UNIVERSITY OF CAPE COAST

EXAMINING THE EFFECTIVENESS OF ICT INTEGRATION IN TEACHING AND LEARNING OF ECONOMICS IN SHSs IN THE BONO REGION OF GHANA

FRANCIS OBENG GYEDU

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BY

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Thesis submitted to the Department of Business and Social Sciences Education of the Faculty of Humanities and Social Sciences Education, College of Education Studies, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Philosophy Degree in Economics Education

NOVEMBER 2022

DECLARATION

Candidate's Declaration

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

Candidate's Signature: …… Date…….....

Name: Francis Obeng Gyedu

Supervisors' Declaration

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

Principal Supervisor's Signature……Date……

Name: Alhaji Prof. Mumuni Baba Yidana

ABSTRACT

This study examined the effectiveness of ICT integration in teaching and learning of economics in SHSs in the Bono Region of Ghana. Specifically, the study examined the availability of ICT resources, teachers' and students' perceived level of self-efficacy, attitudes, and the perceived effects of ICT use on the teaching and learning of economics. The study adopted a mixed-method approach using the explanatory sequential design. In all, 350 economics students were selected using multi-stage sampling, and all 40 Economics teachers at the selected schools were enumerated. Data were collected on a 5-point Likert scale questionnaire. The data were analysed using descriptive (mean and standard deviation) and inferential (independent t-test and one-way ANOVA) statistics. Few Senior High Schools have enough ICT resources, and teachers and students of economics scarcely use them to teach and learn. Both economics teachers and students have a positive attitude toward ICT integration according to the findings. In addition, economics teachers and students agreed that ICT improves teaching and learning. Furthermore, demographic factors like gender and teaching experience did not affect teacher's self-efficacy but there was a statistically significant difference in students' self-efficacy. To promote effective ICT-integrated learning, that takes into account the needs of both urban, urban-poor, and rural students, it is recommended that the Ministry of Education and other stakeholders in secondary education in Ghana implement realistic and rigorous ICT policies.

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DEDICATION

To my family and all loved ones

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CHAPTER ONE

INTRODUCTION

In recent years, the integration of Information and Communication Technology (ICT) in education has become a focal point for enhancing teaching and learning experiences worldwide. In the context of Senior High Schools (SHSs) in the Bono region of Ghana, the exploration of ICT's effectiveness in facilitating the teaching and learning of economics holds significant implications for educational advancement. As digital technologies continue to reshape traditional educational paradigms, it is essential to assess the extent to which ICT integration impacts the acquisition of economic knowledge and skills among students. This study aims to delve into the multifaceted dimensions of this integration, examining its potential to bolster engagement, comprehension, and overall academic performance in the field of Economics. Through a comprehensive evaluation, valuable insights will be gained into the role of ICT in shaping modern education in the Bono region and beyond. This chapter discusses the background to the study, the statement of the problem, the purpose of the study, the study's research questions, the significance of the study, the delimitation, and limitations of this research, and the organization of the entire study.

Background to the Study

Information Communication Technology (ICT) has prompted developme-nt in a variety of fields, such as business, health care, and education. As a result, education has expanded rapidly, spurring the development of e-learning, which is

a direct result of the combination of education and technology and is considered a potent learning medium (Al-Fraihat, Joy, & Sinclair, 2017). Individuals who formerly could not get access to education due to location, social rank, or physical limitations now have diverse ways to learn (Carr-Chellman, 2005). In Kim's (2020) assertion, he describes online learning as an inventive way of teaching students in inaccessible places that includes all sorts of learning done with the computer or other ICT tools. Since its inception in 1995, online learning has been used interchangeably with mixed learning, online courses, online or remote education, and e-learning (Singh & Thurman, 2019).

With ICT growth, online learning has become a viable and cost-effective way of spreading higher education with quality (Asunka, 2008). Aljaraideh and Bataineh (2019) mentioned that information and communication technology (ICT) is important in education, particularly education in tertiary institutions cannot be overstated; it benefits both students and teachers. Conversely, since online learning relies on ICT facilities availability, the problem connected with online learning is ICT resource access (Arthur-Nyarko & Kariuki, 2019). Because network connectivity is not the same everywhere, access to ICT is unevenly distributed among diverse populations, homes, and spaces (Lembani, Gunter, Breines, & Dalu, 2019).

Technology's role in learning and teaching is quickly dominating among the most significant and highly debated topics in modern education policy, (Thierer, 2014). Most education specialists believe when ICT is correctly implemented, it has the potential to augment instruction and learning as well as

shape workforce opportunities (Robbins, 2008; Teye, 2012). According to Law, Pelgrum, and Plomp (2008), ICT in both developed and developing nations' educational systems has a firm reputation. Also, through ICT education, the required skills to adjust and contest in this information society in the twenty-first century can be taught (Haji, Moluayonge, & Park, 2017). ICT in education, as posited by these researchers, improves learning, gives training to students who have no or restricted access to education, aids in teacher training, increases the number of trained workers and promotes mobility in society. ICT is also believed to be necessary for quality education in higher institutions (Liebenberg, Chetty, & Prinsloo, 2012). It possesses the potential to improve teaching and learning, aid a subject to be more engaging, and make communication, problem-solving, research, and making decisions easier (Wong, 2016). ICT is a favorable predictor of students' academic progress in science, mathematics, and reading (Waluyo, 2019). Instruction and e-learning are also made easier by ICT, which has a favorable impact on teaching, learning, and research.

The necessity for social and economic growth is raised to explain investments in educational ICT and educational reforms in several nations, including Singapore, Malaysia, Thailand, and Indonesia (Tullao, Borromeo & Cabuay, 2015). Roztocki, Soja, and Weistroffer (2019) make a similar thesis, stating that ICT has a significant impact on all sectors of society, comprising politics, economics, and cultural and social development. Again, they posited that how people acquire information and services, do business, interact with one another, and even entertain themselves is changing through ICT.

Many African countries have made concerted attempts to establish Internet connections and technical training programs (Carlson & Firpo, 2011). To promote education in this global era, such programs connect schools all around the world. In Ghana, the development and use of ICT in schools have only been operational for a little over a decade (Dankwa, 2007). Although there have been various attempts to establish ICT in schools, in the beginning, no definite policy direction had been rolled out as to what is particularly necessary to be accomplished and the method for doing so to integrate ICT in education (Teye, 2012). Several ICT in education policies were launched as a result of this process by various interest groups to satisfy various requirements (Dankwa, 2007).

Because of its critical role in education, the Ghanaian government has committed numerous resources and implemented numerous policies that ensure ICT is available to all students. In 2003, the Ghanaian government issued the ICT for Accelerated Development (ICT4AD) strategy that defined a structure for transforming the nation into an ICT-literate nation (Ministry of Education, 2015). In 2006 and 2008, the policy was revised twice and was released in 2009. The key purpose of the revised policy was to make it easier to integrate, use, and modernize ICT in Ghanaian classrooms. According to the policy, ICT was to be included as an aid for teaching all other subject areas including economics, a core subject, and an elective subject. Ghana has limited ICT access and literacy, according to the policy. In the 2007 educational reforms, it was a priority for all Ghanaian students in pre-tertiary institutions to attain basic ICT skills (including the usage of the internet) and utilize them in their daily activities and studies

(Mereku, Yidana, Hordzi, Tete-Mensah, & Williams, 2009). ICT is widely assumed to be a priority for Ghana to fulfill global economic, social, and political demands. As a result, Ghana's Ministry of Education implemented a "one laptop, one pupil" policy, distributing 1,000 laptops across the country to 30 schools (three in each region) (Education Sector Performance Report, 2010). Besides a total of 60,000 laptops were also procured, and shared with 2500 junior high schools (Education Sector Performance Report, 2012).

The reasons behind Ghana's government and organizational policies on ICT integration are numerous and diverse. The need to provide students with the abilities to participate and thrive in an information society, as well as the necessity to generate highly skilled and flexible workforces, are stated as reasons for pushing ICT integration (Baskin & Williams, 2006; Ottesen, 2006). Other motivations driving ICT integration in classrooms are the ability to improve the "quality of the learning experience" and the reform of pedagogy (McNair & Galanouli, 2002). The availability of ICT resources, teachers' and students' preparedness for ICT integration, and teachers' and students' attitudes toward ICT integration in teaching-learning, among other things, are all necessary for effective ICT integration in teaching and learning. Teachers, according to Smarkola (2008), must progress from being "computer literate" to "technology competent" to effectively integrate technology.

Most government measures in Ghana to promote all-inclusive excellent and accessible ICT education have been unsuccessful, according to Amanortsu, Dzandu, and Asabere (2013). Agyemang and Dadzie (2010), for example, in their

research discovered that a policy statement for providing ICT-based support for Distance Education (DE) students existed, yet, had not been implemented. Most developing countries' educational systems are still in the early stages of integrating ICT into teaching and learning (Antwi, Bansah, & Franklin, 2018). Distance education began approximately a decade ago in Ghana as a way to give students access to high-quality education while also promoting growth in human resources (Addah, Kpebu, & Kwapong, 2012). The inequity of resources for education, which includes the use of computers and other ICT materials, is among the main difficulties in Ghana's education system (Buabeng-Andoh, 2012). According to a study by Antwi et al. (2018), the availability of ICT for learning is tilted toward secondary schools classified as leading ("A") schools and found in cities. Furthermore, ICT is tilted toward private institutions at the primary level (Ayebi-Arthur, Aidoo, & Wilson, 2009). Aghion, David, and Foray (2009) mentioned that ICT projects with a focus on the needs, capabilities, perspectives, and aspirations of the vast majority of people who live in rural areas should be sponsored by governments.

According to a survey of 20 teachers and 105 students at Accra Polytechnic, ICT facilities access was limited, inadequate time to access ICT, and ICT software was used sparingly (Amanortsu, Dzandu, & Asabere, 2013). Another study by Hanson and Asante (2014) in Ghana established that 60 percent of instructors in the early years of school teaching ICT had some knowledge of the technology and that 67 percent of instructors did not use it in their teaching. In his study, Boni (2018) found that instructors and students lacked the efficacy and

inventiveness needed to effectively use ICT for teaching and learning in Ghana. According to Mubashir-Ahmed (2009), hurdles to ICT integration in schools in Ghana include lack of access to the internet, shortage of qualified teachers, lack of computers, high cost of ICT devices, and lack of electricity in some places. Another study revealed that access to power is a critical issue affecting online learning in Ghana (Arthur-Nyarko & Kariuki, 2019). Ghana's process to integrate ICT into instruction and learning has been riddled with difficulties, particularly in rural areas, despite extraordinary attempts by successive governments. In 2016, Ghana was placed 112th out of 175 nations in the global ICT development index, up from 123rd in 2014 (International Telecommunication Union, 2014; 2016).

The Ghanaian education system, recognizing the importance of ICT, has undertaken initiatives to ensure widespread access to technology, aiming to bridge the digital divide and foster economic and social progress. However, the journey has been met with hurdles including resource limitations, lack of infrastructure, and uneven implementation. As Ghana strives to advance its education system through ICT integration, policymakers must address these challenges systematically, thereby creating an inclusive and technology-enabled learning environment that aligns with global demands and societal needs.

Statement of the Problem

Despite significant governmental efforts and expenditures aimed at integrating ICT into the educational landscape of Sub-Saharan nations like Ghana, several challenges have impeded progress. Notably, an intervention intended to provide access to core educational content for all Senior High School (SHS)

students during the COVID-19 pandemic was fraught with difficulties (Anyorigya, 2020). Research in the Cape Coast Metropolis by Barfi, Amenu, and Arkorful (2020) identified pervasive challenges within the current educational system, including a lack of computers, poor internet connectivity, and the absence of a coherent ICT policy framework for SHSs. Similarly, Adarkwah's study (2021) concurred, highlighting issues such as limited access to ICT, reluctance among teachers and students to embrace ICT, and persistent network and electricity challenges despite substantial investments in ICT by low-income countries like Ghana. UNESCO's report (2021) on the outcomes of the Global Education Coalition Surveys further underscores the continued disruptions to education, with 70% of students worldwide, equivalent to 1 billion learners, still facing interruptions in learning even one year into the pandemic.

In the context of educational research in Ghana, a large corpus of research exists using other existing models (TPACK, TIM, TAM, TLM) in technology integration. However, very little research has focused on the effectiveness of ICT integration in teaching and learning of economics particularly through the lens of the "Will, Skill, and Tool" (WST) model which has a multi-dimensional approach to explaining effective technology integration in teaching and learning through three constructs both internal (will & skill) and external (tool) factors (Shaw et al. 2018; Taimalu & Luik 2019; Teo & Bahçekapili 2012; Vongkulluksn et al. 2018). Furthermore, the majority of studies exploring ICT integration, including a few that evaluated economics education in SHS (Kaku & Arthur, 2020; Wilson, Tete-Mensah & Boateng, 2014; Nji & Idika, 2018), have predominantly adopted either

entirely qualitative or quantitative research methodologies (Adarkwah, 2021; Msila, 2015; Ottestad, 2013; Chigona & Chigona, 2010; Gill & Dalgarno, 2008; Muslem, Yusuf & Juliana, 2018). Notably, these studies often focus exclusively on either students' or teachers' perspectives, potentially overlooking the nuanced dynamics of ICT integration. Besides, most literature (Wilson, Tete-Mensah & Boateng, 2014; Tagoe, 2012; Kaku & Authur, 2020) focused on students' perspectives on assessing ICT integration without including the views of teachers instructing students and the following literature (Islam, 2020; Wong, 2016; Kayode, Agunbiade, & Olaniyan, 2019, Singh & Chan 2014) assessed teachers' perspectives on assessing ICT integration without including the views of students doing the learning.

In other to study holistically rather than in fragments, these gaps in the literature need conscious efforts to be filled by considering the perspective of both teachers and students using a mixed-method approach to guide the methodology of this study as the use of both quantitative and qualitative neutralize the weaknesses of each form of data. Therefore, there is a need for an empirical study to examine how effective ICT integration is in teaching and learning Economics in Senior High Schools which would subsequently resolve problems encountered by disadvantaged rural school students.

Purpose of the Study

The study sought to examine the effectiveness of ICT integration in teaching and learning of Economics in Senior High Schools. Specifically, the study was led by these research objectives to:

1. assess ICT resources available for use by teachers and students in teaching and learning of Economics.
2. assess the level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes.
3. examine the attitude of Economics teachers and students when technology is integrated into lessons.
4. identify the perceived effects of ICT use on the teaching and learning of Economics.

Research Questions

1. What ICT resources are available for use by teachers and students in teaching and learning of Economics?
2. What is the perceived level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes?
3. What is the attitude of Economics teachers and students when technology is integrated into lessons?
4. What are the perceived effects of ICT use on the teaching and learning of Economics?

Research Hypothesis

1. H_0: There is no statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*
   H_1: There is a statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*

2. H_0: There is no statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *years of teaching experience*

   H_1: There is a statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *years of teaching experience*

3. H_0: There is no statistically significant difference in *Economics students' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*

   H_1: There is a statistically significant difference in *Economics students' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*

Significance of the Study

The core objective of this research is to examine the effectiveness of ICT integration in the instruction and learning of concepts, conventions, and principles among others in Economics in Senior High Schools in the Bono region.

The findings from this study provided relevant information on the status of ICT integration in teaching and learning of Economics at the SHS level to key stakeholders in education. The study provided the opportunity for the government and institutions involved to obtain adequate information about what needs to be done to address the challenges and promote effective ICT integration in the learning and teaching of Economics in SHS in Ghana.

Again, the findings of the research guided the Ministry of Education (MoE) and the National Council for Curriculum and Assessment (NaCCA) for realistic and rigorous laid-down policies on online learning and ICT integration in the teaching and learning of Economics. Similarly, the findings provided the platform for investment planning in ICT facilities, designing efficient ways to minimize cost (cost-effectiveness), and planning professional development training and other capacity-building programmes for Economics teachers to update their pedagogical skills and knowledge.

Finally, the study contributes to empirical studies by augmenting the limited literature on Economics education in Ghana concerning ICT integration in the learning and teaching of Economics in SHS.

Delimitations

This study was limited in scope to only Economics teachers and students in public second-cycle institutions in Ghana's Bono region. A study by Antwi et al. (2018) asserted that the availability of ICT for learning is tilted towards secondary schools classified as leading (“A”) schools and the Bono region, like other parts of the world, may experience socio-economic disparities and has fewer leading schools. Therefore, conducting the study in the Bono region fosters a sense of local empowerment, bridges the gap, and provides enhanced learning experiences for students regardless of their socio-economic backgrounds. The research may have been expanded to include other private second-cycle schools in the area. However, given the study's objective to examine the effectiveness of ICT integration in Economics teaching and learning in Senior High Schools, the scope

was limited to include Economics teachers and students in public second-cycle institutions in the Bono region of Ghana. The study was limited to Knezek and Christensen's (2002, 2008) WST model for measuring the effectiveness of ICT integration in analysing the effectiveness of ICT integration.

Limitations

A few obstacles were encountered in the course of the study. There were a few obstacles in the research. The use of self-report measures to measure variables for analysis was the first constraint. This could have an impact on the study's outcome. There's a possibility that some of the responses from Economics teachers and students don't accurately reflect the situation on the ground, which could skew the data collected from them. Nonetheless, respondents were motivated to participate voluntarily and faithfully. In addition, some teachers were interviewed to provide explanations that reflected the actual situation on the ground.

The fact that the findings were based on a sample of Economics teachers and students limits the generalizability of the findings. The study's findings cannot be applied to all Ghanaian Economics teachers and students to reflect the situation across the country; rather, they can only be applied to regions in Ghana that share the same characteristics as Economics teachers and students in Ghana's Bono region. Involving other subject teachers and students in the study, on the other hand, may have increased the breadth and depth of the findings and conclusions.

Definition of Terms

Effectiveness: is the capacity to accomplish the desired result or generate a desired product. It was also defined based on Knezek, Christensen, and Fluke's (2002, 2008) WST model for measuring the success of ICT integration; will (positive attitude), skill (technological competence/self-efficacy), and tools (access to technological tools/availability of ICT resources).

ICT Integration: the application and usage of technology in teaching and learning**.**

ICT Resources: refers to supplying equipment, appropriate software, reliable internet connectivity, and availability of technical support and maintenance.

Attitude: is an affective, behavioural, and cognitive component response towards the object of a specific attitude.

Self-Efficacy: refers to technology competence; an individual's ability and experience related to the use of ICT.

Information Communication Technology (ICT): the set of knowledge, skills, experience, and techniques through which humans change, transform, and use our environment to create tools, machines, products, and services that meet our needs and desires.

Organisation of the Study

The research was divided into five (5) chapters. The background to the study, statement of the problem, the purpose of the study, objectives of the study, research questions, significance of the study, limitations of the study, and organisation of the study were all covered in Chapter One. A review of related

literature was the focus of Chapter Two. It covers the theoretical underpinning for e-learning and ICT integration studies and also considers the conceptual basis around which the study is built. The study's research methodology was the subject of Chapter Three. It explains the research approach, research design, study population, sample and sampling procedure, variable measurement, research instrument, data collecting, data preparation, and data analysis. Chapter Four involved the presentation and discussion of the results. It also includes the evaluation and examination of findings concerning the current theoretical position as well as its practical application. Finally, Chapter Five was devoted to the summ ary, conclusions, and recommendations as well as areas for future research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter examines studies undertaken by other researchers that were deemed relevant to the current study. Comparing this research's findings to those of past similar studies provided a foundation for validating or rejecting earlier findings and conclusions, as well as for situating the current investigation. The chapter is separated into three sections: theoretical viewpoint, conceptual perspective, and empirical perspective. The theoretical viewpoint is based on Knezek, and Christensen's (2002, 2008) "Will, Skill, Tool (WST) Model," whilst the empirical approach examined relevant studies by other academics in the field of ICT integration.

Theoretical Framework

The study's theoretical foundation is based on the ‘will, skill, tool’ (WST) model, although the study would first review some learning theories before moving on to the ‘will, skill, tool’ (WST) Model, the study's theoretical lens.

Learning Theories and their Implications

Learning theories must be used for successful and efficient instruction, according to Mitchell and Laski (2013) when producing learning materials for technology use in education. In both the twentieth and twenty-first centuries, various ideas have been proposed by various scholars in an attempt to explain the effective learning process. Harasim (2012), on the other hand, asserted that at the dawn of the twenty-first century, three dominant educational viewpoints predominate: behaviorism, cognitivism, and constructivism.

Many educational researchers have backed and endorsed this viewpoint, claiming that it captures the massive changes in how learning is conceptualised and offers some distinctively different directions for instructional practice. This section examines learning theories as a foundation for incorporating ICT into the teaching and learning environment. The behaviourist perspective is the first to be discussed, followed by constructivist and constructionist perspectives.

Behaviourist Theory

The context and learning pedagogy of behaviorist theory, as well as its significance in the creation of learning technology, are presented in this section.

Many educational researchers see behaviorism, which was developed in the late nineteenth century, as the first significant theory of learning and as a revolutionary leap forward in human science (Harasim, 2012). Although numerous researchers have been linked to the development of behaviorism (e.g., Skinner, 1938; Thorndike, 1932), Frederick Skinner, an American psychologist, is widely considered to be the greatest of behaviorist theorists (Skinner, 1968). Behaviorism is a learning theory based on the premise that behavior can be controlled and modified depending on the antecedents and consequences of behavior, according to Skinner (1938). Shunk (2012), using metaphor to describe the theory, stated that behaviorism relies on the sponge technique of teaching, in which the learners' purpose is to absorb what they are given until the examination when the information is wrung out of them. This approach is strongly established in Ghana's education system, particularly pre-tertiary education, where a high-stakes testing culture is prominent to help learners pass assessments. Unlike in a

constructivist learning environment, where teachers act as facilitators and guide students, Ghanaian teachers' traditional role is to pass on their knowledge to their students, to learn and reproduce the information for exams and tests without necessarily processing it to change their practice.

Though behaviorism is still a popular educational orientation in Ghana, it has been widely criticized by the majority of modern educational researchers and scholars, who claim that the theory discourages active learning because it is based on fixed rules and procedures and the memorizing of facts (Jonassen, 1995; Harasim, 2012). It has also been discovered to inhibit students from acquiring higher-order thinking skills, which are critical in the Information Age of the twenty-first century (Harasim, 2012).

Despite the limitations of behaviorist theory, it is crucial to recognize that the behaviorist school tradition provided the theoretical underpinnings for modern instructional technology, which has grown in importance and impact on constructivist academics and instructional designers (Harasim, 2012; Edwards, 1970). Other scholars (e.g., Harasim, 2012) believe that, while constructivism is beneficial for using ICT, basic knowledge of well-structured domains must still be taught because certain pre-service teachers require information from which to build. An earlier study by Jonassen (1995), who claimed that pre-service teachers require mastery of technical skills at an initial stage and are better supported by more traditional behaviorist approaches such as direct instruction, agrees with Harasim. Constructivist approaches, such as inquiry-based learning, are not as

effective until teachers have attained a desirable level of knowledge and competence, according to Jonassen (1994).

