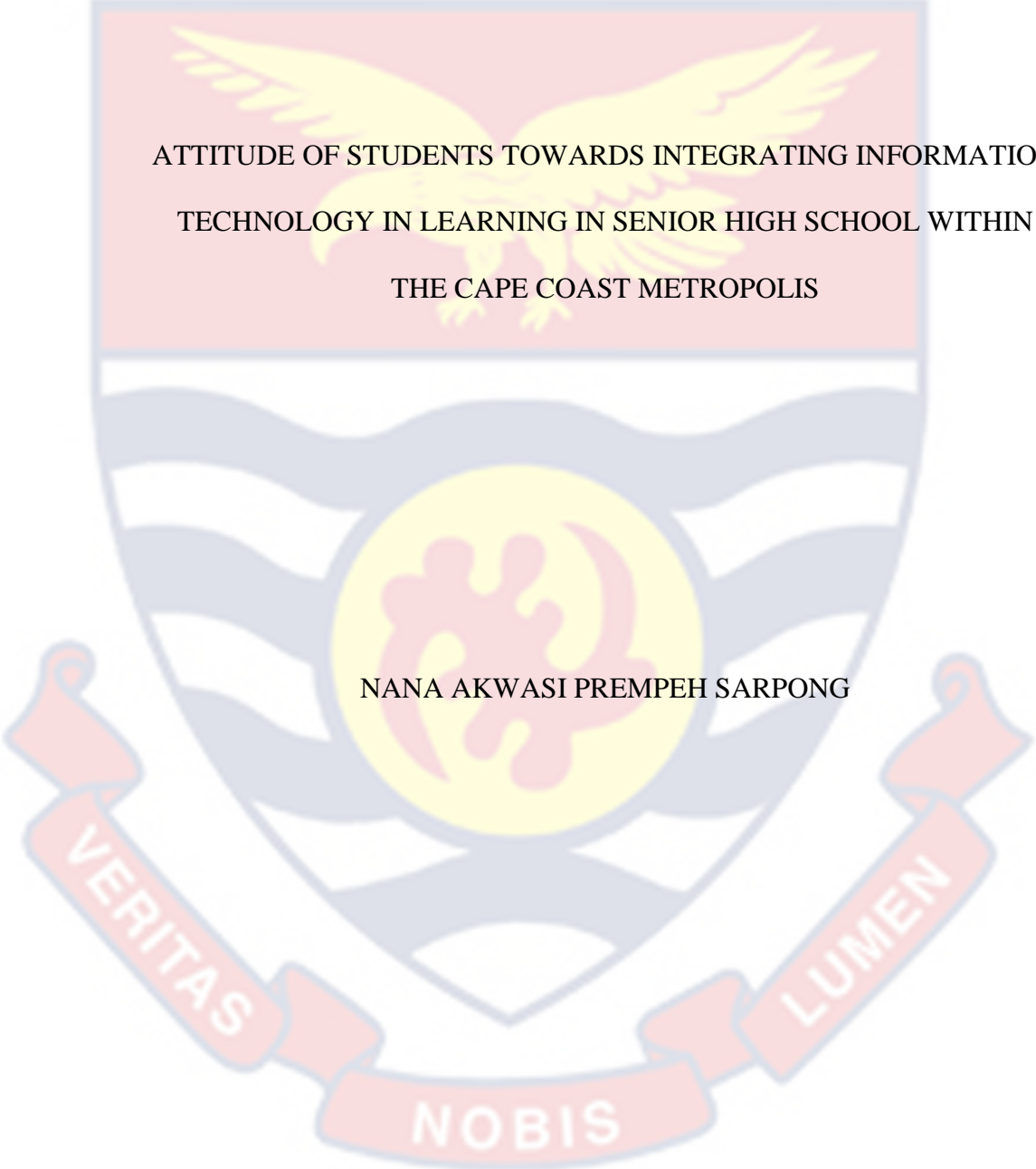


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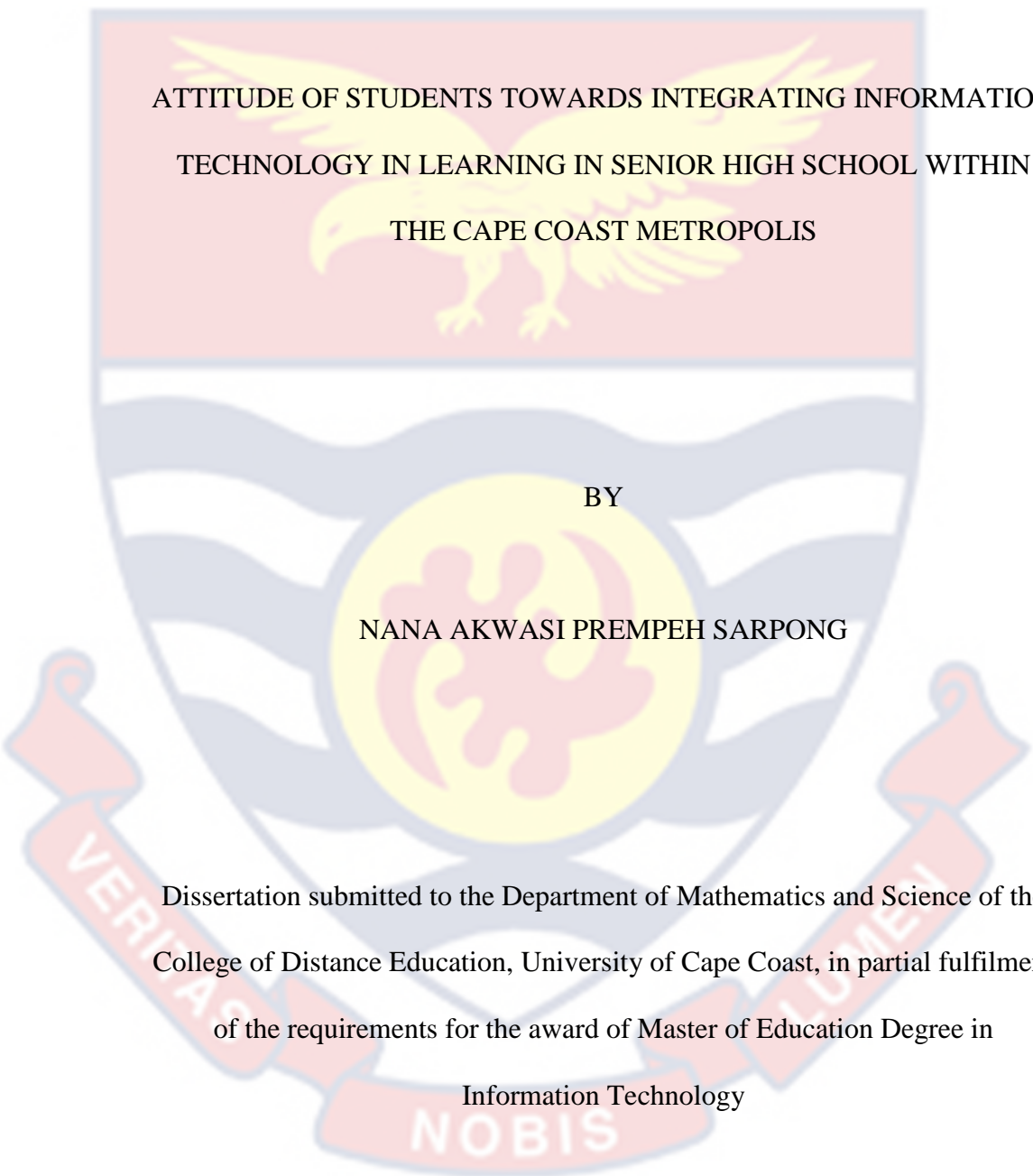


