative and unbiased selection for the quantitative survey, simple random sampling was utilized, involving accounting students and faculty members from various higher education institutions across Ghana.

#### 4.5.2 Sample Size

The Taro Yamane (1967) formula was utilized in calculating the sample size for this study, specifically for the student population. The formula employed for the computation of the sample size is as follows:

$$n = \frac{N}{1+N(e)^2}.$$

Where:

n = sample size

N = population size

e = margin of error

Substituting N=10,100, assuming a 95% confidence interval and an error margin (e) of 0.05, the minimum sample size required for the survey was determined to be 385 students. However, a total of 636 accounting students were selected from various academic institutions. As argued by Yin (2014), a larger sample size is particularly crucial in studies involving complex and heterogeneous populations, such as university students who come from diverse backgrounds and exhibit varying levels of experience and educational preferences.

For the qualitative aspect of the study, a sample size of eight respondents was chosen for the interviews. This selection was based on the principle of data saturation, which asserts that a small number of participants would provide sufficient data, as additional respondents would not likely contribute new insights or information. Guest et al., (2006) highlighted that saturation in qualitative research is typically reached with 12 to 15 interviews, while Creswell (2009) recommended that conducting between 5 and 25

interviews to achieve saturation. Additionally, the main emphasis of qualitative research should be on the adequacy of the sample, as this reflects the richness of information gathered and ensures the inclusion of diverse perspectives (Ritchie et al., 2013).

#### **4.6 Data Collection Process**

This section provides a comprehensive overview of the methods and techniques employed in the data collection process, outlining the rationale behind their selection and their alignment with the study's objectives.

##### **4.6.1 Questionnaires**

A structured questionnaire was employed as the primary data collection tool for gathering information from accounting students and faculty members at the selected academic institutions. This method was chosen due to its efficiency in obtaining substantial amounts of standardized quantitative data while ensuring internal consistency and coherence for subsequent analysis. Additionally, the questionnaire's ease of distribution and collection makes it a practical tool for surveying a large sample of participants within a relatively short time frame, offering advantages in scalability and time efficiency compared to more resource-intensive methods such as interviews or direct observations (Sharma, 2022).

In this study, the scale for assessing the adoption of virtual accounting education was developed by adapting established instruments on online learning from Aguti et al., (2014) and Basak et al., (2016). Careful attention was given to the design of the questionnaire, including its structure, clarity, appearance, language, and the overall length, to ensure it was both accessible and engaging for the participants. The survey

employed a combination of multiple-choice questions and Likert scale statements, allowing the participants to express their level of agreement on a scale ranging from “strongly disagree” to “strongly agree”. The final questionnaire was organised into five main sections, (see Appendices A and B). The first section of the survey instrument sought to gather demographic information from the participants, including age, gender, educational level, and the university to which they are affiliated. The second section of the instrument focused on assessing the level of interactivity, specifically examining faculty members' computer proficiency and their personal experiences with utilizing virtual learning systems.

The third section of the survey instrument sought to gather responses on the critical factors that influence the successful adoption of virtual accounting education within universities. The fourth section aimed to capture participants' perceptions regarding the potential benefits and challenges associated with the adoption of virtual accounting education, as experienced by both faculty members and students. The final section provided participants with an opportunity to provide suggestions for enhancing the implementation of virtual accounting education in Ghana.

#### **4.6.2 Interviews**

As part of the qualitative data collection process, interviews were conducted with e-learning experts and administrative staff from the various academic institutions. Interviews are particularly effective in exploring participants' perceptions and experiences, allowing for a deeper understanding of their views on the research phenomenon (Lambert & Loiselle, 2007). This method is appropriate for qualitative

research seeking to uncover knowledge, attitudes, beliefs, and values of participants. Whittaker (2012) argued that, interviews are an excellent approach for examining complex issues and generating rich data, enabling participants to discuss sensitive topics openly without the constraints of written responses.

The literature identifies three primary types of interviews: structured, unstructured, and semi-structured. Structured interviews adhere to a predetermined set of standardized questions, ensuring consistency and comparability across participants. Unstructured interviews, by contrast, are more flexible, with the interviewee guiding the direction of the conversation. Semi-structured interviews represent a hybrid approach, combining aspects of both structured and unstructured formats. This interview type mostly involves an interview guide that provides a framework for the conversation, while still allowing the interviewer the flexibility to explore issues in more depth as they emerge (Dunn, 2016). As revealed by Bogner et al., (2014), the semi-structured format offers an optimal balance between maintaining thematic coherence and enabling the interviewer to probe further into participants' responses, thus enhancing the richness and depth of the data collected.

In this study, semi-structured interview was utilized to facilitate a more natural flow of conversation, giving the interviewer the flexibility to explore emerging topics or adjust the direction of the interview as needed (Silverman, 2013). This approach also encouraged participants to share their experiences and insights more openly, without being confined to rigidly predefined questions. The interview guide, developed from the

conceptual framework and relevant literature, informed the design of the questions, ensuring they aligned with the study's key themes.

The interview questions focused on critical aspects of virtual learning, including administrators' understanding of the concept, the most suitable subject areas for virtual learning, and the challenges faced by both students and faculty members. Additionally, the interviews addressed the level of institutional support, existing policies, and budget allocations for virtual learning, as well as strategies for improving stakeholder involvement. These responses were anticipated to provide valuable insights into the effectiveness and implementation of virtual learning in the institutions.

To accommodate the schedules of the academic administrators and ensure flexibility, each interview was conducted at a time and location designated by the participants, mostly in their offices. At the commencement of each session, the researcher presented the interview guide, clearly stating the research purpose as well as the potential contributions to the field of accounting education. This guide served as a structured reference for the research, promoting of direction in the conversation process and ensuring alignment with the research objectives. With the explicit consent of the participants, the interviews were documented through both field notes and audio recordings, with each interview lasting between 30 and 40 minutes. The recordings were then transcribed verbatim, and the transcripts were carefully reviewed for accuracy to ensure the reliability and integrity of the data for subsequent analysis.

#### **4.6.3 Pilot Study**

Pilot testing is an essential and integral phase in the development of survey instruments, designed to ensure the validity, reliability, and impartiality of the findings. As emphasized by Gay et al., (2012), pre-testing of survey instruments is indispensable regardless of the specific data collection methods utilized. Pilot studies involve the selection of a small, representative subset of individuals from the target population to rigorously evaluate the questionnaire and associated procedures. This process facilitates the identification of potential ambiguities, enhances instrument precision, and provides actionable feedback for refinement. Additionally, pilot testing aids researchers in estimating the anticipated completion time for the survey and projecting the response rates for the primary data collection phase (Mertler & Charles, 2011).

In March 2023, a pilot study was undertaken with a purposive sample of forty (40) accounting students from the University of Education, Winneba (UEW). The primary objective of this exercise was to solicit detailed feedback on the survey questionnaire, focusing on its clarity, interpretability, and readability. The data obtained from the pilot study also enabled the researcher to refine the data collection protocols and conduct preliminary reliability and validity analyses, thereby evaluating the suitability of the instrument for the intended analytical frameworks. Participant feedback was systematically analysed and informed several modifications to the questionnaire, including the incorporation of additional instructions, the rephrasing of items for enhanced comprehensibility, the correction of typographical and grammatical errors, and

the inclusion of targeted reminders for specific items. These iterative refinements ensured the instrument's methodological rigor and appropriateness for the main study.

#### **4.6.4 Research Validity and Reliability**

Validity and reliability are important metrics for evaluating research instruments, ensuring the rigor, precision, and credibility of the measurements obtained. Validity, in particular, refers to the degree to which an instrument measures the constructs it purports to assess. Li et al., (2019) defined validity as the established through empirical evidence that demonstrates the instrument's ability to measure its intended constructs accurately, while the findings must be interpretable in alignment with the overarching research objectives. Validity is typically categorized into four primary types: face validity, content validity, construct validity, and criterion-related validity, each serving distinct evaluative purposes in instrument development.

Face validity represents the most basic form of validity assessment, focusing on the apparent appropriateness of the instrument without relying on empirical evidence (Cook & Beckman, 2006). It is characterized by its subjective nature, as it depends on the judgment and expertise of the evaluator regarding the subject matter (Nwana, 2007). While face validity provides an initial qualitative assessment of the instrument's suitability, it lacks methodological precision and does not offer evidence of substantive measurement rigor.

In contrast, content validity offers a more robust evaluation, assessing the degree to which survey items comprehensively cover the conceptual domain of the construct under investigation (Creswell et al., 2009). The determination of content validity is a systematic

process involving domain experts who evaluate whether the survey items are both relevant and exhaustive in representing the construct (Mohajan, 2017). This evaluative approach ensures that the instrument's content reflects the theoretical and conceptual parameters of the research domain, thereby enhancing its comprehensiveness, accuracy, and alignment with the study objectives.

Construct validity evaluates the extent to which a measurement instrument accurately reflects the theoretical construct it is intended to measure. This form of validity is established by testing the instrument against theoretical expectations regarding the nature and relationships of the underlying variables or constructs (Picardi & Masick, 2013; Pallant, 2011). The primary objective of construct validity is to develop and refine theoretical constructs that facilitate a deeper understanding, explanation, and prediction of behaviors. In empirical research, methods such as correlation analysis, factor analysis, and the multi-method matrix of correlations are commonly employed to assess and establish construct validity (Thatcher, 2010).

Criterion validity, on the other hand, represents the extent to which an instrument's scores correspond with a well-established construct or criterion of interest (Sullivan et al., 2009; Macnee & McCabe, 2008). This form of validity is further subdivided into predictive validity and concurrent validity. Predictive validity assesses the extent to which scores on one measure can accurately predict scores on a criterion measure obtained at a future point in time, while concurrent validity evaluates the correlation between an instrument and another measure of a related construct administered simultaneously. The inclusion of

an appropriate time interval between the administration of predictor and criterion measures is critical for rigorously examining predictive validity (Sullivan et al., 2009).

The validity of the survey instrument was established through a systematic two-step process involving face validity and content validity. Face validity was evaluated by conducting a pilot test of the survey questionnaires, during which feedback from participants was collected and used to revise and refine the instrument. Content validity, on the other hand, was achieved by submitting draft versions of the student and lecturer questionnaires to the supervisory team, comprising experts in the field of study. These experts reviewed the survey instruments for clarity, relevance, comprehensiveness, and the appropriateness of items and scales. The feedback and recommendations provided by the supervisory team were systematically incorporated to enhance the quality and rigor of the data collection instruments.

Reliability pertains to the degree to which research findings can be replicated or reproduced using the same instruments or measures, reflecting the stability and consistency of the data collected (Ritchie et al., 2013). It also represents the extent to which the items of a specific construct converge and collectively measure the same construct, with internal consistency indicated by the correlation among the items (Sekaran & Bougie, 2010). In this study, reliability was assessed using Cronbach's Alpha, a widely recognized statistical measure of internal consistency. The results, as presented in Table 4.1, indicated Cronbach's Alpha coefficients ranging from 0.675 to 0.885, demonstrating a high level of reliability across all measures. According to Sekaran & Bougie (2010), a reliability coefficient of 0.6 is generally considered an acceptable threshold, while

coefficients of 0.7 or higher denote a high level of reliability. These findings confirm the robustness and consistency of the survey instruments used in the study.

**Table 4. 2: Cronbach Alpha of the pilot study**

<b>Constructs</b>	<b>No. of Items</b>	<b>Alpha (<math>\alpha</math>)</b>
Course dimension	11	0.675
Instructor Dimension	7	0.758
Individual Dimension	7	0.709
Institutional Dimension	8	0.712
Perceptions on VAE	10	0.885

**Source: SPSS Output (2023)**

#### **4.6.5 Document Reviews**

Document review is a critical methodological approach in research, involving the systematic examination and interpretation of written materials to deepen understanding of the phenomenon under investigation (Adebiyi & Mukumbang, 2019). In this study, document review was employed to analyse institutional records as a means of triangulating and enhancing the qualitative data obtained from participants. A range of text-based documents, including university strategic plans, vision and mission statements, institutional websites, and teaching and learning resources, were subjected to thematic analysis to identify key patterns and themes. This rigorous examination provided significant insights into the contextual factors influencing the implementation of virtual accounting education in Ghanaian universities, contributing to a more robust and comprehensive understanding of the research problem.

#### **4.7 Data Analysis Procedures**

Data analysis is an essential component of research, involving the systematic preparation, organization, and interpretation of data to extract meaningful insights and generate valuable conclusions. According to Burns & Grove (2009), this process entails the extraction of relevant information from raw data, which is then transformed into a numerical or thematic representation, facilitating the researcher's ability to comprehend the data and draw valid, generalizable conclusions applicable to the broader population. In this study, the analysis of the collected data was conducted using a combination of qualitative and quantitative approaches, as detailed in the following sections.

##### **4.7.1 Quantitative Analysis**

The study employed a combination of descriptive and inferential statistics to analyse the quantitative data. In the initial phase of analysis, descriptive statistics were utilized to characterize the respondent sample and the key constructs explored in the study. These analyses were conducted using SPSS version 20, which facilitated the computation of various descriptive measures, including frequencies, cross-tabulations, and central tendency statistics (means and standard deviations). Furthermore, tests for the normality of the data distributions were performed using skewness, kurtosis, and the Kolmogorov-Smirnov and Shapiro-Wilk tests, providing a comprehensive assessment of the data's distributional properties.

In the subsequent phase, Structural Equation Modeling (SEM) was employed to test the hypothesized research framework and investigate the relationships between the dependent and independent variables. According to Hair et al. (2019), SEM is a powerful

multivariate analytical technique that allows for the examination of complex interrelationships among latent constructs and their observed indicators. As a versatile tool, SEM is particularly advantageous for analysing systems of interconnected variables that influence one another dynamically (Singha, 2023). Moreover, SEM offers the added benefit of facilitating model comparison, enabling the evaluation of competing theoretical models to identify the one that most accurately represents the data. This approach allows for the testing of both nested and non-nested models, refining theoretical frameworks and hypotheses based on empirical validation (Gefen et al., 2011).

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed in this study for several compelling reasons. Primarily, PLS-SEM is particularly effective for investigating phenomena that are nascent or lack a well-established theoretical foundation, making it an ideal method for exploring emerging research areas. An additional advantage of PLS-SEM lies in its capacity to handle datasets that do not conform to multivariate normality, while also being robust enough to accommodate small to medium sample sizes (Lin et al., 2019). Furthermore, PLS-SEM estimates model parameters by minimizing the discrepancy between the estimated and observed sample covariance matrices, thereby enhancing the reliability and validity of the results (Ali et al., 2018). By leveraging SEM, this study sought to provide more precise, reliable, and comprehensive insights, contributing to the expanding body of knowledge on the adoption of innovative technologies within higher education.

#### 4.7.2 Variables and Scale of Measurement

This section provides a comprehensive overview of the latent variables and the measurement scales employed to evaluate the perceptions of both accounting students and lecturers regarding the adoption of virtual accounting education.

**Table 4.3 Student’s variables and scale of measurement**

<b>Classification</b>	<b>Variables</b>	<b>Code</b>	<b>Scale of Measurement</b>
Dependent	Adoption of virtual accounting education.	AVAL	The construct was measured using six latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014) and Basak et al., (2016).
Independent	Course Dimension	CD	The construct was measured using six latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014).
Independent	Instructor Dimension	IND	The construct was measured using four latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Basak et al., (2016).
Independent	Individual Dimension	ID	The construct was measured using five latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014).

Independent	Institutional Dimension	ISD	The construct was measured using seven latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014) and Basak et al., (2016).
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**Table 4.4 Lecturers' variables and scale measurement**

Classification	Variables	Code	Scale of Measurement
Dependent	Adoption of virtual accounting education.	AVAL	The construct was measured using four latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014) and Basak et al., (2016).
Independent	Course Dimension	CD	The construct was measured using three latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014).
Independent	Individual Dimension	ID	The construct was measured using four latent variables, assessed on a 5-point Likert scale, as adapted from the studies of Aguti et al., (2014).
Independent	Institutional Dimension	ISD	The construct was measured using six latent variables, assessed on a 5-

			point Likert scale, as adapted from the studies of Aguti et al., (2014) and Basak et al., (2016).
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#### 4.7.2 Qualitative Analysis

The qualitative method of thematic analysis was employed in this research to analyse qualitative responses based on both predefined and emergent codes, with the aim of identifying key themes related to the research questions. Braun et al., (2018) emphasised that, thematic analysis involves a systematic process of identifying, organizing, and providing insights into patterns of meaning or themes across the dataset. Denscombe (2021) highlighted that, the main purpose of thematic analysis is to enhance the trustworthiness of the data by demonstrating that the themes derived from participants' views are consistent across a larger group of respondents in the study.

In addition, Alhojailan (2012) argued that the thematic analysis is not merely a quantitative technique of counting words or phrases, but rather a qualitative approach focused on identifying and describing both implicit and explicit ideas within the data. The identified themes are coded in order for the labelling or summarizing the raw data for further thematic exploration. This iterative process allows for the identification of significant themes that may not have emerged from the initial research questions. The qualitative data analysis in this study was conducted through the following systematic processes.

- **Familiarization and organization:** In this initial phase, the researcher carefully listened to the interviews and reviewed the textual data, actively seeking patterns and meanings within both the auditory and textual content. The researcher also identified key points and concepts, which were used to guide the classification of the data for the subsequent stages of analysis.
- **Generating initial codes:** In the second phase, the researcher engaged in coding and reducing the data based on the ideas identified during the familiarization and organization phase. Each data segment was assigned a label that reflected its content or meaning and was linked to the research questions. Relevant quotes from the data were selected to illustrate or support each code.
- **Searching for themes:** At this stage, the focus shifted from individual codes to broader themes. The researcher reviewed the list of categories derived from the coded data and searched for potential themes that captured the core meanings of the data.
- **Reviewing themes:** In the fourth phase, the researcher evaluated the emerging themes and identified the candidate themes that best represented the main patterns or meanings in the data. A thematic map was created to visualize the relationships and connections between the themes and subthemes, providing a clear representation of the analysis.
- **Defining and naming themes:** In this stage, the researcher refined the candidate themes by assessing their validity, coherence, and distinctiveness. Themes were revised, combined, or discarded as necessary. A final thematic map was created

to represent the relationships among themes and subthemes, offering a visual summary of the analytical process.

- **Producing the report:** The final phase involved the researcher synthesizing and communicating the themes and data extracts in a report. Each theme was summarized, with its significance, implications, and supporting evidence discussed. Relevant quotes were included to illustrate each theme, and the connection between the themes and the research questions was clearly explained.

#### **4.8 Ethical Considerations**

Ethical considerations are paramount in research, especially in academic studies that seeks to investigate the behaviours and attitudes of the participants (Hesse-Biber & Leavy, 2010). In research, it is the ethical responsibility of researchers to safeguard the rights and privacy of participants, ensuring that they are thoroughly informed about the study's objectives, potential risks, and anticipated benefits. Researchers must guarantee that the data collected will be utilized solely for academic purposes and will be treated with strict confidentiality. Furthermore, it is essential for researchers to uphold the principles of anonymity and secure informed consent from participants before using any personal information. In the context of this study, ethical clearance was obtained from the University of Ghana's Ethics Committee, with formal approval granted prior to the commencement of data collection.

In this study, the researcher obtained permission from the heads of departments at the participating academic institutions, ensuring that the rights and autonomy of all individuals involved were upheld throughout the research process. Participants were

provided with informed consent forms that clearly outlined the confidentiality of their responses and assured the anonymity of their identities. Additionally, participants were informed of their right to withdraw from the study at any point without facing any negative consequences. To maintain objectivity, the researcher refrained from sharing personal experiences with the participants, thereby safeguarding the integrity of their opinions and judgments. Before the analysis of qualitative data, participants who took part in the interviews were given the opportunity to review and confirm the accuracy of their responses, ensuring the validity and reliability of the data collected.

#### **4.9 Conclusions**

This chapter presented a comprehensive discussion of the research methodology employed in this study, detailing the three primary research paradigms: positivism, interpretivism, and pragmatism. The pragmatic paradigm was identified as the most appropriate framework for this study, given its alignment with the research objectives and its balance of strengths and limitations. A sequential explanatory research design, integrating both quantitative and qualitative approaches, was utilized to explore the perceptions of students, faculty members, and academic administrators from various public tertiary institutions across the country. The application of mixed methods enabled an in-depth understanding of the research phenomena, allowing for the corroboration of findings and a deeper insight into the complexities of the topic under investigation. The ethical considerations were also addressed in order to ensure the protection of the participants' rights and confidentiality of information. The following chapter will present a thorough analysis and discussion of both the qualitative and quantitative data collected in the study.