According to the researcher, behaviorism and constructivism provide various viewpoints on the learning process from which we can conclude how we should foster learning. The current study, on the other hand, believes that rather than seeking to instruct teachers and students, ICT should be used as a knowledge production tool that teachers and students learn with rather than from. Teachers and students in Ghana should act as designers, and ICT should act as Mind tools for understanding and organizing their knowledge in this approach. In this sense, ICT is viewed as a tool that may assist Ghanaian teachers and students in completing complicated tasks related to educational development rather than as a subject of study in and of itself.

Cognitivist Theory

Learners create a sense of the world by actively making sense of what they read and their interactions with the environment, according to cognitivism (Wilson & Peterson, 2006). Cognitivists consider learning to be an internal process involving motivation, reflection, meta-cognition, memory, abstraction, and reasoning (Ally, 2014). According to cognitivism, information is processed from the sensory store through various senses and then transferred to short and long-term memories by various cognitive mechanisms (Modritscher, Spiel, & Garcia-Barrios, 2006). Individual differences are constantly acknowledged by cognitivists, as is the inclusion of varied learning strategies to deal with these disparities (Kolb, 1984; Myers & Paris, 1978). Cognitivists depict a person's

unique method of remembering, thinking, and solving problems (Witkin et al., 1977). This theory has significant implications for the effectiveness of integrating Information and Communication Technology (ICT) into teaching and learning. Here's how the cognitive theory relates to the effectiveness of ICT integration:

Active Learning and Engagement:

According to the cognitivist theory, learners actively make sense of information. When ICT tools are integrated into teaching, they can provide interactive and engaging learning experiences. Interactive simulations, multimedia content, and online collaboration platforms allow students to actively engage with the material, which aligns with the cognitivist view of learning.

Internal Processes:

Cognitivists emphasize that learning is an internal process involving various cognitive functions such as memory, reasoning, and metacognition. ICT can facilitate these processes by providing tools that help students organize, store, retrieve, and analyze information. For example, digital note-taking apps and educational software can enhance memory and problem-solving skills.

Information Processing:

Cognitivists describe how information is processed from sensory input to short-term and long-term memory. ICT tools can assist in this information processing by providing multimedia presentations, simulations, and interactive content that cater to different sensory modalities, making it easier for learners to encode and retain information.

Individual Differences:

Cognitivists acknowledge the importance of individual differences in learning. ICT integration allows for personalized learning experiences, where students can choose their learning paths, pace, and resources. Adaptive learning platforms and intelligent tutoring systems can tailor instruction to individual needs, ensuring that learners of different abilities and preferences can benefit from technology-enhanced learning.

Varied Learning Strategies:

Cognitivists emphasize the inclusion of varied learning strategies to address individual disparities. ICT offers a wide range of tools and resources that cater to diverse learning styles. Visual learners, for example, can benefit from infographics and videos, while text-based learners can access digital textbooks and online articles.

Unique Cognitive Processes:

Cognitivists recognize that individuals have unique methods of remembering, thinking, and problem-solving. ICT can support this aspect by allowing students to choose tools and approaches that align with their cognitive strengths. For instance, students who excel in visual thinking can use graphic design software to create concept maps or diagrams.

In summary, the cognitivist theory aligns with the idea that ICT integration into teaching and learning can be effective when it leverages technology to engage learners actively, support internal cognitive processes, facilitate information processing, cater to individual differences, provide varied learning strategies, and accommodate unique cognitive styles. When properly

designed and implemented, ICT can enhance the learning experience and help students construct meaningful knowledge.

Constructivist Theory

The constructivist theory, which underpins this research, is examined in this part. It's divided into two (2) primary sections. The context and learning pedagogy of constructivist theory in the educational setting are discussed in the first section. The link between constructivism and ICT will next be discussed.

Constructivist theory, which has its roots in the pioneering work of philosopher and developmental psychologist Jean Piaget (see Piaget, 1952), is still the most common orientation in current educational systems around the world (Harasim, 2012 Shunk, 2012). Constructivism is commonly regarded as a paradigm shift for educators and designers, with far-reaching implications for the role of modern technology in facilitating meaningful learning (Jonassen, Hernandez-Serrano & Choi 2000). In a constructivist learning environment, according to Piaget (1952), knowledge is not information to be provided at one end and encoded, memorised, retrieved, and applied at the other. Instead, knowledge is learned by engagement with the world, other people, and objects.

Brook and Brooks (1993), who provided the strongest and most explicit description of the theory, stated that constructivism is not a theory about teaching, but rather a theory about knowledge and learning. Unlike the behaviorist perspective, which focuses on the outcomes, this paradigm emphasizes the process rather than the outcome. As a result, learning is a process of making sense of one's experiential reality by developing meaningful representations. Students

learn in constructivist learning environments by actively making sense of new knowledge, interpreting it, and mapping it into their existing knowledge map or schema.

Despite the diversity of views encompassed in constructivism, Duffy and Cunningham (1996) observed that there appears to be a consensus that "learning is an active process of constructing rather than acquiring knowledge" and that "instruction is a process of supporting that construction rather than communicating knowledge." This perspective, which underlies effective teaching and learning in a constructivist environment, contradicts the reality of Ghanaian senior high education. There is a need for a shift in mindset toward the idea that the key to successful learning lies with learners themselves, rather than teacher educators, and that, as a result, students need to be trained in a constructivist environment to become active learners and develop knowledge for themselves (Chen, 2011), rather than relying on teacher educators, as is currently the case. As a result, students should be given responsibility for their learning, with teacher educators serving as "scaffolds" to assist them.

Constructionism, which, according to Papert (1991), provides a testing ground for engaging students in problem-solving and learning to learn with technology, is closely related to constructivism. The constructionist paradigm explains an educational theory that believes that learning occurs most successfully when students are actively involved in producing tangible objects in the actual world. It was heavily influenced by the works of Seymour Papert, a dedicated student of Piaget (Piaget, 1973; Harel & Papert, 1991). It goes on to say that

rather than having a teacher dictate several of the facts, students can excel by generating and constructing the specific knowledge they require for themselves. As a result, in this learning environment, teachers serve as knowledge facilitators (Papert, 2003).

When technology (ICT) is integrated into a constructionist environment, students develop new experiences and a way of thinking for themselves, according to Papert (1980) and Bers (2008). In this sense, a computer becomes a think-with object that allows students to reflect on their performance in the same way that experienced learners do. As a result, they will be able to learn about their thinking and learning, which is known as meta-cognition. This approach is based on Fox's concept of the computer as a tutee, in which students control computers rather than the computers controlling them (Jonassen et al., 2008). In contrast to the typical behaviorist environment, where computers are used as tutors, this allows students to use computers as mindtools. Harel and Papert (1991), for example, discovered that students learned geometry and measuring abilities better in the context of constructing a computer-based program than their counterparts who learned the topic more traditionally. Teachers are supposed to obtain a deeper knowledge of subjects and pedagogies when they produce or build artifacts linked to their learning in the context of senior high education.

The study then moves on to ICT integration models.

ICT Integration Models

Over the past three decades, many models for the adoption and integration of ICT into educational settings have been developed to assist in measuring and guiding educators' use of technology. "Will, Skill, and Tool" (WST) Model

(Christensen & Knezek, 2008), "Technology Acceptance Model" (TAM) (Davis, 1989), "Technological, Pedagogical, and Content Knowledge" (TPACK) (Mishra & Koehler, 2006), "Apple Classrooms of Tomorrow" (ACOT) (Sandholtz, et al., 1997), and "Diffusion of Innovation" (Rogers, 2003). However, this study adapts Christensen and Knezek's (2008) "will, skill, and tool" (WST) model.

The 'Will, Skill, Tool' Model

The 'will, skill, tool' (WST) model is a well-established theoretical framework that encompasses all the essential elements for the successful integration of ICT into teaching and learning processes (Christensen & Knezek, 2008). The model consists of three central components (Knezek & Christensen, 2016): (a) 'will,' which represents a positive attitude toward ICT integration into education; (b) 'skill,' which refers to the ability and self-efficacy to use ICT; and (c) 'tool,' which refers to the availability and extent of ICT use. Each of the three components in the WST model may be measured with a variety of equipment (Tondeur et al. 2020). In addition, according to Tondeur et al. (2020), the WST is congruent with other technology integration models, such as the Technological Pedagogical Content Knowledge (TPACK) framework, and has a broad reach, since it has been implemented in other nations (Agyei & Voogt, 2010; Farjon et al. 2019).

Prior research has demonstrated that these three factors account for a substantial amount of diversity in the frequency of classroom ICT use. Knezek et al. (2003) revealed that this model's metrics explained 64–83 percent of the variation in ICT integration by instructors. In a similar vein, Morales (2006)

performed a transnational analysis of the model with instructors from Mexico and the United States and concluded that the WST model explained 90–96% of the variance in ICT use across the sample. According to more recent research by Petko (2012), model components can account for sixty percent of the variation. A few studies have also utilised the WST paradigm to evaluate pre-service teachers' usage of ICT. Agyei and Voogt (2010), for instance, examined the ICT usage of pre-service and in-service Ghanaian mathematics teachers. The WST model described 60% of pre-service teachers' technology integration, according to a study by Farjon et al. (2019). In addition, their findings revealed that pre-service teachers' attitudes were the most significant predictor of their technological integration.

Will/ Attitude

The idea of attitude has three constituents: emotional, cognitive, and conative (Fishbein & Ajzen, 1975). Computer attitudes impact teachers' acceptance of the value of technology, as well as whether they implement technology in the classroom (Meelissen, 2008; Paraskeva, Bouta, & Papagianna, 2008). Huang and Liaw (2005) also asserted that teachers' attitudes about computers are a crucial component in determining the effectiveness of computer integration in the classroom. The study revealed that regardless of how advanced and strong the current state of technology is, the degree to which it is applied is contingent on consumers' positive attitudes toward it (Huang & Liaw, 2005).

Numerous studies (Cavas et al., 2009; Czaja et al.,2006; Rashid, 2016; White Baker et al., 2007) have demonstrated that gender, socioeconomic level,

and age are all factors that influence computer attitudes. Recent research on the influence of age on attitude toward computers has revealed that younger people tend to have more favourable views regarding computer use than their elder counterparts (Christensen & Knezek, 2006; Meelissen, 2008). This suggests that younger teachers are more likely to employ technology in the classroom than older teachers. Other related studies on attitudes and motivation/personality factors toward technology in education included attitude surveys with questions about fear of computers, the extent of liking technology, attitudes toward using technology in school, enjoyment in using computers, productivity/utility of computers, and computer use for e-mails. These surveys revealed strong links between pupils' and teachers' attitudes and the impact on technology use and learning (Marshall & Cox, 2008). Several studies have identified "Computer anxiety" as a consistent, quantitative construct in teacher data sets on teachers' attitudes regarding computers (Christensen & Knezek, 2000a, 2001). According to Pamuk and Peker (2009), computer anxiety is the most significant feature of the attitude towards the computer scale, showing that teachers who are nervous about computers likely to acquire negative attitudes towards computers and oppose their usage. Several research studies (e.g., Bozionelos, 2001; Durndell & Haag, 2002) investigated computer anxiety as a distinct concept and discovered a strong correlation between computer attitudes and computer anxiety.

Few studies have supported the notion that computer pleasure (see Bagozzi, Davis, and Warshaw, 1992) has a favourable influence on the desire to implement technology in classrooms. Other research has indicated that the

cognitive aspect of attitude is a crucial one. For instance, Vankatesh (1999) and Davis and Wiedenbeck (2001) discovered that the perceived utility of computers influences computer views positively. This is essential to a person's evaluation of his or her productivity and describes the amount to which the execution of an activity contributes to the achievement of desirable results (Vankatesh, 1999). Several studies also examine the influence of the conative component of computer attitudes on computer use. Marshall and Cox (2008) discovered that educators who have an internet connection at home have more favourable opinions about computers and a stronger need for them in their daily life. Christensen and Knezek (2001) discovered a similar pattern and proved that teachers without internet access at home seldom become proficient technology integrators in the classroom.

Self-efficacy; Technology Competencies (skill)

The skill construct of the WST model depicts a person's self-efficacy, aptitude, and experience with ICT (Baturay et al. 2017; Tondeur et al. 2020). Self-efficacy is defined by Woolfolk (2004) as an individual's confidence in his or her capacity to control and handle problems. The relationship between self-efficacy and successful coping behaviours in the face of computer-related obstacles has been established. Recent research indicates that instructors with more self-efficacy suffer less ICT-related anxiety and stress (Dong et al. 2020). The previous study has suggested that instructors' ICT self-efficacy has a significant effect on how they integrate ICT into education (Gil-Flores et al. 2017).

Moreover, according to Sang et al. (2010), the self-efficacy of pre-service teachers predicts their future computer use in education.

The digital capabilities of teachers are also a significant factor in determining ICT utilisation in education (Tiede et al. 2015). Multiple well-established ICT competence frameworks have been developed on a global scale. These frameworks employ several names, including ICT literacy, digital literacy, and ICT competence (Markauskaite 2006). According to Tondeur et al. (2017), the term ICT competency is the most popular since it incorporates a broader understanding of ICT use. Digital competence may be described in this sense as the functional application of digital knowledge, skills, and attitudes (Ananiadou & Claro, 2009).

Institutional authorities governing teacher training standards globally (such as in the United States and Germany) have included ICT capabilities in their requirements (e.g., the International Society for Technology in Education, 2008, in the United States of America; the Standing Conference of the Ministers of Education and Culture, KMK, 2016, in Germany). In Germany, where this study was done, the necessity of preparing pre-service teachers has long been recognised. By the European Digital Competence Framework (DigComp) (Ferrari, 2013), the KMK has published a strategy paper outlining the six digital competencies (searching and organising, communicating and collaborating, producing and presenting, protecting and acting safely, problem-solving and handling, analysing and reflecting) that teachers are expected to instill in their students across disciplines. Teachers and pre-service teachers (Rubach &

Lazarides, 2019) must learn certain competencies to do this mission. Thus, ICT-related content must be incorporated into the teacher education curriculum (Tiede 2020). Pre-service teachers can acquire digital pedagogical competencies by choosing elective courses during their teacher training programmes, obtaining additional certificates in addition to their teacher training certification, or completing graduate studies focusing on specific aspects of digital pedagogy (Tiede et al. 2015). Therefore, it is not surprising that pre-service teachers continue to feel unprepared to integrate ICT into their teaching methods successfully (Gill et al. 2015; Tondeur et al. 2017). In addition, research indicates that teacher training course instructors lack ICT for educational purposes and expertise as a result, they are unable to support and educate pre-service teachers (Barbour & Harrison, 2016; Urez et al. 2018).

Tool/ICT Resources

The experience and usage of ICT by teachers are significant predictors of ICT integration. According to Christensen and Knezek (2008), teachers who use ICT are more likely to incorporate instructional ICT resources into their teaching practice than colleagues with less ICT expertise. According to the 2013 International Computer and Information Literacy Study (ICILS), teachers' ICT experience for educational purposes is marginally correlated with their frequency of ICT use (Fraillon et al. 2014). According to Breiter et al. (2010), using a variety of media in the classroom has a favourable effect on teaching practice. Moreover, Petko (2012) believes that instructors who often use ICT for personal and professional objectives prefer to incorporate ICT into their teaching practice

more frequently. Rubach and Lazarides (2019) studied the association between the self-reported digital abilities of pre-service teachers and the variety of their usage of digital materials and technologies. They argued that the employment of a variety of digital technologies might influence the classroom behaviour of pre-service and in-service instructors.

The necessity of a stable and high-quality ICT infrastructure in the process of ICT integration cannot be overstated (Rudra, Pradhan, Girijasankar, and Tapan, 2007). (2018). Meaningful ICT integration will be impossible without a reliable and high-quality ICT infrastructure. Countries committed to achieving meaningful ICT integration in their education systems prioritise the development of high-quality ICT infrastructures, such as electricity, a dependable Internet connection, telephone lines, and a cutting-edge, state-of-the-art building to house modern technologies (International Telecommunication Union [ITU], 2018; Ministry of Education, Singapore, 2016; U.S. DOE, 2017).

Conceptual Review

Effectiveness of ICT Integration

Effectiveness is the capacity to accomplish the desired result or generate a desired product. When something is deemed effective, it means that it produces the desired outcome or leaves a lasting impact. According to a study by Noesgaard and Ørngreen (2015), as many as 19 distinct ways to measure technological effectiveness have been discovered in prior studies for this study; learning outcome, transfer (application to practice), perceived learning, skills or competency, attitude, satisfaction, skills acquired, usage of the product, learning

retention, completion, motivation and engagement, organizational results, application to simulated work practice, self-efficacy, confidence, cost-effectiveness, connectedness, few errors, raised awareness, success of (former) participants, and undefined effectiveness. However, this study will resort to three (3) of them to measure effectiveness which is in line with the WST model to measure the effectiveness of ICT integration. This is because research has proved that a teacher's will (positive attitudes), skill (technology competence/self-efficacy), and tool (access to technology tools/availability of ICT resources) of the WST model are all necessary factors for integrating information technology into classroom activities (Christensen & Knezek, 2002, 2008). As a result, this study used Christensen and Knezek's (2002, 2008) WST model to measure the effectiveness of ICT integration as already discussed.

Ghana ICT Initiatives and Policy on Education

The government of Ghana has implemented many initiatives in which information and communication technology integration has remained a top emphasis. Under the Basic School Computerisation Project, the government provided approximately 60,000 RLG computers to schools across the country as of December 2016. (MOE, 2017). A total of 350,000 laptops were given over to the Ghana Education Service and the Ministry of Education in 2021 as part of the government's "One Teacher One Laptop Initiative" to be distributed to all Ghanaian teachers teaching in Pre-tertiary institutions from kindergarten to senior high schools (MOE, 2021).

In a similar vein, Buabeng-Andoh (2015) noted that the provision of hardware has been a regular ICT infrastructure that can be found in Ghanaian pre-service teacher institutes, even though some of them are outdated or not functioning properly. Buabeng-Andoh's findings are true in Ghana, where successive governments' ICT projects have focused on procuring hardware rather than satisfying the training needs of teachers' capacity to use technology (MOE, 2014). For example, in 2004, the government launched the Baah Wiredu One Laptop Per Child initiative, which distributed 10,000 laptops. In 2015, the government, in collaboration with RLG, a local computer manufacturing company, launched the "Better Ghana Laptop" project, which distributed approximately 15,000 laptops to teachers and students in several schools across the country, all to provide students with greater access to modern technologies. However, students are not using computers for learning. Thousands of computers have been delivered to most educational institutions across the country as a result of these activities. Some school buildings have been rebuilt and rewired to allow for the installation of ICT (MOE, 2016). The next pillar to think about is software. It's been said that hardware's power is expressed in the software applications it runs (ITU, 2018). Specific software for specific courses such as Economics, Geography, Mathematics, Science, and others are available in several educational institutions, particularly in the developed world. However, productivity tools like word processing, excel, and presentation software are the most frequent in Ghanaian pre-tertiary education.

Internet accessibility is one pillar of ICT infrastructure that has significantly changed the worldwide educational scene in the previous two decades. From a global viewpoint of the Ghanaian situation, this pillar will be addressed in depth. Due to its rapid rise in the global arena, Internet access, which has been a key impediment to ICT integration in the past three decades, especially in poor worlds, including Ghana, is now transforming the educational landscape (ITU, 2018). According to a survey published by the International Telecommunications Union in 2018, global mobile broadband subscribers increased by more than 20% annually over the prior five years, reaching 4.3 billion in 2017. (ITU, 2018). According to the report, global internet bandwidth increased by 32% between 2015 and 2016. (ITU, 2018). Africa, on the other hand, saw a 72 percent increase throughout this time, making it the world's most populous continent (ITU, 2018). Ghana is feeling the effects of this exponential rise in worldwide internet subscriptions. For example, the Ghana National Communication Authority (NCA) supported the ITU 2018 global report in its July 2018 report. According to the report, in the worldwide arena, there has been an exponential expansion of high-speed mobile broadband that is more inexpensive than fixed broadband. According to the NCA (2018) report, which is backed up by the ITU (2018) report, the number of individuals using the internet in Ghana has increased significantly. As a result of the exponential increase in Internet use and the Ghanaian government's open-door policy, many international and local mobile network operators have sprung up to provide affordable mobile broadband connectivity. Vodafone Ghana, MTN, Glo, Air TEL/Tigo, and others are

examples of private mobile broadband companies that provide affordable Internet access. Apart from these commercial firms, the government is working hard to deliver high-speed internet connection to every Ghanaian's doorstep, particularly in educational institutions. Recognizing that slow, unreliable dial-up connections can no longer serve rich multimedia content and to improve internet access across the country, the government launched the 600-kilometer Eastern Corridor Fibre Optic Broadband Infrastructure Project on April 4, 2013. The project was conceived and implemented by Arcatel-Lucent, a major leader in the field of networking and communications technology, and was funded by the Danish government at US$38 million. The goal of this cutting-edge project is to close the digital gap between rural and urban areas by promoting ICT applications that help education, e-government, health, and a variety of other areas (Ghana Government Website, April 4, 2013).

In August 2017, the government launched Abenase Telephony in Abenase, Eastern Region, to bridge the rural-urban divide in Internet access. Despite government initiatives to expand internet access, most educational institutions still lack high-speed Internet connections when compared to business organizations (Afari & Kumah, 2015). In-service and pre-service teachers, on the other hand, can supplement what they have in the schools with their mobile broadband due to the affordability of mobile broadband. Although mobile broadband is inexpensive and simple to use, it has restrictions such as limited bandwidth, which makes it difficult to download content and can make it impossible to connect due to faulty sim card installation. The government's

investment in fiber optics is increasing the fixed broadband in most preservice teacher education institutes (NCA, 2018).

According to UNESCO (2013), supplying equipment, appropriate software, and reliable connectivity to in-service and pre-service teacher education institutions is worthless unless technical assistance and maintenance are included. In support, ISTE (2018) stated that constant and trustworthy assistance for maintaining and reviewing ICT digital materials is required for successful ICT integration in teacher education. This implies that one of the most important aspects of effective ICT integration is the availability of technical support and maintenance. Unfortunately, most policymakers in the developing world, particularly in Africa, fail to see this as a vital aspect and an integral part of the overall planning of the ICT integration process, particularly in the early stages. In Nigeria, for example, Olakulehin (2007) discovered that technical support and maintenance posed a substantial impediment to ICT integration in teacher education since they are frequently placed in the hands of "amateurs" because ICT suppliers' promises of after-sales assistance are rarely kept. In a similar survey done in South Africa, school administrators identified a lack of technical experts as a major impediment to ICT integration in teaching and learning. Nigeria and South Africa are in a similar predicament as Ghana. Although diverse pre-service teacher education institutions in Ghana encountered a range of issues, technological assistance and maintenance seem to be a peculiar issue among all of these institutions according to Andoh (2015). According to Zinger, Naranjo, Gilbertson, and Warschauer (2017), most ICT efforts, particularly in poor

countries, do not include provisions for professional growth, particularly in the early phases.