ATTITUDE OF STUDENTS TOWARDS INTEGRATING INFORMATION
TECHNOLOGY IN LEARNING IN SENIOR HIGH SCHOOL WITHIN
THE CAPE COAST METROPOLIS

NANA AKWASI PREMPEH SARPONG

2023

UNIVERSITY OF CAPE COAST



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TECHNOLOGY IN LEARNING IN SENIOR HIGH SCHOOL WITHIN
THE CAPE COAST METROPOLIS

BY

NANA AKWASI PREMPEH SARPONG

Dissertation submitted to the Department of Mathematics and Science of the
College of Distance Education, University of Cape Coast, in partial fulfilment
of the requirements for the award of Master of Education Degree in
Information Technology

AUGUST 2023

DECLARATION

Candidate's Declaration

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

Candidate 's Signature: Date:

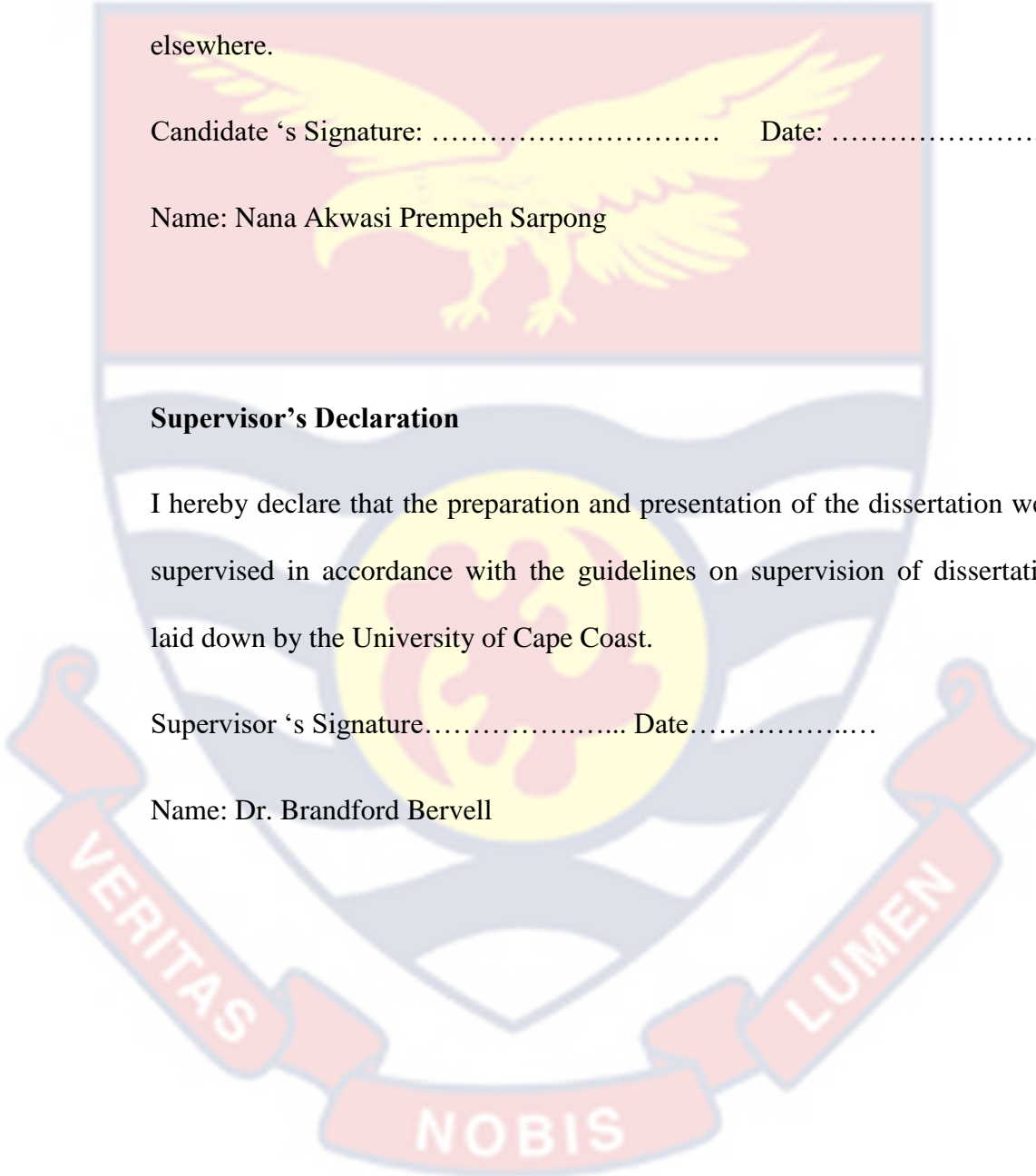
Name: Nana Akwasi Prempeh Sarpong

Supervisor's Declaration

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

Supervisor 's Signature..... Date.....

Name: Dr. Brandford Bervell



ABSTRACT

This study investigated attitude of students towards ICT integration in education at Senior High School in the Cape Coast Metropolis. The study adopted the positivist philosophical position and quantitative approach. Specifically, the study used the correlational survey design, and a sample size of 366 from a study population of 7,511 students from three senior high schools in the Central Region of Ghana. The data collection instrument was a questionnaire measured on a five-point Likert scale covering two parts. The analytical tool deployed for the data collected was the Partial Least Square - Structural Equation Model (PLS-SEM). The study found that students' attitude towards ICT integration in education was significantly predicted by students' attitude towards computers, internet, learning management systems, and online learning. It was therefore recommended that the management of Secondary Schools in the Central Region of Ghana should provide support for students' accessibility to computers, internet, learning management systems and online platforms. These facilities are required to influence students' behavioral intention towards ICT integration in education at secondary schools in the Central Region of Ghana.