## CHAPTER FIVE

### PRESENTATION AND ANALYSIS OF RESULTS

#### 5.0 Introduction

This chapter provides an analysis and discussion of the study's findings in relation to existing academic research. The empirical results is structured into four main sections. The first section presents the findings on the perceptions and attitudes of accounting student in relations to the adoption of virtual accounting education. The second section examines faculty member's perspectives and experiences with the integration of educational technologies into accounting curricula. Following this, the third section provides insights from academic administrators, identifying the critical organizational resources and support required to promote a successful adoption of virtual accounting education within tertiary institutions in Ghana. The final section synthesizes the main findings, contextualizing the results within both empirical and theoretical literature in order to provide a deeper and better understanding of the research phenomena in the settings of Ghana.

#### 5.1 Student's Rate of Response

The rate of response was determined by dividing the number of valid responses by the total number of eligible participants. Of the 750 questionnaires distributed to accounting students in the four public universities, 650 were completed and returned, resulting in a response rate of 86.7%. However, ten responses were from participants under the age of 18 years and four responses with over 70% missing data were excluded from the data analysis. As a result, the final sample consisted of 636 valid responses. While this

response rate of 86.7% is slightly lower than those reported in similar studies, such as those by Liu & Zainuddin (2021) and Elsayed et al., (2022), which exceeded 90%, it remains within an acceptable range for academic research.

### 5.1.1 Demographic Characteristics of Students

This section presents an overview of the demographic characteristics of the respondents involved in this study. The analysis focuses on key background variables, including gender, age, nationality, type of university, education level, and mode of study. This examination of participants' profiles aims to offer a deeper understanding of the characteristics of the students who contributed to this study. A summary of the demographic information of the accounting students is presented in Table 5.1.1 below.

**Table 5.1 1: Demographics information of the student participants**

		<b>Frequency</b>	<b>Percent</b>
Gender	Male	372	58.5%
	Female	264	41.5%
Age group	Below 20	125	19.7%
	21-25	384	60.4%
	26-30	76	11.9%
	31-35	25	3.9%
	36-40	14	2.2%
Nationality	above 40	12	1.9%
	Ghanaian	628	98.7%
	Non-Ghanaian	8	1.3%
University	UEW	142	22.3%
	UG	162	25.5%
	UPSA	173	27.2%
	UCC	159	25.0%
Degree Type	Postgraduate	83	13.1%

	Undergraduate	553	86.9%
Level of study	1st Year	40	6.3%
	2nd Year	48	7.5%
	3rd Year	475	74.7%
	4th Year	73	11.5%
Mode of Study	Part-Time	65	10.2%
	Full-Time	571	89.8%

**Source: Field Data (2023)**

- Age Group:** As presented in Table 5.1.1, the sample included students from a range of age groups, with the majority (60.4%) falling within the 21 to 25-year age bracket. The next largest group consisted of those aged under 20 years (19.7%), followed by respondents in the 26 to 30 year range (11.9%), and those aged over 30 years (8%). The mean age of the participants was 23.8 years, with a standard deviation of 5.05 years. These findings indicate that the majority of respondents were young adults, all of whom were capable of providing informed consent and offering valid responses for the study.
- Gender:** The gender distribution of participants revealed a disproportionate representation, with 58.5% male respondents and 41.5% female respondents. This reflects a broader trend within accounting programs, where male students generally outnumber female students.
- Nationality:** The study was predominantly comprised of Ghanaian students, accounting for 98.7% of the sample, while a smaller proportion of 1.3% represented international students enrolled in various accounting programs in the

public universities across Ghana. This composition underscores the concentration of the study on examining the perceptions and experiences of all accounting students within the Ghanaian context, while also recognizing the inclusion of a few international students.

- **University:** As shown in Table 5.1.1, the sample was drawn from four distinct academic institutions. The participants were distributed as follows: 27.2% from the University of Professional Studies, 25.5% from the University of Ghana, 25% from the University of Cape Coast, and 22.3% from the University of Education. This distribution reflects a better representation of accounting students from the various universities in Ghana, thereby enhancing the comprehensiveness and generalizability of the findings.
- **Degree Type:** Regarding the educational levels of the respondents, the majority of participants (89.1%) were enrolled in undergraduate accounting degree programs, reflecting the predominant focus of the study on accounting students at the undergraduate level of education. In contrast, post-graduate accounting students represented a smaller percentage, accounting for 13.1% of the total sample used in the research.
- **Level of study:** The distribution provides a comprehensive representation of accounting students at different stages of their academic journey. The study showed that, the majority of student respondents (74.7%) were in their third year of study, followed by 11.5% in their fourth year. The remaining of the student

respondents were in the first and second years of study, comprising 6.3% and 7.5%, respectively.

- **Mode of Study:** In relations to the mode of education, majority of the student respondents (89.8%) were enrolled in regular full-time accounting programs, highlighting the prominence of this mode of study. A smaller yet notable proportion of respondents (10.2%) were pursuing their academic studies through part-time study mode.

### 5.1.2 Students' interactivity with Virtual Learning Platforms

This section examines the level of engagement and interactivity demonstrated by respondents in their adoption of the virtual learning systems. The analysis includes key factors influencing level of interactivity, including ownership of computing devices, proficiency in utilizing virtual learning platforms, formal training undertaken, and the frequency of access to these platforms. Table 5.1.2 presents a detailed summary of the findings on the interaction with virtual learning systems.

**Table 5.1 2: Interactivity with the virtual learning systems**

	Categories	Frequency	Percent %
Ownership of virtual learning devices	Yes	603	94.8%
	No	33	5.2%
The use of internet for academic purposes	Daily	534	84.0%
	Twice Weekly	66	10.4%
	Weekly	29	4.6%
	Monthly	7	1%
	30-60 minutes	134	21.1%

Average duration of internet connectivity	1-2 hour	200	31.4%
	3-5 hours	171	26.9%
	More than 5 hours	131	20.6%
Expertise with virtual learning tools	Beginner	66	10.4%
	Intermediate	447	70.3%
	Advanced	123	19.3%
Formal training for virtual learning	Yes	211	33.2%
	No	425	66.8%
Frequency in accessing the virtual learning platform	Everyday	169	26.6%
	Once a week	108	17.0%
	Occasionally	335	52.7%
	I do not access it	24	3.8%
Lecturers instruction to log on to the virtual learning system	Everyday	151	23.7%
	Once a week	68	10.7%
	Occasionally	389	61.2%
	Never	28	4.4%
Is the virtual learning system interactive	Yes	400	62.9%
	No	236	37.1%

**Source: Field Data (2023)**

The level of interactivity with virtual learning systems was significantly influenced by the availability of computing devices and the frequency of internet usage for academic purposes. The study revealed that the majority of students (94.8%) owned essential devices, such as laptops, smartphones, or iPads, enabling their participation in virtual learning activities. Conversely, a minority (5.2%) lacked access to such devices, posing a challenge to their engagement in virtual accounting education.

The findings also showed variations in internet usage for academic purposes among participants. A substantial proportion (84.0%) reported daily internet access, while 10.4% accessed the internet twice a week. A smaller group (5.6%) exhibited minimal internet usage, either on a weekly or monthly basis. Regarding daily internet usage, the distribution was as follows: the largest segment (31.4%) used the internet for 1–2 hours per day, followed by 26.9% who utilized it for 3–5 hours. Participants with minimal usage included 21.1% who reported 30–60 minutes of daily internet use and 20.6% who engaged for more than five hours per day.

Additionally, the study examined whether participants had received formal training in the use of virtual learning systems. The results indicated that the majority (66.8%) had not received any formal instruction, while a smaller proportion (33.2%) reported having undergone training provided by their universities. These findings underscore the disparities in technological preparedness and training that influence the interactivity and efficacy of virtual learning systems.

The study further examined the frequency with which faculty members provided instructional support to students for accessing virtual learning systems. The analysis revealed that a majority of respondents (61.2%) reported receiving guidance on an occasional basis, while less than one-quarter (23.7%) indicated that they received daily instructions. A smaller segment (10.7%) noted receiving such guidance on a weekly basis, whereas 4.4% of respondents stated that they never received any instructions from faculty on how to access the virtual learning systems.

Finally, the study examined the perceived interactivity of virtual learning systems in the context of accounting education. The findings indicated that a significant proportion of students (62.9%) regarded these systems as interactive and conducive to fulfilling their academic needs. However, 37.1% of the participants perceived the systems as lacking interactivity, reporting challenges such as limited opportunities for engagement and communication with both instructors and peers within the virtual learning environment.

### 5.1.3 Cross-tabulations of Interactivity and Demographics

Table 5.1.3 presents the results of a cross-tabulation analysis examining significant variations in interactivity levels based on key demographic characteristics of participants, including age group, gender, and institutional affiliation.

**Table 5.1 3: Expertise in using the virtual learning systems**

		Rate your expertise in using virtual learning tools			Total	p-value
		Beginner	Intermediate	Advanced		
Gender	Male	40	254	78	372	.394
	Female	26	193	45	264	
Total		66	447	123	636	
Age group	Below 20	9	92	24	125	.475
	21-25	37	275	72	384	
	26-30	11	50	15	76	
	31-35	5	16	4	25	
	36-40	2	7	5	14	

	above 40	2	7	3	12	
Total		66	447	123	636	
University	UEW	22	94	26	142	.023
	UG	20	113	29	162	
	UPSA	6	127	40	173	
	UCC	18	113	28	159	
Total		66	447	123	636	
Degree	Postgraduate	13	50	20	83	.083
	Undergraduate	53	397	103	553	
Total		66	447	123	636	

**Source: Field Data (2023)**

Table 5.1.3 reports the results of a chi-square test conducted to examine the relationship between participants' demographic characteristics and their experiences with virtual learning systems. The analysis revealed no statistically significant associations between respondents' virtual learning experiences and gender ( $p = 0.394$ ), age group ( $p = 0.475$ ), or degree type ( $p = 0.083$ ). However, a significant relationship was identified between participants' university affiliation and their proficiency in utilizing virtual learning systems ( $p = 0.023$ ). Particularly, the University of Professional Studies, Accra (UPSA) exhibited the highest proportion of advanced users, accounting for 23.1% of participants with advanced proficiency.

**Table 5.1 4: Training on using the virtual learning systems**

		Have you gone through a formal training for virtual learning		Total	<i>p-value</i>
		Yes	No		
Gender	Male	115	257	372	.150
	Female	96	168	264	
Total		211	425	636	
Age group	Below 20	38	87	125	.807
	21-25	131	253	384	
	26-30	28	48	76	
	31-35	8	17	25	
	36-40	3	11	14	
	above 40	3	9	12	
Total		211	425	636	
University	UEW	42	100	142	.033
	UG	56	106	162	
	UPSA	47	126	173	
	UCC	66	93	159	
Total		211	425	636	
Degree	Postgraduate	25	58	83	.526
	Undergraduate	186	367	553	
Total		211	425	636	

Source: Field Data (2023)

The chi-square test results, which assessed the association between formal training in virtual learning and participants' demographic characteristics, identified institutional

affiliation as the only variable with a statistically significant influence on the level of training ( $p = 0.033$ ). Notably, the University of Cape Coast (UCC) accounted for the highest proportion of participants who had received formal training, representing 41.5% of the total. In contrast, other demographic variables, including gender ( $p = 0.150$ ), age group ( $p = 0.807$ ), and degree type ( $p = 0.526$ ), did not exhibit statistically significant associations with the likelihood of receiving formal training.

**Table 5.1 5: Frequency in accessing virtual learning platforms**

		How often do you access the virtual learning platform				Total	<i>p-values</i>
		Everyday	Once a week	Occasional	I do not access it		
Gender	Male	98	70	188	16	372	.357
	Female	71	38	147	8	264	
Total		169	108	335	24	636	
Age group	Below 20	30	22	71	2	125	.127
	21-25	101	70	197	16	384	
	26-30	29	6	39	2	76	
	31-35	4	6	12	3	25	
	36-40	4	1	8	1	14	
	above 40	1	3	8	0	12	
Total		169	108	335	24	636	
University	UEW	48	33	56	5	142	.012
	UG	42	25	84	11	162	
	UPSA	41	26	103	3	173	
	UCC	38	24	92	5	159	
Total		169	108	335	24	636	

Degree	Postgraduate	14	13	51	5	83	.104
	Undergraduate	155	95	284	19	553	
Total		169	108	335	24	636	

**Source: Field Data (2023)**

The examination of the frequency of accessing virtual learning systems included an analysis of the relationship between system usage rates and respondents' demographic characteristics. The results revealed that only institutional affiliation exhibited a statistically significant impact on the frequency of access ( $p = 0.012$ ). Students from the University of Education, Winneba (UEW) represented the highest proportion of daily users, comprising 33.8% of the total. In contrast, demographic variables such as gender ( $p = 0.357$ ), age group ( $p = 0.127$ ), and degree type ( $p = 0.104$ ) did not demonstrate any meaningful associations with participants' access patterns to virtual learning systems.

**Table 5.1 6: The interactivity with the virtual learning systems**

		Is the virtual learning system interactive		Total	<i>p-value</i>
		Yes	No		
Gender	Male	237	135	372	.613
	Female	163	101	264	
Total		400	236	636	
Age group	Below 20	77	48	125	
	21-25	242	142	384	
	26-30	48	28	76	

	31-35	17	8	25	.424
	36-40	6	8	14	
	above 40	10	2	12	
Total		400	236	636	
University	UEW	80	62	142	.009
	UG	106	56	162	
	UPSA	99	74	173	
	UCC	115	44	159	
Total		400	236	636	
Degree	Postgraduate	50	33	83	.592
	Undergraduate	350	203	553	
Total		400	236	636	

**Source: Field Data (2023)**

The study also investigated the influence of demographic characteristics on respondents' perceptions of the interactivity of virtual learning systems. The Pearson chi-square analysis revealed that the perceived interactivity of the online system was not significantly influenced by gender ( $p = 0.613$ ), age group ( $p = 0.424$ ), or degree type ( $p = 0.592$ ). However, significant variations were observed based on the participants' university affiliation ( $p = 0.009$ ), with the University of Cape Coast (UCC) reporting the highest proportion of students who perceived the virtual learning system as interactive for the delivery of accounting courses, accounting for 72.3% of the respondents.

**5.1.4 The perception of students on the adoption of virtual accounting education**

This section presents a comprehensive analysis of the data collected regarding students’ general perceptions towards the adoption of virtual accounting education. The survey responses were measured using a five-point Likert scale, where a score of 1 represented “strongly disagree” and a score of 5 indicated “strongly agree”. The responses to the relevant survey questions are presented in Table 5.1.7.

**Table 5.1 7: The perception of students towards virtual accounting education**

	Mean	SD	Skewness	Kurtosis	Kolmogorov-Smirnov				
			Value	S.E	Value	S.E	Value	P	Value
VL promotes efficiency in accounting education	3.26	1.203	-.414	.097	-.890	.194	.261	0.00	
VL increases motivation to learning accounting	3.17	1.190	-.284	.097	-.976	.194	.242	0.00	
VL contributes to the acquisition of IT skills.	3.56	1.191	-.664	.097	-.494	.194	.273	0.00	
VL assists students to better manage their time.	3.39	1.170	-.477	.097	-.669	.194	.247	0.00	
VL encourages the learning of other non-accounting courses.	3.40	1.167	-.503	.097	-.638	.194	.252	0.00	
VL is more flexible than face-to-face mode.	3.29	1.199	-.403	.097	-.829	.194	.244	0.00	

VL contributes to solving some educational issues	3.42	1.179	-.523	.097	-.660	.194	.260	0.00
Satisfaction on virtual accounting education	3.09	1.203	-.190	.097	-.962	.194	.205	0.00
Support for VL in various universities	3.49	1.191	-.627	.097	-.546	.194	.273	0.00
Recommendation for VL to other students.	3.32	1.219	-.374	.097	-.881	.194	.235	0.00

**Source: Field Data (2023)**

The skewness, kurtosis, and the Kolmogorov-Smirnov test were performed to evaluate the normality of the survey data. Following the guidelines, which was given by Ghasemi & Zahediasl (2012), data can be considered normally distributed when skewness and kurtosis values fall within the range of -1 to +1. In the current study, skewness values ranged from -0.190 to -0.664, while kurtosis scores varied from -0.494 to -0.962, indicating a deviation from normal distribution. This conclusion was also supported by the Kolmogorov-Smirnov test, which yielded a p-value of less than 0.05.

The mean scores suggested a generally positive perception in relations to the adoption of virtual accounting education. As illustrated in Table 5.1.7, the mean values for all survey items measuring the relevant constructs were above the “Neutral” point on the five-point Likert scale, with values ranging from 3.09 to 3.56. Additionally, the standard deviations, ranging from 1.167 to 1.219, indicated a moderate degree of variation in the respondents’ views. These results imply that students generally acknowledged the

potential advantages and benefits associated with the adoption of virtual accounting education in the university settings.

### 5.1.5 Factors to the adoption of virtual accounting education

This section investigates the main factors influencing the adoption of virtual accounting education, drawing on insights from the empirical literature. The analysis showed the findings related to the various dimensions, such as course, individual, instructor’s influence, and institutional support. The empirical findings are presented in Table 5.1.8, below.

**Table 5.1 8: Course dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Kolmogorov- Smirnov Value	P Value
VL of accounting is very difficult.	3.15	1.34	-.073	.097	-1.273	.194	.197	.000
VL of non-accounting courses is difficult.	2.37	1.18	.663	.097	-.465	.194	.256	.000
VAE is very frustrating in my institution.	3.26	1.32	-.205	.097	-1.213	.194	.211	.000
Many accounting questions cannot be solved in VL	3.29	1.40	-.310	.097	-1.255	.194	.226	.000
I can assess course materials online.	3.89	1.06	-1.032	.097	.517	.194	.299	.000
The OCM are well developed for learning accounting	3.51	1.16	-.495	.097	-.726	.194	.257	.000

The OCM inspire me to learn new accounting concepts.	3.66	1.07	-.662	.097	-.261	.194	.274	.000
The OCM are interactive for me to understand.	3.65	1.05	-.608	.097	-.343	.194	.272	.000
The contents covered in the OCM are adequate.	3.56	1.15	-.598	.097	-.533	.194	.270	.000
When the OCM, is difficult, I give up or study the easier parts.	2.94	1.31	.020	.097	-1.206	.194	.192	.000
I enjoy accounting through VLM.	2.79	1.27	.089	.097	-1.155	.194	.189	.000
I enjoy non-accounting courses through VLM	3.49	1.18	-.568	.097	-.590	.194	.261	.000

**Source: Field Data (2023)**

The analysis of mean values showed a moderate level of agreement among students regarding the influence of course-related factors on the adoption of virtual accounting education. Specifically, respondents exhibited moderate agreement with the statements that “online studying of accounting was difficult” (M = 3.15, SD = 1.34) and “practical accounting questions could not be addressed using virtual learning platforms” (M = 3.29, SD = 1.40). In contrast, students demonstrated stronger agreement with statements pertaining to the “availability of online learning materials” (M = 3.89, SD = 1.06) and the

belief that “online resources were adequate” (M = 3.51, SD = 1.16) to support virtual accounting education within Ghanaian universities.

**Table 5.1 9: Instructor dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Kolmogorov- Smirnov Value	P Value
Lecturers are very enthusiastic when teaching using VLS	3.21	1.18	-.327	0.97	-.872	.194	.236	.000
Lecturers are able to motivate the students to use the VLS	3.49	1.10	-.648	.097	-.352	.194	.287	.000
Lecturers clearly explains the communication channels	3.65	1.06	-.859	.097	.112	.194	.319	.000
The lecturers have the ability to use the VLS	3.52	1.13	-.556	.097	-.546	.194	.267	.000
Lecturers manage student’s expectations	3.38	1.15	-.525	.097	-.641	.194	.272	.000
Feedback on assignments are provided in a timely manner.	3.38	1.15	-.510	.097	-.696	.194	.275	.000
Lecturers have the ability to solve students problems	3.24	1.22	-.407	.097	-.894	.194	.250	.000

**Source: Field Data (2023)**

The findings above demonstrate that the instructor dimension plays a significant predictive role in the adoption of virtual accounting education in Ghanaian universities.

This is evidenced by the respondents' agreement with all seven items related to this dimension. The mean values for these items ranged from 3.21 (SD = 1.18) to 3.65 (SD = 1.06), underscoring the critical role of instructors in providing timely feedback on assignments, delivering clear and concise instructions, and effectively managing students' expectations. In summary, the significance of the instructor in the virtual learning process was shown as vital for a successful adoption and implementation of virtual accounting education.