Benefits of Technology in Teaching and Learning

Education has adopted a dynamic strategy in the twenty-first century. The era of technology has arrived to stay, and the use of technology is anticipated to facilitate education. According to UNESCO (2002), educational systems are under growing pressure to adopt new technology to offer students the 21st-century knowledge and skills they require. Fundamentally, student-teachers on the point of graduating from a college of education are expected to have the ability to use technology to teach, not only in the local context where they obtain their training but also in the international arena. LeCompte (2004) adds that not only do student-teachers require abilities in the use of technology, but they also need the skills to act as technical leaders and peer advisers to assist teachers in keeping up with the quality and quantity of technology. The employment of technical leaders signifies that when student-teachers are trained to teach using technology, they will not only improve their teaching skills but also function as a tool for giving guided training to in-service teachers.

To properly fit into this new era of technology-facilitated teaching and learning, teachers would need to be prepared and able to use technology in their lessons. With a constructivist mindset, educators may incorporate technology into their lessons. Through active and cognitive learning, the constructivist perspective encourages instructors to utilise technology to "extend classroom limits, connect students to real-world events, and assist students to become autonomous learners"

(Teo, 2009, p. 7). Watson (2007) asserts that the incorporation of technology into classrooms is essential to provide the education necessary for the success of modern students and that this is the most successful method for changing the way teachers perceive the educational process. Classrooms outfitted with technology boost the teaching and learning process by transitioning from old ways to a more constructive manner of education, which presumably improves students' learning (Matzen & Edmunds, 2007).

Several researchers have emphasised the importance of technology in this new era of education. According to Al-Alwani (quoted in Savas, 2011), the primary advantage of technology in education is that it enables students to become autonomous, self-paced learners via the use of information and communication technologies (ICTs). This suggests that the use of technology in education assures that students are skilled and rely on their talents, as opposed to conventional classrooms in which students' proficiency is contingent on the teacher's abilities and the pace of classroom engagement. This also proposes that students use information and communication technology to set the speed of their learning processes.

Matray and Proulx (1995) suggest that technology encourages students to be more active and involved in the classroom, as well as fosters collaboration. The engagement of students in the instructional process is increased when the lesson is impacted by technology since the majority of youngsters like playing with these technologies. Becta (2002) lists the benefits of using technology in education as greater motivation, increased self-esteem and confidence, enhanced

questioning skills, promoted initiative and independent learning, enhanced presentation, development of problem-solving skills, promoting better information handling skills, increased 'time on task,' and enhancing social and communication skills.

Roschelle, Abrahamson, and Penuel (2004) hypothesize that the use of technology in the teaching and learning process can assist student learning in four significant dimensions: "active engagement, collaborative learning, real-world situations, and frequent and quick feedback" (p. 253). Additionally, technology facilitates student learning by fostering "the needed higher-order thinking and metacognitive abilities for meaningful learning" (Wang, Kinzie, McGuire, & Pan, 2010, p. 382). According to Wang et al., technology may increase learning by fostering interest and motivation, enabling access to knowledge, and deliberately and tactfully structuring the learning process. Brandstrom (2011) said that the usage of the Internet in education enhances learning, teaching, and communication.

Wikis and digital storytelling platforms are being employed in the teaching and learning process to engage and inspire students by taking their talents into account. Through constructivist, student-centered practises, the utilisation of these instruments enables students to develop and support their self-efficacy (Adcock & Bolick, 2011). These also let teachers and students co-construct information and meaning, promoting constructivism in the classroom. Educational technology allows teachers to be perceived as classroom motivators and information brokers (Schneiter, 2010). In addition, the use of these

educational technologies enables teachers to offer knowledge in several formats, since the multimodal representation of information and ideas enhances the likelihood that more students will learn and remember course material (DeGennaro, 2010). Schneiter (2010) elaborates that the usage of various educational technologies in teaching and learning may help students comprehend, perceive, and engage with particular dynamic topics.

Beyond the classroom, instructors utilise technology for planning, grading, data management, sharing and organising materials, interacting with colleagues and parents, and video conferencing, according to Morris (2012). Morris asserts further that teachers utilise technology in the classroom for multimedia presentations, classroom demonstrations and explorations, class web pages, and blogs, images and movie clips, concept mapping, digital storytelling, movie production, and the facilitation of group work and homework. Personal computers, interactive whiteboards, LCD projectors, presentation software, the Internet, various Web 2.0 applications, wikis, digital flex books, graphing calculators, spreadsheets and word processors, cell phones and other mobile devices, educational software, mobile data collection units, iPods and iPads, and digital/video cameras are utilised in all of these instances (Thieman, 2008; Hammond, Fragkouli, Suandi, Crosson, Ingram, Johnston-Wilder, Johnston-Wilder, Kingston, Pope & Wray, 2009; Schneiter, 2010; Steinweg, Williams & Stapleton, 2010; Adcock &Bolick, 2011).

Savas (2011), commenting on the use of technology in education, explains that instructors benefit from Information and Communication Technologies to

keep track of and organise students' information, as well as to have more time for instructional activities. As teachers can contact students at any time and from anywhere, the use of technology in education also improves the teaching and learning process. With the use of educational technology, teaching, and learning are no longer confined to the classroom, as was the case in the past. By leveraging the features of information and communication technologies, the use of technology also enables instructors to be more imaginative and provide more engaging teaching materials (Matray & Proulx, 1995). This implies that teaching and learning become significant and engaging when aided by technology.

Given the significant role that technology plays in teaching and learning in today's digital environment, student-teachers must be educated about evolving technologies when they eventually accept the responsibility of teaching as professional teachers. To provide the required assistance or advice, it is crucial to determine whether or not students and instructors are prepared to implement technology in the classroom.

Empirical Review

In this section, research conducted by other authors concerning the problem under examination in this study was considered. It looked at works conducted in the area of ICT resources available for use by teachers and students in teaching and learning of Economics, the level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes, the attitude of Economics teachers and students when technology is integrated

into lessons, and perceived effects of ICT use on teaching and learning of Economics.

ICT Resources

The role of ICT resources as a core requirement in incorporating ICT has not been left unsupported by empirical works. Several studies have highlighted ICT resources as one of the factors affecting integrating ICT in teaching and learning.

In research conducted at the University of Cape Coast by Edumadze and Owusu (2013), it was determined that the university provides teaching and learning resources, but that these resources are insufficient. In addition, they demonstrated that a lecturer's prior abilities and knowledge in ICT indicated the level of ICT integration in their teaching and that there was a substantial positive correlation between ICT-related courses and students' ICT competencies. Although the association between these factors was not found to be statistically significant, the results revealed that ICT-related courses helped students enhance their ICT knowledge and abilities. The consequence is that teachers' ICT competence is an essential antecedent to ICT integration.

Again, research was done by Yusuf, Bashir, and Dare (2013) on the assessment of the availability, usage, and administration of ICT facilities in secondary schools in the Nigerian state of Kaduna for the instruction of the English language. According to the findings of the study, there is a shortage of ICT facilities in Kaduna's secondary schools, since the majority of the visited schools had just a small number of these resources. This suggested that schools

lacked easily available ICT facilities. In addition, educators lacked sufficient access to computers, interactive whiteboards, and multimedia resources. There were just projectors and e-libraries accessible in certain schools.

Similarly, Arthur and Kaku's (2020) study attempted to determine Economics students' opinions of the current condition of technology utilisation in the teaching of Economics in selected Senior High Schools in the Central Region of Ghana. Descriptive research employing a survey approach was conducted. 150 students in form 2 of Senior High School Economics from the Cape Coast Metropolitan Area in Ghana's Central Region participated in this research. Students were asked to respond to a 33-question questionnaire. The resulting index of reliability was 0.904. The data were examined utilising frequency and percentages, mean and standard deviation, and the t-test for independent samples. The outcomes of the study indicated that technical instruments such as computers, presentation software, and projectors may be used to teach economics. Again, it was discovered that economics teachers utilise existing tools for teaching the topic infrequently. In addition, when technology is utilised in the classroom, children demonstrate a positive attitude. The study concluded that there were no gender-based differences in the opinions of SHS Economics students about the use of technology in Economics classes.

Gyamfi (2020) utilised the Technology Adoption Model (TAM) to empirically investigate the variables impacting the acceptance and integration of Information and Communication Technology as a tool for teaching and learning in pre-service teacher education in Ghana. First, 380 respondents enrolled in a

three-year Diploma in Education programme at two colleges of education in Ghana were surveyed. Following this, interviews and observations with teacher educators and pre-service teachers were conducted to acquire additional qualitative data to triangulate with the quantitative results. The empirical results revealed that erratic power supply, a lack of technical support and maintenance, poor internet access, pressure from high-stakes testing, and disconnection between the colleges and practicum schools in the use of ICT were identified as the most significant barriers to ICT integration in both colleges.

In addition, Adebi-Caesar (2012), evaluating the ICT situation in Senior High Schools in the Lower Manya Krobo District, found that the majority of the schools lacked adequate computer resources and that instructors seldom utilise computers in the classroom. Ayebi-Arthur, Aidoo, and Wilson (2009) performed research on Internet usage in senior high schools in the Cape Coast Metropolitan Area in the Central region of Ghana. The majority of instructors have Internet access but seldom utilised it, according to the study's results.

Obiri-Yeboah, Kwarteng, and Kyere-Djan (2013) did a study on the determinants influencing ICT adoption in Ghana's postsecondary institutions: a case study of Kwame Nkrumah University of Science and Technology. This study aimed at shedding light on the variables influencing ICT uptake and utilisation in Ghana's postsecondary institutions. This research was conducted in imperial units using both qualitative and quantitative data-gathering techniques. The research revealed that perceived utility and usability are the most influential factors in ICT adoption. Additionally, the study indicated that ICT is not adequately

incorporated into KNUST's teaching, research, and learning. The fact that the majority of users, although aware of the potential benefits, are reluctant or unprepared to fully adopt ICT is a significant impediment. Inadequate ICT infrastructure and expertise were also recognised as contributing concerns.

These studies highlight several gaps and areas of concern. Edumadze and Owusu (2013) noted that resources for teaching and learning were insufficient at the University of Cape Coast. Similarly, Yusuf, Bashir, and Dare (2013) found a shortage of ICT facilities in secondary schools in Kaduna, Nigeria. Adebi-Caesar (2012) also observed a lack of computer resources in Senior High Schools in Ghana's Lower Manya Krobo District. In several studies, including Arthur and Kaku (2020), Adebi-Caesar (2012), and Ayebi-Arthur, Aidoo, and Wilson (2009), it is highlighted that ICT resources, when available, are underutilized by educators. Teachers tend to use computers and the internet for teaching.

Gyamfi (2020) identified significant barriers to ICT integration in pre-service teacher education in Ghana, including erratic power supply, lack of technical support and maintenance, poor internet access, and disconnection between colleges and practicum schools. Obiri-Yeboah, Kwarteng, and Kyere-Djan (2013) also found barriers to ICT adoption in postsecondary institutions, including reluctance among users and inadequate ICT infrastructure and expertise. Arthur and Kaku (2020) did not find gender-based differences in the opinions of senior high school economics students regarding the use of technology in economics classes, suggesting a potential research gap.

By addressing these gaps in the literature by focusing specifically on the availability and utilization of ICT resources for economics education. It seeks to provide an updated assessment of the state of ICT resources in the context of economics teaching and learning. The current study assesses the availability of ICT resources specifically for Economics teachers and students. Focusing on a subject-specific context can provide insights into whether Economics education has received adequate attention in terms of ICT resources, which earlier studies did not explicitly address.

The study investigates how Economics teachers and students utilize existing ICT tools for teaching and learning. It seeks to understand whether these resources are effectively integrated into Economics education or if they face underutilization, addressing a common issue identified in previous studies. Building on Arthur and Kaku's (2020) finding of no gender-based differences, the current study may explore this aspect further to understand if gender plays a role in the utilization of ICT resources in Economics education.

In summary, the current study addresses the gaps in the literature by providing a subject-specific analysis of ICT resources in Economics education, assessing their availability, utilization, and potential barriers. This focused approach can offer valuable insights and recommendations for improving ICT integration in economics teaching and learning, contributing to the broader discussion on technology integration in education.

Perceived Level of Self-efficacy

Self-efficacy towards integrating ICT as a pedagogical learning tool has not been left unsupported by empirical works. Several studies have highlighted the level of self-efficacy of teachers and students in integrating technology.

Murithi and Yoo (2021) examined the case of Kenyan public primary schools to determine the availability of ICT facilities, teacher competence to incorporate technology into teaching, and teacher attitudes toward technology in schools. Specifically, the study was grounded in the constructivist learning theory and the Technology Acceptance Model. An online questionnaire was filled out by 351 teachers. Inadequate ICT facilities in schools, as viewed by teachers, were a problem for the integration of technology throughout the implementation of the new curriculum. The majority of teachers said that they only had minimal computer instruction. Teachers had difficulty incorporating technology into their classes, even though they viewed the use of computers as essential.

Again, the primary focus of a 2014 study by Ghavifekr et al. was the efficacy of ICT integration in education. This study primarily attempted to determine the degree of computer skills and knowledge of primary school teachers in the teaching and learning process. In addition, the purpose of this article was to determine the extent to which primary school teachers integrate ICT into the teaching and learning process in the classroom. Randomly selected to complete the survey questionnaire for this quantitative study were 61 teachers from 10 public elementary schools in the Klang Valley, Malaysia. The data revealed that the majority of teachers were average users and that many teachers used ICT for their jobs in their offices rather than in the classroom for instruction

and learning. In addition, the results indicated that teachers should always be prepared and well-equipped in terms of ICT competencies and have a positive attitude to offer ICT-based learning opportunities to students to increase the quality of their learning. In addition, the survey revealed that respondents possess ICT skills and knowledge that are above average.

In a similar vein, Buabeng-Andoh (2012) conducted research to investigate the ICT knowledge, attitudes, and behaviours of second-cycle teachers in Ghana. With a response rate of 85%, questionnaires were issued to 273 instructors in various departments, 241 were returned, and 231 were valid for data analysis. A panel of experts in the area validated the questionnaire's accuracy. The alpha coefficient of Cronbach's reliability was 0.91. The data was analysed using descriptive statistics and correlation. There were 66% men and 34% women among the 231 educators. The majority of responders were thirty to forty-nine years old. The correlation study found a favourable association between ICT usage and teacher competencies. In addition, favourable but non-statistically significant attitudes toward the use of ICT by educators were observed. The study indicated negative connections between ICT use, age, and teaching experience. The descriptive results suggested that teachers had a limited understanding of fundamental ICT applications and the integration of ICT into teaching and learning activities. These results demonstrated that the incorporation of ICT into teaching and learning in Ghana's second-cycle schools has not altered the delivery of education. This also suggested that teachers have not changed from a focus on the teacher to a focus on the student. In addition, the majority of the respondents

had a modest level of proficiency in word processing and communication. The majority of respondents, on the other hand, rated their database skills as "poor" or "cannot use."

Despite enormous attempts to help instructors with the integration of information and communication technology (ICT) into their classroom practice, recent research indicates that teachers encounter significant obstacles when incorporating ICT into their instruction. With the fast spread of the COVID-19 virus, schools throughout the world have been forced to close for an undetermined amount of time, necessitating the provision of remote digital learning solutions. In light of this, Pozas and Letzel (2021) examined the determinants of pre-service teachers' anticipated ICT usage and the diverse outcomes of prior studies concerning ICT use and gender. Following the 'will, skill, tool' concept, multiple regression analyses were used to assess important characteristics of pre-service teachers' (N=103) anticipated usage of ICT for teaching and learning processes. To investigate their influence on the future use of ICT in the classroom, background factors, ICT profiles (attitudes and self-efficacy), digital competencies, and the usage of digital tools were analysed for pre-service teachers. They also demonstrated that there are no gender variations in pre-service teachers' ICT integration expectations. However, male pre-service teachers had more favourable opinions regarding the usage of ICT than their female colleagues. In addition, the results indicated that pre-service teachers' attitudes and perceived competence to teach and apply technology in their teaching practices are the two most significant determinants of their future ICT use.

Finally, the results gave essential information on the training requirements of educators. There is a discussion of the implications of the results and future studies. Consistent with prior research on pre-service teachers' views about ICT (Gretter & Yadav, 2018), this study's sample appeared to have favourable attitudes toward ICT. Similarly, pre-service teachers' evaluations of their planned future ICT usage were rather favourable. Intriguingly, the sample assessed self-efficacy in ICT use as somewhat negative.

In addition, Gutiérrez-Martin, Pinedo-González, and Gil-(2022) Puente's study outlines teachers' assessments of their ICT and media abilities as well as the emphasis they place on these competencies in teacher training. Based on UNESCO's recommendations on ICT (Information and Communication Technologies) and MIL, a questionnaire was utilised to collect data (Media and Information Literacy). The questionnaire was completed by 402 teachers and pre-service teachers. This is exploratory cross-sectional research employing quantitative descriptive and correlational techniques. The findings indicated that teachers' self-perceived competence was poor and that the self-perceived level was consistently lower than the emphasis placed on the corresponding competence. A greater emphasis was placed on MIL competencies than the ICT capabilities of instructors; this calls into question the propensity to favour technological and didactic training over media education training. Conclusions included the necessity for a paradigm change toward convergence in teacher training programmes for the digital age and the proposal of a worldwide model of teacher competencies in media and ICT (COMPROMETIC) that unites MIL

abilities with those of ICT teachers. Instructors saw themselves to be poorly trained in ICT and MIL competencies, as evidenced by their low self-perceptions in each area, but they viewed these abilities as crucial for both teachers and trainees.

These studies highlight several gaps and areas of concern. The studies by Murithi and Yoo (2021), Ghavifekr et al. (2014), Buabeng-Andoh (2012), and Pozas and Letzel (2021) consistently point out the challenges related to inadequate ICT facilities and limited teacher competence in effectively integrating ICT into the teaching and learning process. These studies also examine teacher attitudes and perceptions toward ICT. While some teachers view ICT as essential, there are variations in attitudes across different contexts and among male and female teachers. The studies emphasize the importance of teacher self-efficacy in ICT use.

Pre-service teachers' self-efficacy is particularly highlighted by Pozas and Letzel (2021), who found that attitudes and perceived competence are significant determinants of future ICT use. Gutiérrez-Martin, Pinedo-González, and Gil-Puente's (2022) study emphasizes the need for better teacher training programs in ICT and media literacy. The study suggests that teachers often perceive themselves as poorly trained in these competencies. The current study, "Level of Teachers' and Students' Self-Efficacy Towards Integrating ICT," appears to address these gaps in the literature by focusing on the critical aspect of self-efficacy among both teachers and students in integrating ICT. Here's how this study addresses these gaps.

The current study assesses the self-efficacy levels of both teachers and students, providing insights into their confidence and perceived competence in using ICT for teaching and learning. This is a crucial aspect that was highlighted in previous studies as a determinant of ICT integration. While the earlier studies primarily focus on teachers' competence and attitudes, this study includes students. Assessing students' self-efficacy provides a comprehensive view of the readiness and perceptions of both key stakeholders in the educational process. The findings of this study may offer insights into the training needs of teachers and students.

If the study identifies low self-efficacy levels, it can suggest areas where training and support are required, aligning with the concerns raised in the previous literature. By examining both teachers' and students' self-efficacy, the study can provide a comparative analysis of their readiness for ICT integration. This may help identify any gaps in perceptions between these two groups and inform strategies for bridging them.

In summary, the current study appears to build on the existing literature by delving into the self-efficacy aspects of ICT integration among teachers and students. By doing so, it contributes to a more comprehensive understanding of the challenges and readiness levels related to ICT integration in education, which were identified as areas of concern in the earlier studies.

Attitude

Teachers’ and students’ attitudes have been regarded as an essential component in technology acceptability and effectiveness since the early days of

computer usage in schools in the 1980s and 1990s (Marshall & Cox, 2008; Myers & Halpin, 2002; Woodrow, 1992). Several studies on teachers' and students' attitudes have been discovered by researchers to affect their integration toward ICT.

The purpose of Belay, Khatete, and Mugo's (2020) study was to determine how instructors feel about incorporating ICT into classroom education methods. The research was conducted at secondary schools in Eritrea's southern area. Adoption of a descriptive survey research design. The study focused on 27 secondary public schools in the region. The technique of stratified random sampling was employed to get a sample of twelve secondary schools from twelve subregions. The study's sample of respondents was taken from 12 secondary schools in these 12 subregions. 12 school administrators, 34 biology teachers, and 175 eleventh-grade students responded to the survey. For data gathering, questionnaires, interviews, and observation schedules were utilised. The majority of Biology teachers who participated in the survey had a favourable view of the use of ICT in teaching and learning, according to the report. They enjoyed using ICT in their biology classes; they said ICT made studying biology more engaging, comprehensible, and effective. The report advised that the Ministry of Education equip teachers with suitable in-service training on ICT integration abilities.

Moreover, Boateng, Boateng, Awuah, Ansong, and Anderson (2016) evaluated the opinions and attitudes of University of Ghana students. This study aimed to evaluate the opinions and attitudes of students at the University of Ghana about the usage of instructional films. Through semi-structured interviews,

qualitative data was obtained. Students' participation was fully voluntary and contingent on their verbal assent. Twenty students replied to a call for participation, and content analysis was used to examine the data. In general, students perceived films to be beneficial to their educational pursuits. Positive remarks were made about videos as a teaching and learning tool. However, students' assessments of the nature of the videos they viewed were unfavourable. Nearly every participant reported that the content and structure of the videos they viewed were problematic. However, the majority of participants felt that the videos benefited their learning outcomes and improved their learning strategies. As a result, the learning results of students and instructors should rely on how videos are utilised as a part of the broader educational process. This was one of the first publications to examine in depth the opinions and attitudes of Ghanaian students towards video-based instruction, and it gives unique insights into the idea and its use in postsecondary institutions.

Arkorful, Barfi, and Aboagye (2021) studied the Integration of Information and Communication Technology in Senior High School Teaching in a comprehensive study of senior high school teachers in Ghana. The subject of the investigation was the Kumasi Girls Senior High School in Ghana. The research has two aims. The first goal investigated the extent to which the mindset of instructors affects the incorporation of ICT into the classroom. The second goal explored gender inequalities in senior high school ICT integration. The study employed a descriptive survey design and quantitative methodology; descriptive statistics based on means and inferential statistics based on standard regression

were used to analyse the data. Utilizing the notion of the diffusion of innovations, hypotheses were constructed. Self-administered questionnaires were sent to the study population to collect data. The application of structural equation modelling enabled the testing of hypotheses. The findings demonstrated a substantial beneficial association between instructors' attitudes and ICT integration. In addition, the study found no significant gender differences in the acceptability of ICT integration in education.