KEY WORDS

Attitude

Computer

Information Technology

Integration

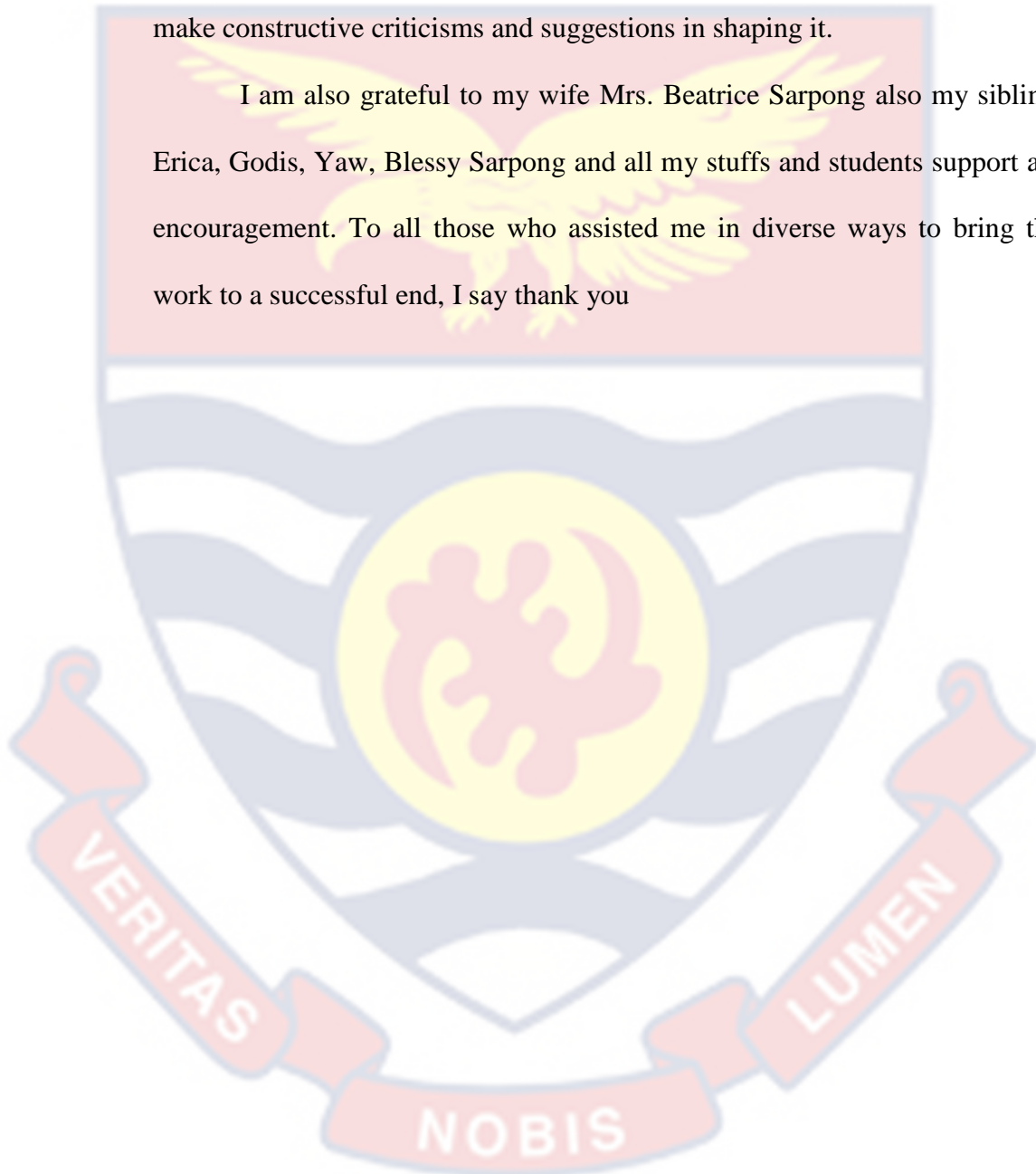
Intention



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This work has been successful because of the support of many people. I am deeply grateful to my supervisor, who despite his tight and busy schedules had time and patience not only to read through this work but also to make constructive criticisms and suggestions in shaping it.

I am also grateful to my wife Mrs. Beatrice Sarpong also my siblings Erica, Godis, Yaw, Blessy Sarpong and all my staffs and students support and encouragement. To all those who assisted me in diverse ways to bring this work to a successful end, I say thank you



DEDICATION

To my wife, Mrs. Beatrice Sarpong



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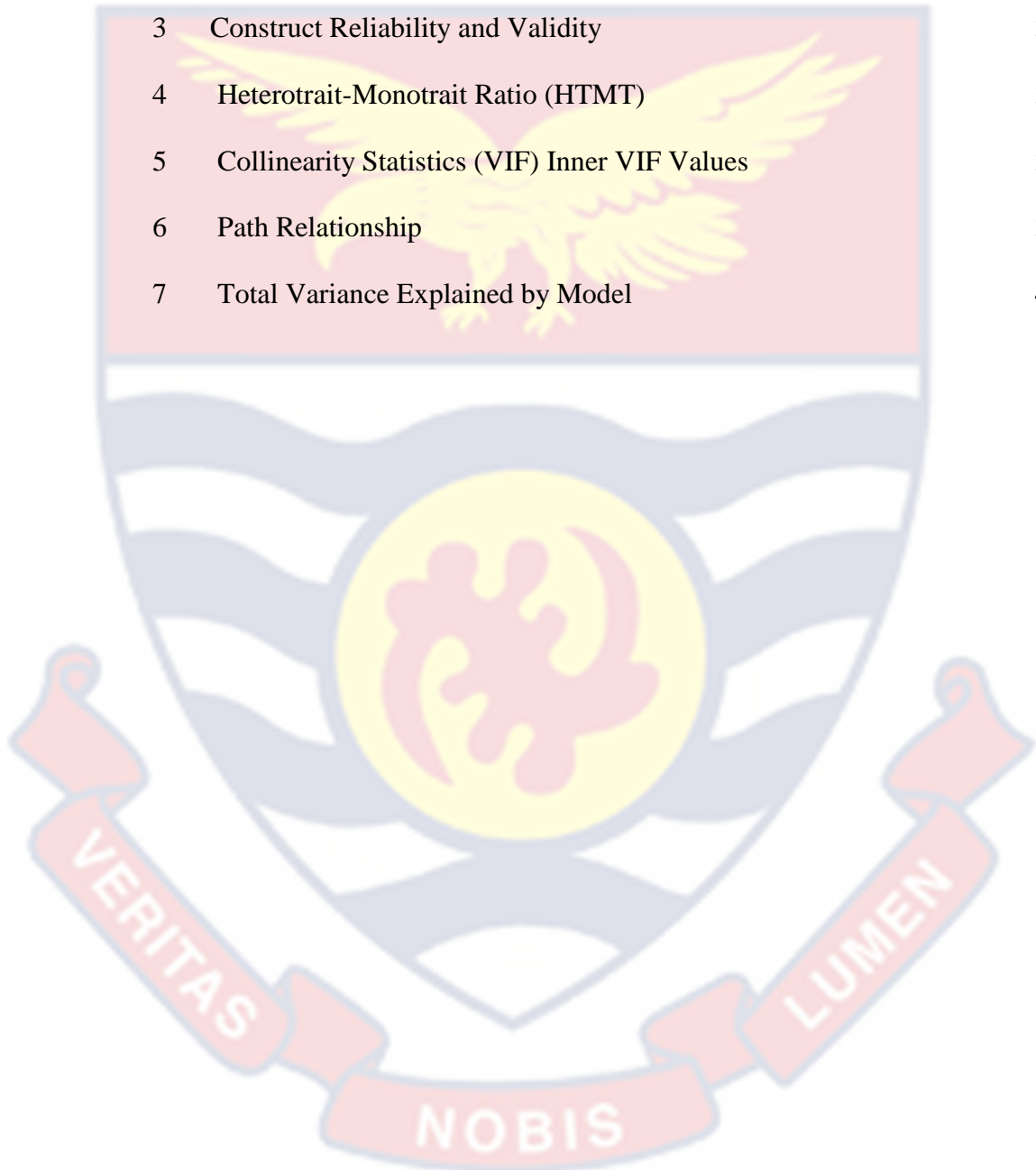
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CHAPTER ONE