**Table 5.1 10: Individual dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Kolmogorov- Smirnov Value	P Value
My aim is to pass online courses	3.51	1.30	-.573	.097	-.880	.194	.266	.000
There is frustration with attending face-to- face lecture sessions.	2.52	1.28	.359	.097	-1.077	.194	.209	.000
Time spent commuting to lectures is reduced.	3.31	1.19	-.345	.097	-.866	.194	.233	.000
VL encourages me to participate in lecture discussions.	3.24	1.25	-.280	.097	-1.023	.194	.227	.000
VAE allows me to progress at my own pace.	3.36	1.25	-.434	.097	-.890	.194	.243	.000
Obtaining very good grades is my main concern.	3.21	1.32	-.252	.097	-1.149	.194	.221	.000

VL makes students to perform well in exams.	3.33	1.25	-.372	.097	-.919	.194	.225	.000
It is easy for students to engage others to do assignments.	3.58	1.26	-.610	.097	-.722	.194	.250	.000

**Source: Field Data (2023)**

The analysis presented in Table 5.1.10 showed that, the individual dimension had a moderate influence on the adoption of virtual accounting education, with mean scores ranging from 2.52 to 3.58 and standard deviations between 1.19 and 1.32 for the eight items assessing this dimension. Students’ responses reflected diverse perspectives on how individual beliefs and attitudes influenced the adoption of virtual accounting education. For instance, while students agreed with the statement “it is easy for students to engage others to do assignments”, they disagreed with the statement “there is frustration with attending face-to-face lecture sessions”.

**Table 5.1 11: Institutional dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Kolmogorov- Smirnov Value	P Value
I find a functioning computer laboratory in my university.	3.11	1.37	-.291	.097	-1.205	.194	.234	.000
I find a working internet connectivity in my university.	3.45	1.24	-.597	.097	-.663	.194	.261	.000

There is an online library resource in my university.	3.22	1.37	-.356	.097	-1.172	.194	.246	.000
There is constant supply of electricity in my university.	3.63	1.25	-.789	.097	-.417	.194	.283	.000
There is availability of offline technical support.	3.03	1.35	-.190	.097	-1.240	.194	.220	.000
The support team are approachable.	3.08	1.29	-.232	.097	-1.058	.194	.202	.000
There is availability of online help desk.	3.06	1.29	-.229	.097	-1.082	.194	.205	.000
There is availability of printing facilities.	3.65	1.27	-.849	.097	-.352	.194	.292	.000

**Source: Field Data (2023)**

The above findings shows that, the accounting students generally held a positive view regarding the impact of institutional infrastructure and support on adoption of virtual accounting education in tertiary institutions. The mean scores for all items measuring this construct ranged from 3.03 to 3.65, with standard deviations between 1.24 and 1.37. These results suggested that students' readiness to adopt educational innovations is closely associated with the availability of adequate institutional infrastructure and support. These essential factors included the availability of well-equipped computer

laboratories, reliable internet connectivity, and access to online learning resources, constant supply of electricity as well as highly efficient and effective technical support for accounting students.

### 5.1.6 The Assessment of the Measurement Model

The evaluation of the measurement model in the PLS-SEM involves a thorough assessment of internal reliability, discriminant validity, and convergent validity. This section of the analysis begins with a comprehensive evaluation of the validity and reliability of the constructs, followed by an in-depth examination of the factor loadings for each construct to ensure their adequacy and significance for the study.

#### 5.1.6.1 Reliability and Validity

The assessment of the validity and reliability of the survey instrument was conducted using several metrics, including Cronbach's alpha, composite reliability, and average variance extracted. The statistical values associated with these validity and reliability measures are presented in Table 5.1.12, providing a detailed evaluation of the various constructs; robustness within the adoption framework.

**Table 5.1 12: Construct Validity and reliability component**

	<b>Cronbach's alpha</b>	<b>Composite reliability</b>	<b>Average variance extracted (AVE)</b>
Adoption of virtual education	0.938	0.944	0.764
Course Dimension	0.800	0.797	0.497
Individual Dimension	0.839	0.864	0.609
Institutional Dimension	0.856	0.857	0.539

Instructor Dimension	0.736	0.751	0.556
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**Source: PLS SEM Output (2023)**

In alignment with the guidelines set forth by Hair et al. (2019), a construct is considered internally consistent when its composite reliability value is 0.7 or higher. The findings of this study have demonstrated both Cronbach’s alpha and composite reliability values for all dimensions exceeded the 0.7 threshold, indicating a strong level of reliability and internal consistency. Convergent validity, typically assessed through average variance extracted (AVE), is regarded as satisfactory when the AVE value meets or exceeds the recommended threshold of 0.5 (Cheung et al., 2023). In this study, the AVE values for all constructs, except for the course dimension, surpassed the 0.5 threshold. However, given that the composite reliability values for all constructs remained above the 0.7 threshold, the overall construct validity remains acceptable (Fornell & Larcker, 1981).

**Table 5.1 13: Outer Loadings of virtual accounting adoption factors**

	AVAL	CD	ID	ISD	IND
CD1		0.676			
CD2		0.747			
CD3		0.761			
CD4		0.794			
CD5		0.684			
CD6		0.537			
IND1					0.794
IND2					0.771
IND3					0.723
IND4					0.690
ID1			0.687		
ID2			0.832		
ID3			0.830		
ID4			0.716		
ID5			0.824		

ISD1		0.716
ISD2		0.685
ISD3		0.672
ISD4		0.757
ISD5		0.807
ISD6		0.770
ISD7		0.723
AVAL1	0.831	
AVAL2	0.876	
AVAL3	0.868	
AVAL4	0.883	
AVAL5	0.911	
AVAL6	0.873	

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The values of the outer loadings offer valuable insights into the relative importance of each item in measuring the various constructs. According to Hair et al., (2019), a robust standardized loading estimate should ideally be 0.70 or higher. However, items with loadings between 0.4 and 0.7 may still be retained, provided that the composite reliability and average variance extracted meet the required thresholds. In adherence to these guidelines, several items were excluded from the analysis due to their outer loadings falling below the acceptable range. The final outer loadings for the retained items, after the removal of those that did not meet the criteria, are presented in Table 5.1.13.

#### **5.1.6.2 Discriminant Validity**

Discriminant validity was evaluated with the use of the Heterotrait-Monotrait (HTMT) ratio, which is regarded as an appropriate and more reliable method for evaluating discriminant validity, especially within the context of the Structural Equation Modeling (SEM) (Hair et al., 2019). The adoption of the Heterotrait-Monotrait (HTMT) ratio to establish the discriminant validity is strongly supported by Roemer et al. (2021), who assert that traditional approaches such as the Fornell-Larcker criterion and the

examination of (partial) cross-loadings are less robust and reliable in comparison to HTMT. Various threshold values for HTMT have been proposed in the literature, with Kline (2011) suggesting a threshold of 0.85, while Henseler et al., (2015) recommended a threshold value of 0.9. As presented in Table 5.1.14, the HTMT values in this study were all below the recommended thresholds, thereby confirming the strong discriminant validity of the constructs.

**Table 5.1 14: Heterotrait-Monotrait (HTMT) values**

	<b>AVAL</b>	<b>CD</b>	<b>ID</b>	<b>ISD</b>	<b>IND</b>
<b>AVAL</b>					
<b>CD</b>	0.442				
<b>ID</b>	0.501	0.437			
<b>ISD</b>	0.300	0.339	0.273		
<b>IND</b>	0.409	0.472	0.488	0.380	

**Source: PLS SEM Output (2023)**

### **5.1.7 Structural Equation Modelling Analysis**

Following the validation of the measurement model, the study proceeded to assess the structural model while examining the potential issues related to multi-collinearity. In accordance with the guidelines given by Hair et al., (2019), a variance inflation factor (VIF) exceeding 5 is indicative of potential collinearity among constructs. The results presented in Table 5.1.15 demonstrate that the VIF values for all constructs in this study were well below the critical threshold of 5, therefore suggesting the absence of multi-collinearity concerns and aligning with the established criteria outlined by Hair et al., (2019).

**Table 5.1 15: Multi-collinearity Analysis**

<b>Constructs</b>	<b>VIF</b>
CD1	1.614
CD2	1.829
CD3	1.937
CD4	2.118
CD5	1.633
CD6	1.050
IND1	1.424
IND2	1.496
IND3	1.406
IND4	1.331
ID1	1.452
ID2	2.063
ID3	1.841
ID4	1.613
ID5	2.029
ISD1	1.839
ISD2	1.782
ISD3	1.621
ISD4	1.960
ISD5	2.524
ISD6	2.217
ISD7	1.696
AVAL1	2.332
AVAL2	4.273
AVAL3	3.548
AVAL4	3.344
AVAL5	4.468
AVAL6	3.114
AVAL7	1.614

**Source: PLS SEM Output (2023)**

#### **5.1.7.1 Model Fitness**

To examine the adequacy of the study's model, several fitness indices were employed, including the standardized root mean square residual (SRMR) and the normed fit index (NFI), to assess the overall goodness of the model fitness. According to the guidelines

outlined by Hair et al., (2019), a well-fitting model is characterized by an SRMR value below 0.08 and an NFI value exceeding 0.90. The study’s findings revealed that the SRMR value of 0.069 was within this criterion, indicating a good fitness, while the NFI value slightly fell below the 0.90 threshold, suggesting a moderately acceptable fitness. Nevertheless, in alignment with the recommendations of Hair et al., (2010) and Holmes-Smith (2006), the study relied on multiple fit indices to comprehensively assess the overall model fitness.

**Table 5.1 16: Indicators of Model Fitness**

	<b>Saturated model</b>	<b>Estimated model</b>
SRMR	0.069	0.069
d_ULS	1.960	1.960
d_G	0.466	0.466
Chi-square	1742.469	1742.469
NFI	0.816	0.816

**Source: PLS SEM Output (2023)**

### **5.1.8 Test of Hypothesis – Path coefficient**

This section provides a detailed analysis of the hypothesized relationships using structural equation modeling (SEM). This analytical technique enabled a rigorous evaluation of the associations between the core dimensions and the adoption of virtual accounting education among the student respondents. The findings, which showed the significant influence of each construct, are presented in Table 5.1.17 below.

**Table 5.1 17: Hypothesis testing results**

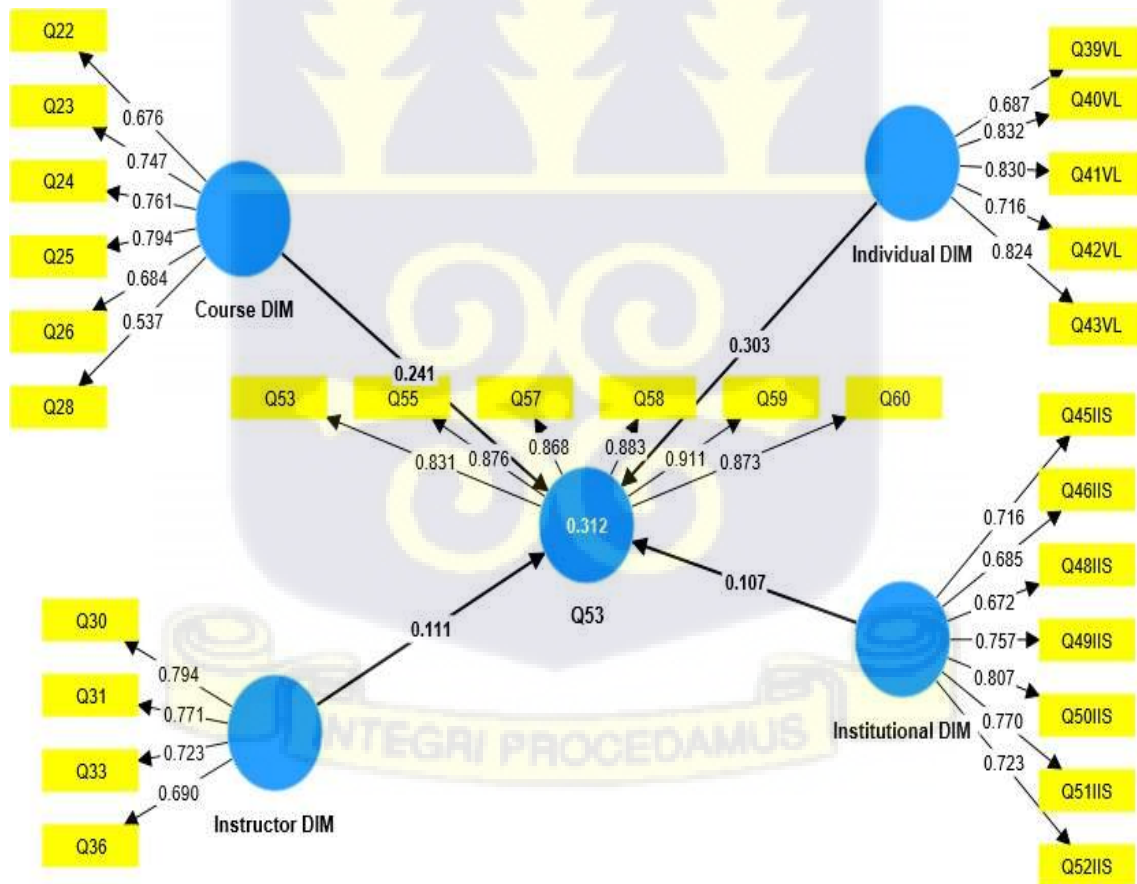
H	Relationship	Path	t-value	p-value	Direction	Decision
H1	The course dimension has a positive influence on the adoption of virtual accounting education.	0.241	6.378	0.000	Positive	Supported
H2	The individual dimension has a positive influence on the adoption of virtual accounting education.	0.303	6.938	0.000	Positive	Supported
H3	The institutional dimension has a positive influence on the adoption of virtual accounting education.	0.107	2.946	0.003	Positive	Supported
H4	The instructor dimension has a positive influence on the adoption of virtual accounting education.	0.111	2.777	0.006	Positive	Supported

**Source: Field Study (2023)**

The results presented in Table 5.1.17 showed that, all four hypotheses regarding the significant influence of the course, individual, institutional, and instructor dimensions on the adoption of virtual accounting education were supported in the study. Specifically, the course dimension was found to have a statistically significant and positive influence on the adoption of virtual accounting education (CD → AVL,  $\beta = 0.241$ ,  $p \leq 0.000$ ), thereby confirming H1.

Similarly, the individual dimension significantly influenced the adoption of virtual accounting education ( $ID \rightarrow AVL, \beta = 0.303, p \leq 0.000$ ), supporting H2. The institutional dimension also exerted a positive and significant influence on virtual accounting education adoption ( $ISD \rightarrow AVL, \beta = 0.107, p \leq 0.003$ ), in alignment with H3. Finally, the instructor dimension demonstrated a positive and significant relationship with the adoption of virtual accounting education ( $IND \rightarrow AVL, \beta = 0.111, p \leq 0.006$ ), validating H4. These findings collectively emphasises the importance of these dimensions in ensuring the successful adoption and implementation of virtual accounting education in Ghanaian tertiary institutions.

**Figure 5. 1: Students Path Coefficient Results**



Source: PLS SEM Output (2023)

### 5.1.9 The Coefficient of Determination

The coefficient of determination ( $R^2$ ) is a fundamental measure of a model's explanatory power, representing the proportion of variance in the endogenous latent variable, which could be attributed to the exogenous constructs. According to Hair et al., (2019), the coefficient of determination ( $R^2$ ) is derived by squaring the correlation between the observed and predicted values of the endogenous construct. A model is considered acceptable when the  $R^2$  value falls between 0.10 and 0.50, as long as the majority of the predictors are statistically significant (Ozili, 2023). In this empirical study, the analysis resulted in an  $R^2$  value of 0.312, which demonstrates a moderate but a meaningful predictive capacity.

**Table 5.1 18:  $R^2$  of the endogenous latent variables**

Construct	R-square	R-square adjusted
Adoption of VAL	0.312	0.308

**Source: PLS SEM Output (2023)**

### 5.1.10 Analysis of open-ended questions

The survey instrument concluded with an open-ended question, inviting respondents to provide any additional comments or concerns not addressed in the questionnaire. Of the 636 questionnaires distributed, 125 were returned with supplementary feedback. The responses, which included a wide-range of issues in relations to the adoption of virtual accounting education, have been analysed and summarized in this section.

#### **5.1.10.1 The training programmes to improve on the adoption of virtual accounting education**

The student participants suggested the critical role of well-structured and integrated training programs in ensuring the effective adoption and implementation of virtual accounting education. According to their responses, such programs are fundamental in enhancing digital literacy, particularly for students who encounter difficulties with the usage of innovative technologies. The specific areas presented by the accounting students include the following:

- Institutions should organize comprehensive orientation and training sessions to support students in effectively navigating virtual learning systems.
- Universities should prioritize training in IT literacy and time management to better prepare students for the demands of online learning environments.
- There is a need for instruction on the use of communication and collaboration tools, such as Google Meet and Microsoft Teams, to ensure students can engage effectively in virtual settings.
- Training initiatives should also focus on equipping accounting students with proficiency in modern software applications, such as Microsoft Excel, which are crucial for their academic and professional development.
- Universities must offer guidance on effectively navigating and utilizing virtual learning platforms, ensuring students can maximize the available resources.
- Lastly, the students argued for academic institutions to provide foundational training in order to ensure students have the essential skills to effectively engage with virtual learning systems.

#### **5.1.10.2 Institutional resources to improve on the adoption of virtual accounting education**

The accounting students indicates the importance of reliable internet services for enhancing the adoption of virtual accounting education. A strong and uninterrupted internet connection is important for smooth access to online classes, interactive quizzes, e-books, videos, and podcasts, ensuring that students can fully engage with the content. In addition to this, the students provided the following suggestions on the institutional resources to effectively support their virtual learning process:

- Providing a flexible and reliable internet services that would allow students to access resources without disruptions.
- Providing students with free mobile data, helping individuals without constant access to the internet in order to stay connected and fully participate in the online learning process.
- Ensuring that every student have access to laptops with complete internet connectivity to enable accounting students to engage fully with the virtual learning process.
- Providing access to computers, IT labs, and wireless networks, so that students would have access to the necessary resources for their academic studies.
- Offering access to an E-library, where students could easily find and access academic materials.

- Incorporating features or add-ons within the online learning platforms that enable lecturers to provide timely feedback, thereby helping students gain insights and improve their performance.
- Students should be provided with access to accounting software, such as QuickBooks, and other essential tools that support their virtual learning experience in accounting courses.

#### **5.1.10.3 The role of students in the virtual learning process**

In relations to the role of students in the virtual learning process, the majority of participants highlighted the importance of fostering a positive attitude and maintaining a strong commitment to the virtual accounting learning experience. Furthermore, many respondents identified additional critical responsibilities, including providing constructive feedback to universities on challenges encountered in virtual accounting education and upholding academic integrity. The following are the suggestions put forth by the accounting students:

- Students are encouraged to adopt a positive mind-set towards virtual accounting education.
- It is essential for students to support one another in overcoming learning challenges.
- Students should complete and submit all online assignments while actively participating in online class sessions.
- Students are encouraged to subscribe to additional online resources, such as YouTube, to deepen their understanding of accounting concepts.

- Punctuality is very important and various students must connect to online platforms at the scheduled times.
- Students should be encouraged to engage actively in discussions on the design and development of virtual learning platforms to enhance interactive learning experiences.

#### **5.1.10.4 Additional suggestions to improving the virtual learning process**

The survey findings indicated a predominantly positive outlook among accounting students regarding the adoption of virtual accounting education, with respondents offering a range of constructive suggestions aimed at facilitating its smoother integration within university settings. A central theme identified by the students was the necessity for a well-structured learning schedule at the commencement of each semester, with instructors adhering to predetermined course timings. Furthermore, students emphasized the importance of upholding academic integrity through the implementation of measures to mitigate plagiarism and by fostering an environment, which encourages independent completion of assignments and examinations. Drawing from their experiences, the accounting students provided the following recommendations:

- Universities should consider providing computer devices to financially disadvantaged students who cannot afford laptops.
- Priority should be given to ensuring seamless and reliable access to virtual learning platforms.
- Training on the use of virtual learning systems should be made available to both students and lecturers.