Mwila (2018) evaluated the attitudes of secondary school teachers in Kilimanjaro, Tanzania, concerning the use of ICT in the teaching process. Utilizing a Cross-sectional Survey design. One hundred (100) teachers from ten (10) secondary schools comprised the sample. As study instruments, interview schedules, questionnaires, and observation schedules were utilised. Using descriptive and inferential statistics, the data were evaluated. The survey revealed that both male and female teachers had favourable opinions regarding ICT integration in the classroom. In addition, it was observed that there was a correlation between the age of a teacher and their attitudes toward the integration of ICT into the teaching and learning processes. Based on these findings, the study concluded that ICT integration into the teaching process was highly dependent on teachers' and students' attitudes toward ICT integration; favourable ICT attitudes are likely to promote ICT integration into the teaching and learning processes. The research advised that curriculum designers include ICT into a curriculum by taking economic, cultural, political, social, educational, and catalytic rationales into account.

These studies highlight several gaps and areas of concern. The studies by Belay, Khatete, and Mugo (2020), Arkorful, Barfi, and Aboagye (2021), and Buabeng-Andoh (2012) consistently emphasize the importance of teachers' attitudes and perceptions towards ICT integration in education. They find that teachers generally view ICT as beneficial, but there may be gaps in their competence and understanding of how to effectively use ICT in teaching. Boateng, Boateng, Awuah, Ansong, and Anderson (2016) explore student perceptions of instructional films and how they impact learning outcomes.

The study suggests that while students generally see the benefit of such technology, they may have concerns about the content and structure of instructional materials. Arkorful, Barfi, and Aboagye (2021) examine gender inequalities in ICT integration, finding no significant differences in the acceptability of ICT integration in education among male and female teachers. Mwila (2018) investigates the influence of teachers' and students' attitudes on ICT integration in the teaching and learning processes. The study suggests that favorable attitudes are likely to promote ICT integration, highlighting the importance of perceptions and attitudes in driving adoption.

The current study, "Attitude of Teachers and Students Towards Teaching and Integration of ICT," appears to address these gaps in the literature by focusing on the attitudes of both teachers and students toward the integration of ICT in teaching and learning. Here's how this study addresses these gaps. The current study assesses the attitudes of both teachers and students. This comprehensive approach provides a more holistic view of the readiness and perceptions of both

key stakeholders in the educational process. Previous studies often focused primarily on teachers, and this study extends the examination to include students.

Building on Arkorful, Barfi, and Aboagye's (2021) findings of no significant gender differences in the acceptability of ICT integration, this study may further investigate whether attitudes are gender-neutral or if there are nuances to consider. By assessing the attitudes of both teachers and students, this study may explore how these attitudes influence the actual integration of ICT in teaching and learning. It can help bridge the gap between attitudes and practice, shedding light on the factors that facilitate or hinder integration. The study can provide insights into the policy implications of attitudes towards ICT integration. If attitudes are found to significantly influence integration, it may suggest the need for interventions to improve attitudes among teachers and students.

In summary, the current study extends and complements the existing literature by focusing on the attitudes of both teachers and students, gender neutrality in attitudes, and the potential impact of these attitudes on actual ICT integration. It contributes to a deeper understanding of the dynamics and challenges related to ICT integration in education, addressing the gaps identified in the earlier studies.

Perceived Effect of ICT

To address the influence of technology on teaching and learning, Dzakpasu and Adom (2017) performed a study that revealed that ICT had a favourable impact on the lesson presented by lecturers and students, as well as good learning results in several subject areas. These categories included research,

information distribution, and evaluation techniques. The study argued that to improve ICT integration in the lesson delivery of lecturers and the academic performance of students, educational policies should be modified to make room for modern technological advancement, which would groom and equip students with the necessary skills to enter the job market. In addition, frequent training should be provided to teachers to enhance their delivery abilities. Teachers have a higher duty to ensure that students learn the necessary skills; consequently, it is necessary to investigate the elements that impact teachers' acceptance of ICT integration.

Kaku and Arthur (2020) conducted a study to determine Economics students' perspectives on the use of technology in the teaching of Economics in selected Senior High Schools in Ghana's Central region. The study was descriptive and utilised a survey approach. 150 Senior High School form 2 Economics students from the Cape Coast Metropolis in Ghana's Central Region participated in this study. Students' responses were collected using a 33-item questionnaire. The dependability index achieved was 0.904. Frequency and percentages, mean and standard deviation, and the independent sample t-test were utilised to examine the data. The study found that technical instruments such as computers, presentation software, and projectors may be used to enhance the teaching and learning of Economics.

Also, Belay, Khatete, and Mugo (2020) conducted research in secondary schools in Eritrea's southern area on how instructors feel about incorporating ICT into classroom education methods. Adoption of a descriptive survey research

design. The study focused on 27 secondary public schools in the region. The technique of stratified random sampling was employed to get a sample of twelve secondary schools from twelve subregions. The study's sample of respondents was taken from 12 secondary schools in these 12 subregions. 12 school administrators, 34 biology teachers, and 175 eleventh-grade students responded to the survey. For data gathering, questionnaires, interviews, and observation schedules were utilised. Employed were a questionnaire for biology instructors and students and an interview schedule for school directors. Before the instruments were utilised for real data collection, they were piloted and consulted to confirm their validity and dependability. The obtained data includes qualitative and quantitative information. SPSS was used to examine the quantitative data. Based on the study goals, qualitative data acquired from open-ended questions were evaluated thematically. The study revealed that instructors enjoy using ICT in their biology classes; they feel ICT makes learning Biology more engaging, comprehensible, and productive for students.

Rampersad (2011) investigated how the incorporation of technology affects students' interest, motivation, and participation in modern studies. The findings of the study indicated that the usage of technology-assisted students in recalling lessons fostered an environment favourable to learning, and attracted students' attention. Once more, students acquired an interest in the topic and participated actively in the teaching process. However, the absence of technology would reduce students' concentration and motivation to engage in a session (Lavin, Korte & Davies, 2011). According to Turan (2010), student attitudes

toward the usage of technology in the classroom were favourable. The use of technology in teaching and learning piques students' curiosity (Gragert, 2000; Haddad & Drexler, 2002).

Rafaei (2015) said that the use of ICT in the teaching and learning of Economics in secondary schools fosters collaboration and creates a dense network of students. Additionally, the use of ICT in teaching and learning can boost students' memory, retention, and motivation.

The provided empirical literature discusses various studies related to the influence of ICT on teaching and learning. These studies highlight several aspects and benefits of integrating ICT into education, including enhanced lesson delivery, improved learning outcomes, increased student engagement, and positive student attitudes toward technology use. However, there is a need to bridge the gap between these findings and the specific context of teaching and learning economics.

Here's how the current study, "effects of ICT use on teaching and learning of economics," addresses these gaps. While the previous studies cover the impact of ICT in education broadly, the current study focuses specifically on the teaching and learning of economics. This context-specific approach allows for a deeper understanding of how ICT can benefit economics education, which may have unique requirements and challenges compared to other subjects. Arthur and Kaku's (2020) study briefly touched on the use of technology in teaching economics. However, the current study aims to provide more comprehensive

insights into the effects of ICT use on both the teaching and learning aspects of economics education.

This includes exploring how technology can enhance economics lessons and improve students' comprehension and engagement in this subject. While several studies mention positive attitudes and outcomes related to technology use, they do not specifically delve into the context of economics education. The current study bridges this gap by directly addressing the use of ICT in economics classrooms, which may have unique instructional requirements. The current study, based on the description provided, appears to utilize both quantitative and qualitative data to evaluate the effects of ICT use. This mixed-methods approach allows for a more comprehensive assessment of the impact of technology on economics teaching and learning.

The findings of the current study can have direct relevance for curriculum development in economics education. If the study demonstrates the positive effects of ICT use, it may inform educational policies and practices to integrate technology effectively into economics curricula. In summary, the current study addresses the gaps in the literature by offering a focused investigation into the effects of ICT use specifically in the context of teaching and learning economics. It provides insights that can be valuable for educators, policymakers, and curriculum developers seeking to harness the benefits of technology in economics education.

Conceptual Framework

The Christensen and Knezek (2001, 2008) Will-Skill-Tool (WST) model was modified for this study. The model asserts that the constructs Will, Skill, and Tool independently forecast the adoption of technology in the classroom. According to the theory, they are necessary components for an effective integration of technology into education. In addition, the use of ICT in teaching and learning depends on both internal (will and skill) and external (tool) factors. People who are eager to utilize ICT (will), have the necessary ICT abilities (skills), and are given the necessary tools and facilities (tools) are more likely to integrate highly.

This study primarily focused on the original idea that will, skill, and tool independently affect the integration of ICT in teaching and learning, even if a tool can be an antecedent or intervening variable of teachers' will and skill (Inan and Lowther 2010; Vongkulluksn et al. 2018). Will is referring to the affective tendency toward the usage of technology in the classroom. The conceptual definition of skill is the capacity to carry out ICT-related tasks. The term tool refers to the accessibility of ICT resources. The degree to which ICT is included in the teaching and learning process is conceptually referred to as ICT integration in teaching and learning.

Although other technology integration models have been developed (Shaw et al. 2018, Taimalu & Luik 2019, Teo & Bahçekapili 2012, Vongkulluksn et al. 2018), the WST model was chosen for this study due to its concise yet comprehensive explanation of technology integration in teaching. The WST model, created especially for teachers, contained just three core variables as

opposed to the extended Technology Acceptance Model (TAM) of Teo and Bahçekapili (2012), the Technology Integration Model (TIM) of Shaw et al. (2018), and Taimalu and Luik's (2019) Model (TLM), which all included more than three constructs. The overall variability described in previous studies utilizing the WST model, however, was substantial, ranging from 60 to 96% (Farjon et al. 2019; Morales 2006).

Additionally, TIM, TAM, and TLM placed a strong emphasis on internal elements including cost-benefit analysis, situational context, knowledge, self-efficacy, beliefs, attitudes, and judgments of utility and usability. In contrast, both internal (will and skill) and external (tool) variables are included in the WST paradigm. Due to its inclusion in the International Handbook of Information Technology in Primary and Secondary Education (Voogt & Knezek 2008), this paradigm has gained popularity.

The study took into account how numerous studies conducted in other nations that were thought to be pertinent in the Ghanaian setting similarly used the WST model. The instruments used to assess a person's ability, skill, tool, and integration, however, differ. Although traditional WST measurements were not used, strong Cronbach's alpha and substantial results were found in the reliability tests and study findings. The ability of teachers and students to integrate ICT in the teaching and learning of Economics in the classroom was predicted using the demographic characteristics (control variables) of teachers and students and their effect on their ICT competence (skill). The conceptual framework illustrates how control factors have a direct effect on skill. The Will, Skill, and Tool are

hypothesized to predict effective ICT integration in teaching and learning Economics.

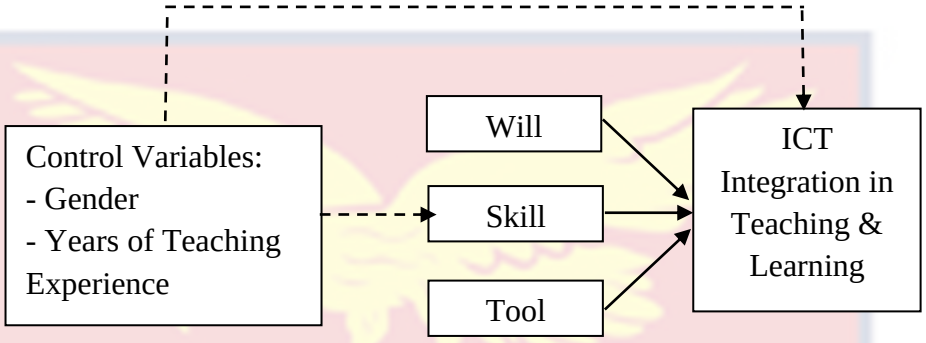


Fig. 1 Conceptual Framework in Analyzing the WST Model of ICT Integration in Economics Teaching & Learning

Chapter Summary

In summary, the empirical review revealed that the integration of ICT in teaching and learning is confronted with several factors. These include but are not limited to the inadequacy of resources, the negative attitude of pre-service teachers in incorporating technology, limited experiences from the perspective of teachers, and lack of technical abilities and skills. However, teachers' and students' self-efficacy, attitudes, and perceived effects of ICT use in teaching and learning of Economics have not received much attention in the literature. Considering the perspective of both teachers and students using a mixed-method approach to guide the methodology. This explains why the study examined teachers' and students' self-efficacy, attitude, and effects of ICT use on the integration of ICT in Senior High Schools.

CHAPTER THREE

RESEARCH METHODS

Introduction

This study examines the effectiveness of ICT integration in teaching and learning of Economics in SHSs in the Bono region of Ghana. This chapter outlines the methodology used in carrying out the study. Specifically, it discusses the research approach, research design, population, sampling procedure, data collection instrument, data collection procedures, data analysis, and processing.

Research Philosophy

The study adopted the pragmatic worldview. Pragmatism is a philosophical stance that emphasizes practical consequences, problem-solving, and the utility of knowledge. In the realm of research, a pragmatic approach focuses on the applicability of research findings and their real-world impact. A pragmatic approach allowed the study to combine quantitative and qualitative methods to robustly approach the hypothesis and research questions on the effectiveness of ICT integration in teaching and learning. This worldview aligned best with the explanatory sequential mixed methods design.

Research Approach

This study employed a mixed-method approach. Specifically, the explanatory sequential mixed method was used. The sequential collection of quantitative and qualitative data is appropriate for the sequential use of the explanatory sequential mixed approach. This approach was chosen because it assisted in doing quantitative research (phase), analysing the results, and then elaborating on the results with qualitative research (phase) to facilitate

understanding of the investigated topic. The two paradigms (quantitative and qualitative) provided an equivalent platform for data collection; yet, the quantitative part of the design was predominant. It indicated that the strategy wisely addressed the shortcomings and lack of feedback offered by each of the paradigms (Creswell, 2012).

Quantitative (primarily deductive) methods are ideal for measuring the prevalence of "known" phenomena and central patterns of association, including inferences of causality, whereas qualitative (primarily inductive) methods, permit the identification of previously unknown processes, explanations of why and how phenomena occur, and the extent of their effects (Pasick et al., 2009). Even though several scholars (Kaku & Authur, 2020; Semerci & Aydın, 2018; Amenu, 2019; Kayode, Agunbiade, & Olaniyan, 2019; Navani & Ansari, 2020; Daher, Baya'a & Anabousy, 2018) have employed the quantitative approach when investigating a similar phenomenon in Ghana and other countries, the combination of both the quantitative and qualitative (mixed) approach allowed for the researcher to develop a more complete understanding of the problem (Plano, 2010).

Research Design

The optimal research design for this study was the explanatory sequential, as it incorporates a survey of teachers' and students' viewpoints on the themes. The study used both quantitative and qualitative research approaches. According to Cohen et al (2011), the researcher obtains breadth and depth of insight and corroboration by combining quantitative and qualitative research and data, while

countering the shortcomings inherent in employing each approach separately. The use of explanatory sequential as the research design explained the quantitative results further with qualitative research. In the explanatory sequential mixed methods design, the researcher started with a postpositivist worldview for the quantitative portion of the research. Then moved to a constructivist worldview during the qualitative phase (Creswell & Plano Clark, 2018). The pragmatic approach allowed us to combine these worldviews and approach the work with the belief that it was appropriate to apply what worked best to each portion of the research as it changed. Therefore, it was best to work with a pragmatic worldview to consider multiple approaches and utilize objective and subjective knowledge (Creswell & Plano Clark, 2018).

Population

There are 70 Senior High Schools in the Bono region, with 34 of them being public schools (GES, 2020). There were 4692 economics students and 136 Economics teachers in the Bono region's 34 public Senior High Schools. The researcher was interested in only public Senior High Schools in the region. The rationale for focusing just on public Senior High Schools was that the majority of public-school teachers also teach in private schools, and including teachers in private schools would result in a duplication of responses. Second, in comparison to private schools, most public-school teachers are thought to be professional educators. Even if these nonprofessional teachers have adequate content knowledge, it is presumed that they lack adequate pedagogy when it comes to teaching the subject.

The study's target population was all Economics teachers and students in the ten (10) selected public SHS during the 2021/2022 academic year. All Economics teachers and students in the selected public SHSs were targeted since Economics was the subject of interest. All selected public SHS Economics teachers and students in the region who were willing and participate in the study made up the study's accessible population. The teachers were chosen because they had participated in the study while they were likely in Senior High School and then Senior Secondary School. Some possess credentials in post-diploma degrees, bachelor's degrees, and even master's degrees. These students were in a better position to contribute significant information on the subject under inquiry. Age and experience vary among these individuals (the teachers). In contrast, most of the students were in their teens, with a handful in their twenties. Due to their exclusive participation in the teaching and study of Economics, respondents from both groups were selected. Therefore, selecting them assisted in the collection of the necessary data for the study.

Sample and Sampling Procedure

The study's sample consisted of three hundred fifty (350) students and all forty (40) teachers. The minimum sample size for a population of 1380 persons, according to Krejcie and Morgan (1970), is 302. As a result, the researcher chose an extra 48 respondents, making the actual sample size 350. This was done to guarantee that the questionnaire's return rate did not influence the sample's representativeness of the population, as well as to improve external validity. The census method was employed with the teachers because there were only 40 of

them. The use of a census survey for teachers was justified, according to Anderson (2004) and Cooper and Schindler (2000), because the researcher could cover all of the respondents. After all, there weren't a lot of Economics teachers.

Table 1: Distribution of Economics Students Sampled for the Study

Schools	Population	Sample Size
Twene Amanfo SHS	150	38
Badu Technical SHS	138	35
Berekum SHS	161	41
Sunyani SHS	170	43
Wenchi SHS	143	36
Dormaa SHS	168	43
Drobo SHS	126	32
Jinijini SHS	119	30
Nkoranman SHS	107	27
Nsawkaw State SHS	98	25
Total	1380	350

Source: Fieldwork (2022)

According to Cohen and Manion (1989), when the population size is too big, the researcher collects data from a smaller group or subset of the population so that the data acquired is representative of the whole population being studied. For this work, the researcher used multistage sampling, a mix of various sampling approaches.

Following the construction of a sampling frame to cover the 34 schools, the lottery technique, which is one of the simple random sampling processes, was employed to choose ten (10) schools, by Sarantakos (1998) and Simon and Goes

(2012), who indicated that a sample of between 10 and 30 percent of the population would be optimal for any survey study. The Bono Regional Education Office provided a list of the schools in the area. To eliminate bias in the sampling procedure, the names of the 34 public Senior High Schools were assigned with codes. The codes were printed on paper and placed in a container. The selector did not look into the pool while the slips of paper were selected one by one. Once a name was selected, it was recorded and returned to the container before a new one was selected; the folded pieces of paper were reshuffled by shaking the container strongly. A new name was selected, documented, and returned. This process was repeated until a total of 10 schools were chosen from the list of schools. This strategy was utilised to guarantee that all of the schools had an equal chance of getting picked.

The number of students in each school was not equal. To determine the sample size for each school, the proportionate stratified sampling method was used. To determine the proportion of students in each school, the total number of students in each selected school was divided by the total number of students offering Economics in the ten (10) schools (1,380) and multiplied by the sample size of students to be selected (350). For example, Twene Amanfo SHS had 150 students offering Economics, which was divided by 1380 total students from the 10 schools and multiplied by 350 students sampled. There were 38 students chosen for this school as a result of this (Cohen & Manion, 1995). The process was repeated until each school's proportional representation of students was determined.

The researcher then proceeded to choose the sample unit from each school after calculating the total number of sampled students for each. A total of 10% of each form's students were sampled at each school. Consequently, 10% of students from SHS 1, SHS 2, and SHS 3 were selected. Because the majority of schools included students from several programmes (Business, Arts, Home Economics) studying Economics, a simple random sample method was employed to choose one class from each programme. Each form's sample unit was chosen by a lottery method. Because all members of the sample had an equal chance to be selected, the lottery method was used. The class list was obtained from the selected schools' class teachers. On pieces of paper, the names of Form 1 students were written and placed in a basket. They were chosen and then returned to the basket. When a name was picked a second time, it was not recorded. The technique was continued until the sample size for students in Form 1 was established. Students in Forms 2 and 3 went through the same process. The sample for the study comprised a total of 350 students and 40 teachers.

Data Collection Instruments

For data collection, two instruments were used. It comprised a questionnaire and a semi-structured interview guide. They gave a plethora of precise information and validated the validity of the data findings.

Questionnaire

The questionnaire was chosen because it was considered to be the quickest way to acquire a large volume of data from respondents. It was also anticipated that the questionnaire would protect respondents' privacy and anonymity, as it

relies heavily on self-reporting and is therefore capable of eliciting more precise responses. The questionnaire was used because it was useful whenever the sample size was large enough to make it impractical, for reasons of time or money, to interview each study subject (Osuala, 2005).

However, there are certain flaws with the questionnaire as a tool. Some of the items, for example, could be misconstrued due to poor wording or conflicting definitions of terminology, resulting in replies that aren't as expected by the researcher. However, the researcher ensured that all variables that could affect the questionnaire's validity and reliability were considered.

The questionnaire was in five sections. Section A consisted of four (4) items that measured the demographic data of the respondents. The second had six (6) items and thirty-nine (39) sub-items that were responded to using “yes” and “no” answers. These items measured ICT resources available for use by teachers and students in teaching and learning Economics. Section C had nineteen (19) items that measured the perceived level of Economics teachers’ and students’ self-efficacy towards integrating ICT into teaching-learning processes. Section D also had thirty (39) items and measured the attitude of Economics teachers and students when technology is integrated into lessons. The final, section E had sixteen (16) items which also measured the perceived effects of ICT use on teaching and learning of Economics. The items in Sections B, C, D, and E were rated on a 5-point Likert scale with the following values: strongly disagree (a value of 1), disagree (a value of 2), neither agree nor disagree (a value of 3), agree (a value of 4), and strongly agree (a value of 5). The Likert scale measures

how much people agree or disagree with statements about a common problem. The Likert scale was chosen above other scales since it is the most straightforward, yet equally effective method of graduation.

Semi-structured interview Guide

The non-directive interview was used to get data from the teachers. It was used for the second, third, and fourth research questions to make room for emerging issues from already-asked questions that needed to be probed at length. The only hindrance found was with issues that did not form homogenous data. However, the fact that it made room for emerging issues was a necessity. Participants could give all their information on what had happened on the field. The instrument helped participants to tell every bit of information as and when those data popped up in the informal conversation.

Both open-ended and closed-ended questions were used. The open-ended was dominantly used. Sometimes in the interview process, the closed-ended was used to give the teachers and students respondents some break from a long talk. This was because the instrument gave room for respondents to tell much when they felt what they had to tell was appropriate and as such could give valid pictures for the study. The researcher was aware of one major weakness of the instrument often cited in the literature which is respondents tend to please interviewers by giving acceptable answers instead of honest answers (Open University, 2001). This deficiency is usually attributed to some of the perceptions around the interview method. For this reason, this present study seeks to always encourage respondents to bring factual data. Again, the deficiency was a reason

for using the questionnaire to collect the same data. Their responses were to cater to some of the data given by the participants interviewed. It was a way to triangulate findings so that data might not just be pleasing information but affirmed by another party.