INTRODUCTION

Background to the Study

Over the past two decades, the educational sector has received massive investments. These investments represent the attention given to education, which is the backbone of human development (Bonsu et al., 2021). Education offers human resources to man nations' economic, political and social affairs.

According to Ghavifekr and Rosdy (2015), “technology is the knowledge transfer highway in most countries (p.175).” This means that technology has become the vehicle through which knowledge is transmitted. Breakthroughs and the transformation of our society due to technology integration in education have fundamentally altered how people think, work, and live (Bonsu et al., 2021). Developed nations, mainly, utilize educational technology such as e-learning, mobile learning, and emerging technologies like artificial intelligence (AI), machine learning (MI), virtual reality (VR), augmented reality (AR), mixed reality (MR), and gamification, among others aid their teaching and learning processes.

These technologies are sometimes networked, engaging, self-paced, collaborative and accessible. They are also either used as a standalone instructional medium or blended learning (Bervell & Umar, 2017; Bonsu et al., 2021). Blended learning is generally defined as learning that combines the best features and characteristics of face-to-face and online teaching and learning (Ustun, 2019).

However, it must be noted that developing nations rarely utilize advanced educational technology (Boadu, Awuah, Ababio & Eduaquah, 2014;

Bonsu et al., 2021). What is mainly used is the information communication technology laboratory to enable students to use computers in learning (Ndibalema, 2014). Additionally, instructors and students have access to computers at home, allowing them to connect readily with contemporary technology (Hanimoğlu, 2018). The underutilization of advanced educational technology in developing countries like Ghana is because of issues such as lack of ICT equipment, sluggish internet, lack of political will, inadequate human resources, power shortages, etc. (Margarete & Ebner, 2014; Bervell & Umar, 2017; Adarkwah, 2021). This implies that a cursory look at the classroom of senior high schools in developing nations would reveal that conventional instruction dominates teaching and learning (Boadu et al., 2014; Bonsu et al., 2021).

Despite the underutilization of ICTs in education in Africa and the numerous challenges confronting ICT integration, some countries like Ghana, Gambia and Nigeria have attempted to integrate ICT into primary and senior high schools (Bonsu et al., 2021). The Gambia, for instance, in 2012 implemented a new pedagogical innovation called the Progressive Science Initiative and Progressive Mathematics Initiative, which were piloted in 24 schools. The aim of PSI-PMI was to incorporate technology in the teaching of mathematics and science subjects (physics, chemistry, and biology) in schools (Blimpo, Gajigo, Owusu, Tomita & Xu, 2020). Ghana, on the other hand, has also implemented a national ICT framework to promote the integration of ICT in primary and senior high schools (Ministry of Education, 2018).

The attitude of students towards integrating information and communication technology (ICT) in learning in Senior High schools plays a

pivotal role in shaping the effectiveness and success of this educational approach (Arkorful, Barfi & Aboagye, 2021). Attitude encompasses the beliefs, perceptions, and emotions that individuals hold towards ICT, and it significantly influences their engagement, motivation, and learning outcomes (Arkorful, Barfi & Aboagye, 2021). A positive attitude towards ICT in the context of education entails recognizing its potential to enhance learning experiences, promote collaboration, and provide access to a wealth of resources (Arkorful, Barfi & Aboagye, 2021). It involves embracing technology as a valuable tool for acquiring knowledge, developing critical thinking skills, and preparing for the digital era (Arkorful, Barfi & Aboagye, 2021). Cultivating a favorable attitude among students towards ICT integration empowers them to leverage technology's full potential and paves the way for a transformative and future-oriented learning environment in Senior High schools (Arkorful, Barfi & Aboagye, 2021).

The developing world has made efforts to utilize educational technology because it often promotes student-centered, collaborative learning, distance learning and visualization of the material (Mustafina, 2016; Chitra & Raj, 2018). It also makes lessons more effective, especially when used as a blended learning tool (Cheung, Lee, Simonova, Kozel & Kwok, 2019; Bonsu, 2021). This makes the place of technology in education very vital. These unique characteristics associated with technology integration in learning has necessitated research into students' attitude toward it.

Statement of the Problem

Research on the attitude of students towards technology integration is indecisive. While the majority of studies reported positive attitude, others, on

the other hand, reported negative attitude. The differences in students' attitude could be attributed to geographical location and the subject taught with the educational technology. For instance, Boser, Palmer and Daugherty (1998) revealed that, in the USA, students' attitude towards technology was positive.

In Turkey, Alkana and Erdema (2010) established that students have positive attitude towards educational technologies. Also, in Ghana, Bonsu et al., (2021) found that students have positive attitude towards educational technology like mobile blended learning. Contrary to these results, Robinson (2016) investigated on the effect of technology integration on High School Students' literacy achievement and recorded a negative effect. Lai et al. (2016) also recorded a negative relationship between students' attitude and integration of technology.