- Lecturers should be encouraged to connect to virtual learning systems on time, as scheduled, to maintain consistency.
- The university should organize conferences, seminars, and workshops, inviting accounting graduates to showcase how technology can be integrated into accounting education.
- Building strong, collaborative relationships between lecturers and students is vital for the successful adoption of virtual accounting education.
- Students should receive access links for online lectures in advance, ensuring smooth transitions when classes begin.
- Effective communication and information flow between lecturers and students should be promoted by the universities.
- Students expressed a need for a more proactive and responsive IT department to address any technical issues.
- To foster peer learning and support, the establishment of student groups to assist those with varying levels of virtual accounting proficiency is encouraged.
- Finally, motivating students to engage more deeply in the virtual accounting process can be achieved by providing timely and constructive feedback on assignments, quizzes, and exams.



### 5.2.1 Demographic Characteristics of the Lecturers

This section of the study provides a comprehensive overview of the demographic characteristics of the faculty members, including their gender, nationality, affiliated university, academic roles, and teaching experience. The analysis was conducted to provide a deeper understanding of the demographic profiles of the faculty members who participated in this study. The detailed demographic information is presented as follows.

**Table 5.2 1: Demographic information of on lecturers**

	Categories	Frequency	Percent %
Gender	Male	29	90.6%
	Female	3	9.4%
Nationality	Ghanaian	32	100.0%
	Non-Ghanaian	0	0.0%
University	UEW	12	37.5%
	UPSA	12	37.5%
	UCC	8	25.0%
Role at University	Assistant Lecturer	12	37.5%
	Lecturer	15	46.9%
	Senior Lecturer	5	15.6%
	Professor	0	0.0%
Period of Teaching	1-5 years	22	68.8%
	6-10 years	9	28.1%
	11-15 years	1	3.1%
	Above 15 years	0	0.0%

**Source: Field Data (2023)**

Table 5.2.1 provided a comprehensive summary of the demographic characteristics of the respondents from three academic institutions in Ghana during the 2022/2023 academic

year. The majority of participants were male (90.6%), with a smaller proportion of female faculty members (9.4%). In terms of academic rank, most respondents were lecturers (46.9%), followed by assistant lecturers (37.5%) and senior lecturers (15.6%) from the selected public universities. All the participants were Ghanaian nationals, and the majority had relatively limited teaching experience. Specifically, 68.8% had between 1-5 years of teaching experience, 28.1% had 6-10 years, and only 3.1% had 11-15 years, with none of the respondents reporting more than 15 years of experience in university teaching.

### 5.2.2 Interactivity with Virtual Learning Platforms

This section examines the participants' engagement with the virtual learning systems, focusing on their interactions and experiences. To assess the level of engagement, participants were asked to respond to a series of structured categorical statements, with the findings summarized in Table 5.2.2.

**Table 5.2 2: Respondents interactivity with the virtual learning system**

	Category	Frequencies	Percent
Average online student	Less than 50 students	0	0.0%
	50-100 students	9	28.1%
	100-150 students	11	34.4%
	Above 150 students	12	37.5%
Basic computer skills	Elementary	0	0.0%
	Intermediate	22	68.8%
	Advanced	10	31.2%
Years of online instruction	1-5 years	23	71.9%
	6-10 years	9	28.1%

	11-15 years	0	0.0%
	More than 15 years	0	0.0%
Number of online courses	1-2	19	59.4%
	3-4	7	21.9%
	5-6	4	12.5%
	7-8	2	6.2%
Online students attending face-to-face sessions	Yes	32	100.0%
	No	0	0.0%

**Source: Field Data (2023)**

The findings in Table 5.2.2 above, provide in-depth insights into the online teaching experiences of faculty members. All respondents reported having prior experience with virtual teaching methods. Of these, 28.1% taught class sizes of 50 to 100 students, 34.4% handled 100 to 150 students, and 37.5% managed larger classes with over 150 students per online accounting course. The results also highlighted differences in computer literacy, a critical factor for engaging effectively with virtual learning systems. Most faculty members (68.8%) showed an intermediate computer literacy, while 31.2% exhibited advanced skills.

The duration of online teaching experience varied among participants. A majority (71.9%) had been delivering online accounting courses for 1 to 5 years, while 28.1% had been teaching virtually for 6 to 10 years. Furthermore, in relations to the course load, most faculty members (59.4%) used virtual learning systems to teach 1 to 2 courses per semester, 21.9% taught 3 to 4 courses, and 18.7% facilitated more than four courses per semester.

Interestingly, all faculty members (100.0%) adopted a blended or hybrid teaching approach, combining online and traditional face-to-face sessions. This dual approach facilitated greater flexibility and integration of virtual learning tools to promote effectiveness and interactivity of virtual accounting education.

### 5.2.3 Cross-tabulations of level of interactivity and demographics

This section presents the outcomes of chi-square analyses conducted to evaluate the statistical significance between the levels of interactivity or engagement and the demographic attributes of university lecturers involved in this study. The detailed results are provided below.

**Table 5.2 3: Training on computer applications**

		Training in computer applications		Total	<i>p-values</i>
		Intermediate	Advanced		
University	UEW	8	4	12	.824
	UPSA	9	3	12	
	UCC	5	3	8	
Total		22	10	32	
Position	Assistant Lecturer	6	6	12	.112
	Lecturer	13	2	15	
	Senior Lecturer	3	2	5	
Total		22	10	32	

**Source: Field Data (2023)**

A Pearson chi-square test was performed to investigate potential differences between formal training constructs and individual demographic factors, including faculty members' affiliated institutions and academic positions. The analysis yielded p-values exceeding the threshold of 0.05, indicating no statistically significant associations between the extent of formal training in virtual learning and the examined demographic variables. Consequently, the findings suggested that the level of formal training in virtual learning did not vary significantly across the selected academic institutions or among faculty members occupying different academic roles.

**Table 5.2 4: The period of online instruction**

		The period of online instruction		Total	<i>p-values</i>
		1- 5 years	6 - 10 years		
University	UEW	8	4	12	.525
	UPSA	10	2	12	
	UCC	5	3	8	
Total		23	9	32	
Roles	Assistant Lecturer	8	4	12	.117
	Lecturer	13	2	15	
	Senior Lecturer	2	3	5	
Total		23	9	32	

**Source: Field Data (2023)**

The potential relationship between the duration of online instruction and variations across universities and academic positions of faculty members was examined using a chi-square test. The analysis revealed no statistically significant differences among these variables, as indicated by p-values of 0.525 and 0.117, both exceeding the 0.05 significance

threshold. These findings demonstrate that the duration of virtual instruction does not vary significantly across the academic institutions considered in this study or among faculty members having different academic roles.

#### 5.2.4 The Perceptions of Faculty Members

This section examines participants’ perspectives on the potential benefits and challenges associated with integrating technology into the teaching of accounting courses. The summarized viewpoints of faculty members regarding the implementation of virtual accounting education are presented in Table 5.2.5.

**Table 5.2 5: Perception of lecturers towards virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Shapiro-Wilk Value	<i>P-value</i>
VAE promotes effective teaching	3.41	1.24	-.420	.414	-1.021	.809	.867	.001
VAE demands extra hours of development	4.19	.59	-.054	.414	-.160	.809	.752	.000
Teaching online is preferable to the face-to-face.	3.03	1.12	-.065	.414	-1.156	.809	.874	.001
VAE improves interaction with students.	2.97	1.03	-.311	.414	-1.390	.809	.799	.000
VAE improves access to education.	4.28	.581	-.096	.414	-.415	.809	.743	.000
VAE is easy to manage.	2.90	1.12	.343	.414	-.749	.809	.897	.005
VAE is an effective mode of instruction	3.34	1.04	-.017	.414	-1.208	.809	.858	.001
VAE threatens face-to-face education.	2.59	1.36	.399	.414	-1.225	.809	.857	.001

**Source: Field Data (2023)**

The normality of the dataset was determined prior to analysing the perceptions of lecturers regarding the adoption of virtual accounting education. The skewness values for all constructs ranged from -0.420 to -0.399, and the kurtosis values varied between -1.390 and -0.160, indicating the degree of asymmetry and peakedness in the data distribution. The findings were also validated with the Shapiro-Wilk test, which confirmed the non-normality of the data, as all constructs resulting in statistically significant p-values ( $p < 0.05$ ).

The perceptions of faculty members towards the adoption of virtual accounting education showed mixed responses in term of the potential benefits and challenges in higher education. While the majority of respondents acknowledged the benefits of virtual education, such as its ability to increase access to higher education for a wider student population ( $M = 4.2$ ,  $SD = 0.58$ ) and its potential to enhance the teaching process ( $M = 3.41$ ,  $SD = 1.24$ ), the lecturers also identified significant challenges associated with the adoption process. In particular, lecturers expressed concerns about the significant time and effort required to develop online instructional materials, noting that virtual accounting education placed considerable additional demands on their workload ( $M = 4.19$ ,  $SD = 0.59$ ).

### **5.2.5 Factors influencing the adoption of virtual accounting education**

This subsection provides a summary of the descriptive statistics, including the means and standard deviations, for each independent variable that influences faculty members' perceptions and attitudes towards the adoption of virtual accounting education. The results are presented in Table 5.2.6 below.

**Table 5.2 6: Course dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Shapiro-Wilk Value	P Value
Accounting students need to be proficient in the use of technology	4.75	.44	-1.212	.414	-.570	.809	.540	.000
VAT is recognised in my university.	4.5	.67	-1.277	.414	.488	.809	.665	.000
Many accounting questions cannot be solved using VLS	2.28	1.25	1.116	.414	.602	.809	.827	.000
Accounting courses cannot be instructed VLS	1.9	.93	.711	.414	-.373	.809	.807	.000
Teaching accounting in virtual mode is very frustrating	3.21	1.04	-.285	.414	-.981	.809	.864	.001
The essence of studying accounting courses is lost in a VL environment	2.25	1.11	.532	.414	-1.004	.809	.822	.000
The content in the accounting course materials is sufficient to complete the course work.	3.63	1.04	-.632	.414	-.022	.809	.884	.002
The virtual learning materials are in line with the programme standards.	4.28	.81	-1.346	.414	2.137	.809	.739	.000

VL materials are reviewed periodically	4.06	1.08	-.960	.414	-.278	.809	.772	.000
I enjoy teaching accounting through a virtual format.	3.94	1.01	-.661	.414	-.564	.809	.837	.000
I prefer a traditional lecture format for accounting courses.	3.41	1.48	-.188	.414	-1.560	.809	.832	.000

**Source: Field Data (2023)**

With respect to the course dimension, respondents generally agreed on its significant impact on the adoption of virtual accounting education. This agreement was reflected in their responses to statements such as “accounting students are required to possess 21st-century technology skills” (Mean = 4.57, Standard Deviation = 0.44) and “virtual accounting education is widely recognized across various universities” (Mean = 4.5, Standard Deviation = 0.67). Furthermore, the lecturers respondents indicated that accounting courses exhibited a consistent structure (Mean = 4.3, Standard Deviation = 0.81) and that online learning materials were regularly updated (Mean = 4.06, Standard Deviation = 1.08).

**Table 5.2 7: Individual dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Shapiro-Wilk Value	P Value
I believe the adoption of VAE will enhance the effectiveness of their teaching.	2.63	1.18	.427	.414	-.816	.809	.885	.003

I believe lecturers spend extra hours to develop VA courses	3.53	1.02	-1.667	.414	1.846	.809	.639	.000
I enjoy teaching online compared to teaching face-to-face.	3.88	.75	-.761	.414	1.068	.809	.797	.000
I believe the adoption of VAE improves interaction with students.	2.72	1.20	.105	.414	-.886	.809	.913	.014
I believe VAE increases student's access to education.	3.28	1.33	-.379	.414	-1.033	.809	.887	.003
I believe it is easy to manage a VLA courses.	3.88	.87	-.684	.414	.177	.809	.833	.000
I believe that VAE is effective.	1.63	.91	1.678	.414	2.381	.809	.671	.000
I consider the VL as a risk to the continuation of the face-to-face education.	3.81	.86	-.593	.414	.062	.809	.842	.000
Lecturers believe the adoption of virtual accounting education will enhance the effectiveness of their teaching.	3.44	1.34	-.285	.414	-1.341	.809	.860	.001
Lecturers believe they must spend extra hours to develop virtual accounting courses.	2.59	1.10	.439	.414	-.230	.809	.907	.009

Lecturers enjoy teaching online compared to teaching face-to-face.	2.97	1.33	.410	.414	-1.095	.809	.862	.001
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**Source: Field Data (2023)**

As shown in Table 5.2.7, faculty members expressed varied opinions regarding the influence of individual factors on the adoption of virtual accounting education. This diversity was apparent in their responses to certain statements, such as “having the ability to address student issues related to virtual accounting education” (Mean = 3.88, Standard Deviation = 0.87) and “social influence from colleagues and lecturers motivating the adoption of virtual accounting education” (Mean = 3.88, Standard Deviation = 0.75), where they generally agreed. However, the lecturers disagreed with statements such as “uploading course materials diminishes the value of lecturers” (Mean = 1.63, Standard Deviation = 0.91) and “there are appropriate incentives to promote the adoption of virtual accounting education” (Mean = 2.72, Standard Deviation = 1.20). These variations in perspectives suggest that a more targeted strategy is necessary to address the diverse attitudes and create a supportive environment for the broader adoption of virtual accounting education.

**Table 5.2. 8: Institutional dimension of virtual accounting education**

	Mean	SD	Skewness Value	S.E	Kurtosis Value	S.E	Shapiro-Wilk Value	P- Value
I find a functioning computer laboratory in my university.	2.84	1.22	-.363	.414	-1.126	.809	.862	.001

I find a working internet connectivity in my university.	3.34	1.26	-.500	.414	-.555	.809	.892	.004
There is an online library resource in my university	3.81	1.12	-1.223	.414	1.026	.809	.788	.000
There is constant supply of electricity in my university.	3.72	1.02	-.542	.414	-.730	.809	.834	.000
There is availability of offline technical support	3.03	1.28	-.355	.414	-.976	.809	.885	.003
The support team are friendly and approachable	3.00	1.045	.000	.414	-.645	.809	.914	.015
There is availability of online help desk.	2.66	1.26	.087	.414	-1.068	.809	.898	.005
There is availability of on campus printing facilities	3.53	1.41	-.543	.414	-.980	.809	.856	.001

**Source: Field Data (2023)**

The findings showed that, while respondents expressed generally favourable views, their enthusiasm regarding the institutional dimension's role in the adoption of virtual accounting education was limited. The mean values for the lecturers' responses ranged from 2.66 to 3.81, with standard deviations between 1.02 and 1.28. These results suggested a moderate agreement on the availability of online library resources and the reliability of electricity supply. However, respondents expressed disagreement concerning the existence of a functional computer laboratory and the provision of an online support desk to address challenges associated with virtual accounting education.

### 5.2.6 Assessment of the Measurement Model

This subsection of the research focuses on evaluating the reliability, convergent validity, and discriminant validity of the measurement model. These steps are important for ensuring that the model accurately captures the different factors influencing faculty members' adoption of virtual accounting education in Ghanaian universities.

**Table 5.2. 9: Construct validity and reliability component**

	<b>Cronbach's alpha</b>	<b>Composite reliability</b>	<b>Average variance extracted (AVE)</b>
Adoption of VAL	0.763	0.763	0.584
Course Dimension	0.621	0.718	0.562
Individual Dimension	0.740	0.862	0.567
Institutional Dimension	0.848	0.857	0.574

**Source: PLS SEM Output (2023)**

As presented in Table 5.2.9, the Cronbach's alpha values for all constructs ranged between 0.621 and 0.848, indicating an acceptable internal consistency in line with the benchmarks outlined by Taber (2018). Furthermore, the composite reliability (CR), which evaluates the extent to which measurement items are free from random error and produce consistent results, exceeded the recommended threshold of 0.70, as stipulated by Hair et al. (2019). The average variance extracted (AVE), which is also a measure of convergent validity, is in consistent with the prescribed standard, with all constructs achieving AVE values above the minimum threshold of 0.50, as recommended by Hair et al. (2010).

**Table 5.2 10: Outer loadings for determinants**

	<b>AVAL</b>	<b>CD</b>	<b>ID</b>	<b>ISD</b>
CD1		0.483		
CD2		0.879		
CD3		0.825		
ID1			0.496	
ID2			0.862	
ID3			0.744	
ID4			0.852	
ISD1				0.597
ISD2				0.773
ISD3				0.703
ISD4				0.884
ISD5				0.833
ISD6				0.721
AVAL1	0.783			
AVAL2	0.780			
AVAL3	0.764			
AVAL4	0.729			

**Source: PLS SEM Output (2023)**

The factor loadings for all constructs, as reported in Table 5.2.10, exceeded the minimum threshold of 0.4, consistent with the recommendations of Stevens (2002) and Hair et al., (2019). These guidelines establishes that all factor loadings within the range of 0.4 to 0.7 are acceptable when the associated constructs exhibit strong composite reliability (CR)

and average variance extracted (AVE), ensuring the adequacy of the measurement items. Furthermore, discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio, with all computed HTMT values falling below the critical threshold of 0.90, as proposed by Henseler et al. (2015). This outcome demonstrates that the constructs exhibit sufficient discriminant validity, thereby reinforcing the rigor and validity of the measurement model employed in the study.

**Table 5.2 11: Heterotrait-Monotrait (HTMT) values**

	AVAL	CD	ID	ISD
AVAL				
CD	0.846			
ID	0.864	0.769		
ISD	0.875	0.871	0.488	

**Source: PLS SEM Output (2023)**

### 5.2.7 Structural Equation Modelling Analysis

A preliminary assessment was conducted in this study, in order to evaluate common method bias and detect potential multi-collinearity among the variables. As presented in Table 5.2.12, the variance inflation factor (VIF) values for all constructs ranged from 1.212 to 3.666, remaining well below the recommended threshold of 5.0, as proposed by Hair et al. (2019). These findings confirm the absence of significant multi-collinearity and suggest that common method bias is unlikely to compromise the validity of the study's findings.

**Table 5.2 12: Collinearity analysis**

<b>Constructs</b>	<b>VIF</b>
CD1	1.212
CD2	1.570
CD3	1.332
ID1	1.654
ID2	1.551
ID3	2.733
ID4	3.086
ISD1	1.658
ISD2	2.565
ISD3	2.108
ISD4	3.666
ISD5	2.628
ISD6	1.979
AVL1	1.727
AVL2	2.978
AVL3	2.963
AVL4	1.609

**Source: PLS SEM Output (2023)**

### **5.2.8: Test of Hypothesis – Path coefficient**

This section presents the findings of the structural model analysis, which employed bootstrapping with 5,000 resamples to estimate the path coefficients and coefficients of

determination ( $R^2$ ). The estimated findings, including the path coefficients, t-statistics, and p-values for the constructs, have been shown in Table 5.2.13

**Table 5.2 13: Hypothesis testing**

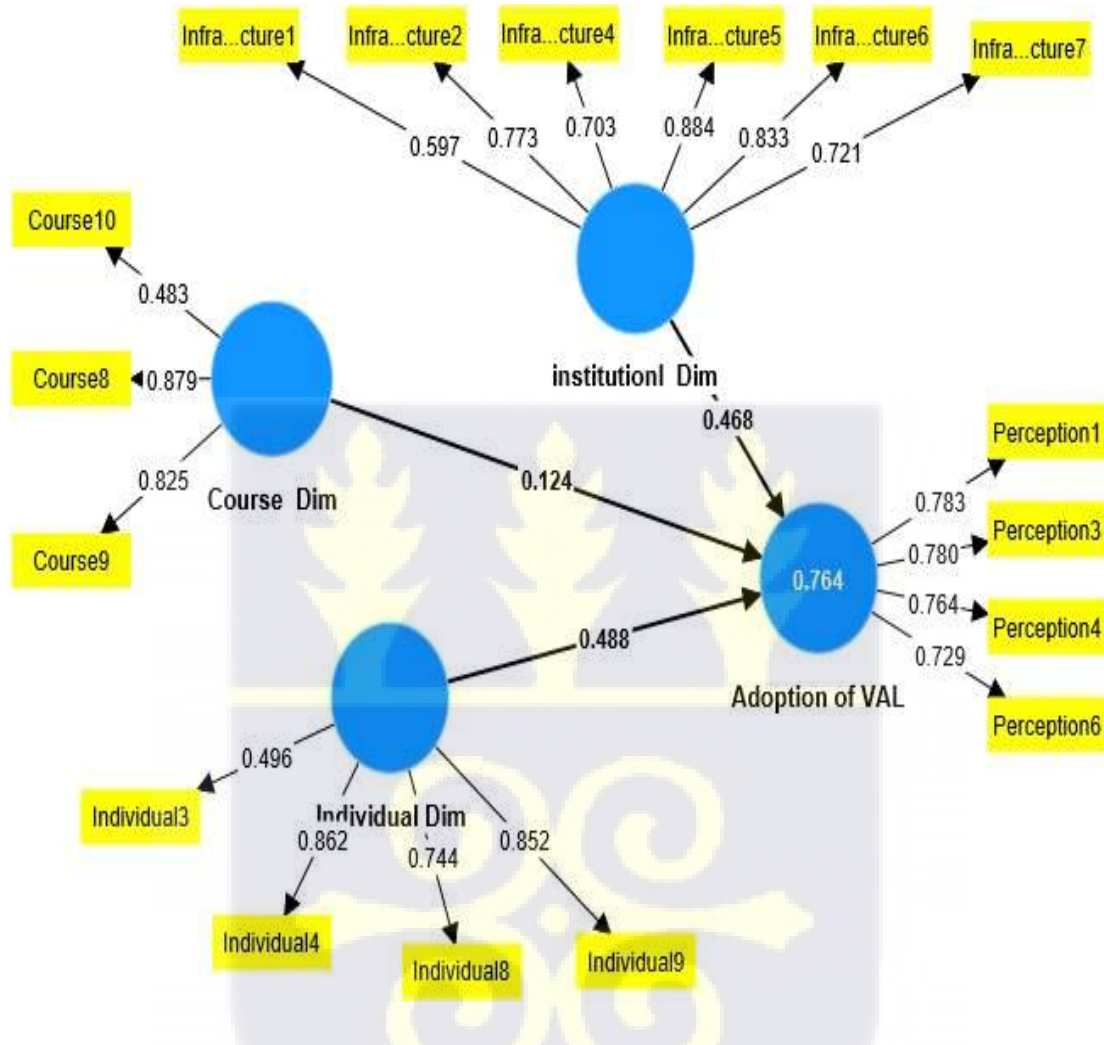
H	Relationship	Path	t-value	p-value	Direction	Decision
H5	The course dimension has a positive influence on the adoption of virtual accounting education.	0.124	0.836	0.403	Positive	Not Supported
H6	The individual dimension has a positive influence on the adoption of virtual accounting education.	0.488	4.050	0.000	Positive	Supported
H7	The institutional dimension has a positive influence on the adoption of virtual accounting education	0.468	3.401	0.001	Positive	Supported

**Source: PLS SEM Output (2023)**

The results of the study indicate that the individual dimension exerted a statistically significant and positive influence on the adoption of virtual accounting education by faculty members ( $ID \rightarrow AVAL$ ,  $\beta = 0.488$ ,  $p \leq 0.000$ ). Similarly, the institutional dimension was found to have a significant positive effect on the adoption of virtual accounting education ( $INS \rightarrow AVAL$ ,  $\beta = 0.488$ ,  $p \leq 0.001$ ). However, the course

dimension did not result in a statistically significant relationship with the adoption of virtual accounting education (CD → AVAL,  $\beta = 0.124$ ,  $p = 0.43$ ).