The interview focused on three broad areas. The first section assessed the perceived level of Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes. The second section looked at the attitude of Economics teachers when technology is integrated into lessons. The third section established the perceived effects of ICT use on the teaching and learning of Economics. There were twenty (20) items in all the sections. Section A had seven (7) items, Section B had seven (7) items and the last section had six (6) items.

Measurement of Constructs

ICT Resources

In the process of ICT integration, the importance of reliable and high-quality ICT infrastructure is undeniable (Rudra, Pradhan, Girijasankar & Tapan, (2018). In this study, measuring ICT infrastructure for successful integration was centred on four main pillars (Hardware, Software, Connectivity, and technical support & maintenance) articulated by UNESCO (2011). It is widely believed that these pillars work together for a successful integration of ICT in any education system that is serious about achieving meaningful ICT integration. A checklist was used rather than a standardized scale and respondents indicated their response using "yes" and "no" categorizations.

Self-efficacy

Self-efficacy in ICT integration refers to an individual's belief in their ability to effectively use ICT tools and technologies in educational contexts. In measuring self-efficacy in ICT integration, self-report assessment and survey were used as a proxy for measuring. Respondents were asked to rate their confidence in their ability to perform specific ICT-related tasks or activities. The survey included Likert scale items ("Strongly Disagree" to "Strongly Agree"), where respondents indicated their level of agreement with statements related to ICT integration skills.

Attitude

Measuring attitudes toward ICT integration in education is important for understanding individuals' perceptions and beliefs about the use of technology in teaching and learning. Attitudes can significantly influence the adoption and success of ICT initiatives. The Technology Acceptance Model and its variations (TAM2, TAM3) as a theoretical framework were used to assess attitudes toward technology. The model typically included constructs like perceived ease of use and perceived usefulness, which were used as proxies for attitudes. The Likert scale items ("Strongly Disagree" to "Strongly Agree") were used, where respondents indicated their level of agreement based on their perceived ease of use and perceived usefulness.

Test for Validity and Reliability

A brief preliminary study was conducted before the major study to confirm the instrument's validity and reliability. The researcher piloted it in four SHSs in the Central region, notably in the Cape Coast Metropolis. Representative

samples of the target population's categories were chosen for the pilot testing. The pilot test was conducted at University Practice SHS, Edinaman SHS, Aggrey Memorial SHS, and Mfantipim SHS. The rationale for selecting these schools was that they have characteristics with the schools chosen for the main study. A total of 35 respondents took part in the pilot study, accounting for 10% of the actual sample size. This was following Baker (1994), who suggested that a pilot sample size of 10-20% of the actual study sample size is an acceptable number of participants to explore enrolling in a pilot. In addition, the researcher showed the instrument to my supervisor in the Department of Business and Social Sciences Education (DOBSSE) for his professional opinion on content validity. The pre-test uncovered unclear phrases, poorly formulated questions that respondents didn't understand, confusing options, and questions with multiple solutions. Questions that were deemed to be confusing or not appropriate for the local condition were modified. Other items that elicited comparable responses were either deleted or reorganized as a result. Before the final administration, the necessary modifications were made.

The collected data was analysed and the Cronbach's alpha for each of the items was determined using the Statistical Package for Social Sciences (SPSS) computer application. Cronbach's alpha was used to assess the instrument's reliability. The Cronbach's alpha for the teacher’s questionnaire was .76 whereas that of the students was .73. DeVellis (1991) considers a reliability coefficient of this value to be respectable. As a result, the instrument was found to be reliable and appropriate for collecting the data required to answer the questions.

Furthermore, as a rule of thumb, the reliability coefficient in research should be 0.7 or greater, according to Frankel and Wallen (1990). As a basis, the instrument may be deemed of high quality and capable of collecting useful data for the research. As a result, only a minor modification was made to the questionnaire. A few minor modifications were made before the primary data collection. Respondents' recommendations regarding the phrasing of some instrument components, for example, were reviewed, and the relevant items were reworded to make them clearer.

Data Collection Procedures

Before administering the instrument, the Head of the Department of Business and Social Sciences Education (DOBSSE), UCC, Cape Coast, wrote a letter of introduction to the heads of the schools that were chosen for the study. As a result, the study received the attention, support, and cooperation required from the staff. Because the researcher sought to ensure a high accessibility and response rate, the questionnaire was individually administered to the respondents. The advantage of administering in person is summarized by Osuala (1982) in that the researcher has the opportunity to brief respondents to understand exactly what the items mean to obtain the right responses.

Teachers from the various schools chosen for the study met to discuss and agree on a convenient time to administer the instrument. It is ethical in research to assure respondents of their confidentiality and anonymity; hence the questionnaire was accompanied by a cover letter to this effect and to encourage their maximum

cooperation. After that, the researcher supervised the respondents as they completed the questionnaire.

After the twenty minutes given for the respondents to complete the questionnaire, the researcher collected the completed questionnaires. Respondents whose questionnaires were not ready at that time were given an extra five minutes to complete them. During the data collection, the researcher was available to clarify issues that the respondents failed to fully understand. In all, 320 questionnaires were collected which gave a return rate of 91%.

The collection of the interview data involved two different procedures. While the majority of interviewees were approached for one-on-one interviews, some of the teachers were called on the phone. A one-day data collection exercise for each was attained in various schools. It gave me the time to go through the recorded interview to make up and correct mistakes including other relevant items that gave me the experience to question other interviewees. Data were acquired during school time because most of the teachers were in the school and teaching. The data acquired from the teachers and the students during and after school periods were manually and electronically dealt with through the use of computer analysis software that aided analyses concurrently.

Ethical Consideration

Study ethics help to protect the rights of research participants while also promoting the research's credibility (Israel & Hay, 2006). The following steps were taken to ensure that research ethics were followed. The researcher applied to the UCC IRB for a research permit. The researcher ensured maximum

confidentiality and made sure the rights of the respondents were not infringed upon. The respondents' anonymity in the study was ensured. Before collecting the data, the respondents were made aware of the purpose of taking their opinions. They were made aware that their participation in the study was optional. Their participation in the study is not compulsory and, can opt for the study anytime, anywhere without any penalty. The respondents' right to reject the research results was upheld in terms of confidentiality; the names of respondents were withheld as well as any other confidential and personal information. Participants were informed that participation is voluntary, refusal to participate attracts no penalty or loss of benefits to which the participants were entitled, and the participants were given the freedom to discontinue at any time without penalty.

Data Processing and Analysis

The data gathered from respondents was evaluated to ensure that the assumptions of normality and homogeneity were not violated. The data collected was sorted to eliminate any questionnaires that were not completed. To code the valid surveys into their proper categories, the following scoring keys were used: strongly disagree-1, disagree-2, neither agree nor disagree-3, agree-4, and strongly agree-5. They were then analysed with the Statistical Product for Social Sciences (SPSS). The researcher analysed the data using the same descriptive approach as well as some inferential statistics because the data was gathered via a descriptive sample survey. The statistics used allowed for the reporting of the major variables as well as the different ways in which respondents ranked those concerns. The responses were then added together to complete the data.

Percentages and frequencies were used to analyze the demographic characteristics of the respondents.

Research question one assessed ICT resources available for use by teachers and students in teaching and learning of Economics and was analysed using percentages and frequencies. In the first-level analysis, a bar graph specifically was used to record whether ICT resources were "available or not available" to indicate the availability and usage of ICT resources by teachers and students in teaching and learning. Again, the second-level analysis captured the frequencies of the ICT resources "available and not available", and reported on the individual items accordingly.

Research question two focused on the perceived level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes. It was measured on a five-point Likert scale and coded as 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree). Data were analysed using mean and standard deviation. Based on the mean values generated, a scale was developed; 1.00-1.49 (very low), 1.50-2.49 (low), 2.50-3.49 (moderate), 3.50-4.49 (high), 4.50-5.00 (very high). A mean value above 4.5 indicates that teachers and students have a very high perceived level of self-efficacy towards integrating ICT into teaching-learning processes and a mean value below 1.5 indicates that teachers and students have a low perceived level of self-efficacy towards integrating ICT into teaching-learning processes. The scale was based on the distribution of the data. After analyzing the mean values of the

data, a threshold that seemed meaningful was adopted. Again, a review of existing literature and studies in the field used similar scales developed in the past.

Research question three sought to determine Economics teachers' and students' attitudes towards ICT integration into lessons. It was also measured on a five-point Likert scale same as research question two. It was then analysed using mean and standard deviation. The mean was used to determine students feeling about each item on the questionnaire. The standard deviation provided information on the congruence of the responses given by the students. The scale was established based on the data's distribution. A criterion that seemed relevant was chosen after the mean values of the data were examined. Once more, investigations into the subject and reviews of previous work utilised scales created in the past. A mean value below 3.0 indicated that teachers and students had a negative attitude towards ICT integration into lessons and a mean value above 3.0 indicated that students had a positive attitude towards ICT integration into lessons.

Research question four determined the perceived effects of ICT use on the teaching and learning of Economics. It was also measured on a five-point Likert scale same as research questions two and three. Again, it was analysed using mean and standard deviation. Like research question three, a mean value below 3.0 indicated that ICT use in teaching and learning of Economics does not improve teaching and learning and a mean value above 3.0 indicated that ICT use in teaching and learning of Economics improves teaching and learning. Based on the data's distribution, a scale was determined. A criterion that seemed meaningful

was chosen after examining the data's mean values. In addition, research on the subject employed scales created in the past to examine the material that has already been published.

Research hypothesis one also focused on whether there is a significant difference in Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on gender. The research question had two variables, thus self-efficacy as the dependent variable, and gender as the independent variable. To obtain the self-efficacy variable in the research question, the data on research question one was transformed into a single variable called the mean self-efficacy. After this, the differences between the male and female Economics teachers' self-efficacy towards ICT integration were analysed using the independent t-test at a 0.05 level of significance.

Research hypothesis two also sought to determine the mean differences that exist in self-efficacy across three categories of years of teaching experience (1-5 years, 6-10 years, and 11-15 years). The independent variable is the years of teaching experience while the dependent is self-efficacy. To analyze these mean differences, a one-way ANOVA test was conducted.

Research hypothesis three also focused on whether there is a statistically significant difference in Economics students' self-efficacy towards integrating ICT into teaching-learning processes based on gender. The research question had two variables, thus self-efficacy as the dependent variable, and gender as the independent variable. To obtain the differences between the male and female

Economics students' self-efficacy towards ICT integration, it was analysed using the independent t-test at a 0.05 level of significance.

In addition, the data collected through the interview guide on research questions two, three, and four were manually transcribed for thematic analysis. The data from the interview were analysed using themes (level of self-efficacy, attitude, and impact of ICT on teaching and learning of Economics) to provide a comprehensive analysis, corroborate, and give insight into data collected through the questionnaire that needed further explanation.

Table 2: Summary of Data Analysis

Research Question/ Hypotheses	Data Analysis Technique
1. What ICT resources are available for use by teachers and students in teaching and learning of Economics?	Percentages and Frequencies
2. What is the perceived level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes?	Mean, Standard Deviation & Thematic Analysis
3. What is the attitude of Economics teachers and students when technology is integrated into lessons?	Mean, Standard Deviation & Thematic Analysis
4. What are the perceived effects of ICT use on the teaching and learning of Economics?	Mean, Standard Deviation & Thematic Analysis
5. There is no significant difference in Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on gender.	Independent t-test

Table 2 (continued)

6. There is no significant difference in Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on years of teaching experience.	One-way ANOVA Test
7. There is no significant difference in Economics students' self-efficacy towards integrating ICT into teaching-learning processes based on gender.	Independent t-test

Source: Author's Construct (2022)

Chapter Summary

This study adopted the descriptive survey design to study the effectiveness of ICT integration in teaching and learning of Economics in selected SHSs in the Bono region. The data was collected using two instruments. A questionnaire and semi-structured interview guide were the tools used. They supplied a vast supply of comprehensive information and ensured data validation by working together. To analyze the data, descriptive and inferential statistics were used. The data on demographical variables and research question one was analyzed using percentages and frequencies, whereas the data on research questions two, three, and four were analyzed using mean and standard deviation. Again, the data collected through the interview guide on research questions two, three, and four were manually transcribed for thematic analysis. One-way ANOVA-test and independent *t*-test were used in running the hypothesis.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results of the fieldwork and the discussion to assess the effectiveness of ICT integration in teaching and learning of Economics in Senior High Schools in the Bono region of Ghana. This section consists of both the quantitative and qualitative analyses of the study based on the objectives of the study. It includes the descriptive statistics of the demographic characteristics of the respondents followed by its discussion. The discussions are presented with headings reflecting the research questions being addressed. Results have been presented in tables to facilitate understanding.

Demography of Respondents

This section presents and discusses the background information of the respondents (teachers and students) for the study. Data were obtained on five important demographic characteristics which were deemed necessary for the study. These were the gender, ages, years of teaching, and level of education of the respondents because the characteristics provided understanding to readers as to the category of teachers and students who were involved in the study with their level of maturity and experiences. In addition, they helped to analyse the hypothesis formulated for the study which sought to identify the significant difference between Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes based on their gender and years of teaching. The results of the characteristics of the respondents (students) are presented in Table 3.

Table 3 - Characteristics of Student Respondents

Variable	Subscale	No	%
Gender	Male	188	58.8
	Female	132	41.3
Age (in years)	13-15	10	3.1
	16-19	259	80.9
	20-Above	51	15.9

Source: Fieldwork (2022)

Table 3 shows the gender, and age of respondents. Majority (n = 188, 58.8%) of the Economics students were males. As indicated in Table 3, only 132 of the respondents were female Economics students representing 41.3%. By implication, more male Economics students are likely to be produced in Senior High Schools. The dominance of male students in the study has been a usual phenomenon experienced in our educational institutions. From time immemorial, male students have had the opportunity to enroll in educational institutions whilst more of their female counterparts remain at home. The female seems disadvantaged at some point due to some social, economic, and financial reasons. Socially, formal traditional parents viewed the position of the girl child: they were seen to have their place in the kitchen and as housewives in the future. This has resulted in most schools using affirmative action to ensure that the number of female students is increased in our educational institutions. In addition, some females of the school-going age get dropped out of school due to early pregnancy. Ghanaian society seems not to support the girl child to continue their education when they are caught up in teenage pregnancy. Most such teenage pregnant girls

pick up early jobs to support themselves and family and the upcoming child. Economically, most families that are not economically sound seem to prefer to train the male child rather than the girl child. One possible reason is that the girl child will be married and taken care of by the husband. Hence, by their perception the education of the male child is important. The dominance of the male economics students also means that the findings that are likely to be obtained in the study will be highly influenced by them.

Concerning the age of the students, it was noted that 10 representing 3.1% of the students were within ages 13 – 15 years, 259 constituting 80.9% of them were within ages 16 – 19 years, and 51 forming 15.9% of the students were within ages 20 and above. This indicates that most of the students used for the study were between the ages of 16 – 19 years which is very normal with senior high students in Ghana.

Table 4 - Characteristics of Teacher Respondents

Variable	Subscale	No	%
Gender	Male	28	70.0
	Female	12	30.0
Age (in years)	23-25	4	10.0
	26-29	14	35.0
	30 and Above	22	55.0
Highest Academic Qualification	Bachelors' Degree	38	95.0
	Masters' Degree	2	5.0
Years of Teaching	1-5	34	85.0
	6-10	4	10.0
	11-15	2	5.0

Source: Fieldwork (2022)

Table 4 presents data on the background information of the teacher respondents. Concerning the gender of the teachers, it was indicated that 28 constituting 70.0% of the teacher respondents were males whilst 12 representing 30.0% were females. The implication from Table 4 is that most of the Economics teachers are males while few of them are females. It can be said that males like the Economics subject more than females, or the subject seems to favour males more than females which is why there are more males teaching Economics than females. This means there were more males than females teaching Economics at the Senior High School level in Bono region. This is obvious from the percentages in Table 3 that 58.8% and 70.0% of the student respondents and teacher respondents respectively were males, whereas the remaining 41.3% of the students and 30.0% of the teachers were females. This is an indication of the fact that Economics is more of a masculine subject than a feminine one as shown by the small percentages of female teachers and students of Economics in the Bono region.

Again, the majority (n = 22, 55.0%) of the teachers were within the age range of 30 and above, followed by those in the age range of 26-29 years (n = 14, 35.0%). Only a few (n = 4, 10.0%) teachers were found within the age range of 23-25 years.

It can be observed from Table 4 that thirty-eight respondents of the teachers representing 95.0% hold a Bachelor's degree, and two representing 5.0% hold Master's qualifications. This shows that the majority of the teachers are Bachelor's Degree holders 95.0%, and Master's qualifications record the lowest

proportion of 5.0%. These figures and percentages again indicate that we have people who are academically qualified to handle Economics in the Ghanaian SHSs.

Similarly, from Table 4 that 34 (85.0%) of the teachers have worked or taught for five years or less (1-5years), 4 representing 10% of them have taught for six to ten years (6-10 years), and 2 representing 5% of them have taught for eleven to fifteen years (11-15 years). This is an indication of the fact that most of the teachers (85%) have taught for more than five years, and can therefore be assumed that they have enormous experience in teaching which can facilitate the teaching and learning of Economics in Senior High School.

Discussion of Main Findings

This section discusses the main results of the research questions and hypotheses that were posed to guide the study under various themes couched from the research questions. The result of each research question is presented in a table followed by a discussion. Data on research question one was collected using the availability of the ICT resource whereas research questions two, three, and four were collected on a five point-Likert scale (strongly disagree, disagree, neutral, agree, and strongly agree).

Research Question One: What ICT Resources are Available for use by Teachers and Students in Teaching and Learning of Economics?

The first research question finds out which ICT resources are available for use by teachers and students. Regarding this question, the researcher provided ICT resources and asked respondents (both teachers and students) to indicate their

availability or not. Figure 2 and 3 presents the results that were obtained on the factors.

Figures 2 and 3 Showing Teacher's and Student's Responses to Course Materials Available Online for Teaching and Learning

Figure 2: CMAO (Teachers) **Figure 3: CMAO (Students)**

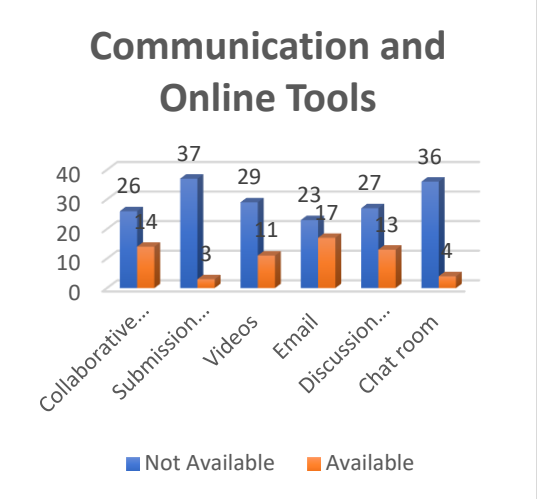
Source: Fieldwork (2022)

In Figure 2, the researcher enquired about the course materials available online to teachers to support their teaching activities. Digital textbooks came out first as the most available material available online for teaching and learning activities as indicated by the majority of the teachers 21 (52.5%), and the least being weblinks 6 (15%) for teaching and learning purposes. Out of the 40 teachers' respondents, 15 (37.5%) affirm the presence of assignments online for teaching and learning purposes, 14 (35%) said there are course notes for use online, 19 (47.5%) said there is a course outline, 21 (52.5%) said they have digital textbooks, 16 (40%) affirms there is a class test available, 14 (35%) indicated that

practice exercises are available online, 6 (15%) said they have weblinks for teaching and learning purposes as illustrated in Figure 2.

Figure 3 depicts the course materials available online for the student for their learning activities. Out of the 320 student respondents, majority 147(45.9%) confirmed course notes are available online for their learning activities, next was 143 (44.7%) affirmed course outlines are available, followed by 141 (44.1%) who indicated that practice exercises are available online, 133 (41.6%) said there are weblinks for use, 132 (41.3%) said there are class tests online, 128 (40.0%) affirms the presence of digital textbooks for teaching and learning purposes, and the least representing 127 (39.7%) said they have assignments online for learning purposes as illustrated in Figure 3.

Figures 4 and 5 Showing Teacher's and Student's Responses to Communication and Online Tools for Teaching and Learning



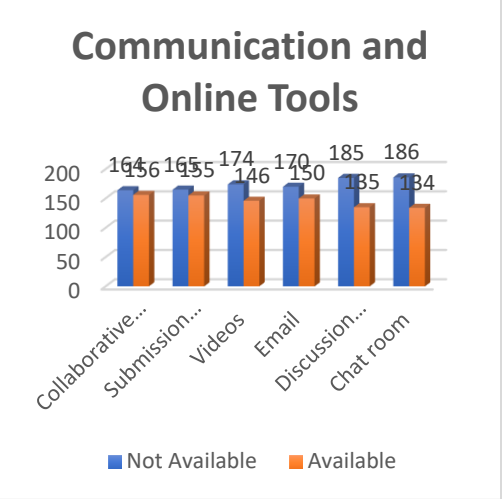


Figure 4: COT (Teachers) **Figure 5: COT (Students)**

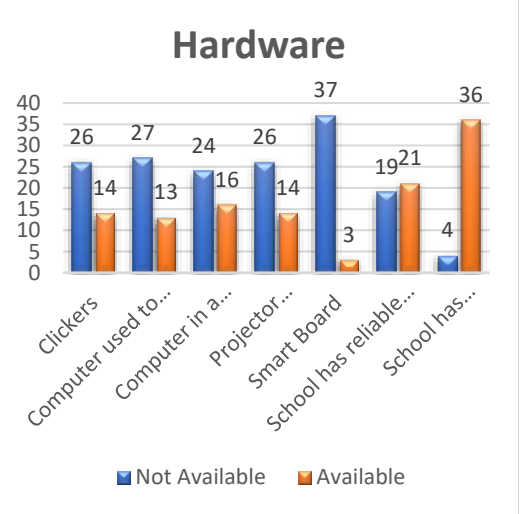
Source: Fieldwork (2022)

In teachers' responses to the availability of communication and online tools used for teaching purposes in Figure 4, the majority 17 (42.5%) said email is

available as a communication tool for teaching and learning activities, followed by collaborative work online, 14 (35%) indicated it is available, next, is a discussion forum which constituted 13 (32.5%), 11 (27.5%) said videos are available online for teaching and learning activities, 4 (10%) mentioned chat rooms were available and 3 (7.5%) represented the least for submission of assignments.

In the case of students' response to the availability of communication and online tools used for teaching and learning activities in Figure 5, 156 (48.8%) out of 320 students representing the majority said collaborative work is available online, followed by, 155 (48.4%) of students saying there is the submission of assignments online, next, 150 (46.9%) affirmed that email is available, 146 (45.6%) also confirmed the availability of videos, last but not least, 135 (42.2%) indicated discussion forum is available, and the least being chat room indicated by 134 (41.9%) students.