The significance of students' attitude in the acceptance of educational technology cannot be also overlooked. Davis, for instance, espoused this in his Technology Acceptance Model (Davis, 1989; Bonsu, Bervell, Armah, Aheto & Arkorful, 2021). His model established the mediating relationship among perceived ease of use, perceived usefulness and attitude on the one hand and attitude and behavioral intention to use technology on the other hand. This indicates the intricate role attitude plays in technology acceptance.

Although studies modeled on Technology Acceptance Model (TAM) establish the mediating role of attitude as a predictor of behavioral intention to use technology, no studies have focused on the relationships among students' attitude towards different types of technology and their behavioral intention to use technology integration in education in Ghana currently. In relation to behavioral intention towards ICT integration, the study seek to find various

technologies such as the internet and students' attitude. Therefore, it is against this backdrop that this study seeks to formulate a model to assess students' attitude towards computers, internet, Learning Management System (LMS), online learning and the effects on their behavioral intention towards ICT integration in learning.

Objectives of the Study

The study's main objective was to examine the attitude of students in integrating technology into learning in senior high school at the Cape Coast Metropolis. Specifically, the study sought to:

1. examine the relationship that exist between students' attitude towards computers, internet, LMS and online learning.
2. establish the direct predictive effects of attitude towards computers, attitude towards LMS.
3. establish the direct predictive effects of attitude towards the internet
4. establish the direct predictive effects of attitude towards online learnings on students' behavioral intention towards ICT integration in education.

Research Questions

The following research questions were formulated to achieve the research objectives:

1. What is the relationship between students' attitude towards computers, internet, LMS, and online learning?
2. What are the direct predictive effects of attitude towards computers, attitude towards LMS.
3. What are the direct predictive effects of attitude towards the internet.

4. What are the direct predictive effects of attitude towards online learnings, on students' behavioural intention towards ICT integration in education?

Research Hypotheses

Based on the research questions the following hypotheses were formulated:

- H₁. There is a statistically significant relationship between students' attitude towards computers and their attitude towards the internet.
- H₂. There is a statistically significant relationship between students' attitude towards computers and their attitude towards learning management system (LMS).
- H₃. There is a statistically significant relationship between students' attitude towards the internet and their attitude towards online learning.
- H₄. There is a statistically significant relationship between students' attitude towards LMS and their attitude towards online learning.
- H₅. There is a statistically significant relationship between students' attitude towards LMS and their behavioral intention towards ICT integration in education.
- H₆. There is a statistically significant relationship between students' attitude towards computers and their behavioral intention towards ICT integration in education.
- H₇. There is a statistically significant relationship between students' attitude towards the internet and their behavioral intention towards ICT integration in education.

H₈. There is a statistically significant relationship between students' attitude towards online learning and their behavioral intention towards ICT integration in education

Significance of the Study

Firstly, the outcome of the study would be helpful to curriculum developers, policymakers and teachers to understand senior high school students' attitude towards LMS, computers, online learning, and the internet and how these affects or influence their behavioral intention towards ICT integration. Again, this study would benefit educational stakeholders and policymakers to develop plausible policies for schools to integrate educational technology to blend classroom instruction at the senior high school level. Finally, the outcome of this study would add to the body of knowledge on the attitude of students in integrating technology into learning in senior high school at the Cape Coast Metropolis.

Delimitations of the Study

The study was delimited in scope to the attitude of students in integrating technology in learning in senior high schools at the Cape Coast Metropolis. Additionally, the study was geographically delimited to selected senior high school students in the Cape Coast Metropolis, Ghana.

Limitations of the Study

Every study has some inherent flaws. As such, this study also encountered some limitations: Firstly, the respondents' replies were constrained by the closed-ended questionnaire used to gather data. In addition, adopting only a closed-ended questionnaire may have led to bogus responses from respondents. Furthermore, other extraneous factors that the researcher

could not notice could influence the result of the study. Only attitude of students were considered, and other possible factors excluded.

Definition of Terms

The following definitions were provided to facilitate the understating of the terms that were used throughout this study:

Attitude: refers to a set of emotions, beliefs, and behaviours toward online learning.

Information Communication Technology: refers to all communication technologies, including the internet, wireless networks, cell phones, computers.

Learning Management System: A learning management system (LMS) is a piece of software used for managing, documenting, tracking, reporting, automating, and delivering educational programs, training materials, and courses.

Massive Open Online Courses: Massive Open Online Courses (MOOCs) are open enrolment, free online courses.

Online learning: A learning system based on formalised teaching and imparting and acquisition of knowledge with the help of electronic resources such as Zoom, Google classroom, etc.

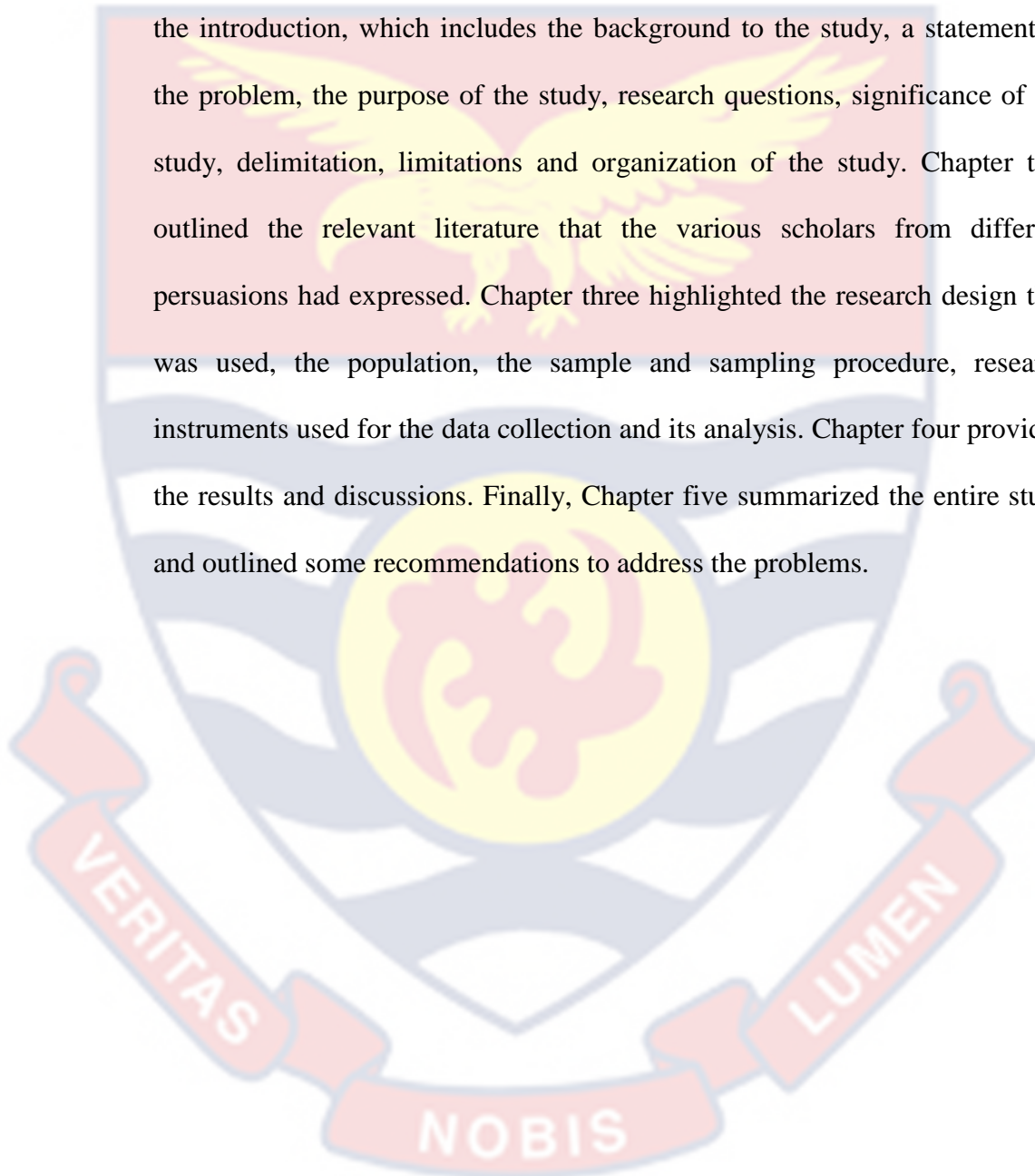
LMS: A learning management system (LMS) is a piece of software or web-based technology that is used to organize, carry out, and evaluate a particular learning activity.