**Figure 5. 2: Lecturers Path Coefficient Results**



Source: PLS SEM Output (2023)

### 5.2.9: The Coefficient of Determination

The evaluation of the structural model in PLS-SEM was conducted through the R-Squared ( $R^2$ ) value, which showed the extent to which the variance in the endogenous constructs is explained by the exogenous constructs. This section presents the R-Squared

values for each construct within the model and compares them against the established thresholds of 25%, 50%, and 75%, representing low, moderate, and high explanatory power, respectively, as recommended by Hair et al. (2016).

**Table 5.2.14: R<sup>2</sup> of the endogenous latent variables**

	<b>R-square</b>	<b>R-square adjusted</b>
Adoption of virtual accounting education	0.764	0.739

**Source: PLS SEM Output (2023)**

The statistical analysis, aimed at determining the coefficient of determination (R<sup>2</sup>), resulted in an R-Squared value of 76.4%. This finding suggests that, the collective influence of the three independent variables: course, individual, and institutional dimensions was explaining 76.4% of the variance in lecturers' perceptions towards the adoption of virtual accounting education in Ghana's tertiary institutions. This very high score for the R-Squared demonstrates a significantly impact of the three dimensions related to the adoption of educational innovation in higher education.

**5.2.7 Analysis of the open-ended questions**

The analysis of the open-ended responses from the faculty members indicated a strong alignment with the feedback from the accounting students regarding the adoption of virtual accounting education. Additionally, important themes emerged from the lecturers' responses, providing valuable insights into their perspectives on the adoption of virtual

accounting education. This section presents a detailed analysis of the responses from lecturers, showing the main factors and considerations influencing their views on the virtual learning process.

#### **5.2.7.1 The training programmes to improve on the adoption of virtual accounting education.**

The analysis of the open-ended responses provided valuable insights into the training needs of accounting lecturers. A significant majority of the respondents expressed a strong demand for enhanced training in the use of learning management systems (LMS) for both teaching and assessment purposes. Additionally, many lecturers suggested the need for training in specialized software and advanced applications, such as V-Class, Excel, and financial modeling tools. The various suggestions emerging from the responses included the following:

- The university should offer a range of targeted training programs for lecturers, with a focus on student assessment and the uploading of course materials via LMS.
- Comprehensive training should be provided on the development and design of online accounting courses, ensuring lecturers are equipped to create effective and engaging digital content.
- Universities should offer guidance on the integration of online videos and interactive tools to support dynamic and engaging teaching practices.
- Workshops should be organized to enhance lecturers' proficiency in using software applications critical for delivering virtual accounting education.

- Lecturers should receive training in video editing software, such as Adobe Premiere, iMovie, and Camtasia, to improve their ability to create and edit instructional videos.
- Training on the use of diverse online assessment tools and techniques, including quizzes, assignments, projects, and portfolios, is essential for effectively measuring and evaluating student learning in virtual environments.

#### **5.2.7.2 Institutional resources to improve on the adoption of virtual accounting education.**

In the study, the accounting lecturers identified the necessary resources including a reliable and stable internet connection, and a consistent electricity supply, to minimize online class disruptions. The respondents also stressed on the need for universities to provide internet bundles or subsidies for data purchases in order to facilitate access to virtual learning platforms from home or other remote locations. The diverse responses on the necessary resources include the following:

- Universities should establish virtual classrooms equipped with dependable, uninterrupted internet connections to support effective online learning.
- Lecturers should be provided with whiteboards and other interactive tools, particularly for accounting courses involving complex computations.
- Adequate technical support should be readily available to assist lecturers in addressing any challenges encountered during the adoption and delivery of virtual accounting education.

- Universities should incentivize and recognize lecturers actively involved in the implementation of virtual accounting education.
- Lecturers should be granted access to a range of accounting software, such as QuickBooks, to facilitate the seamless integration of technology into accounting programs in various universities.

### **5.2.7.3 The role of lecturers in the virtual learning process**

In relation to the role of lecturers in the successful adoption of virtual accounting education, the findings of the study underscore the critical responsibilities of academic instructors in facilitating the effective implementation of this educational innovation. Respondents emphasized that lecturers are central to ensuring the adoption process succeeds, particularly through their provision of timely and constructive feedback to students and their promotion of meaningful interactions within a diverse academic cohort. Furthermore, the findings highlight the necessity for lecturers to exhibit a strong commitment to educational innovation and a readiness to adapt to the transformative technological changes, which is reshaping education across the globe. The following points outline the key expectations regarding the role of lecturers:

- Academic faculty are required to actively engage students by emphasizing the relevance and importance of virtual accounting education in contemporary academic and professional contexts.
- Instructors must demonstrate a proactive approach by acquiring requisite technological tools and developing proficiency in the use of advanced accounting software applications, ensuring alignment with modern technological standards.

- Faculty members are encouraged to adopt a progressive and adaptable mindset, integrating emerging technologies into their teaching practices to foster an innovative learning environment.
- Lecturers are expected to support institutional initiatives by participating in the procurement and development of tailored software solutions, including the design and implementation of in-house systems that address specific pedagogical needs.
- Collaborative engagement among faculty should be prioritized, with an emphasis on peer learning and knowledge exchange, particularly with colleagues possessing expertise in virtual accounting education, to promote collective growth and instructional effectiveness.
- Instructors must maintain consistent communication with institutional stakeholders, providing detailed feedback on the implementation, challenges, and outcomes associated with virtual accounting education programs to facilitate continuous improvement and strategic planning.
- Ensuring a stable technological infrastructure, including reliable internet connectivity, is critical to creating an environment conducive to effective virtual teaching and learning.

#### **5.2.7.4 Additional suggestions for the improvement of the virtual accounting process.**

In view of the recommendations provided by the faculty members, the study's findings revealed the increasingly need for academic institutions to address the challenges associated with the implementation of virtual accounting education. The responses emphasized on the importance of developing a comprehensive policy framework to

ensure a successful online learning process while also advocating for increased financial investment to support technological advancements and technical expertise. The following key recommendations reflect the perspectives of faculty members:

- Academic institutions should design and implement comprehensive policies for online learning, addressing critical aspects such as learning objectives, assessment frameworks, grading standards, and mechanisms to uphold academic integrity.
- Universities must conduct a systematic evaluation of existing virtual learning resources and infrastructure to identify gaps and establish priorities for future improvements.
- The evaluation of faculty performance should integrate assessments of contributions to both virtual accounting education and traditional face-to-face instruction, thereby promoting excellence across diverse teaching modalities.
- Ensuring data protection within the virtual learning environment must remain a priority, with universities implementing robust safeguards to protect the personal information of both students and instructors.
- Collaborative initiatives between universities and faculty members are essential to address copyright issues, particularly in defining ownership rights and usage policies for instructional materials and virtual learning resources.

#### **5.4.0 Interviews with Academic Administrators**

This study explored the perspectives and experiences of academic administrators in relations to effective strategies for the successful adoption and implementation of virtual accounting education within Ghanaian universities. Data were collected through eight

semi-structured interviews conducted with key personnel from the ICT directorates of selected public universities. Thematic analysis of the qualitative data obtained from these interviews identified seven major themes and twenty sub-themes, which are detailed in the subsequent section. The demographic characteristics of the study participants are presented in Table 5.4.1.

**Table 5.4.1: Demographic characteristics of academic administrators**

<b>Number</b>	<b>Gender</b>	<b>Education</b>	<b>Experience (in years)</b>
1	Male	Doctorate	14
2	Female	Master's degree	8
3	Male	Master's degree	12
4	Male	Bachelor's degree	6
5	Male	Master's degree	7
6	Male	Bachelor's degree	5
7	Female	Master's degree	10
8	Male	Bachelor's degree	7

#### **5.4.1 Major Themes and Sub-Themes from for Data Analysis**

This section identifies and presents the overarching themes and associated sub-themes derived from the thematic analysis of the qualitative data obtained through interviews with academic administrators. These themes provide a comprehensive framework for understanding the perspectives and experiences shared by the participants.

**Table 5.4.2 Themes and Sub-themes from interviews with e-learning experts**

Theme	Sub-themes
1. Understanding of the virtual learning concept.	<ul style="list-style-type: none"> <li>• Facilitator of education.</li> <li>• Online learning system or process.</li> <li>• Transformation from traditional learning methods.</li> </ul>
2. Suitability of virtual accounting education.	<ul style="list-style-type: none"> <li>• Feasibility of online education for all courses.</li> <li>• Challenges related to calculation courses.</li> </ul>
3. Organisational resources and support.	<ul style="list-style-type: none"> <li>• Limited training and orientations.</li> <li>• Insufficient resources and facilities.</li> <li>• Poor communication and coordination.</li> </ul>
4. Policy framework on virtual learning.	<ul style="list-style-type: none"> <li>• Absence of a written ICT policy.</li> <li>• Reliance on management directives.</li> <li>• Discrepancy between policy and practice.</li> </ul>
5. Insufficient and restricted finances.	<ul style="list-style-type: none"> <li>• Declining government funding.</li> <li>• Increasing cost of technological devices.</li> <li>• Low rate of school fees collection.</li> </ul>

- |  |   |
|--|---|
| 6. Preference for blended mode of instruction.                     | <ul style="list-style-type: none"><li>• Requirement from national accreditation.</li><li>• Human and social elements.</li><li>• Challenges and limitations.</li></ul>                             |
| 7. Strategies to promote adoption of virtual accounting education. | <ul style="list-style-type: none"><li>• Providing devices and software.</li><li>• Providing training and incentives.</li><li>• Planning, timing and evaluation of the learning process.</li></ul> |
- 

**Source: Researcher’s construct based on interview responses (2023)**

**Theme 1: Understanding of virtual learning concept**

The concept of “virtual learning” emerged as the primary theme from the interviews, reflecting the general understanding of respondents on the role of technology in enhancing and shaping the teaching and learning process. The interviewees described virtual education as an innovative and transformative pedagogical approach, enabling diverse learners and instructors to access, engage with, and disseminate knowledge through various virtual platforms. This understanding was exemplified in the following illustrative statements provided by the respondents:

*“All the devices including computers, smartphones and even WhatsApp platforms created to exchange feedback with students are considered virtual learning .... in effect, they are technologies that enhances the educational process”.* (Interviewee 1)

*“Virtual learning is typically the processes that support how lecturers and their students interact. It’s mostly tools that enhances educational activities in the university”.*

*(Interviewee 2)*

## **Theme 2: Suitability of virtual accounting education**

The study’s respondents expressed a range of perspectives regarding the feasibility of virtual accounting education. While two academic administrators expressed scepticism concerning the efficacy of delivering courses that require numerical computations in a virtual learning environment, the majority of participants strongly contended that virtual accounting education could be effectively implemented, provided that the necessary institutional infrastructure and support were in place. For instance, an IT manager remarked that:

*“With the right infrastructure all courses can be taught online... .. during the Covid-19 period all courses in this university were taught online and it was possible”.*

*(Interviewee 3)*

Another participant affirmed this viewpoint, stating that: *“Although it can be challenging handling calculation subjects online, the university has the resources to support the teaching process”.*

*(Interviewee 4)*

In contrast, to the above opinions and experiences, one respondent expressed the view that: *“Teaching mathematically related courses in an online format can be highly challenging and often frustrating... This concern is shared by many lecturers and students at this university”.*

*(Interviewee 7)*

### **Theme 3: Organisational resources and support**

The participant identified several institutional challenges and barriers, which prevented both students and lecturers from effectively utilizing virtual learning systems. These challenges were organized into the following sub-themes:

#### **1. Limited training and orientations**

The interviewees indicated that both students and lecturers faced significant challenges in accessing and utilizing online platforms, primarily due to frequent disruptions in internet services on campus and the slow response times of ICT support staff. These issues were exemplified in the following statement:

*“Users complains are mostly about the interruptions of internet services on campus and it also take about 2 to 3 days to get a response from the ICT directorate, which makes it difficult for the individual to participate in the learning process”.* (Interviewee 1)

#### **2. Poor communication and coordination**

Two-thirds of the respondents in this study revealed that, the timing of training programs designed to orient students and lecturers on the virtual learning process, mostly conflicted with teaching and learning schedules. This scheduling issue posed a significant barrier, preventing both students and lecturers from fully participating in the training and acquiring the essential skills and knowledge needed to effectively utilize the online platforms. This concern was clearly articulated in the following statements:

*“Training programmes are organised when active class sessions are going on and this makes it difficult for the students and lecturers to join them”. (Interviewee 5)*

*“Most users were not able to quickly adjust to the technological changes as it was envisage. Although this challenges are been addressed, there is still more to be done”. (Interviewee 8)*

### **3. Insufficient resources and facilities**

Some of the interviewees suggested that, the inadequate provision of physical infrastructure and institutional support as significant barriers to the successful adoption of virtual learning in Ghanaian universities. This viewpoint was expressed in the following statement:

*“I know the business school has two computer labs, but most of the machines have broken down and not working. Also not all students have their own laptops and the internet services can be very slow on campus during the day time”.*

*(Interviewee 6)*

### **Theme 4: Policy framework on virtual learning**

The qualitative study also examined the availability of e-learning policies to provide structured guidance for the adoption of virtual accounting education. A significant number of academic administrators expressed concerns about the absence of formal policy frameworks to support the integration of virtual learning in their respective institutions. The following statements highlights the concerns regarding the lack of such policies:

*“Unfortunately there is no written ICT policy in this university..... what we are doing here is based on management decision”.* (Interviewee 1)

*“We don’t have a stand-alone policy on virtual learning, though there are issues on it embedded in our strategic plan”* (Interviewee 2)

*“There is no written document for virtual learning adoption as far as I know. This my sixth year in the university and I have not come across any such document”.* (Interviewee 4)

*“The e-learning policy of this university has been in a draft version for more than three years, hence it’s not operational”* (Interviewee 5)

*Policy discussions and objectives of virtual learning is far advanced. However, the plans the implementation, is still in the draft stages waiting for the approval from senior management”.* (Interviewee 8)

#### **Theme 5: Insufficient and restricted finances**

The majority of participants in the study emphasized the theme of insufficient and constrained financial resources as a significant barrier to the successful implementation of virtual accounting education. The respondents attributed these challenges to the continuous delays in the disbursement of government subsidies, the rising costs of ICT equipment, and the financial difficulties faced by students in settling their school fees. The following statements from the respondents further illustrate these challenges:

*“Government release of funding to public universities have been dwindling gradually over the years, therefore forcing the university to cut-down funding for some project including virtual learning.”* (Interviewee 1)

*“Though the government provides financial subsidies to the university, the cost of the computers and bandwidth are so expensive that the university cannot afford to acquire these items to support the entire students and lecturers access to e-learning”.* ( Interviewee, 5)

*“Most of our students are still owing schools fees and this is affecting the financial situation of this university, making all areas including virtual learning to suffer for budgetary allocation”.* (Interviewee 7)

#### **Theme 6: Preference for blended mode of instruction**

With regard to the most feasible mode of instructing accounting programmes in the various public universities, the academic administrators unanimously suggested that, virtual education should be introduced as a supplementary approach to the traditional face-to-face instructional model. This perspective was reflected in the following statements:

*“Even though, I strongly believe in virtual learning being a valuable addition to the conventional learning process, the accreditation requirement for our academic programs is that, they should be entirely or predominately through course work and that includes face-to-face teaching”* (Interviewee 2)

*“This university does not want to lose the human element and social aspect of learning that is why we recommend a blended approach of education that balances both virtual and face to face learning”.* (Interviewee 3)

*“Though our institution is in favour of virtual learning, the current challenges and limitations hindering its effective implementation can be avoided and prevented with the introduction of the blended mode of teaching”.* (Interviewee 6)

### **Theme 7: Strategies to promote adoption of virtual accounting education**

To address the various challenges encountered by both students and lecturers in the adoption of virtual accounting education, academic administrators emphasized the necessity of organizing training programs and seminars to raise awareness of the functionalities and advantages of this innovative approach to teaching and learning among relevant stakeholders. Furthermore, all eight respondents advocated for the introduction of motivational and incentive schemes for stakeholders, viewing them as effective strategies to foster increased adoption of innovative technologies in the classroom. The following responses illustrate the individual perspectives on this important theme:

*“The leadership of this school needs to consider providing lecturers and students with the devices and the software for teaching and learning. There are some of application software, which are really expensive for individuals to buy and use for their teaching and learning needs”.* (Interviewee 1)

*“It’s very important for the university to provide some form of training and workshop programmes for lecturers and students. This would in some cases help overcome the skills challenges in using the virtual learning systems” (Interviewee 2)*

*“I think incentives is a very important factor. If management wants students and lecturers to use new technologies, then they need to support it and incentives can be a useful way of gaining motivations for the lecturers and staff” (Interviewee 3)*

*“Students and lecturers can only be motivated to using these learning systems, only when they are available and functioning properly” (Interviewee 5)*

*“I believe the university must have a plan for its implementation, taking into account the purpose of virtual learning and when it should be employed for teaching and examination” (Interviewee 7)*

*“I think that, the use of technologies in the classroom does need a lot of rapport between the lecturers and ICT staff, in order to evaluate and learn the best ways of integrating the system into the curriculum or the course that is being taught”. (Interviewee 8)*

#### **5.5.0 Discussions of the study’s findings**

The increasing adoption of virtual accounting education underscores the need for academic research to explore how students and lecturers engage with virtual learning platforms. Consequently, the first objective of this study was to evaluate the level of

interaction and engagement with these interactive platforms among accounting students and lecturers in selected Ghanaian universities. The findings showed that, while the majority of students and faculty members had ownership of various virtual learning devices such as smartphones, tablets, and laptops, many of the participants lacked the essential skills and knowledge to effectively utilize online learning systems such as the V-Class, LMS, and Sakai. A significant number of the accounting students and lecturers identified various factors including low computer literacy, insufficient technical training, and unreliable network connectivity as key factors that was hindering their interactivity and engagement with virtual accounting education in Ghanaian universities.