Figures 6 and 7 Showing Teacher's and Student's Responses to Hardware for Teaching and Learning



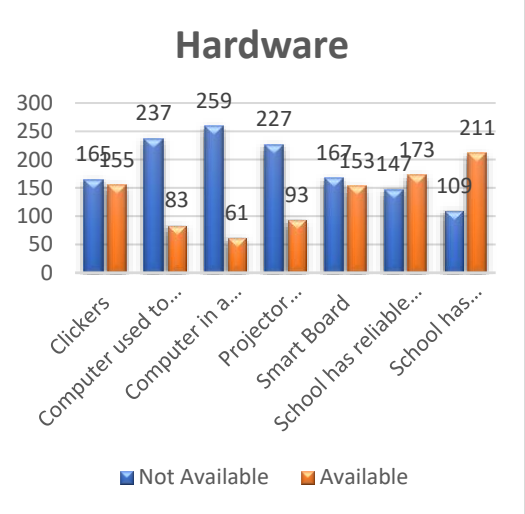


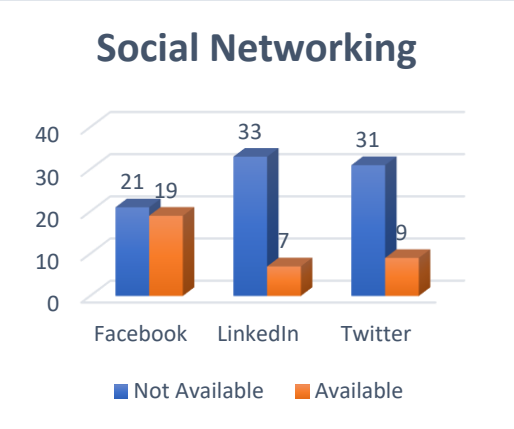
Figure 6: Hardware (Teachers) **Figure 7: Hardware (Students)**

Source: Fieldwork (2022)

Out of the 40 teacher respondents, the majority 36 (90.0%) said they have electricity to support online learning, 21 (52.5%) said they have reliable internet to enhance e-learning, 16 (40.0%) said they have computers in the lab, 14 (35.0%) each said they have clickers and projectors respectively, last but not least, 13 (32.5%) said they have computers used for teaching, and finally, 3 (7.5%) indicated they have a smart board which represents the least among all the hardware for teaching and learning activities.

Students' response to the hardware available for teaching and learning is illustrated in Figure 7. The majority 211 (65.9%) of the students said they have electricity to support online learning, and the least 61 (19.1%) affirmed that they have computers in the lab. According to the results from the students' survey, 155 (48.4%) said they have clickers, 83 (25.9%) said they have computers used for learning, 61 (19.1%) said they have computers in the lab, 93 (29.1%) said they have projectors, 153 (47.8%) indicated they have smart board, 173 (54.1%) affirmed that they have reliable internet to enhance e-learning, and 211 (65.9%) said they have electricity to support online learning.

Figures 8 and 9 Showing Teacher's and Student's Responses to Social Networking for Teaching and Learning



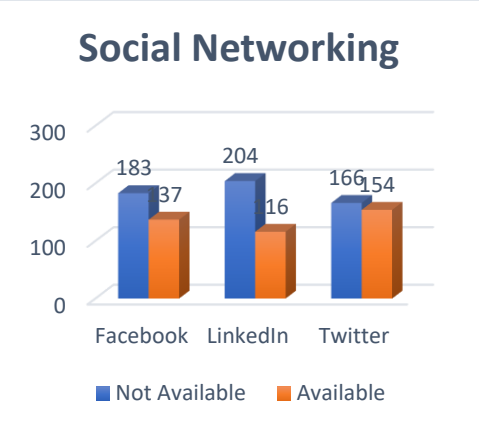


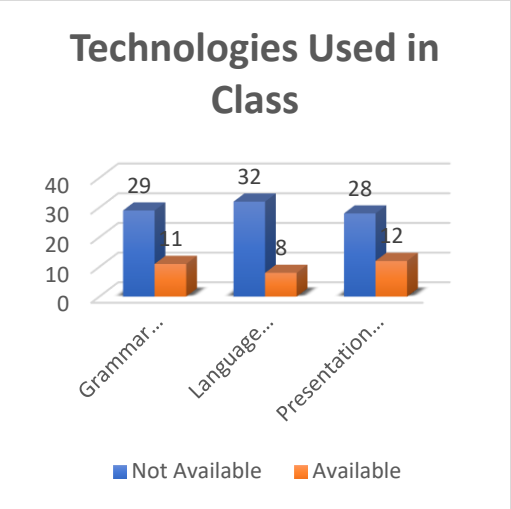
Figure 8: SN (Teachers) **Figure 9: SN (Students)**

Source: Fieldwork (2022)

Concerning social networking for teaching purposes, the teachers were asked to determine ICT resources available for teaching and learning. Out of 40 teacher respondents, a majority of 19 (47.5%) reported having Facebook for teaching purposes, 9 (22.5%) said they have Twitter, and 7 (17.5%) said they have LinkedIn. This is illustrated in Figure 8.

For social networking for learning purposes by students, the students were asked to determine ICT resources available for teaching and learning. Out of 320 student respondents, majority 154 (48.1%) reported having Twitter for learning purposes, 137 (42.8%) said they have Facebook, and 116 (36.3%) said they have LinkedIn. This is illustrated in Figure 9.

Figures 10 and 11 Showing Teacher's and Student's Responses to Technologies Used in Class



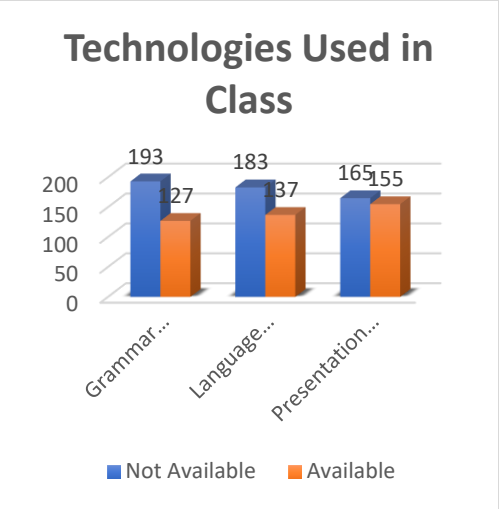


Figure 10: TUC (Teachers) **Figure 11: TUC (students)**

Source: Fieldwork (2022)

Figure 10 illustrates technologies used in class by teachers for teaching and learning activities. 12 (30.0%) out of 40 teachers indicated that they have presentation software, which constituted the majority, followed by 11 (27.5%) teachers corroborating grammar tools availability, and 8 (20.0%) indicating language learning software availability.

In Figure 11, students indicated the availability of technologies used in class for teaching and learning activities. The majority 155 (48.4%) indicated presentation software as the most available, and the least available being grammar tools confirmed by 127 (39.7%) students. 127 (39.7%) indicated that they have grammar tools, 137 (42.8%) indicated language learning software availability and 155 (48.4%) corroborated the availability of presentation software.

On teachers' responses to whether they use ICT for teaching purposes, all 40(100%) teachers said “Yes“ in affirmation. The majority of teachers 34(85%) said “No” they do not use ICT facilities during their teaching periods and only

6(15%) said "Yes" they use ICT facilities during their teaching periods. When they were asked if they apply the available ICT facilities during their teaching sections, 5(12.5%) affirmed that they use some of the facilities and 35(87.5%) said they use none of the available facilities during teaching.

In the case of students' responses to whether they use ICT for learning purposes, out of 320 students, 277 (86.5%) said "Yes" and 43 (13.5%) said "No". The majority of student respondents 305 (95%) said they do not use ICT facilities during their learning periods and only a few 15 (5%) said ICT facilities are used during their learning periods. When they were asked if their teachers apply the available ICT facilities, out of the 15 who affirm that ICT facilities are used for learning, a majority 9 (60%) said their teachers apply some during teaching, and 6 (40%) said their teachers apply none in their teaching.

In conclusion, the analysis of ICT resources available for teachers and students in the context of teaching and learning Economics reveals a notable presence of digital tools and technologies to support education. Both teachers and students have access to a range of course materials online, including digital textbooks and course notes, emphasizing the shift toward digital resources in education. Communication and online tools, such as email, collaborative work platforms, and discussion forums, are prevalent, fostering interactive learning experiences. Adequate hardware infrastructure, including electricity and reliable internet, facilitates online learning, though there's room for improvement in computer availability. Social networking platforms, particularly Twitter and Facebook, are utilized by both teachers and students for educational purposes.

Additionally, technology integration within the classroom is evident, with presentation software being a commonly used tool. Overall, this analysis underscores the importance of ICT resources in enhancing the teaching and learning of Economics, with opportunities for further advancements and increased access to digital tools.

What is the Level of Economics Teachers' and Students' Self-efficacy towards Integrating ICT into Teaching-learning Processes?

To address this research question, Economics teachers and students were asked to respond to many statements relating to their level of self-efficacy towards integrating ICT by indicating their level of agreement (mean ranging from 4.5 to 5.0) or disagreement (mean ranging from 1.00 to 1.49) to the statements. An agreement indicates that teachers' and students' perceived level of self-efficacy towards integrating ICT is very high and a disagreement indicates that it is very low. The results are summarized in Table 5.

Table 5- Economics Teachers' and Students' Self-efficacy towards ICT Integration

Statements	Teachers		Students	
	M	SD	M	SD
I know how to meaningfully integrate its use into my classroom lesson plans	4.10	.67	3.81	1.23
I can align its use with my district's standards-based curriculum	4.00	.85	3.72	1.15
I have received adequate training to incorporate it into my instruction	3.83	.81	3.57	1.30
My computer skills are adequate to conduct classes involving it	4.18	.68	3.69	1.29

Table 5 (continued)

I feel confident that I understand computer capabilities well enough to maximize them in my classroom	4.15	.83	3.66	1.33
I feel confident that I have the skills necessary to use the computer for instruction	3.82	.81	3.97	1.23
I feel confident that I can successfully teach relevant subject content with the appropriate use of technology	3.75	.78	4.02	1.11
I feel confident in my ability to evaluate the software for teaching and learning	3.57	.78	3.91	1.15
I feel confident I can help students when they have difficulty with the computer	4.00	.91	3.57	1.13
I feel confident I can effectively monitor students' computer use for project development in my classroom	3.65	1.00	3.57	1.04
I feel confident that I can motivate my students to participate in technology-based projects	3.93	1.05	3.87	.77
I feel confident I can mentor student's inappropriate use of technology	3.85	.92	3.70	1.05
I feel confident I can consistently use educational technology in effective ways	4.10	.84	3.81	1.21
I feel confident I can provide Individual feedback to students during technology use	3.95	1.04	3.94	1.21
I feel confident I can regularly incorporate technology into my lessons, when appropriate for student learning	4.05	.68	3.63	1.20
I feel confident about selecting the	3.73	.88	3.67	1.21

Table 5 (continued)

appropriate technology for instruction based on curriculum standards				
I feel confident about assigning and grading technology-based projects	3.72	1.13	3.62	1.27
I feel confident about keeping curricular goals and technology use in mind when selecting an ideal way to assess student learning	3.75	.78	3.42	1.06
I feel confident about using technology resources (such as spreadsheets, etc.) to collect and analyze data from student tests and products to improve instructional practices	3.87	.82	4.05	1.24
Mean of Means/Average Sd. Deviation	3.89	0.86	3.71	1.17

Scale: 1.00-1.49 (Very low); 1.50-2.49 (Low); 2.50-3.49 (Moderate); 3.50-4.49 (High); 4.50-5.00 (Very High).

Source: Fieldwork (2022)

Results from Table 5 indicate the perceived level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes. The mean values of both teachers' and students' responses were calculated and a mean of means and mean of standard deviation were obtained for each group (that is, students and teachers). On average (M =3. 89, SD =.86), the teachers responded that they have high perceived self-efficacy towards integrating ICT. The high congruence (SD= .86) in the responses of the teachers shows the degree to which they believe their level of self-efficacy is high. In the students' view, a mean of means (M = 3. 71, SD = 1.17) showed students also have high perceived self-efficacy in integrating ICT into their learning. However, the degree

of homogeneity in the responses of the students was very low (*SD*= 1.17). Despite teachers and students having a high level of self-efficacy, the teachers had the highest mean of 3.89 and a standard deviation of .86. This shows that their technical competence level is significantly ahead of the students they teach. This puts them in a better position to effectively assist students when they face difficulty in incorporating technology into their learning activities. Many reasons might have accounted for the higher competencies of teachers than students. One possible reason for this situation could have been the fact that the teachers had more access to technology compared to the students. Numerous studies have revealed that an increase in computer experiences such as computer access, and computer usage frequencies leads to lower computer anxiety and higher technology competencies (Christensen & Knezek, 2001; Gurcan-Namlu & Ceyhan, 2003; Tekinarslan, 2008).

Most of the teachers (*M*= 4.18, *SD*= .68) indicated their computer skills are adequate to conduct classes, which is represented by the highest mean whereas the lowest mean (*M*= 3.57, *SD*= .78) of the teachers affirmed that they feel confident in their ability to evaluate the software for teaching and learning. This implies the teachers already possess the needed skills to support ICT integration to improve the teaching and learning experiences of students. Moreover, with a mean of (*M*= 4.05, *SD*= 1. 24), the students confirmed that they feel confident about using technology resources to improve their learning practices. Again, the students agreed that they feel confident about keeping curricular goals and technology in their learning which constituted the lowest

mean (*M*= 3.42, *SD*= 1. 06) from the students' responses. Both the responses from the teachers and students with their corresponding mean signify they have the fundamental skill that helps them in their ICT integration.

By probing further, he asked about their training and computer skills for teaching and learning. The response to this is as follows:

Mr. A said;

… *"in fact, it is hard for me to answer this question, although I have average computer skills for educational purposes"*

The findings of this study indicate that most teachers are more likely to use ICT applications and resources for educational purposes, such as the Internet, multimedia computers, projector systems, PowerPoint presentations, or word processor programs during the teaching and learning process. At the same time, the advanced usage of ICT like building a learning website or creating learning software such as educational games appears to be rarely used in the teaching and learning process or even preparation for educational purposes (Hussain et al., 2011).

Mr. A said;

… *"We don't go through any capacity-building programs including in-service training on ICT which is a potential source of ICT self-efficacy. The issue is my school has few ICT resources and that one, of these, is only in our computer lab. So, ICT-trained teachers are the ones who use that to teach ICT as a subject and we don't get them to incorporate it into our routine teaching. So, the school*

doesn't bother to organise any workshop on that for us. We build our capacity for academics and more importantly for other purposes."

Mr. D added that;

"In-service training would enhance the teachers' self-efficacy by increasing content mastery and equipping them with new pedagogical skills."

The finding of the current study, therefore, is that teachers' self-efficacy can be enhanced by capacity-building programs involving in-service and counselling services. This is similar to Berghe (2010), Bluestone et. al. (2013), Bunyi et. al. (2013), Dube, Nhamo, and Magonde (2018), Hughes and Kinder (2007), Mshila (2012), Murphy and Greenwood (1998), Shahmohammadi (2014) and Tondeur et al. (2012) which had found that capacity-building programs including in-service training and workplace counselling services enhanced workers self-efficacy

What is the Attitude of Economics Teachers and Students when Technology is Integrated into Lessons?

The essence of this research question was to determine whether Economics teachers and students have positive or negative attitudes towards technology integration. To address this research question, Economics teachers and students at the Bono region were asked to respond to several statements by indicating their level of agreement (mean above 3.0) or disagreement (mean below 3.0) with some statements. An agreement indicates a positive attitude towards technology integration and a disagreement indicates a negative attitude towards technology integration. The results obtained are summarized in Table 6.

Table 6- Attitude of Economics Teachers and Students

Statements	Teachers		Students	
	M	SD	M	SD
I feel that it is a very useful teaching tool	4.40	.87	4.41	1.05
I feel that it is easy to use as a teaching tool	3.70	.82	4.17	1.08
Working with a computer makes me nervous	2.65	.92	3.19	1.48
Using a computer is very frustrating	2.48	.96	2.89	1.50
Computers are difficult to use	2.50	.91	2.76	1.45
I think that it takes a long time to finish a task when I use a computer	2.48	1.11	3.00	1.62
I feel confident learning new computer skills	3.85	.98	4.10	1.17
I find it easier to teach by using ICT	3.58	.81	4.05	1.14
I am aware of the great opportunities that ICT offers for effective teaching	3.93	.92	3.85	1.32
I think that ICT-supported teaching makes learning more effective	4.13	.72	4.00	1.17
The use of ICT helps teachers improve teaching with more updated materials	4.18	.45	4.17	1.13
The use of ICT enables the students to be more active and engaging in the lesson	4.18	.50	4.08	1.11
I can still have effective teaching without the use of ICT	3.80	.91	3.24	1.41
I think the use of ICT in teaching is a waste of time	2.25	1.19	2.36	1.44
I am confident that my students learn best without the help of ICT	3.00	.99	2.97	1.38
Class management is out of control if ICT is used in teaching	2.65	.86	3.03	1.50

Table 6 (continued)

Students pay less attention when ICT is used in teaching	2.75	1.28	2.74	1.47
Students make no effort for their lesson if ICT is used in teaching	2.93	1.21	2.98	1.50
ICT allows students to be more creative and imaginative	3.75	.87	4.18	1.13
The use of ICT helps students find related knowledge and information for learning	4.05	.82	4.19	1.11
The use of ICT encourages students to communicate more with their classmates	3.93	.97	4.33	1.07
The use of ICT increases student's confidence to participate actively in the class	3.80	.91	4.23	1.04
I think students learn more effectively with the use of ICT	3.77	.89	4.10	1.13
The use of ICT enables students to express their ideas and thoughts better	3.80	.99	4.18	.98
The use of ICT promotes active and engaging lessons for students' best learning experience	3.80	.82	4.13	1.11
E-learning helps you to enhance your qualification abilities	3.95	.90	4.04	1.21
The e-learning method provides an opportunity for collaborative learning	3.97	.73	3.93	1.13
E-technology helps develop students' problem-solving skills	4.00	.91	3.90	1.14
E-technology can enhance independent learning	4.08	.89	4.04	1.10

Table 6 (continued)

Using e-learning resources saves a great deal of time in finding learning resources	3.65	1.00	3.80	1.23
E-learning can encourage learners to take an active part in learning	3.75	.95	3.98	1.16
Every course should include e-learning techniques in teaching and learning	3.90	.98	3.94	1.17
Computer-based learning enhances interpersonal relationships between lecturers and students	3.67	1.14	3.82	1.19
E-learning can provide useful ways of assessing student's feedback	3.85	1.10	3.82	1.22
Getting access to an internet-connected computer is a problem for us	3.42	1.43	3.46	1.43
I am satisfied with the e-learning method	3.37	1.03	3.59	1.32
E-learning can accommodate learners having different learning styles	3.83	.96	3.92	1.23
Online communication among students and lecturers is more effective and motivating than face-to-face communication	3.35	1.05	3.74	1.32
Mean of Means/Average Sd. Deviation	3.56	0.94	3.71	1.25

Scale: below 3.00 (Negative attitude); above 3.00 (Positive attitude)
Source: Fieldwork (2022)

Table 6 presents the attitude of Economics teachers and students towards ICT integration. A mean of means (M = 3.56, SD = .94) indicates that Economics teachers generally have a positive attitude towards ICT integration, an average standard deviation of .94 indicates the dispersion of the various responses from each other, in other words, the respondents' responses are scattered around the

mean of 3.56 (positive attitude). The implication is that since teachers act positively toward technology integration there is an enabling environment for technology to thrive and have positive impacts on teaching and learning because these educators facilitate students' technology use and therefore would encourage continuous usage of technology in learning activities. Studies have revealed that teachers who have positive attitudes and are highly enthusiastic about interactive teaching aids or tools for teaching are motivated to use ICT for lesson delivery (Gyamfi, 2017). In the view of the students, a mean of means (*M* = 3.71, *SD* = 1 .25) indicates that the students generally have a positive attitude towards ICT integration, an average standard deviation of 1.25 shows the level of dispersion of the various responses from each other, in other words, the respondent's response is scattered around the mean of 3.71 (positive attitude). This implies that students liked to use ICT in their lessons and they believed ICT makes learning interesting, and understandable and improves learners' performance. This means that a positive attitude is a major predictor of teachers' and students' use of ICT for classroom teaching and learning.

The highest mean of teachers (*M* = 4.40, *SD* =.87) acknowledged that teachers feel ICT is a very useful teaching tool however the lowest mean (*M* = 2.25, *SD* = 1.19) is associated with the statement, I think the use of ICT in teaching is a waste of time. Interestingly, the highest mean of students (*M* = 4.41, *SD* = 1.05) also meant that students feel that ICT is a very useful teaching tool and the lowest mean (*M* = 2.36, *SD* = 1.44) was on the statement, I think the use of ICT in teaching is a waste of time. In effect, the similarity with both

teachers and students indicating ICT as a very useful teaching and learning tool shows the feeling both attach to technology integration and they believe that technology makes teaching and learning more effective and also promotes active and engaging lessons for students' best learning experience. Both teachers and students achieve the lowest mean on the statement, I think the use of ICT in teaching is a waste of time**,** and is an indication that technology in teaching and learning is necessary for academic improvement.

To buttress the findings of the study the researcher also enquired to know how teachers feel or act towards integrating technology into lessons. All of the interviewed school teachers said teachers in their schools had a positive attitude towards ICT integration. Teachers like using ICT and believe ICT makes teaching and learning more interesting.

One teacher was quoted as saying: The response is as follows;

"Without providing ICT resources necessary for teaching and learning their subject, giving them adequate training on how to integrate ICT in Economics teaching, and without observing them using ICT in their classrooms, it is not easy to judge teachers' attitude towards ICT integration in teaching and learning."

Based on the quotation of the first teacher interviewed, it was difficult to measure teachers' attitudes towards the integration of ICT in Economics lessons before providing the requirements.

The other teachers were also asked to give their views on how they see the integration of ICT in teaching and learning. The majority of them believed ICT would improve the quality of teaching and learning. However, few responded that

computers and the internet could take the attention of students away from their Economics learning. When school teachers have a positive attitude towards ICT integration in schools, they can give the necessary support to students in using ICT in their lessons. Teachers and students involved in the study showed a positive attitude towards the integration of ICT in the teaching and learning process.

What are the Perceived Effects of ICT use on the Teaching and Learning of Economics?

This question was formulated to find out from the teachers and students how they perceive the effects of ICT use in teaching and learning. In other words, it sought to find out what teachers and students think about how technology affects their teaching and learning at the High School level. To this end, teachers and students in the selected schools were asked to indicate their agreement (mean above 3.0) or disagreement (mean below 3.0) with some statements. An agreement with the statements means teachers and students indicate ICT use improves teaching and learning and disagreement means ICT use does not improve teaching and learning. The responses of teachers and students are shown in Table 7.