Internet: The Internet, sometimes known as "the Net," is a global system of computer networks. It is a network of networks that allows users at any one

computer to obtain information from any other computer with permission (and sometimes talk directly to users at other computers).

Organization of the Study

The study was structured into five chapters. Chapter one encompassed the introduction, which includes the background to the study, a statement of the problem, the purpose of the study, research questions, significance of the study, delimitation, limitations and organization of the study. Chapter two outlined the relevant literature that the various scholars from different persuasions had expressed. Chapter three highlighted the research design that was used, the population, the sample and sampling procedure, research instruments used for the data collection and its analysis. Chapter four provided the results and discussions. Finally, Chapter five summarized the entire study and outlined some recommendations to address the problems.



CHAPTER TWO

LITERATURE REVIEW

This chapter focuses on a review of the study's related literature. In this chapter, the researcher reviewed existing body of studies that were relevant to this investigation. The brief history of the internet, the concept e-learning, learning management systems, characteristics of online learning, advantages of online learning and challenges facing online learning implementation were also covered in the conceptual review. The conceptual framework was also looked at in this chapter.

Conceptual Review

The Concept of Online learning (Electronic Learning)

Electronic learning which is also acronym as eLearning or online learning refers to “as the science of learning without using paper printed instructional material” (Goyal, 2012, p240). Further, online learning has been described as “the intentional use of networked information and communication technology in teaching and learning” (Chitra & Raj, 2018, p.11). Kassymova, Issaliyeva and Kosherbayeva (2019) defined online learning as the implementation of electronic learning resources to deliver distance education or blended learning. Thus, from the above definitions and descriptions, online learning relies heavily on information communication technology utilisation to provide educational resources, courseware and instructional materials. However, the term online learning is sometimes used interchangeably with terms like E-learning, virtual learning, distributed learning, networked learning, and web-based learning (Goyal, 2012).

Online learning is enabled by the internet and ICT devices such as personal computers, notebooks, netbooks, interactive whiteboards, network systems, mass media, programs and software. Educational software like Learning Management Systems such as Google Classroom and Moodle; and synchronous software like Google Meet and Zoom are utilised in online learning (Fernández-Rodriquez, Rainer & Miralles, 2014).

Characteristics of Online Learning

The main features or characteristics of online learning are synthesised from Bonsu (2021) and outlined below:

1. **Networking:** online learning allows students, irrespective of their location, to access education resources remotely through computer use.
2. **Flexibility:** online learning accommodates the needs of learners. In fact, handicap students who are unable to attend regular classes can benefit significantly from online learning or online courses.
3. **Interactivity and collaboration:** learners can collaborate with each other and their tutors or instructors anytime, anywhere. This is done through chats, comments etc. features of LMS and video conferencing tools like Zoom.
4. **Blended:** Teachers can utilise online learning in a blended learning instruction. Online learning, thus, can use for classwork, homework, and projects, among others.
5. **Engaging:** Online learning is based on current technology that students utilise daily; hence, it increases student engagement.
6. **Permanency:** The instructional materials or information remains permanent on the computer or server unless removed or cleared.

7. **Immediacy:** The instructional materials can be retrieved immediately.
8. **Accessibility:** The instructional materials are always available wherever and whenever students need to use them.

Benefits of Online Learning

First, online learning offers reusable content. Unlike classroom teaching where instruction is not reusable, with online learning, students can access the same educational content an unlimited number of times. According to Bonsu (2021) and Zervas and Sampson (2014), many online-based open-access digital repositories and libraries have been developed. These repositories and libraries offer students and instructors reusable digital learning resources for their teaching and learning activities.

Furthermore, online learning is more cost-efficient than conventional teaching. In general, the initial cost associated with developing and deploying online learning is higher in terms of infrastructure and training material costs (Weller, 2004). But afterward, the training materials and infrastructure become reusable saving a lot of money. Also, regarding online learning, the cost associated with travel and accommodation are reduced (Guragain, 2016).

Again, online learning offers a higher degree of interactivity among instructors and learners. Instructors can easily communicate and exchange ideas with each other, while learners on the other hand, can easily receive instant feedback on their learning via online learning platforms (Radović-Marković, 2010). Thus, online learning makes interactivity between students or students and instructors possible through the use of interactive systems such as LMS, Hypermedia, SMS, and Email (Garaj, 2010; Bonsu, 2021).

Also, online learning offers easy access to the instructor outside the official working hours. The learner could send inquiries to the instructor via email, instant messaging, or chat system (Abed, 2019).

Moreover, online learning is often scalable. As a result, the same infrastructure and materials can be used for a larger or smaller number of students without affecting the total cost (Guragain, 2016).

Furthermore, unlike classroom-based teaching and learning, online learning resources can be updated more regularly. After the study materials have been uploaded to a database server or LMS, they can be changed without replacing the entire set of materials (Guragain, 2016).