The study's findings was consistent with the observations made by Adarkwah (2021), who indicated that most students perceived e-learning as ineffective because of the lack of prior exposure to ICT tools, the absence of orientations for students and staff, the absence of social interaction and communication, and the challenges posed by poor internet connectivity and electricity supply. Similarly, Otoo-Arthur et al. (2021) reported that the slow pace of adoption and implementation of virtual learning programs in Ghanaian educational institutions was largely influenced by important factors, including the absence of policies and guidelines for online learning adoption, inadequate technological infrastructure, limited familiarity with e-learning tools, and the insufficient support and training of students and faculty members.

The study's findings were also consistent with previous studies on how new ideas and products spread in developing economies, where online education has similar adoption barriers. Roger (2003) argued that, the adoption of any innovative systems should be a collaborative process involving both the organisations and the individual users. The

diffusion theory also suggested that the communication of innovations to each individual user would influence their choices. Additionally, empirical studies grounded in the diffusion of innovation theory have shown that students and faculty are more likely to adopt new learning systems if they believe the system aligns with their values and teaching methods, if they feel confident and skilled in using it, and if they see its pedagogical benefits (Sahin & Thompson, 2006; Gonçalves & Pedro, 2012). Therefore, academic institutions should focus on improving users' knowledge, skills, and training, while also ensuring the availability of the necessary infrastructure to boost motivation and increase adoption rates among students and faculty.

The academic literature have also discussed the significant effects of demographic characteristics, including the age and gender of respondents, in affecting the engagement and interactivity with virtual learning systems, with no clear consensus (Morante et al., 2017). Therefore, the second objective of this research was to investigate how these factors, along with the academic role and the institution of affiliation, influenced the engagement and interaction of students and lecturers with the virtual learning platforms. The study's findings supported some of the existing evidence on the impact of gender, age and academic position in the virtual learning context, but also provided some contrasting results.

The results of the study showed that gender of students did not have a significant impact on the levels of engagement with virtual learning systems. This implies that individuals, regardless of their demographic characteristics, exhibit a similar degree of interactivity and involvement with virtual learning platforms. Therefore, educational institutions should prioritize elements they can control, such as content quality, interface design, and

feedback mechanisms, when implementing virtual accounting education. These findings is in line with a study conducted by Wang et al. (2021), who also established that gender had no notable effect on students' interactions with online education. Similarly, Khan et al. (2017) concluded that gender did not play a role in students' motivation, engagement, performance, or comprehension within online learning environments. However, it's worth noting that contradictory results were obtained in a study by Mohammed et al. (2023), suggested that students' gender did indeed have a significant influence on their use of electronic learning systems.

The existing body of literature has revealed the age of respondents as a significant predictor variable in social sciences and psychological research. However, the findings of this study has shown that age does not exert a statistically significant influence on engagement with virtual learning systems. This implies that the adoption and effectiveness of virtual learning are not contingent on the age of students and lecturers. In essence, individuals of all age groups could actively participate and engage in the virtual learning process, provided they have access to effective and user-friendly online learning tools and receive adequate technological support from their educational institutions. This finding is consistent with a similar study conducted by Tagoe (2012), who found no substantial difference between age and students' perceived ease of using online learning systems. Similarly, a research conducted by Fleming et al. (2017) showed that age did not significantly impact participants' intentions and engagement with e-learning systems within the Australian context.

However, this finding is in contrast to the evidence presented by Simonds & Brock (2014), who indicated a statistically significant relationship between students' age and

their preferences for online learning activities. Furthermore, Venkatesh et al. (2003) reported that the age of individual users had a noteworthy moderating effect on the relationship between performance expectancy, facilitating conditions, and behavioural intention in the UTAUT model.

Regarding the impact of academic positions or ranks on the level of interactivity with virtual learning systems, the study reported that the academic position of faculty members did not significantly influence their engagement with the virtual learning systems. This suggests that academic institutions provide consistent and equal levels of technical training and support for faculty members, regardless of their academic position or rank within universities. These findings is consistent with the previous research that was conducted by Al-Sarrani (2010), who investigated faculty members' engagement with online learning in Saudi Arabia and found no significant relationship between the academic rank of lecturers and their adoption of virtual education. Similarly, Omar & Hashim (2021) found that the academic rank of faculty members did not significantly impact the integration of technology in education. However, it is important to note that these results contrast with other studies, including Alnujaidi's (2008), who reported a statistically significant impact of academic rank on the adoption of innovation in educational institutions in Saudi Arabia.

The study also examined the significant influence of the academic institutions of the participants on their engagement levels with the virtual learning systems. The analysis, which involved a chi-square testing, showed a positive and significant effect of institutional affiliation on engagement levels with virtual learning systems. This suggests that the various supports provided by institutions has the potential of enhancing the

proficiency of individuals in using the virtual learning systems. It is therefore imperative for academic institutions to enhance their support systems, policies, and structures in order to facilitate the implementation of virtual accounting education.

The finding of the study is in line with similar studies conducted by Mtebe & Raisamo (2014), who showed that, facilitating conditions played a substantial role in determining students' acceptance of mobile learning in universities in East Africa. Venkatesh et al., (2003) also showed the importance of this relationship, suggesting that facilitating conditions, including technical and organizational infrastructure, are key factors that strongly influence an individual's acceptance and adoption of new technologies. However, it is worth noting that these findings contradict other studies, including Muries & Masele (2017), who reported that instructional support and facilitating conditions were not significant factors influencing student engagement with electronic learning management systems in Tanzanian universities.

The second objective of the study was aimed at examining the perceptions and attitudes of accounting students and lecturers regarding the adoption of virtual accounting education in Ghanaian tertiary institutions. The findings indicated a generally positive view on virtual accounting education, with students demonstrating moderate optimism about its benefits, particularly emphasizing its potential to improve accessibility and foster interaction among learners. The lecturers also recognised the potential of virtual education in providing access to tertiary education to diverse student populations. However, their optimism was moderated by practical challenges, including the significant

workload and management challenges to the effective adoption of virtual accounting education.

These findings aligns with prior studies including, Dampson (2021) and Al-Okaily et al. (2023) underscore the potential of online education to enhance inclusivity and flexibility within higher education. However, in Ghana, online education remains in its early stages of implementation, with many school organizations encountering significant challenges in its adoption and usage (Dampson, 2021) and these difficulties are leading to great concerns about new forms of exclusion, further exacerbating risks to both students and faculty members (Fauzi, 2022).

The third objective of the study sought to investigate the salient factors influencing the adoption of virtual accounting education among accounting students and lecturers in Ghanaian tertiary institutions. To assess the significant impact of various determinants including the course component, instructor quality, and individual and institutional characteristics on students' behavioural intentions, the structural equation modeling was employed in the study. The results revealed that the course dimension had a significantly positive effect on students' adoption of virtual accounting education. This finding suggested that, innovative systems should support the design of online accounting courses by ensuring clear instructional objectives, an organized structure, and defined learning outcomes. Consistent with the Diffusion of Innovations theory, these elements improve the relative advantage, compatibility, and ease of use of innovative systems, making them more effective in supporting the teaching and learning of accounting courses in universities. These findings are consistent with previous studies by Tarus et al. (2015) and Almaiah & Almulhem (2018), which demonstrated that innovative systems that support

well-designed courses tailored to students' abilities, knowledge, and skills significantly facilitate the adoption of e-learning systems. In contrast, poorly designed courses may serve as an hindrance to the successful adoption of virtual accounting education among stakeholders in the educational sector.

This study also investigated the influence of the instructors dimension on the behavioural intentions of students into embracing and implementing virtual accounting education. The results showed a significant positive influence of instructors' characteristics on the overall online learning experiences of accounting students. Additionally, the results underscore the important role of instructors in facilitating, guiding, and coordinating social and cognitive processes in virtual accounting education. The survey responses emphasize the strong need for faculty members to cultivate positive interpersonal relationships with students, including being approachable and patient while demonstrating expertise in using virtual learning systems.

These findings are in line with study conducted by Cheng & Li (2020), who suggested that students' satisfaction with online learning systems is enhanced when the instructors employ innovative teaching strategies, demonstrate proficiency in using educational technologies and provide timely feedback to their students. Furthermore, the adoption of virtual learning is positively influenced when individual instructors take proactive measures and offer prompt feedback to students, as suggested by Abbasi et al. (2020). The active participation of the instructor in online discussions, quick responses, follow-up questions, and seeking input on how to improve online courses can positively impact students' motivation, satisfaction, and engagement with online learning systems (Jaggars & Xu, 2016).

This study also investigated the significant impact of the individual factors on the adoption of virtual accounting education. The survey results indicated that the individual characteristics of both students and lecturers had the most significant impact on their intention to embrace and implement virtual accounting education. This underscores the notion that the successful implementation of virtual accounting education heavily relies on the willingness and acceptance of individual stakeholders to use these systems. These findings align with the tenets of the theory of planned behaviour, as proposed by Ajzen & Fishbein (2005), which suggest that individual's attitude towards a system and their perceived behavioural control are significant predictors of intention. In other words, when the students and faculty members exhibit a positive attitude towards online learning systems and feel confident in their ability to control the system, they are more likely to adopt and implement virtual learning systems. These results from the study are reinforced by the conclusions drawn in a study conducted by Wu & Chen (2017), who argued that individual attitudes towards e-learning were crucial for the sustained intention to use Massive Open Online Courses (MOOCs). Additionally, instructor's attitudes significantly impact the adoption of innovative technologies in education, influencing not only the instructors' personal experiences but also those of their students (Onasanya & Adegbija, 2007).

This study also revealed that the institutional dimension plays a significant role in predicting the behavioural intention to adopt virtual accounting education. For instance, Venkatesh et al. (2003) argued that, the acceptance of any new technology is heavily contingent on the conditions and environment within the institution. Numerous previous studies have further corroborated the importance of institutional infrastructure and

support systems in promoting the adoption of e-learning systems, recognizing them as vital components in implementing new technologies within university settings, as highlighted by Eze et al. (2020). Consequently, this study has effectively demonstrated the substantial and positive impact of institutional characteristics on the behavioural intention to adopt virtual accounting education in universities in Ghana.

The findings of this study closely aligns with the conclusions drawn by Singh & Hardaker (2014), who emphasized the significance of institutional support and commitment for the effective implementation and dissemination of e-learning technologies in higher education contexts. In a similar study, Almaiah & Alismaiel (2019) highlighted that support from top management was essential for improving e-learning quality and ensuring the sustainability of e-learning systems' development and implementation. Therefore, the management of universities should take steps to ensure that adequate financial and technological resources are accessible for system upgrades to keep pace with rapid technological advancements.

The fourth objective of the study, which aimed at promoting the successful adoption of virtual accounting education in Ghanaian tertiary institutions, revealed a generally positive outlook from both students and lecturers. These stakeholders expressed strong support for integrating virtual learning technologies in universities but also highlighted several significant challenges hindering the implementation process in public universities. The significant challenges included a lack of training in essential digital skills, as well as insufficient physical infrastructure for smooth technology integration in classrooms. Additionally, unreliable and expensive internet connections, along with the absence of a

formal policy framework to guide the implementation of virtual accounting education, were identified as major barriers to the effective adoption of this learning mode.

This finding is in line with the broader perspective that incorporating technology into the educational process in African contexts has consistently posed challenges for both students and lecturers. The existing literature outlines various factors influencing the use of technology in education, including issues with hardware and software functionality (Yalley, 2022), resistance to change (Hamlaoui, 2021), a lack of proficiency in utilizing virtual learning systems (Nyamekye et al., 2021), and insufficient resources to support an effective virtual learning process (Okongo et al., 2015).

This study also demonstrated the significant impact of incentives on the willingness of students and lecturers to embrace and incorporate virtual accounting education. The outcomes of open-ended questions revealed that while the availability of resources and improved educational outcomes were important, they were not the only driving factors behind the acceptance of virtual accounting education. In addition to these aspects, various incentives, such as financial rewards and recognition opportunities for both students and instructors were very crucial to the adoption of virtual accounting education. These results are similar and consistent with prior empirical studies that have shown the significant influence of incentive schemes within the education systems. For instance, a study conducted by Seaman and Seaman (2017) indicated that, considering the unfamiliarity with online education and the hurdles confronting students and instructors in the process of engaging and interacting with the virtual learning systems, it is imperative to provide appealing incentives and rewards to individuals who embrace

online learning. A similar study conducted by Belikov & Bodily (2016) suggested that academic institutions should temporarily reduce the workload of faculty members when transitioning to virtual learning and organize a series of workshops to facilitate the involvement of various stakeholders in the learning process.

The findings of the study also demonstrated the importance of supports from peers and social interactions within the virtual learning environment for both accounting students and faculty members. The students articulated their experiences of isolation, disorientation, and feeling overwhelmed by the online learning mode, further emphasizing the importance of fostering collaborative and communicative opportunities. The respondents also suggested that enhancing opportunities for collaborations and communications with their peers and instructors would enhance their learning outcomes and performance. This observation aligns with the consensus in empirical research, which has emphasized the role of online peer support in boosting students' confidence, enjoyment, and motivation within virtual learning environments (Huang, 2023). Similarly, Livana et al. (2020) identified the absence of support and difficulties in engaging in group assignments as factors contributing to academic stress in the virtual learning environment. Georgina & Olson (2008) also demonstrated that faculty members' adoption of e-learning pedagogies was influenced by institutional factors, including social support and peer-to-peer learning opportunities. Therefore, it is imperative for academic institutions to actively promote increased social interactions and collaborations among both students and faculty members to improve on the motivation to adopt and implement the virtual accounting education.

## 5.6 Conclusion

In this chapter, we presented the analysis of the quantitative findings using both descriptive statistical techniques and Structural Equation Modeling (SEM). The quantitative analysis commenced with an examination of the response rate, the demographic characteristics of the participants, and the descriptive statistics for the various constructs related to the adoption of virtual accounting education. The study further assessed the validity and reliability of the study's instruments, followed by significance testing of the hypotheses using SEM. The second part of the analysis presented the qualitative findings from the open-ended responses of students and lecturers, as well as the interview findings of the academic administrators. The chapter concluded with an in-depth discussion of the key findings, integrating the results with both empirical evidence and theoretical literature on the adoption of virtual education. The subsequent chapter, serving as the conclusion of the thesis, would provide a comprehensive summary of the study's objectives, key findings, contributions, implications, limitations, and recommendations for future research in the field of virtual accounting education.



## CHAPTER SIX

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 6.0 Introduction

The preceding chapters have examined the significant impact of innovative technologies in influencing the adoption of accounting education in tertiary institutions. This chapter aims at presenting the conclusions of the study and recommendations, summarizing the key findings and providing practical suggestions to promote the adoption of technological innovations in higher education. These recommendations are directed at university management, policymakers, educational decision-makers, and academic staff who are actively involved in implementation of virtual accounting education. The final chapter also concludes by acknowledging the limitations of the study and the various areas for future studies.

#### 6.1 An overview of the research

This section is aimed at providing a comprehensive overview of the six main chapters, which outlines the various processes to achieving the study's objectives.

Chapter one provided an introduction to the research by indicating the background and the motivation of the study. As an introduction to the thesis, the chapter examined the recent developments in information and communication technology and its implications for the pedagogical and learning outcomes of higher education institutions in Ghana. The chapter also outlines the specific research objectives, the research questions as well as the study's scope, the significance, limitations and delimitations of the study. The chapter concluded by detailing the complete structure and organisation of the study.

Chapter two presented a comprehensive review of related studies on the adoption and implementation of virtual accounting education. The chapter explained the concept of virtual education and outlined the various advantages and challenges associated with its diffusion in educational sector. In addition, the chapter presented a systematic review of the literature, which guided the development of the conceptual framework for the current study. In the research framework, the determinants for an effective implementation of virtual accounting education was classified into: the course dimension, individual dimension, instructor dimension and organisational dimension.

Chapter three examined the various theories and models on innovation adoption to establish the advanced conceptual framework for the integration of technologies in the classroom. It then explained and justified the choice of the Theory of Planned Behaviour (TPB), the Diffusion of Innovations Theory (DOI) and the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical foundations for the study. The chapter also acknowledged some potential limitations of using these theories and assessed the capabilities of the theories in predicting and explaining the adoption and implementation of technologies in the education sectors.

Chapter four described the methodological frameworks used in this study. It explained the philosophical assumptions, the research design and the justification for choosing the mixed-methods approach in this study. The chapter also discussed the population of the study, the sampling techniques and the data collection instruments, such as questionnaires and semi-structured interviews that were employed in generating the data for the study. The quantitative analysis of the data involved various descriptive statistics such as percentages, frequencies and

cross-tabulations, while inferential statistics were employed to examine the significant relationships between the constructs of this study. In addition, the quantitative data from the interviews were interpreted and analysed, using a thematic content analysis.

Chapter five provided a comprehensive analysis of the study's findings and a discussion of the results in relation to the theoretical and empirical literature. The chapter commenced with an analysis of the demographic characteristics of the students and lecturers participants. This was followed with the statistical findings from the model testing, where the study examined the relationship among the constructs within the proposed research model from the students and faculty perspectives. The chapter also discussed the perspectives and experiences of selected academic administrators in relation to the implementation of virtual accounting education in Ghanaian universities.

Chapter six was aimed at providing a comprehensive summary of the study, highlighting the main findings of the research. The chapter presented significant recommendations to guide both practical implementation and policy development, with a focus on promoting the adoption and effective implementation of virtual accounting education in Ghanaian universities. The chapter also reflected on the study's limitations, analysing the constraints that may have shaped the research outcomes. Finally, it identified important areas for future research, outlining specific directions that could deepen understanding and support the advancement of virtual accounting education in universities.

## **6.2 Summary of the Main Findings**

This sub-section presents the findings from the quantitative and qualitative analyses, systematically aligning the results to the key research objectives.

The first objective of the research was to investigate the current level of engagement or interactivity with the virtual learning systems among accounting students and faculty members in selected public universities. The findings of the study showed that a significant number of accounting students and faculty in public universities had access to or owned various interactive devices, such as laptops and smartphones, which supported the engagement and participation in the virtual learning process. However, this study revealed that simply having access to these learning devices was not enough for effective participation in virtual accounting education. The findings also showed that all the selected public universities were confronted with similar challenges, including limited training and workshop opportunities for both accounting students and faculty. In addition, the study highlighted significant barriers to successfully implementing virtual accounting education, such as unstable internet connections and the lack of technical support for both students and faculty members.

The survey also examined the significant influence of several demographic variables including age, gender, academic roles, and institutional affiliation on the levels of engagement and interactivity with the virtual learning systems among accounting students and lecturers. The findings suggested no significant differences in adoption behaviour between male and female students, indicating that gender may not be a significant determinant of interactivity with these systems. Similarly, the ages of the students and the academic roles of lecturers did not show a significant effect on the level of engagement with the virtual learning systems. However, the university to which a student was affiliated was found to significantly influence their level of interactivity. This finding is an indication that variations in the facilitating conditions across academic institutions played a critical role in shaping students' engagement with the virtual learning systems. This aligns with the Unified Theory of Acceptance and Use of Technology

(UTAUT), which emphasised that facilitating conditions, such as access to resources, infrastructure, and technical support, significantly influence individuals' behavioural intentions and usage of innovative technology (Venkatesh et al., 2003).

In relations to the second research objective, which aimed to examine the perspectives of accounting students and lecturers on the adoption of virtual accounting education in Ghanaian tertiary institutions, the findings showed generally positive views and attitudes towards its adoption among accounting students. The students particularly valued its contribution to enhancing IT skills and promoting effective time management. The flexibility associated with virtual accounting education was strongly appreciated by the accounting students, with the respondents viewing it as more adaptable than traditional face-to-face education. Additionally, students acknowledged the potential of virtual accounting education to serve a broader demographic, including individuals with disabilities. However, despite these favourable perceptions, accounting students expressed only moderate satisfaction with the effectiveness of virtual learning for delivering accounting courses and showed hesitation in recommending it to their peers in other educational institutions.

The findings also indicated that accounting lecturers in higher education generally hold positive views and attitudes toward the adoption of virtual accounting education. The lecturers recognize the potential to enhancing teaching effectiveness and broaden access to education, particularly by making learning more accessible to a wider range of students. However, the accounting lecturers expressed concerns about the increased preparation time needed for developing online learning materials, stating that virtual teaching demands significant time for course development, adaptation to online platforms, and addressing various managerial challenges associated with virtual accounting education in higher education.