Table 7- Perceived Effects of ICT use on Teaching and Learning of Economics

Statements	Teachers		Students	
	M	SD	M	SD
It allows my teaching to be more student-centered and less lecture-based	3.50	.78	4.00	1.16
I routinely integrate it into my instruction	3.48	1.06	3.72	1.15

Table 7 (continued)

It has changed my classroom's learning activities in a very positive way	3.55	1.01	3.96	1.16
It allows my students' learning activities to be more interactive and collaborative	3.55	.99	3.88	1.19
Students feel more involved in the lesson	3.60	1.13	4.01	1.17
Educational technology motivates students to do more study	3.72	.99	4.14	1.07
Promotes students' learning and improves students' performance	3.70	1.02	4.04	1.14
It makes the subject matter more interesting	3.72	1.04	4.09	1.14
Provision of a better learning experience	3.63	1.01	4.05	1.03
It makes the lesson more real and practical rather than abstract	3.70	.97	4.01	1.13
It helps teachers in their lesson notes preparation	3.78	.83	4.23	1.04
It helps in faster access to information	3.88	.97	4.21	1.11
It has increased the level of student interaction and/or collaboration	4.03	.70	3.98	1.16
It has positively impacted student learning and achievement	3.87	.79	3.97	1.21
It has improved the quality of my students' work	4.00	.68	4.10	1.23
Mean of Means/Average Sd. Deviation	3.71	0.93	4.03	1.14

Scale: below 3.00 (No perceived effect); above 3.00 (Perceived effect)

Source: Fieldwork (2022)

Table 7 shows mean and standard deviation analysis to ascertain how teachers and students perceive the effects of ICT use in teaching and learning of

Economics. The mean values of both teachers' and students' responses were calculated and a mean of means and mean of standard deviation were obtained for each group (that is, students and teachers). In the view of the teachers, a mean of means (M = 3.71, SD = .93) indicated that on average the teachers agreed with the fact that, ICT use improves teaching and learning of Economics, and a standard deviation of .93 however indicates the dispersion of the various responses to each other, in other words, the teachers' response is scattered around the mean of 3.71 (ICT use improves teaching and learning of Economics). This implies teachers were highly congruent in their responses. Also, in the view of the students, a mean of means (M = 4.03, SD = 1.14) revealed that the students also agreed with the statement that, ICT use improves teaching and learning of Economics, and a standard deviation of 1.14 indicates that the degree of homogeneity in the responses of the students was very low, in other words, the students' responses are scattered from the mean of 4.03 (ICT use improves teaching and learning of Economics). Although both respondents (teachers and students) attested that integration of ICT into teaching and learning improves educational performances, the results from students' mean of means reflected a much stronger impression of the influence of ICT on teaching and learning of Economics which contrasted with school teachers' views, which perceived ICT to have a moderate influence on their learning.

The highest mean for teachers (M = 4.03, SD =.70) affirmed that ICT use in teaching and learning has increased the level of student interaction and collaboration whereas the lowest mean (M = 3.48, SD = 1.06) specified teachers

routinely integrate it into their instruction. On the side of students, the highest mean (M = 4.23, SD = 1.04) meant that technology helps teachers in their lesson note preparation and the lowest mean (M = 3.72, SD = 1.15) signified that they routinely integrate it into their learning activities. In effect, it was adduced that the lowest means of both teachers and students agreed to the item on routinely integrating technology into instruction and learning activities. This is an indication that when ICT is incorporated into the teaching and learning of economics, it influences student learning and achievement.

This theme captures the teaching and learning outcomes that teachers perceived they gained from the use of technology in teaching and learning. The perceived outcomes were either positive or negative. However, two teachers indicated that the use of technology did not have any impact on their teaching and learning outcomes. About the positive outcomes, three teachers indicated that technology enabled them to get a better/deeper/easier understanding, assisted them to easily recall, and made teaching and learning easier or better. For example, one teacher stated this:

"It [technology] makes me understand the topic I teach in detail. For example, the concepts that are difficult to grasp, I watch YouTube videos and search the internet which helps me to understand certain topics better. There are times that before the normal class session, I sit and watch videos and this helps me a lot."

Another teacher indicated how technology (videos) made the learning process easier.

"It [videos] made teaching and learning easy. It made it fun and much easier. Sometimes when I am in class, I may be tired or students cannot concentrate but with the help of video, they concentrate, and learning continues."

Mr. C added that;

… "*Despite the notion and reality that technology improves teaching and learning, these schools still face challenges. Availability of ICT facilities is still a challenge for our school faces and other schools. Even those that have been inadequate for the students to use. Because of the limited number of functional computers in the computer laboratories, accessibility is timetabled and doesn't help a smooth integration into the curriculum of teaching and learning."*

Research Hypotheses

Three hypotheses on differences were formulated in the study. All the hypotheses were tested at an alpha level of .05. The dependent variable was the self-efficacy to integrate ICT and the independent variables were gender and years of teaching experience.

Is there a Significant Difference in Economics Teachers' Self-efficacy towards Integrating ICT into Teaching-learning Processes based on Gender?

***H_0*:** There is no significant difference between Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on gender.

***H_1*:** There is a significant difference between Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on gender.

To establish mean differences that exist in teachers' self-efficacy towards ICT integration concerning gender an independent sample t-test was conducted. The independent variable was gender (male and female) while the dependent

variable was self-efficacy. Before the independent sample t-test was conducted, the normality assumption had to be met; thus, the Shapiro-Wilk normality test was conducted (see results in Table 8). Normality was assumed since *p*> .05 on the Shapiro-Wilk test.

Table 8: Normality Test Results on Teachers' self-efficacy towards ICT Integration

	Statistic	df	Sig.
Self-Efficacy	.954	40	.102

a. Lilliefors Significance Correction
p> .05
Source: Fieldwork (2022)

Table 9 below shows the group statistics and results from the independent samples t-test respectively.

Table 9: Results of Independent Samples T-test of Gender on Self-efficacy

Gender	N	Mean (M)	Std. Deviation (SD)	*t*	Df	Sig.
Male	28	71.11	9.110	1.075	38	.584
Female	12	67.83	8.100			

Source: Fieldwork (2022)

Table 9 shows the result from the independent sample *t*-test. With equal variances assumed based on Levene's test for equality of variance (p= .584), the results from Table 9 show that there is no significant difference between the means of males and females. From Table 9, *t* (38) = 1.075, *p* > .05. Since *p*> .05, it shows that there is no significant difference between the mean scores of male and female teachers on self-efficacy. With p> .05 the null hypothesis is not

rejected. Hence, male and female Economics teachers have equal self-efficacy towards ICT integration into teaching and learning.

Is there a Significant Difference in Economics Teachers' Self-efficacy towards Integrating ICT into Teaching-learning Processes based on Years of Teaching Experience?

***H_0*:** There is no significant difference between Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on years of teaching experience.

***H_1*:** There is a significant difference between Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on years of teaching experience.

This research hypothesis also sought to determine the mean differences that exist in self-efficacy across three categories of years of teaching experience (1-5 years, 6-10 years, and 11-15 years). The independent variable is the years of teaching experience while the dependent is self-efficacy. To analyze these mean differences, a one-way ANOVA test was conducted. Before the one-way ANOVA test was conducted, the normality assumption had to be met; thus, the Shapiro-Wilk normality test was conducted (see results in Table 8 above). Normality was assumed since $p > .05$ on the Shapiro-Wilk test. Table 10 and 11 shows the group statistics and results from the one-way ANOVA test respectively.

Table 10: Group Statistics for Years of Teaching Experience

Years of Teaching Experience	N	Mean	Standard deviation
(1-5years)	34	69.62	9.374
(6-10years)	4	75.00	3.830
(11-15years)	2	69.00	1.414

Table 10 (continued)

Total	40	70.13	8.847

Table 11: One-way ANOVA Results for Years of Teaching Experience on Self-efficacy

	Sum of Squares	Df	Mean Square	F	Sig.
Between groups	106.346	2	53.173	.668	.519
Within groups	2946.029	37	79.622		
Total	3052.375	39			

Source: Fieldwork (2022)

The results presented in Table 11 show that there is no statistically significant difference among years of teaching experience (1-5 years, 6-10 years, and 11-15 years) on self-efficacy. From Table 11, F (2, 37) = .668, $p > .05$ (Means for the years of teaching experience are: 1-5years = 69.62, 6-10years= 75.00, and 11-15years = 69.00). This, therefore, shows that the differences among the group means were not significant. Since $p > .05$, the null hypothesis is not rejected. Post Hoc analysis was not conducted because the differences in the group means are not significant.

Is there a Significant Difference in Economics Students' Self-efficacy towards Integrating ICT into Teaching-learning Processes based on Gender?

***H_0*:** There is no significant difference between Economics students' self-efficacy towards integrating ICT into teaching-learning processes based on gender.

***H_1*:** There is a significant difference between Economics students' self-efficacy towards integrating ICT into teaching-learning processes based on gender.

To establish mean differences that exist in students' self-efficacy towards ICT integration with gender an independent sample t-test was conducted. The independent variable was gender (male and female) while the dependent variable was self-efficacy. Before the independent sample t-test was conducted, the normality assumption had to be met; thus, the Kolmogorov-Smirnov[a] normality test was conducted (see results in Table 12). Normality was assumed since $p > .05$ on the Kolmogorov-Smirnov[a] test.

Table 12: Normality Test Results on Teachers' Self-efficacy towards ICT Integration

	Statistic	df	Sig.
Self-Efficacy	.046	320	.200*

* This is a lower bound of the true significance
a. Lilliefors Significance Correction
$p > .05$
Source: Fieldwork (2022)

Table 13 below shows the group statistics and results from the independent samples t-test respectively.

Table 13: Results of Independent Samples T-test of Gender on Self-efficacy

Gender	N	Mean (M)	Std. Deviation (SD)	*t*	Df	Sig.
Male	188	71.47	8.515	.600	318	.002
Female	132	70.82	10.818			

Source: Fieldwork (2022)

Table 13 shows the result from the independent sample t-test. With equal variances assumed based on Levene's test for equality of variance (p=.002), the results from Table 13 show that there significant is a difference between the means of males and females. From the table, t (318) = .600, $p < .05$. Since $p < .05$,

it shows that there is a significant difference between the mean scores of male and female students on self-efficacy. With $p < .05$ the null hypothesis is rejected. Hence, male and female economics students do not have equal self-efficacy towards ICT integration into teaching and learning.

Discussion of Findings

ICT Resources Available for Use by Teachers and Students

The first research question sought to find out which ICT resources are available for use by teachers and students. The findings show that generally, most Senior High Schools have inadequate ICT resources to incorporate into their teaching and learning. Again, it was found that Economics teachers and students rarely make use of the available technologies they have in their school in the teaching of the subject. This is an indication that the integration of ICT is associated with several factors that encourage and discourage the use of ICT which the study termed as enabling forces and restraining forces. The study findings confirm that a major obstacle is inadequate ICT infrastructure that denies both teachers and students the potential benefits of technology in their teaching and learning.

The findings of the studies by the following researchers (Arthur & Kaku, 2020; Gyamfi, 2020; Edumadze & Owusu 2013; Obiri-Yeboah, Kwarteng, & Kyere-Djan, 2013; Adebi-Caesar, 2012; Yusuf, Bashir & Dare, 2013) confirmed that inadequate ICT resources and the rare use of available technologies in teaching and learning of the subject are major barriers to ICT integration in schools. The implication is that despite all the provision of ICT resources from the

previous government and numerous ICT integration policies, most schools lack various ICT resources. Some have ICT resources but can only be found in their ICT labs. It seems the schools that have these resources learn ICT as a subject rather than integrating it into their routine teaching and learning activities. Therefore, it can be concluded that despite all the educational possibilities and all the promises of change in teaching and learning that ICT raises, teachers and students who have access to technology resources have only perceived these tools as informative support.

Perceived Level of Economics Teachers' and Students' Self-efficacy

The second research question sought to assess the perceived level of Economics teachers' and students' self-efficacy toward integrating ICT into teaching-learning processes. The findings indicated that teachers and students have high perceived self-efficacy towards integrating ICT. This shows that the technical competence level of both respondents is adequate to incorporate it into their teaching and learning processes, although teachers' technology competence was significantly greater than students based on the higher mean value for the teacher.

Similarly, the findings of the study confirm that of Murithi and Yoo (2021), Ghavifekr et al. (2014), Buahbeng-Andoh (2012), Lau and Sim (2008), Jegede et al. (2007) who found that the level of computer skills of the majority of teachers and students are moderately high. Although the majority of teachers and students according to the results indicated a high level of computer competence, the study contradicts the results of Knezek (2006), Meelissen, (2008), Agyei and

Voogt (2011), Pozas and Letzel (2021), Valtonen et al. (2021), Gutiérrez-Martín, Pinedo-González, and Gil-Puente (2022). Agyei and Voogt (2011) in their study reported fairly low technology competencies for the teachers. However, the practicing teachers were more technically competent than prospective teachers. According to Pozas and Letzel (2021), self-efficacy towards ICT use was rated as rather negative by the sample. This result is consistent with previous research indicating that pre-service teachers perceive themselves as less self-efficacious concerning ICT use for instructional purposes (Valtonen et al. 2021). A study by (Gutiérrez-Martín, Pinedo-González, & Gil-Puente, 2022) aimed at describing self-perceived ICT and MIL competencies suggests that teachers feel they are inadequately trained in ICT and MIL competencies, as shown by the low self-perceptions in all of them, but they also consider them to be very important for teachers and trainees.

It can be concluded that teachers and students might consider themselves 'competent' based on the "extensive yet extremely narrow spectrum of recreational use of digital technologies versus competence regarding actual professional requirements, Maderick et al. (2015). However, prior research has also demonstrated that familiarity with ICT resources and tools does not necessarily translate into the use of technology for instructional purposes (Gretter & Yadav, 2018). Thus, this study's results could perhaps be explained by the fact that teachers and students overestimate their competence, given their familiarity with and high usage of ICT resources for private purposes.

Attitude of Economics Teachers and Students

The essence of the third research question was to measure whether Economics teachers and students have positive or negative attitudes towards technology integration. These findings indicate that Economics teachers and students generally have a positive attitude towards ICT integration. The implication is that both respondents liked to integrate technology into their teaching and learning and understanding the use of technology makes their teaching and learning interesting.

The findings support these studies conducted by the following researchers (Arkorful, Barfi, & Aboagye, 2021; Belay, Khatete, & Mugo, 2020; Mwila, 2018; Boateng, Boateng, Awuah, Ansong, & Anderson, 2016; Singh, & Chan, 2014; Buabeng-Andoh, 2012) that found that teachers and students have a positive attitude towards ICT integration. This is an indication that supports the notion that effective ICT use is dependent on individuals' personal beliefs, intentions, and attitudes toward technology. Therefore, teachers and students must have the intention to embrace technology first before it can greatly influence its integration into the teaching and learning processes. The findings can be associated with the common saying that attitude determines altitude, which means attitude is determined by the analysis of the information regarding the results of an action and by the positivity or negativity of the results based on careful evaluation. Hence the mere availability of ICT facilities in schools will not automatically guarantee their effective use in teaching and learning processes.

Only a Few studies (Teo, 2008) had a different finding where teachers had a positive attitude towards using technology in teaching while students with

negative attitudes resisted using the technology. The enormous evidence from literature including this study that teachers and students have positive attitudes toward ICT integration into teaching and learning cannot be underestimated in proving that positive attitude is now widely recognised as a major predictor for ICT integration.

Perceived Effects of ICT Use on Teaching and Learning

The final research question sought to measure the perceived effects of ICT use on the teaching and learning of Economics. This finding showed that teachers and students agreed with the fact that, ICT use improves the teaching and learning of Economics. The results imply the integration of ICT into the teaching and learning process against teaching and learning ICT as a subject positively influences educational performances and improves student's learning experience.

This finding is well grounded in literature by many writers (Gragert, 2000; Haddad & Drexler, 2002; Rampersad, 2011; Papaioannou & Charalambous, 2011; Rafaei, 2015; Mathayo, 2016; Dzakpasu & Adom, 2017; Authur & Kaku, 2020; Qaddumi, Bartram, & Qashmar, 2021; Metu, Eleje, Ezenwosu, Ezeugo, & Mbelede, 2022) contend that ICT use improves teaching and learning activities. Teachers' and students' indication/perception that integration of technology improves their teaching and learning is an indication that it creates a conducive environment for learning, helps students to recall lessons, and actively involves themselves in the teaching process. Students can access more information faster in an efficient manner, which enhances their understanding and, consequently, improves their performance.

It should be noted that in other studies this variable had a different finding that technology integration in teaching and learning would have negative consequences. Ghory, and Ghafory (2021) contended that although technology integration into teaching and learning has been found to positively impact education and free from geographical restrictions, it is also believed to have negative consequences; deteriorating writing ability, and inability to concentrate among others. A study by Lavin, Korte, and Davies (2011) affirmed that if teachers and students are exposed to technology in their teaching and learning activities for a longer period, the absence of technology would have a negative impact on students' attentiveness and their desire to participate in a lesson.

Difference in Economics Teachers' Self-efficacy Based on Gender

The first research hypothesis sought to measure if there is a significant difference between male and female Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes. The results from the independent t-test show that there is no significant difference between the mean scores of male and female teachers on self-efficacy. The study revealed that male and female Economics teachers have the same technology competence in integrating technology into teaching and learning. This implies both male and female Economics teachers' self-efficacy is moderate based on the study findings to enable them to incorporate it into teaching and learning.

This finding was consistent with other studies that pointed out those male and female teachers did now show a difference in terms of teacher capacity and perceived usefulness (Murithi & Yoo, 2021; Hatlevik & Hatlevik, 2018; Buliva,

2018). The findings from the study by Hatlevik and Hatlevik (2018) did not reveal any significant associations between teachers' gender and ICT self-efficacy or even ICT use for pedagogical purposes. Buliva (2018) found that there is no significant difference in the perception of technology use among teachers by gender. It, therefore, suggests that exemplary performance in the integration of technology should be expected from all teachers. The results also indicate that policymakers should formulate ways to equip male and female teachers with technology integration skills since they all have high perceptions and significant skill gaps. The implication is that teachers have adequate self-efficacy towards the use of ICT regardless of gender and the numerous challenges that they face. However, the topic of gender differences appears to be complex, as empirical research has yielded mixed evidence on the impact of gender on ICT-related constructs (Hatlevik and Arnseth 2012; Siddiq et al. 2015). Concerning ICT self-efficacy, the ICILS reported that male teachers showed higher ICT self-efficacy than female teachers (Gebhardt et al. 2019).

Difference in Economics Teachers' Self-efficacy based on Years of Teaching Experience

The second research hypothesis sought to measure whether there is a significant difference between Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on years of teaching experience. The results from the one-way ANOVA show that there is no statistically significant difference among years of teaching experience (1-5 years, 6-10 years, and 11-15 years) on self-efficacy. This implies that the technological competence of Economics teachers is not affected by their years of teaching

experience. Therefore, Economics teachers who have taught within all the year groups have the same self-efficacy and their years of teaching do not influence their technology competence based on this study's results.

These findings are echoed in the works of Coffey (2021), Kimmons and Hall (2017), Tweed (2013), and Wang et al. (2004). Wang et al. (2004), found that experience does not dictate technology self-efficacy or technology integration in the classroom. According to Kimmons and Hall (2017), teachers' beliefs and values greatly influence their technology usage and technology integration in the classroom, not their teaching experience and age. The study by (Coffey 2021) determined that there was no statistically significant relationship between novice and experienced teachers' self-efficacy toward technology integration and technology integration. However, this study supports that regardless of teaching experience, teachers with high self-efficacy toward technology integration utilizes technology for teaching and learning more than teachers with low self-efficacy towards technology integration.

Difference in Economics Students' Self-efficacy based on Gender

The last research hypothesis sought to measure if there is a significant difference between male and female Economics students' self-efficacy toward integrating ICT into teaching-learning processes. The findings show that there is a significant difference between the means of male and female students on self-efficacy. This is an indication that male and female students show differences in their technical competence, and do not have their self-efficacy at par. That is although male and female Economics students' self-efficacy is moderate based on

the study findings, male Economics students have higher technical competence than female Economics students.

The finding, that male and female Economics students show a significant difference in their technical competence, confirms that of Kaarakainen et al. (2017), Tømte and Hatlevik (2011), Vekiri and Chronaki (2008), Hohlfeld et al. (2013), and Hargittai and Shafer (2006). These studies all indicated that male and female students show a significant difference in their technical competence. However, the finding disagrees with that of (Tsai & Tsai, 2010). In Junior High School students, gender differences were examined (Tsai & Tsai, 2010) for Internet self-efficacy (ISE) and internet use. Online exploration (explorative ISE) and online communication are used to investigate students' Internet self-efficacy (communicative ISE). Overall, there was no notable difference noted in students' total ISE and explorative ISE.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This is the last chapter of the study. It summarizes the study highlighting the methodologies adopted in collecting and analysing data to come out with the main findings in addressing the research questions formulated on the assessment of the effectiveness of ICT integration in teaching and learning of Economics in Senior High Schools. Based on the main findings, conclusions are reached to permit the provision of appropriate recommendations as well as suggestions for further studies.

Summary of the Study

This was a survey undertaken in the Bono region of Ghana to examine the effectiveness of ICT integration in teaching and learning of Economics in Senior High Schools. Other subsidiary purposes included assessing the ICT resources available for use by teachers and students in teaching and learning of Economics, examining the perceived level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes, and describing the attitude of Economics teachers and students when technology is integrated into lessons as well as identifying the perceived effects of ICT use on teaching and learning of Economics. The main objective was to assess the effectiveness of ICT integration in teaching and learning of Economics in Senior High Schools. The following research questions and hypotheses guided the study:

1. What ICT resources are available for use by teachers and students in teaching and learning of Economics?
2. What is the perceived level of Economics teachers' and students' self-efficacy towards integrating ICT into teaching-learning processes?
3. What is the attitude of Economics teachers and students when technology is integrated into lessons?
4. What are the perceived effects of ICT use on the teaching and learning of Economics?

Research Hypothesis

1. H_0: There is no statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*

   H_1: There is a statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*
2. H_0: There is no statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *years of teaching experience*

   H_1: There is a statistically significant difference in *Economics teachers' self-efficacy* towards integrating ICT into teaching-learning processes based on *years of teaching experience*
3. H_0: There is no statistically significant difference in *Economics students' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*

H_1: There is a statistically significant difference in *Economics students' self-efficacy* towards integrating ICT into teaching-learning processes based on *gender*

The study used an explanatory sequential design with questionnaires and interviews to collect data for addressing research questions. A multi-stage sampling method was employed, selecting 34 public Senior High Schools offering Economics out of 70 in the region at level one. Ten schools were randomly chosen at level two to eliminate bias. Proportionate stratified sampling determined the sample size for each school at level three, and respondents were randomly selected at level four. Data from 320 respondents (91% response rate out of 350) were analyzed using descriptive statistics for demographics and research question one, while research questions two to four employed mean, standard deviation, and inferential statistics, including independent t-tests and One-way ANOVA Tests for hypotheses one, two, and three, respectively.