Lastly, online learning combined with conventional teaching is effective. Several researches have established the effectiveness of blended-enabled online learning in improving students' academic performance, critical thinking and communicative skills (Ijaz Hussain, Saeed & Syed, 2020). Additionally, the multimedia format used in online learning makes teaching and learning engaging. Learners tend to remember knowledge acquired from multimedia materials (Guragain, 2016).

Learning Management System

A learning management system (LMS) is a software or platform that creates, manages, and maintains learning content, recognizes and analyses individual and group learning, and gathers data to monitor the learning process (Bervell & Umar, 2017). LMS can also be defined as software that automatically administers training (World Bank, 2010). Thus, LMS is a software package that can handle training. LMS have been used for purely online, offline and blended learning all over the world. It is also used to

support online learning activities; thus, it could be concluded that LMS is the backbone of online learning and m-learning (Bervell & Umar, 2017). Kundi and Nawaz (2011) also espoused LMS as web-based learning, which are synchronous, open-network structures created to facilitate collaborative, active, authentic, creative and constructive learning. LMS contains learner enrolment, activity reporting, messaging, discussion boards, conducting assessments and certification, among others. It is essential in planning, developing and implementing learning activities and creating positive learning outcomes for learners (Ndibalema, 2014).

LMS “provides access to student-centred teaching approaches, increased accessibility, assessment and evaluation features, and improved management of course content and administrative tasks” (Bervell & Umar, 2017, p. 46). LMS also has learning environment personalisation, web-driven tool for communication, and enabling best practice for instruction, allowing instructors to deliver instruction. Currently, there are many LMS available in the market, ranging from Moodle, Blackboard, WebCT, Sakai, Docebo. They could be open-source like Moodle or proprietary (closed source) like Blackboard.

Today, LMS is widely used by organisations and educational institutions due to its advantages, such as organising learning in a single location, tracking students learning progress, reducing training cost, allowing micro-learning at scale, allowing gamified learning, easy to customize, consistent and scalable, and multimedia learning (Bervell & Umar, 2017).

Challenges Confronting Online Learning Implementation

Despite the advantages of online learning, its adoption rate is slow in Africa. The slow pace of online learning implementation is as a result of plethora of challenges confronting its adoption. Among these challenges include lack of infrastructure, slow internet, unfavourable government policies, high cost associated with laptops and smartphones and inadequate online or online learning specialists.

First, the internet bandwidth available to transport data between Africa and the rest of the globe is around one-seventh of Europe's international bandwidth capacity. This makes it inadequate for a continent with over a billion population. The effect is that internet connectivity is often poor and slow (Baylon & Antwi-Boasiako, 2016).

Second, infrastructural challenges brought about the online learning implementation in Africa (Kasse & Balunywa, 2013). Online learning implementation relies heavily on hardware and software infrastructure such as computers, servers, internet connectivity, cameras, LMS software, multimedia and video editing software, among others. Unfortunately, most educational institutions in developing countries lack these resources (Bhuiyan, 2010), making online learning implementation difficult in Africa.

Third, unfavourable government policies in some developing nations also hinders online learning implementation. In Ghana, for instance, the Education Service (GES) has outlawed mobile phone and personal computer usage in senior high schools (Bonsu, 2021). The reason for prohibiting computers that can be used for learning is because the authorities feel these gadgets can be a distraction (McLean, 2016).

Furthermore, adequate online learning and instructional design specialists are needed to combine technology with sound pedagogies (Bonsu, 2021). Higher education institutions have encountered a myriad of pedagogical challenges that they should overcome if their attempts at adopting online learning is to bear any fruit. The truth is that instructors in Ghana's senior high schools lack the expertise to integrate online learning into teaching (Bonsu, 2021).

Finally, negative attitude to online learning is a critical challenge confronting online learning adoption in Africa (Mutisya & Makokha, 2016). Some students and tutors are wary of online learning and are hesitant to use it. Mutisya and Makokha (2016) found that instructors in Kenya had negative attitude toward the use of online learning. They further referred to these group of students and instructors as "technology averse, phobic, and conservative" (Mutisya & Makokha, 2016, p.154).

Conceptual Framework

This study utilizes a conceptual framework to explain the relationships among the various variables of interest to the researcher. A conceptual framework utilises a diagram to explain the relationships among variables of the research problem. As opined by Adom, Hussein and Joe (2018), the entire methodology of the research must align with the variables and their relationships and context. The conceptual framework of the study depicts relationships among students' attitude towards different kinds of technology and how these relationships predict use intention behavior. Attitude, according to Olufemi (2012) refers to "feelings, beliefs and reaction of an individual towards an event, phenomenon, objects or person." Attitude is not innate

character of mankind: They are either learnt and can be modified (Olufemi, 2012). Behavioural intention, on the other hand, refers to the psychological variables that motivate a certain conduct, where the more positively one intends to engage in the behaviour, the more likely one will do so (Wayne, 2022). Figure 1 shows the conceptual framework for the study:

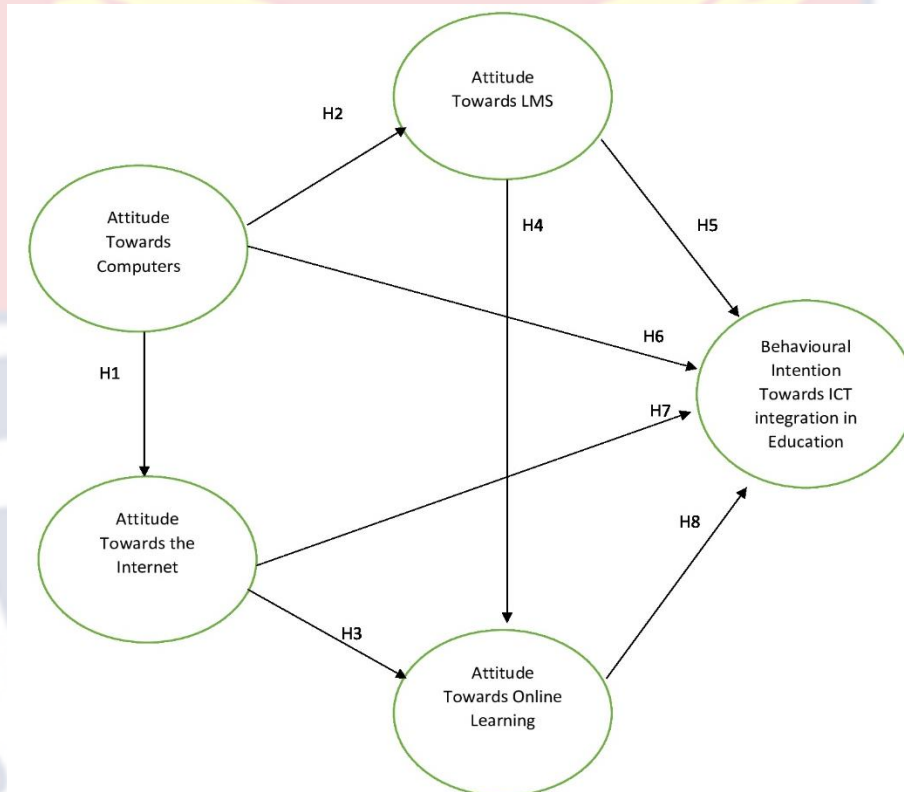


Figure 1: Conceptual Framework

Empirical Review

Relationship Between Students' Attitude towards Computers and their Attitude towards the Internet