The third objective of this study aimed to examine the key factors influencing the adoption of virtual accounting education in public universities. The findings revealed that the course, individual, instructor, and institutional dimensions were all significant in shaping students' adoption of virtual accounting education. Specifically, a well-designed and engaging course content was found to be crucial in fostering students' interest and active participation. The individual dimension, which had the greatest influence, showed the significance influence of personal factors such as self-motivation and the willingness of accounting students to adopting innovative technologies in the university. In addition, the institutional dimension suggested the crucial role of institutional infrastructure and support, including access to resources, technology infrastructure, and administrative backing, in promoting the adoption of virtual accounting education. Finally, the significant influence of instructor dimension demonstrates the critical role of instructors' competence, teaching methods, and attitudes in influencing students' adoption behaviour. This findings align with the Theory of Planned Behaviour and the Unified Theory of Acceptance and Use of Technology by showing that student' adoption of virtual accounting education is influenced by attitudes toward the course, perceived behavioural control through individual factors, social influence from instructors, and facilitating conditions provided by institutions (Ajzen, 1985; Venkatesh et al., 2003).

The survey findings also revealed that the combined influence of the course, individual, and institutional dimensions accounted for 76.4% of the variance in faculty members' technological adoption behaviour. However, only the individual and institutional dimensions had a significant impact on the adoption behaviour of accounting lecturers, while the course dimension did not show a significant effect. This finding suggested that the acceptance and usage of virtual accounting education by lecturers in higher education were primarily driven by their personal attitudes and

subjective norms, as well as the institutional infrastructure and support systems provided by the respective universities. The findings align with the Theory of Planned Behaviour and the Unified Theory of Acceptance and Use of Technology, demonstrating that faculty members' adoption of virtual accounting education is influenced by their personal attitudes, perceived behavioural control, and the facilitating conditions within higher education institutions (Ajzen, 1985; Venkatesh et al., 2003).

Regarding the fourth objective of the study, which focused on the successful adoption of virtual accounting education among students and lecturers, the findings revealed that several key strategies and measures were crucial for the effective accounting education in universities. The findings established the need for providing reliable internet access, especially in regions with limited connectivity, to enable all students to access online learning materials. Furthermore, establishing well-equipped IT laboratories and providing a range of online resources, such as digital textbooks, tutorials, and accounting software, can significantly enrich the learning experience. The study also showed that, bridging the digital divide between the accounting students by providing computers to underprivileged students, along with providing comprehensive technical supports, in order to promote successful adoption and engagement among accounting students. In addition, providing the lecturers with effective interactive tools and continuous technical support were important to promoting their adoption of virtual accounting education. Finally, implementing clear online learning policies and robust data security measures would create a structured, consistent, and secure learning environment for both accounting students and lecturers.

Finally, the findings of the study showed the importance of continuous support and training for administrative personnel as a critical foundation for the effective integration of technologies in accounting education. The administrators acknowledged the increasing need of ongoing professional development programs in order to ensure that technical and support staff remain updated on the latest advancements in virtual learning systems. Keeping pace with advancements in educational innovations would empower the administrative personnel with the necessary skills and competences to support the accounting students and faculty members in utilizing virtual accounting platforms. These efforts, the academic administrators indicated were crucial for ensuring the seamless adoption and widespread implementation of virtual accounting education across Ghanaian universities.

### **6.3 Conclusions**

Virtual learning has emerged as a viable mode of delivering higher education globally. This alternative to traditional face-to-face instruction provides accounting students with greater flexibility in accessing and selecting learning options, irrespective of geographical location, individual learning needs, or preferences. The global outbreak of the COVID-19 pandemic accelerated the adoption of virtual education in many economies and institutions, often without adequate physical infrastructure or resources. This abrupt transition from in-person education to virtual learning has necessitated that accounting educators develop new pedagogical skills and strategies to maintain instructional quality and enhance student-learning outcomes. However, within the virtual learning environment, students have faced numerous challenges, including limited access to physical resources, declining motivation, and a sense of isolation from both peers and instructor (Almaiah et al., 2020; Fauzi, 2022; Dampson, 2021).

The accounting education literature (Mtebe, 2020; Al-Okaily et al., 2023; Mah'd & Mardini, 2022; Sarea et al., 2021) provides that in order to enhance the efficacy of online learning and facilitate the effective implementation of virtual accounting courses, there is need for further empirical studies. The primary purpose of these research should be on examining the level of engagement and interaction within the higher education community and understanding into the factors influencing the adoption of innovative education among students and faculty members. This is essential to promoting the effective adoption and implementation of educational innovations in this sector. The present research addresses these concerns by investigating the salient factors influencing the adoption of virtual accounting education in public universities in Ghana.

In this study, the adoption of virtual accounting education is conceptualized as a multi-stage process involving key stakeholders in tertiary education gaining a comprehensive understanding of the innovation's benefits and features, forming attitudes toward the usage of the innovation, deciding whether to adopt or reject it, and integrating the technology into teaching and learning process. The adoption and implementation of virtual accounting education is significantly influenced by various factors, such as institutional resources and support, instructor quality and motivation, the nature of academic courses and programs, as well as the perceptions and experiences of the key stakeholders of tertiary education.

The purpose of the study was to empirically investigate the significant impact of the four dimensions on the behavioural intentions of accounting students and faculty members as well as develop an advanced research model to ensure the successful adoption of virtual accounting education in higher education institutions. The study utilized a mixed-methods approach, combining quantitative and qualitative methodologies. The quantitative component involved

distributing survey instruments to both accounting students and faculty members, while the qualitative aspect included semi-structured interviews with academic administrators and e-learning experts. While this research approach is not novel, most empirical studies have predominantly relied on quantitative methods, which often limit the depth and richness of findings (Tawfik & Elmaasrawy, 2023; Sarea et al., 2021; Liu & Zainuddin, 2021; Al-Okaily et al. (2023). In this study, the mixed-methods approach was considered suitable for achieving a more comprehensive understanding of the research phenomenon and supporting the development of a research model that ensures an effective adoption of virtual accounting education in developing economies.

This study has made significant contributions to the accounting education literature by not only identifying and examining the salient factors influencing the adoption of virtual accounting education, but also by providing key interventions necessary for the successful implementation and adoption of the virtual innovations in higher education. Several findings of the study were novel and of considerable relevance to higher education institutions, particularly those currently implementing or planning to integrate educational innovations into their accounting curricula. Furthermore, some of the study's outcomes align with established literature on virtual accounting education, indicating the possible generalisation to tertiary institutions beyond the specific regional context in which these findings were generated. However, this generalizability should be considered in light of the study's limitations. Ultimately, the findings are expected to inform university management, decision-makers, policymakers, and academic researchers, guiding their strategic actions in the adoption and usage of virtual accounting education in higher education.

## **6.4 Recommendations of the Study**

The findings of the study have been utilized to formulate several practical recommendations aimed at improving the adoption and implementation of virtual accounting education within the university settings.

### **6.4.1 Practical Contributions**

Based on the findings, this study makes a number of significant recommendations to assist the management of universities in the adoption and implementation of virtual accounting education.

1. For virtual accounting education to be effective, it is critical to enhance the usability and interface of online learning systems, together with carrying out a comprehensive testing process before these innovative systems are widely implemented within the academic institutions. Therefore, the universities should prioritize the designing of virtual learning platforms, which are user-friendly, intuitive, and easy to manage. When both students and faculty members hold a generally positive perception and attitude towards innovative technologies, it may promote a successful adoption of virtual accounting education and regular engagement with the online course materials, while improving learning outcomes and the quality of accounting education.
2. An essential strategy for the adoption of virtual accounting education is the provision of adequate physical infrastructure and resources for both students and faculty members. The management of the universities should prioritize sufficient funding to guarantee equitable access to vital resources such as computer devices, laptops, ICT laboratories, a stable power supply, and technical support. Furthermore, academic institutions should provide highly reliable internet services and engaged highly

experienced academic administrators to efficiently manage and maintain the virtual learning systems.

3. To achieve an effective implementation of virtual accounting education, a paradigm shift is necessitated in practices involving the teaching, research, and student engagement. This transformation can be realized through the implementation of comprehensive training and development programs for all faculty members and students. The training programs should also focus on meeting the requirements of technical and administrative staff members who play a significant role in supporting accounting students and faculty members within the online environment.
4. It is also important to encourage collaboration among accounting students and faculty members to promote success of virtual accounting education. Such collaboration should involve active collaborations and opportunities to learn from successful colleagues who have advanced expertise in the usage of virtual accounting education. Furthermore, universities should promote strong partnerships and knowledge sharing between their faculty members and other academic institutions that have effectively adopted and implemented virtual accounting education to exchange best practices, improve faculty expertise, and promote an overall quality of virtual accounting education.
5. The management of the universities must ensure that accounting students gain maximum benefits from the online learning process. This can be achieved through the development of well-designed and structured online courses that enhance student learning outcomes within the virtual environment. Faculty members should actively

contribute by effectively supervising online class sessions, providing timely and constructive feedback, assessing student performance, and recognizing exceptional achievements to promote academic success and foster student engagement.

6. The study also recommends for the usage of innovative instructional methods to enhance student engagement in the online learning environment. This must involve accounting faculty instructing virtual class sessions using real-life case studies and thought-provoking questions to promote active participation among students. Furthermore, integrating multimedia applications, such as audio, video, and visual content, can significantly improve the acceptance and effective use of virtual learning systems.
7. The successful adoption of virtual accounting education demands a systematic and well-planned approach to implementing these learning innovations within the higher education. The study revealed that stakeholders in tertiary education encountered various challenges and obstacles in their engagement with virtual learning processes. Consequently, it is recommended that university management consider adopting a hybrid or blended learning model as a practical and sustainable strategy for the implementation of virtual accounting education.
8. Universities should also prioritize the implementation of attractive motivational strategies and incentive schemes to drive active engagement from both students and faculty members in the virtual learning process. This requires a critical revision of institutional policies to position the development and instruction of online courses as pivotal benchmarks for faculty promotion. Furthermore, reducing credit hours or

workloads for accounting lecturers involved in virtual instruction is important for the development of high-quality online learning materials, thereby ensuring the successful adoption and implementation of virtual accounting education.

9. This study also recommends that university management establish dedicated helplines and online support services to promptly address the various concerns and challenges confronting both accounting students and lecturers within the online learning environment. These support centres should be staffed with a sufficient number of technical experts and offer online chat options to effectively resolve the diverse challenges associated with the adoption of virtual accounting education in tertiary institutions.

10. As a final recommendation, it is important for university management and other academic institutions to cultivate a culture of proactive maintenance to ensure the ongoing functionality of both hardware and software infrastructure. This practice of maintenance would not only extend the lifespan of educational technologies but also strengthen and promote the effectiveness of the virtual learning process in the long term.

#### **6.4.2 Implication for Policy-Making**

This study provides the following relevant policy recommendations to enhance the successful adoption of virtual accounting education.

1. Firstly, policymakers should prioritize the development of a comprehensive policy framework for virtual learning in higher education. This policy document should address

important areas including student access to online learning, curriculum design, management protocols, assessment methods, and funding mechanisms for information systems. Additionally, the development of these policies and guidelines should involve active collaboration with all stakeholders engaged in the virtual learning process to ensure that the policy framework is inclusive and responsive to the diverse needs of accounting students, lecturers, and administrators.

2. This study also recommends that policymakers improve communication between the Ministry of Education and public universities to ensure that key stakeholders, including management, academic staff, and students, are well-informed about government policy decisions related to virtual learning. In addition, it is crucial to consider the feedback and suggestions of these stakeholders when making legislative or regulatory changes, as their input is vital for the successful adoption of virtual accounting education in the country.
3. To ensure that academic institutions have the necessary resources for providing comprehensive trainings and workshops for both students and lecturers, this study recommends that educational decision-makers foster strong collaborations with internet service providers, information technology companies, private training and support organizations, non-governmental entities, and financial institutions. These strategic partnerships would play a significant role in promoting sponsorships and providing essential resources to address the concerns of both students and lecturers regarding the adoption of virtual accounting education.
4. As higher education institutions transition to online education, they are faced with significant challenges in promoting equitable access to technological devices for both

accounting students and lecturers. To address this, it is important to implement policies that facilitate the affordable acquisition of computer devices through manageable instalment plans and increasing scholarship opportunities for students in underserved communities. Additionally, governments should consider offering tax incentives to hardware and software companies to reduce the costs associated with purchasing the computer technologies, which are necessary for the virtual learning process.

5. The study also suggests that the Ghana Tertiary Education Commission (GTEC) take proactive steps to ensure that the quality standards of accounting education are upheld without compromise in the online learning environment. The GTEC should be actively engaged in monitoring and enforcing policy guidelines related to virtual learning across all academic institutions in Ghana. This proactive approach is essential for enhancing the quality of accounting education and safeguarding educational standards in the virtual learning environment.
6. This study recommends that policymakers prioritize addressing intellectual property ownership issues in order to prevent disputes and legal liabilities associated with the designing of online learning materials by faculty members. It is also essential for educational authorities to establish clear, legally enforceable agreements with both teaching and administrative staff, explicitly delineating the rights and responsibilities regarding the ownership and copyright of these educational materials. These measures are important in safeguarding intellectual property and promoting a sustainable and collaborative academic environment.

7. This study also recommends for the continuous advancement of virtual accounting education through a dynamic cycle of research, evaluation and collaboration. To achieve this, it is imperative for policymakers to establish a national body with the role of facilitating cooperation among faculty members, researchers, and the ICT industry. This body should be tasked with gathering and disseminating global best practices, while fostering strong networks that allow faculty members to easily access and integrate international standards and innovative practices into the teaching and learning process.
8. This study recommends that policymakers prioritize the efficient and effective use of limited financial resources by implementing a transparent procurement process that emphasises value for money and financial management practices. Furthermore, policymakers should explore alternative funding sources and procurement strategies that promote economies of scale and minimize the wastages in the acquisition of these educational technologies.
9. This study emphasizes the responsibility of policymakers in ensuring the protection of information on accounting students and lecturers engaged in the virtual learning process. It is therefore important for policymakers to establish comprehensive data protection, incorporating key measures such as encryption, secure user authentication, controlled access, and transparent consent protocols for data collection. Moreover, regular security audits and well-defined breach response protocols are essential to mitigate risks. These measures are not only fundamental in safeguarding personal data but also in fostering a secure and trustworthy learning environment for both accounting students and lecturers.

10. Finally, for a successful adoption of virtual accounting education, universities and academic institutions must strategically leverage the advantages of open educational resources (OER), massive open online courses (MOOCs), and online platforms that provide high quality, cost-effective learning materials. By integrating these resources, academic institutions would improve the quality of the curriculum, foster greater inclusivity in the online learning environment, and reducing the financial cost related to the development of virtual accounting courses, while also ensuring a broader access to accounting education in the university.

### **6.5 Limitations of the Study**

This study has the following limitations, which present significant opportunities for future research.

1. Firstly, this study aimed to investigate the main factors that influenced the successful adoption of virtual accounting education, focusing specifically on only four public universities in Ghana. However, the findings may not comprehensively capture the perspectives of all stakeholders within the diverse and multifaceted tertiary education landscape in Ghana. Therefore, it is recommended that significant caution be exercised when generalizing these findings to the broader context of universities across the country
2. The coefficient of determination ( $R^2$ ), which measures the model's ability to predict outcomes, revealed a predictive strength of 31.2% for students and 76.4% for faculty regarding their behavioural intentions toward adoption of virtual accounting education. These results showed that key factors including the course, individual, instructor and institutional dimensions play a significant role in influencing adoption behaviour of

stakeholders in higher education. While the significant dimensions in the study were identified through an extensive review of the academic literature, it is important to acknowledge that the study's findings may not encompass all the factors influencing the adoption of virtual accounting education. Therefore, the study recommends further research to explore additional significant determinants that were beyond the scope of this investigation.

3. An additional limitation of this study lies in the reliance on self-report data, which can introduce common method variance and social desirability bias. Common method variance can lead to misleading correlations between variables due to the use of a single measurement approach, while social desirability bias might prompt respondents to provide answers they believe align with societal expectations rather than their true beliefs or behaviours. To gain a more accurate and comprehensive understanding, future research could enhance self-report data with classroom observations, offering a richer, more objective perspective on the real dynamics of virtual accounting education adoption.
4. The study also employed a cross-sectional research design, in which primary data were collected at a specific point in time. However, this design restricts the ability to capture how the key factors influencing the adoption of virtual accounting education may evolve over time, as they are subject to various internal and external influences. As such, the study acknowledges that its findings may not fully reflect the dynamic and long-term influence of the virtual learning process.
5. Furthermore, it is important to acknowledge that this study focused on public universities that had already adopted and implemented virtual accounting education, which may limit

the ability to generalize the findings to a broader range of academic institutions. A more diverse and representative sample, including educational institutions that have not yet adopted these innovative technologies, would offer a deeper understanding of the factors that may be preventing other academic institutions from embracing virtual accounting education in academic institutions.

6. Finally, while the current study provides valuable insights for academic institutions globally, it is important to acknowledge that the findings may not be directly applicable to other countries due to the cultural and contextual differences across regions. The factors influencing the adoption of virtual accounting education, as identified in this study, may vary in other educational settings. This is particularly important given that Ghana's distinctive social, cultural, historical, and political context significantly influences its educational system, which may differ from that of other countries.

### **6.6 Suggestions for Future Research**

To address the limitations outlined above, the study proposes the following important recommendations for future research in the field of virtual accounting education:

1. Future studies should include classroom observations to examine how both accounting students and lecturers implement and integrate innovative technologies into accounting curricula. Further empirical studies that combine direct observation with surveys would provide comprehensive insights into the adoption of virtual accounting education in tertiary institutions.

2. Another important direction for future research would involve expanding the research model by incorporating additional independent variables related to virtual accounting education that were not investigated in the study. Additionally, replicating this study with a larger sample that includes stakeholders from private universities could enhance the generalizability of the study's findings to a wider range of academic institutions across Ghana.
3. Future studies would also benefit from employing a longitudinal design to further investigate the factors influencing the adoption of virtual accounting education. A longitudinal case-study approach would allow for an in-depth examination of the significant factors and their interrelationships over time, providing a more holistic understanding of the factors influencing the adoption of virtual accounting education among students and faculty members.
4. This study also recommends for future research to consider the investigation of the relationship between the adoption of virtual accounting education and the learning outcomes and academic performance of accounting students in higher education institutions in developing economies.
5. It is important to conduct a comparative analysis between public and private tertiary institutions offering accounting education programs, especially since most private institutions were not included in this study. The expansion of the scope of the study to include these academic institutions would offer valuable insights into the perceived benefits and challenges of integrating innovative technologies into the accounting curricula.

6. Future research should also incorporate a cross-cultural analysis to investigate the key factors influencing the adoption of virtual accounting education in both developed and developing economies. This would provide a deeper understanding of the strategies and measures necessary to successfully adopting and implementing virtual accounting education in different economic contexts.
7. The focus of this study was not on comparing virtual accounting education with blended or hybrid-teaching modes, despite each approach offering distinct advantages and challenges for both accounting students and faculty members. Therefore, future research should examine the potential benefits and challenges of employing a blended or hybrid model for facilitating the teaching and learning of accounting programs in higher education.
8. A final area for future research is the ethical implementation of virtual accounting education in higher education. Addressing ethical issues related to the integration of innovative technologies is important for the continuous adoption and implementation of virtual accounting education, as these factors may significantly influence the integrity, credibility, and legitimacy of the educational process.



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**APPENDIX A**

**QUESTIONNAIRE FOR STUDENTS**

**Dear Respondents,**

I am a PhD student conducting research on the topic “Accounting Education: Assessing the Potential for and the Barriers to Deploying Virtual Worlds in Learning and Teaching of Accounting”. Your participation in this study is confirmed by completing the questionnaire. I highly value your responses and want to assure you that all information provided would be kept strictly confidential. Please avoid including any personal information or comments that could potentially identify you to this survey. Your response is greatly appreciated. Thank you.

**Part 1: Demographic information**

This section of the questionnaire seeks to collect basic demographic information from the respondents. Please indicate your response by placing a (√) next to the most appropriate option for each question.

1.	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
2.	Age of student	.....
3.	Nationality	<input type="checkbox"/> Ghanaian <input type="checkbox"/> Non – Ghanaian
4.	University	<input type="checkbox"/> UEW <input type="checkbox"/> UG <input type="checkbox"/> UPSA <input type="checkbox"/> UCC
5.	Are you an accounting student?	<input type="checkbox"/> Yes <input type="checkbox"/> No

6.	Are you currently enrolled as an undergraduate or postgraduate student?	<input type="checkbox"/> Postgraduate <input type="checkbox"/> Undergraduate
7.	Kindly specify your level of study	<input type="checkbox"/> First year <input type="checkbox"/> Second year <input type="checkbox"/> Third year <input type="checkbox"/> Fourth year
8.	Mode of study	<input type="checkbox"/> Part - Time <input type="checkbox"/> Full – Time

**Part 2: Level of interactivity or engagement with virtual learning systems.**

Kindly provide your response to the following statements by marking the appropriate box with a tick (√).