Key Findings

The following key findings were obtained after a thorough discussion of the results. Generally, most Senior High Schools in the Bono region have inadequate ICT resources to incorporate into their teaching and learning. Also, it was revealed that Economics teachers and students rarely make use of the available technologies they have in their schools in the teaching of the subject. Both Economics teachers and students have high perceived self-efficacy towards integrating ICT. It was indicated that Economics teachers and students generally have a positive attitude towards ICT integration. The study showed that teachers

and students agreed that, ICT use improves the teaching and learning of Economics. There was no statistically significant difference between male and female Economics teachers' self-efficacy towards ICT integration. There was no statistically significant difference in Economics teachers' self-efficacy towards integrating ICT into teaching-learning processes based on years of teaching experience. There was a statistically significant difference in Economics students' self-efficacy towards integrating ICT into teaching-learning processes based on gender.

Conclusions

Most Senior High Schools lack sufficient ICT resources for effective integration into their teaching and learning practices. Additionally, it was found that both Economics teachers and students underutilize the available technology in their schools when it comes to teaching the subject. These findings underscore the need for improved ICT infrastructure and greater awareness among educators and students regarding the potential benefits of technology in education.

The high perceived self-efficacy demonstrated by Economics teachers and students towards integrating ICT is a promising finding. This suggests that educators and learners feel confident in their abilities to incorporate technology into the learning process successfully. This confidence can serve as a foundation for further exploration and implementation of ICT-driven teaching methods.

The positive attitude of Economics teachers and students towards ICT integration is a positive sign for the future of technology-enhanced education. A

favorable attitude can foster enthusiasm and motivation among educators and learners, promoting a more conducive environment for effective ICT integration.

The consensus among teachers and students that ICT usage enhances the teaching and learning of Economics highlights the potential benefits of technology in the classroom. These findings emphasize the importance of harnessing ICT tools to improve the educational experience, encouraging further exploration and investment in this direction.

The study did not find a statistically significant difference in self-efficacy towards ICT integration between male and female Economics teachers. This suggests that gender does not play a significant role in teachers' confidence in using ICT for teaching Economics, indicating a relatively level playing field in this regard.

The study revealed that Economics teachers' self-efficacy in integrating ICT does not significantly differ based on their years of teaching experience. This finding indicates that regardless of their tenure, educators generally possess similar levels of confidence in using technology in the classroom, implying that experience does not necessarily correlate with ICT proficiency.

Notably, the research identified a statistically significant difference in economics students' self-efficacy towards ICT integration based on gender. This finding suggests that there may be varying levels of confidence and comfort with technology among male and female students, which should be considered when designing ICT-integrated teaching strategies.

Recommendations

The findings suggest some important actions that must be undertaken if any mark will be made in making ICT integration in Senior High Schools effective. Therefore, in light of such findings, the following recommendations are made.

1. The Ministry of Education should allocate increased funding for the improvement of ICT infrastructure in Senior High Schools within the Bono Region. This should include the provision of modern computing equipment and internet connectivity to ensure that schools have adequate ICT resources for teaching and learning.
2. The National Council for Curriculum and Assessment (NaCCA) should collaborate with educational technology experts and teachers to develop specific guidelines and training programs tailored to integrating ICT effectively into the Economics curriculum. These guidelines should emphasize practical approaches for both teachers and students.
3. Senior high school heads in the Bono region should collaborate with the National Council for Curriculum and Assessment (NaCCA) to adapt the Economics curriculum to include specific ICT integration components. These components should align with the positive attitude and enthusiasm of teachers and students, making it an integral part of the subject.
4. The Ministry of Education and Ghana Education Service should promote awareness campaigns and workshops focusing on the benefits of ICT integration in Economics education. Encourage teachers, students, and

parents to embrace the use of technology as a tool for improved teaching and learning experiences.

5. Training programmes and policies by various stakeholders to enhance teachers' self-efficacy should not focus on gender. However, concentration should be on training and developing all without recourse to such demographic characteristics. Additionally, teachers should be trained to enhance their effort and affection towards the use of ICT in teaching.
6. The Ghana Education Service should implement ongoing professional development programs for all economics teachers in the Bono region, irrespective of their experience levels. These programs should focus on updating teachers with the latest ICT tools and pedagogical approaches, ensuring that they remain proficient in utilizing technology effectively in the classroom.
7. Stakeholders in education and teachers in their capacity as instructional leaders should take the challenge and the desire to build the technical competence of both male and female Economics students without giving preferential treatment to any to use more technology in their learning process. This is expected to help them to take up more learning challenges and to heighten their performance for them to attain their potential growth.

Contribution of the Study

A large corpus of research exists on educational technology using the TPACK model, TAM model, TLM model, and other models. However, in the Ghanaian context, very little research has focused on ICT integration using the

"Will, Skill, and Tool" (WST) model by Christensen and Knezek (2008) which hypothesized essential elements for successful integration of technology into teaching and learning. Therefore, the study's primary contribution lies in its comprehensive exploration and adaptation of the "Will, Skill, and Tool" (WST) model by Christensen and Knezek (2008) to assess the effectiveness of ICT integration in teaching and learning Economics. This adaptation contributes to the broader understanding of how "will" (attitude), "skill" (competency), and "tool" (resources) factors collectively influence the integration of ICT in teaching and learning. Again, the study holistically considered the perspective of both Economics teachers and students which few studies have considered in studying ICT integration. Also, the study adds to rare studies on ICT integration using a mixed-method approach specifically, the explanatory sequential design that neutralizes the weaknesses of single research-approach studies on self-efficacy, and attitude.

Suggestions for Further Research

The study assessed the effectiveness of ICT integration in teaching and learning of Economics in selected SHSs in the Bono region of Ghana. It employed the quantitative and qualitative methods of inquiry in collecting and analysing data. It is therefore recommended that future research efforts be concentrated on:

1. examining the correlation between ICT integration and administrative support, peer-to-peer support, and important student characteristics.
2. conducting in different regions in the country using different methodologies considering all types of institutions of secondary education

rather than only government Senior High Schools to enhance the generalizability of the findings.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST

FACULTY OF HUMANITIES AND SOCIAL SCIENCES EDUCATION

DEPARTMENT OF BUSINESS AND SOCIAL SCIENCES EDUCATION

QUESTIONNAIRE FOR ECONOMICS TEACHERS

Dear Respondent,

I am a Master's student at the University of Cape Coast, who is undertaking a research project under the theme **"Assessment of the Effectiveness of ICT Integration in Teaching and Learning of Economics in Senior High Schools in the Bono Region of Ghana."** The research is purely for academic purposes hence the honest and sincere response you give will contribute a lot to the research.

Participation in this research is voluntary, and you are not under any obligation to participate. Your identity would be kept secret and the confidentiality of your responses guaranteed, as your name will not appear in the research report. In any sort of report that might be published, no information will be used that would make it possible to identify you. In case you do not want to answer some questions or complete some parts of the questionnaire, you can willfully do so. I appreciate the time and effort you are offering. If you have any questions about this research, please feel free to talk to me in person or contact me on 0551400440 or email me at francis.gyedu@stu.ucc.edu.gh

Your rights as a Respondent

This research has been reviewed and approved by the Institutional Review Board of University of Cape Coast (UCCIRB). If you have any questions about your rights as a research respondent, you can contact the Administrator at the IRB Office between the hours of 8:00 a.m. and 4:30 p.m. through the phone lines 0332133172 and 0244207814 or email address: irb@ucc.edu.

Section A: Demographic Data of Teachers

Please tick [√] appropriately: and write where necessary.

1. Gender: Male [ ] Female [ ]
2. Age: 23-25 yrs. [ ] 26-29 yrs. [ ] 30 and Above [ ]
3. My highest level of education completed:
   - Bachelor's degree
   - Master's degree
   - +30 or Specialist's degree
   - Doctoral degree
4. How long have you been teaching the course?.....

Instructions: *Please tick [√] the appropriate box to indicate your level of agreement or disagreement with each statement on the Likert Scale items of section B.* ***Key:*** *Strongly Agree* ***(SA)****; Agree* ***(A)****; Uncertain* ***(U)****; Disagree* ***(D)****; Strongly Disagree* ***(SD)***

Section B: **What ICT resources are available for use by teachers in teaching and learning economics?**

5.	**Course Materials Available Online**	**Available**	**Not Available**
a.	Assignments		
b.	Course notes		
c.	Course outline		
d.	Digital textbooks		
e.	Class tests		
f.	Practice exercises		
g.	Weblinks		
6.	**Communication and Online Tools**	**Available**	**Not Available**
a.	Collaborative work online (e.g., Google Docs)		

b.	Submission of assignments (e.g., online, email)		
c.	Videos		
d.	Email		
e.	Discussion forum		
f.	Chat room		
7.	**Hardware**	**Available**	**Not Available**
a.	Clickers		
b.	Computer used to teach		
c.	Computer in a computer lab		
d.	Projector (multimedia)		
e.	Smart Board		
f.	School has reliable internet to enhance E-learning		
g.	School has electricity to support online learning		
8.	**Social Networking**	**Available**	**Not Available**
a.	Facebook		
b.	LinkedIn		
c.	Twitter		
9.	**Technologies Used in Class**	**Available**	**Not Available**
a.	Grammar tools (e.g., Antidote)		
b.	Language learning software		
c.	Presentation software (e.g., PowerPoint)		

Section C: What is the perceived level of economics teachers' self-efficacy towards integrating ICT into teaching-learning processes?

		1	2	3	4	5
10.	I know how to meaningfully integrate its use into my classroom lesson plans					
11.	I can align its use with my district's standards-based curriculum					
12.	I have received adequate training to incorporate it into my instruction					
13.	My computer skills are adequate to conduct classes involving it					
14.	I feel confident that I understand computer capabilities well enough to maximize them in my classroom					
15.	I feel confident that I have the skills necessary to use the computer for instruction					
16.	I feel confident that I can successfully teach a relevant subject content with appropriate use of technology					
17.	I feel confident in my ability to evaluate the software for teaching and learning					
18.	I feel confident I can help students when they have difficulty with the computer					

19.	I feel confident I can effectively monitor students' computer use for project development in my classroom					
20.	I feel confident that I can motivate my students to participate in technology-based projects					
21.	I feel confident I can mentor student's inappropriate uses of technology					
22.	I feel confident I can consistently use educational technolog y in effective ways					
23.	I feel confident I can provide Individual feedback to student s during technology use					
24.	I feel confident I can regularly incorporate technology into my lessons, when appropriate to student learning					
25.	I feel confident about selecting the appropriate technology f or instruction based on curriculum standards					
26.	I feel confident about assigning and grading technology-based projects					
27.	I feel confident about keeping curricular goals and technology use in mind when selecting an ideal way to assess student learning					
28.	I feel confident about using technology resources (such as spreadsheets, etc.) to collect and analyze data from student tests and products to improve instr uctional practices					

Section D: What is the attitude of economics teachers when technology is integrated into lessons?

		1	**2**	**3**	**4**	**5**
29.	I feel that it is a very useful teaching tool					
30.	I feel that it is easy to use as a teaching tool					
31.	Working with a computer makes me nervous					
32.	Using a computer is very frustrating					
33.	Computers are difficult to use					
34.	I think that it takes a long time to finish a task when I use a computer					
35.	I feel confident learning new computer skills					
36.	I find it easier to teach by using ICT					
37.	I am aware of the great opportunities that ICT offers for effective teaching					
38.	I think that ICT-supported teaching makes learning more effective					
39.	The use of ICT helps teachers to improve teaching with more updated materials					
40.	The use of ICT enables the students to be more active and engaging in the lesson					

41.	I can still have effective teaching without the use of ICT					
42.	I think the use of ICT in teaching is a waste of time					
43.	I am confident that my students learn best without the help of ICT					
44.	The classroom management is out of control if ICT is used in teaching					
45.	Students pay less attention when ICT is used in teaching					
46.	Students' make no effort for their lesson if ICT is used in teaching					
47.	ICT allows students to be more creative and imaginative					
48.	The use of ICT helps students to find related knowledge and information for learning					
49.	The use of ICT encourages students to communicate more with their classmates					
50.	The use of ICT increases students' confidence to participate actively in the class					
51.	I think students learn more effectively with the use of ICT					
52.	The use of ICT enables students to express their ideas and thoughts better					
53.	The use of ICT promotes active and engaging lessons for students' best learning experience					
54.	E-learning helps you to enhance your qualification abilities					
55.	E-learning method provides an opportunity for collaborative learning					
56.	E-Technology helps develop student's problem-solving skills					
57.	E-Technology can enhance independent learning					
58.	Using e-learning resources saves a great deal of time on finding learning resources					
59.	E-learning can encourage learners to take an active part in learning					
60.	Every course should include e-learning techniques in teaching and learning					
61.	The computer-based learning enhances interpersonal relationships between lecturers and students					
62.	E-learning can provide useful ways of assessing students' feedback					
63.	Getting access to an internet-connected computer is a problem for us					
44.	Are you satisfied with the e-learning method					
65.	E-learning can accommodate learners having different learning styles					
66.	Online communication among student s and lectures is more effective and motivating than face-to-face communication					

Section E: What are the key effects of ICT use on teaching and learning economics?

		1	2	3	4	5
67.	It allows my teaching to be more student-centered and less lecture-based					
68.	I routinely integrate it into my instruction					
69.	It has changed my classroom's learning activities in a very positive way					
70.	It allows my students' learning activities to be more interactive and collaborative					
71.	Students feel more involved in the lesson					
72.	Educational technology motivates students to do more study					
73.	Promotes students' learning and improves students' performance					
74.	It makes the subject matter more interesting					
75.	Provision of a better learning experience					
76.	It makes the lesson more real and practical rather than abstract					
77.	It helps teachers in their lesson notes preparation					
78.	It helps in faster access to information					
79.	It has increased the level of student interaction and/or collaboration					
80.	It has positively impacted student learning and achievement					
81.	It has improved the quality of my students' work					

APPENDIX B

UNIVERSITY OF CAPE COAST

DEPARTMENT OF BUSINESS AND SOCIAL SCIENCES EDUCATION

QUESTIONNAIRE FOR ECONOMICS STUDENTS

Dear Respondent,

I am a Master's student at the University of Cape Coast, who is undertaking a research project under the theme **"Assessment of the Effectiveness of ICT Integration in Teaching and Learning of Economics in Senior High Schools in the Bono Region of Ghana."** The research is purely for academic purposes hence the honest and sincere response you give will contribute a lot to the research.

Participation in this research is voluntary, and you are not under any obligation to participate. Your identity would be kept secret and the confidentiality of your responses guaranteed, as your name will not appear in the research report. In any sort of report that might be published, no information will be used that would make it possible to identify you. In case you do not want to answer some questions or complete some parts of the questionnaire, you can willfully do so. I appreciate the time and effort you are offering. If you have any questions about this research, please feel free to talk to me in person or contact me on 0551400440 or email me at francis.gyedu@stu.ucc.edu.gh

Your rights as a Respondent

This research has been reviewed and approved by the Institutional Review Board of University of Cape Coast (UCCIRB). If you have any questions about your rights as a research respondent, you can contact the Administrator at the IRB

Office between the hours of 8:00 a.m. and 4:30 p.m. through the phone lines 0332133172 and 0244207814 or email address: irb@ucc.edu.

Section A: Demographic Data of Students

Please tick [√] appropriately: and write where necessary.

1. Gender: Male [ ] Female [ ]
2. Age: 13-15 yrs. [ ] 16-19 yrs. [ ] 20 and Above [ ]
3. How long have you been learning with ICT?.....

Instructions: *Please tick [√] the appropriate box to indicate your level of agreement or disagreement with each statement on the Likert Scale items of section B.* ***Key:*** *Strongly Agree (**SA**); Agree (**A**); Uncertain (**U**); Disagree (**D**); Strongly Disagree (**SD**).*

Section B: **What ICT resources are available for use by students in teaching and learning economics?**

4.	**Course Materials Available Online**	**Available**	**Not Available**
a.	Assignments		
b.	Course notes		
c.	Course outline		
d.	Digital textbooks		
e.	Class tests		
f.	Practice exercises		
g.	Weblinks		
5.	**Communication and Online Tools**	**Available**	**Not Available**
a.	Collaborative work online (e.g., Google Docs)		
b.	Submission of assignments (e.g., online, email)		
c.	Videos		
d.	Email		
e.	Discussion forum		
f.	Chat room		
6.	**Hardware**	**Available**	**Not Available**
a.	Clickers		
b.	Computer used to learn		
c.	Computer in a computer lab		
d.	Projector (multimedia)		
e.	Smart Board		
f.	School has reliable internet to enhance E-learning		

g.	School has electricity to support online learning		
7.	**Social Networking**	**Available**	**Not Available**
a.	Facebook		
b.	LinkedIn		
c.	Twitter		
8.	**Technologies Used in Class**	**Available**	**Not Available**
a.	Grammar tools (e.g., Antidote)		
b.	Language learning software		
c.	Presentation software (e.g., PowerPoint)		

Section C: What is the perceived level of economics students' self-efficacy towards integrating ICT into teaching-learning processes?

		1	2	3	4	5
9.	I know how to meaningfully integrate its use into my learning					
10	I can align its use with my district's standards-based curriculum					
11.	I have received adequate training to incorporate it into my learning					
12.	My computer skills are adequate to learn involving it					
13.	I feel confident that I understand computer capabilities well enough to maximize them in my learning					
14.	I feel confident that I have the skills necessary to use the computer for learning					
15.	I feel confident that I can successfully learn a relevant subject content with appropriate use of technology					
16.	I feel confident in my ability to evaluate the software for teaching and learning					
17.	I feel confident I can help students when they have difficulty with the computer					
18.	I feel confident I can effectively monitor students' computer use for project development in my classroom					
19.	I feel confident that I can motivate my students to participate in technology-based projects					
20.	I feel confident I can mentor student's inappropriate uses of technology					
21.	I feel confident I can consistently use educational technolo gy in effective ways					
22.	I feel confident I can provide individual feedback to students during technology					

	use					
23.	I feel confident I can regularly incorporate technology into my learning, when appropriate					
24.	I feel confident about selecting the appropriate technology f or learning based on curriculum standards					
25.	I feel confident about assigning and grading technology-based projects					
26.	I feel confident about keeping curricular goals and technology use in mind when selecting an ideal way to assess student learning					
27.	I feel confident about using technology resources (such as s preadsheets, etc.) to collect and analyze data to improve learning Practices					

Section D: What is the attitude of economics students when technology is integrated into lessons?

		1	**2**	**3**	**4**	**5**
28.	I feel that it is a very useful learning tool					
29.	I feel that it is easy to use as a learning tool					
30.	Working with a computer makes me nervous					
31.	Using a computer is very frustrating					
32.	Computers are difficult to use					
33.	I think that it takes a long time to finish a task when I use a computer					
34.	I feel confident learning new computer skills.					
35.	I find it easier to learn by using ICT					
36.	I am aware of the great opportunities that ICT offers for effective learning					
37.	I think that ICT-supported teaching makes learning more effective					
38.	The use of ICT helps teachers to improve teaching with more updated materials					
39.	The use of ICT enables the students to be more active and engaging in the lesson					
40.	I can still have effective learning without the use of ICT					
41.	I think the use of ICT in learning is a waste of time					
42.	I am confident that I learn best without the help of ICT					
43.	The classroom management is out of control if ICT is used					

	in learning					
44.	I pay less attention when ICT is used in teaching					
45.	I make no effort for their lesson if ICT is used in teaching					
46.	ICT allows students to be more creative and imaginative					
47.	The use of ICT helps to find related knowledge and information for learning					
48.	The use of ICT encourages students to communicate more with their classmates					
49.	The use of ICT increases students' confidence to participate actively in the class					
50.	I think students learn more effectively with the use of ICT					
51.	The use of ICT enables students to express their ideas and thoughts better					
52.	The use of ICT promotes active and engaging lessons for students' best learning experience					
53.	E-learning helps you to enhance your qualification abilities					
54.	The e-learning method provides an opportunity for collaborative learning					
55.	E-technology helps develop student's problem-solving skills					
56.	E-Technology can enhance independent learning					
57.	Using the e-learning resources saves a great deal of time on finding learning resources					
58.	E-learning can encourage learners to take an active part in learning					
59.	Every course should include e-learning techniques in teaching and learning					
60.	Computer-based learning enhances interpersonal relationships between lecturers and students					
61.	E-learning can provide useful ways of assessing students' feedback					
62.	Getting access to an internet-connected computer is a problem for us					
63.	I am satisfied with the e-learning method					
64.	E-learning can accommodate learners having different learning styles					
65.	Online communication among students and lecturers is more effective and motivating than face-to-face communication					

Section E: What are the key effects of ICT use on teaching and learning economics?

		1	**2**	**3**	**4**	**5**
66.	It allows my learning to be more student-centered and less					

	lecture-based					
67.	. ICT is routinely integrated into my learning					
68.	It has changed my classroom's learning activities in a very positive way					
69.	It allows my learning activities to be more interactive and collaborative					
70.	I feel more involved in the lesson					
71.	Educational technology motivates me to do more study					
72.	Promotes learning and improves students' performance					
73.	It makes the subject matter more interesting					
74.	Provision of a better learning experience					
75.	It makes the lesson more real and practical rather than abstract					
76.	It helps teachers in their lesson notes preparation					
77.	It helps in faster access to information					
78.	It has increased the level of student interaction and/or collaboration					
79.	It has positively impacted student learning and achievement					
80.	It has improved the quality of my study					

UNIVERSITY OF CAPE COAST

FACULTY OF HUMANITIES AND SOCIAL SCIENCES EDUCATION

DEPARTMENT OF BUSINESS AND SOCIAL SCIENCES EDUCATION

INTERVIEW GUIDE FOR ASSESSING THE EFFECTIVENESS OF ICT INTEGRATION IN TEACHING AND LEARNING OF ECONOMICS IN SENIOR HIGH SCHOOLS

Section A: Perceived Level of Economics Teachers Self-Efficacy

1. What is your level of self efficacy towards integrating ICT into teaching-learning processes?

Probe

1. What training have you received to incorporate ICT into your instruction?
2. What computer skills do you feel confident enough to maximize in your classroom?
3. How do you help students when they have difficulty with the computer?
4. How do you select the appropriate technology for instruction based on curriculum standards?
5. How do you keep curricular goals and technology when selecting an ideal way to assess student learning?
6. How do you use technology resources (such as spreadsheets, etc.) to collect and analyze data from student tests and products to improve instructional practices?

Section B: Attitude of Economics Teachers

1. How do you feel or act towards integrating technology into lessons?

Probe

1. Do you feel that it is a very useful teaching tool?
2. Do you have effective teaching without the use of ICT? Explain
3. Do you think that ICT-supported teaching makes learning more effective?
4. Do you think the use of ICT in teaching is a waste of time? Explain
5. Do you feel working with a computer makes you nervous or is very frustrating?
6. Do you think classroom management is out of control if ICT is used in teaching?

Section C: Key Effects of ICT Use

1. What are the main effects of ICT use on teaching and learning of economics?

Probe

1. How has your classroom's learning activities changed in a very positive way?
2. Does it allow your students' learning activities to be more interactive and collaborative? Explain.
3. To what extent is your teaching more student-centered and less lecture-based? Explain
4. How does integrating ICT promote students' learning and improve students' performance?
5. How does integrating ICT make the lesson more real and practical rather than abstract?