9. Do you own a device that supports virtual accounting education? a.  Yes b.  No
10. How frequently do you utilize the internet for academic purpose?  
a.  Daily b.  Twice weekly c.  Once weekly d.  Once a month.
11. If you utilise the internet, what is the duration of average connectivity?  
a.  30-60 minutes b.  1-2 hour c.  3-5 hours d.  More than 5 hours.
12. Rate your expertise in using virtual learning tools.  
a.  Beginner b.  Intermediate c.  Advanced.
13. Have you gone through a formal training for virtual learning? a. Yes  b. No
14. Please indicate the virtual learning platform available in your university.  
a.  Learning Management System b.  Course Management System.  
c.  Knowledge Management System d.  Others, Kindly provide more details  
.....
15. How frequently do you access the virtual learning platform?  
a.  Everyday b.  Once a week c.  Occasionally d.  I do not access it.
16. How often do lecturers instruct you to log on to the virtual learning system?

- a.  Everyday b.  Once a week c.  Occasionally d.  Never.

17. Is the virtual learning system interactive? a. Yes  b. No

**Part 3: Factors influencing the adoption of virtual accounting education**

Please indicate your level of agreement with the following statements using the scale provided: (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

	<b>Course Dimension to Virtual Learning</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
		<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
18.	Virtual learning of accounting courses are very difficult.					
19.	Virtual learning of non-accounting courses is difficult.					
20.	Studying accounting in virtual mode is very frustrating in my institution.					
21.	Many accounting questions cannot be solved through the virtual learning platforms.					
22.	I can assess course materials online					
23.	The online learning materials provided for studying accounting in my university are of high quality and well-designed.					
24.	The course materials encourage me to grasp new accounting concepts.					
25.	The course materials are designed to be interactive and ensures easy understanding of the content.					
26.	The online course materials provide enough information for the duration of the course work that a student must complete.					
27.	I lose interest or focus on the easier parts when accounting course materials is difficult to understand.					
28.	I enjoy learning accounting through a virtual mode.					
29.	I enjoy learning non-accounting courses through a virtual mode.					

	<b>Instructors Dimension to Virtual Learning</b>					
30.	Lecturers are very enthusiastic when teaching using virtual learning platforms.					
31.	Lecturers are able to inspire the students to engage with the virtual learning systems.					
32.	The lecturers clearly specify the communication channels to use for the course.					
33.	The lecturers are effective in using the virtual learning systems.					
34.	The student receive timely responses and have their expectations managed by the lecturers.					
35.	Timely feedback is given for assignments and examination.					
36.	Lecturers have the ability to solve students problems related to the use of virtual learning of accounting.					
	<b>Individual Dimensions to Virtual Learning</b>					
37.	I want to pass online accounting courses, with minimal effort.					
38.	There is frustration with attending face-to-face lecture sessions.					
39.	The time for commuting to lecture sessions is reduced.					
40.	Virtual learning encourages me to participate in lecture discussions.					
41.	Virtual accounting education allows me to progress at my own pace.					
42.	Obtaining very good grades is my main concern, and it is more important than attending the online class sessions.					
43.	Virtual learning makes students to perform well in assignments and exams.					

44.	Others can be easily engaged by students to write their assignments.					
	<b>Institutional Dimension</b>					
45.	I find a computer laboratory that functions effectively in my university.					
46.	I find an internet connectivity that is reliable and fast in my university.					
47.	An online library resource is available in my university.					
48.	There is constant supply of electricity in my university.					
49.	There is availability of offline technical support.					
50.	The support team are friendly and approachable.					
51.	There is an option for online help desk.					
52.	There is accessibility of printing resources on campus.					

**Part 4: Student’s perception on virtual accounting education**

The statements in this section relates to the potential advantages and challenges of effectively implementing virtual accounting education. Please rate your level of agreement or disagreement with each statement using the following scale: "1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree."

	<b>Perceptions and Attitudes Toward Virtual Learning</b>	<b>SD (1)</b>	<b>D (2)</b>	<b>N (3)</b>	<b>A (4)</b>	<b>SA (5)</b>
53.	Virtual learning implementation increases the efficiency of teaching and learning accounting courses.					
54.	Virtual learning increases the students’ motivation for learning accounting courses.					
55.	Virtual learning promotes the acquisition of IT skills and competences of the students.					
56.	Virtual learning promote effective time management in students					
57.	Virtual learning allows for the effective studying of non-accounting courses.					

58.	Virtual learning method offers more flexibility when compared to the traditional face-to-face classes.					
59.	Virtual learning can help overcome some educational difficulties (such as accommodating more students, enabling disabled people to access online learning materials, supporting learners in remote areas, etc.).					
60.	I am very satisfied with the virtual instruction of accounting courses.					
61.	I am in support of implementation of virtual learning in all universities across Ghana.					
62.	I would recommend virtual accounting education to others based on my experience.					

**Part 5: Suggestion to enhance virtual accounting education**

63. What training programmes will you need to improve on the usage of virtual learning?

.....

64. What resources do you want to see in place, before you agree to use the virtual learning systems?

.....

64. In your perspective, what is the role of students in ensuring the successful implementation of virtual learning in the university?

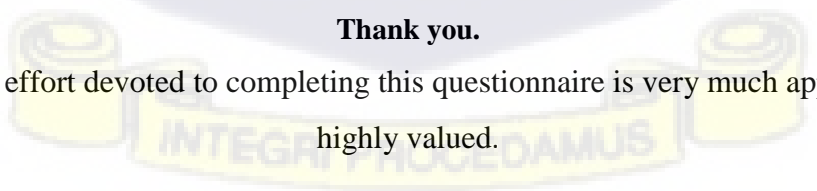
.....

65. What are your suggestions on making the process of implementing online accounting education more efficient?

.....

**Thank you.**

The time and effort devoted to completing this questionnaire is very much appreciated and highly valued.



**APPENDIX B**

**QUESTIONNAIRE FOR LECTURERS**

**Dear Respondents,**

I am a PhD student conducting research on the topic "Accounting Education: Assessing the Potential for and the Barriers to Deploying Virtual Worlds in Learning and Teaching of Accounting." Your participation in this study is confirmed by completing the questionnaire. I highly value your responses and want to assure you that all information provided would be kept strictly confidential. Please avoid including any personal information or comments that could potentially identify you to this survey. Your response is greatly appreciated. Thank you.

**Part 1: Demographic information**

This section of the questionnaire seeks to collect basic demographic information from the respondents. Please indicate your response by placing a (√) next to the most appropriate option for each question.

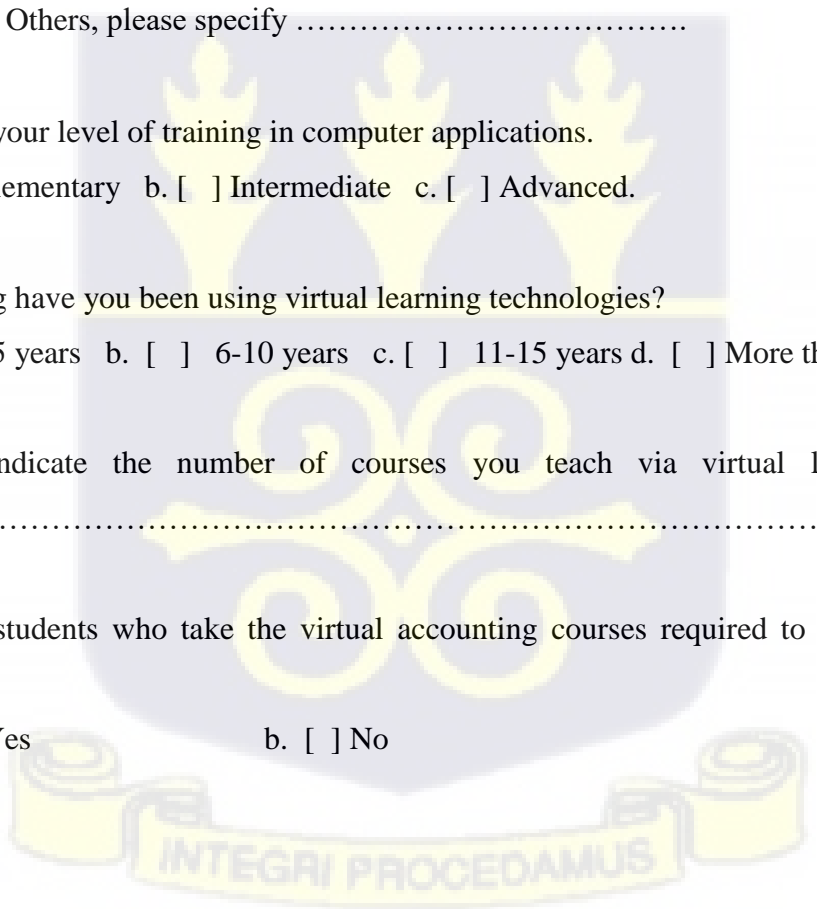
1.	What is your gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
2.	What is your nationality	<input type="checkbox"/> Ghanaian <input type="checkbox"/> Non-Ghanaian
3.	What is the name of your university	<input type="checkbox"/> UEW <input type="checkbox"/> UG <input type="checkbox"/> UPSA <input type="checkbox"/> UCC
4.	What is your position in the university?	<input type="checkbox"/> Assistant Lecturer <input type="checkbox"/> Lecturer <input type="checkbox"/> Senior Lecturer <input type="checkbox"/> Others, Kindly specify .....

5.	For how long have been teaching in the university?	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> 11-15 years <input type="checkbox"/> Above 15 years
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**Part 2: Level of interactivity with virtual learning.**

Kindly provide your response to the following statements by marking the appropriate box with a tick (✓).

6. What is the average number of students that you teach in an online course?
  - a.  Fewer than 50 students
  - b.  50-100 students
  - c.  100-150 students.
  - d.  Others, please specify .....
  
7. Indicate your level of training in computer applications.
  - a.  Elementary
  - b.  Intermediate
  - c.  Advanced.
  
8. How long have you been using virtual learning technologies?
  - a.  1-5 years
  - b.  6-10 years
  - c.  11-15 years
  - d.  More than 15 years
  
9. Please indicate the number of courses you teach via virtual learning if any  
 .....
  
10. Are the students who take the virtual accounting courses required to attend in-person sessions?
  - a.  Yes
  - b.  No



**Part 3: Factors influencing the adoption of virtual accounting education**

Please indicate your level of agreement with the following statements using the scale provided: (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

	<b>Course Dimension to Virtual Learning</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
		<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
12.	Accounting students in the 21 <sup>st</sup> Century need to be proficient in the use of technology.					
13.	Virtual teaching of accounting is recognised in my university.					
14.	Accounting courses cannot be instructed in a virtual learning environment.					
15.	Many accounting questions cannot be solved through the virtual learning platforms.					
16.	Teaching accounting in virtual mode is very frustrating in my institution.					
17.	The essence of studying accounting courses is lost in a virtual learning environment.					
18.	The content in the accounting course materials is sufficient for the time period that a student needs to complete the course work.					
19.	The online accounting courses are designed with a consistent structure that is easy for students with diverse learning abilities.					
20.	The instructional materials for virtual learning are in line with the programme standards, which are ensured by regular reviews.					
21.	I enjoy teaching accounting through a virtual format.					
22.	The traditional class format is preference for accounting courses.					

	<b>Individual Dimension to Virtual Learning</b>					
23.	I have no time to experiment with virtual accounting education.					
24.	I have a feeling of ownership for my course modules.					
25.	The success of my colleagues with virtual learning has encouraged me to experiment with it.					
26.	There are sufficient incentives for using virtual learning systems in my university.					
27.	The university mandates me to use the virtual learning systems.					
28.	I am able to resolve the difficulties that students have with virtual learning in my courses.					
29.	The lecturer becomes less valuable when accounting materials are made available on online.					
30.	The quality of all my modules would improve with the use of virtual learning.					
31.	Virtual learning provides increased opportunities for social interaction.					
32.	Virtual accounting education has no proven impact on learning outcomes and academic achievements.					
33.	Online learning materials will make students lose interest in attending face-to-face classes.					
	<b>Institutional Dimension</b>					
34.	I find a computer laboratory that functions effectively in my university.					
35.	I find an internet connectivity that is reliable and fast in my university.					
36.	An online library resource is available in my university.					
37.	There is constant supply of electricity in my university.					

38.	There is availability of offline technical support.					
39.	The support team are friendly and approachable.					
40.	There is an option for online help desk.					
41.	There is accessibility of printing resources on campus.					

**Part 4: Lecturer’s perception on virtual accounting education**

The statements in this section relates to the potential advantages and challenges of effectively implementing virtual accounting education. Please rate your level of agreement or disagreement with each statement using the following scale: "1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree."

	<b>Perceptions and Attitudes Towards Virtual Learning</b>	<b>SD (1)</b>	<b>D (2)</b>	<b>N (3)</b>	<b>A (4)</b>	<b>SA (5)</b>
42.	Lecturers believe the adoption of virtual accounting education will enhance the effectiveness of their teaching.					
43.	Lecturers believe they must spend extra hours to develop virtual accounting courses.					
44.	Lecturers enjoy teaching online compared to teaching face-to-face.					
45.	Lecturers believe the adoption of virtual accounting education improves interaction with students.					
46.	Lecturers believe virtual accounting education increases student’s access to education.					
47.	Lecturers believe it is easy to manage a virtual learning accounting courses.					
48.	Lecturers believe that virtual accounting education is effective.					

49.	Lecturers perceive virtual learning as a risk to the continuation of conventional educational institution.					
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**Part 5: Suggestion to enhance virtual accounting education**

50. What training programmes will you need to improve on the usage of virtual learning?  
 .....

51. What resources do you want to see in place, before you agree to use the virtual learning systems? .....

52. In your perspective, what are the roles of lecturers in ensuring the successful implementation of virtual learning in the university?  
 .....

53. What are your suggestions on making the process of implementing online accounting education more efficient?  
 .....

**Thank you.**

The time and effort devoted to completing this questionnaire is very much appreciated and highly valued.



## APPENDIX C

### INTERVIEW GUIDE - ADMINISTRATORS

**Dear Respondents,**

I am very grateful for your willingness to participate in this study. Please respond to the questions to the best of your knowledge and expertise. The aim of this study is to explore the potential benefits, challenges, and key factors influencing the adoption of virtual accounting education in Ghanaian universities. The interview is expected to last between 30 and 45 minutes. Based on your responses, additional exploratory questions may be asked to gain a deeper understanding of the research phenomena. The interview would be recorded through handwritten notes and audio recordings, with your consent.

#### **Part 1: Background Information**

1. Gender: .....
2. University of affiliation: .....
3. Type of degree .....
4. Areas of specialisation .....
5. Current position held .....
6. For how long have you held your current position? .....

#### **Part 2: The Virtual learning Dimension**

7. What do you understand by the term “virtual learning”?
8. In your opinion, which subject areas or academic courses are best suited to virtual learning?
9. What are the barriers/obstacles confronting both students and lecturers in your academic institution?
10. Are there any established policies or guidelines relating to virtual accounting education in your universities?
11. Has a specific budget been allocated for virtual learning? What is the earmarked amount for the 2022/2023 academic year?
12. Is the university considering a transition from the traditional in-person education to virtual learning?

13. What measures or strategies have the university implemented to enhance the effective implementation of virtual accounting education?

- (a) .....
- (b) .....
- (c) .....
- (d) .....

**End of interview - Thank you for your participation.**



**APPENDIX D**

**RESEARCH ETHICS INFORMED CONSENT FORM**

**UNIVERSITY OF GHANA  
COLLEGE OF HUMANITIES  
DEPARTMENT OF ACCOUNTING**

**A. Introduction**

My name is Mavis Pobbi, a PhD accounting student in the School of Business at the University of Ghana. I am conducting a research work titled: “Accounting Education: Assessing the Potential for and Barriers to Deploying Virtual Worlds in the Learning and Teaching of Accounting.” As part of this research, you have been selected to contribute to the study by filling out the questionnaire.

**B. Research Title**

“Accounting education: assessing the potential for and the barriers to deploying virtual worlds in learning and teaching of accounting”.

**C. Participant Identity Protection**

The data collected through this survey would be used exclusively for academic purposes. Written consent would be obtained before the data is used for any other purpose. I take full legal responsibility in the event of a breach of this agreement.

**D. The consent from the participant (Kindly, Tick (✓) N/A where not applicable)**

Please indicate your preferences regarding participation in this research by ticking (✓) or circling the appropriate option:

- |      |   |         |        |         |
|------|---|---------|--------|---------|
| i.   | Do you agree to fill out the questionnaire?   | (a) Yes | (b) No | (c) N/A |
| ii.  | Do you agree to grant an interview?           | (a) Yes | (b) No | (c) N/A |
| iii. | Do you agree to have this interview recorded? | (a) Yes | (b) No | (c) N/A |

- iv. Do you agree to share any document? (a) Yes (b) No (c) N/A

**E. The confidentiality agreement**

1. During the interview, you may specify if certain comments should be treated as confidential and excluded from the official record.
2. With your consent, relevant excerpts from the interview may be included in the research findings: (a) Yes (b) No
3. With your consent, relevant portions of any documents you provide may be included in the research findings: (a) Yes (b) No
4. You have the right to discontinue the interviews at any time.

**F. The ownership and custody of the informed consent forms**

The respondent would retain the original copy of this consent form for reference purposes. A photocopy would be kept by the researcher as a backup, where possible.

**G. Details of Research Participants**

Name of organisation ..... Position .....

Signature ..... Date .....

**H. The contact information and signature of the researcher**

Name: Mavis Pobbi

Email: [mpobbi@uew.edu.gh](mailto:mpobbi@uew.edu.gh)

Signature .....

Telephone: 0244563795



**APPENDIX E**  
**PROVISIONAL ETHICAL CLEARANCE**



**UNIVERSITY OF GHANA**  
**ETHICS COMMITTEE FOR THE HUMANITIES (ECH)**

*P. O. Box LG 74, Legon, Accra, Ghana*

16: Ref No. ECH 214/ 22-23

July 05, 2023

Mavis Pobbi  
Department of Accounting  
University of Ghana  
Legon

Dear Ms. Pobbi,

**ECH 214/ 22-23: ACCOUNTING EDUCATION: ASSESSING THE POTENTIAL FOR AND BARRIERS TO DEPLOYING VIRTUAL WORLDS IN LEARNING AND TEACHING OF ACCOUNTING**

This is to inform you that your request for review of your protocol for ethical clearance by the Ethics Committee for the Humanities has been completed. The study design, informed consent, and benefits and risks have been adequately addressed. The Committee has approved your protocol subject to addressing the comments below.

**Selection of Participants:**

- Elaborate on the sampling frame.
- Indicate how gender equity would be achieved in the selection of participants for both the quantitative and qualitative parts.
- Proposal must be re-written in a more detailed fashion to spell out clearly the detailed scientific processes to be followed with the rationale for the choice of the methods to be employed.

**Other Comments:**

- Sample size for the research must be computed and included in the proposal.
- Protocol must be completed properly for resubmission and assessment.

Please respond to the points raised and highlight the corrections/changes (for ease of reference) in your protocol and submit a soft copy **ONLY** of the revised documents for the attention of the ECH Administrator by **Friday, July 07, 2023**.

Yours sincerely,  
ECH Administrator

Tel: +233-303933866

Email: [ech@ug.edu.gh](mailto:ech@ug.edu.gh)

**APPENDIX E**  
**LETTER OF INTRODUCTION FROM THE DEPARTMENT OF ACCOUNTING**

Ref. No.: ..... DOA/PHD/ACC.125/Vol.II April 20, 2023

The Chairperson  
Ethics Committee for Humanities  
ISSER, University of Ghana  
Legon.

Dear Sir/Madam,

**LETTER OF INTRODUCTION**


This is to introduce to you, Ms. Mavis Pobi, a Ph.D. Accounting student at the University of Ghana Business School, Legon.

Ms. Pobi is required to submit a thesis as part of the requirements for the award of the Ph.D. degree. She is therefore submitting her proposal for ethical approval. The topic of her research study is "Accounting Education: Assessing the Potential for and the Barriers to Developing Virtual Worlds in Learning and Teaching Accounting."

I would appreciate any assistance that can be given to her to enable her to collect data/information for her work.

Thank you.

Yours sincerely,

  
Prof. William Coffie  
[Head of Department]



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