Abedalaziz, Jamaluddin and Leng, (2013) investigated and measured postgraduate students' attitude toward the internet and computer use in Malaysia. Specifically, the findings of recent studies reveal that participants have a high-level perception of the usefulness and their control of the computer and internet. No significant differences were found between

participants' attitude toward the Internet and computer related with gender, field of study, and ethnicity, and postgraduate student's attitude toward computer and Internet usage is age related.

Relationship between Students' Attitude towards Computers and their Attitude towards Learning Management System (LMS)

Research by Hsieh, Li, and Yang (2016) explored the impact of computer attitude on the acceptance of e-learning systems, including LMS. Their findings revealed that positive attitude towards computers were positively associated with learners' intention to use e-learning systems. Students with a positive attitude perceived the technology as useful, easy to use, and compatible with their learning needs, thereby influencing their acceptance and engagement with LMS.

Additionally, a study by Al-Fraihat, Joy, and Sinclair (2020) investigated students' attitude towards using LMS in higher education. They found that students' general attitude towards computers significantly affected their attitude towards LMS. Those with a positive attitude towards computers were more likely to view LMS as beneficial, user-friendly, and supportive of their learning experiences. Individuals with a positive attitude towards computers tend to have a more favorable view of LMS and are more inclined to embrace and utilize them for educational purposes. Conversely, individuals with negative attitude towards computers may exhibit skepticism, resistance, or reluctance towards adopting and using LMS (Lee, 2018).

Relationship between Students' Attitude towards the Internet and their Attitude towards Online Learning

Limenie (2022) investigated first-year medical students' attitude and readiness to online learning and challenges. The study reported that computer training and basic computer skills significantly affected students' attitude toward online learning.

Educational institutions are increasingly adopting and implementing web-based teaching-learning activities. Application of this form of the learning platform is becoming inevitable by universities in developing countries including Ethiopia while they are facing a shortage of materials and a lack of experience. In doing so, students are required to be better prepared for the challenges faced in this digital age.

Although online learning platform in education helps students in different ways, many challenges are affecting the implementation. Personal factors, school curricula, institutional and technological-related challenges are among the factors affecting online learning activities. Extents of support from institutions, students' perceptions, attitude, readiness, and previous computer skills also affect web-based teaching-learning activities.

Relationship between Students' Attitude towards LMS and their Attitude towards Online Learning

According to Haerens et al. (2016) discovered that premises to support behaviour and cognition are present when students seek knowledge in synchronous online LMS contexts. Learners were able to rely instinctively on social aspects that influenced their academic performance, such as social influencers who facilitated independent support-seeking. Some of the people

who could have an impact on you include your family and friends (Haerens et al., 2016). Self-regulatory practices that motivate and promote intrinsic motivation factors, provide learners with feedback, use instructional language, and present tolerance are encouraged by instructors who support learner autonomy in online environments (Verma & Shukla, 2019).

Relationship between Students' Attitude towards LMS and their Behavioral Intention towards ICT Integration in Education.

Bervell, Nyagorme and Arkorful, (2020) in their study employed a survey design with the questionnaire as an instrument for data collection from a sample of 267 course tutors in distance education. Their results from a Partial Least Squares Structural Equation Modelling (PLS-SEM) approach revealed that students' attitude towards LMS had a significant mediating effect on all three antecedents in determining behavioural intention towards ICT integration in Education.

Similarly, Alharbi and Drew (2014) proposed a theoretical framework that includes the core constructs in TAM: namely, perceived ease of use, perceived usefulness, and attitude toward LMS usage in additional external variables namely, the lack of LMS availability, prior experience (LMS usage experience), and job relevance. The research outcome suggests that attitude towards LMS use directly correlates with behavioural intention towards ICT integration in Education.

Oprea (2014) also determined users' attitude toward using Jusur LMS in Saudi Arabian universities. The study showed that attitude toward LMS is significantly better at predicting behavioural intention to use ICT in education.

Relationship between Students' Attitude towards Computer and the Internet and their Behavioural Intention towards ICT Integration in Education

Ahmed et al. (2011) examined the attitude and intentions of students to use internet-based software using TAM and found that perceived usefulness, and perceived ease of use predict attitude of students. Attitude towards internet was found to be a stronger predictor of the intention of students to use internet-based software. The relationship between attitude towards computers and behavioural intention towards ICT integration can be significant and influential. Attitude refers to an individual's positive or negative evaluation of an object or concept, such as computers or technology, while behavioural intention refers to an individual's inclination or readiness to engage in a behavior, in this case, integrating ICT into their activities or work (Kreijns et al., 2013).

Similarly, Sujeet and Jyoti (2013) in their study to identify the main factors that influence the student's learning through websites found that students' attitude towards the internet is a critical factor predicting their behavioural intention to use the learning through websites. The findings of Sujeet and Jyoti's study underscored the crucial role of attitude towards computers in shaping students' behavioural intentions towards ICT integration. An individual's attitude towards computers refers to their overall evaluation and perception of computers and technology in general. It encompasses their beliefs, emotions, and tendencies regarding the use and benefits of computers.

Moreover, Carlos and Soares (2011), in their study to provide an understanding of the process of social networks (SN), relying on a specific

model, the technology acceptance model (TAM) revealed that students' attitude towards SN impacts on behavioural intention to integrate ICT in education.

Relationship between Students' Attitude towards Online Learning and their Behavioral Intention towards ICT Integration in Education

Altanopoulou and Tselios (2017) investigated undergraduate students' intention to use wiki technology using an extended Technology Acceptance Model (TAM). The result confirmed the relationship between students' attitude towards online learning and their behavioural intention towards ICT integration in education.

Similarly, Bonsu, Bervell, Armah, Aheto and Arkorful (2021) examined students' Whatsapp use in teaching and learning during covid-19 pandemic period by investigating the initial attitude and acceptance of students using TAM. The result of the study revealed that students' attitude towards WhatsApp Messenger correlates with students' use of WhatsApp Messenger for educational purposes.

Also, Letchumanan and Tarmizi (2011) investigated the use of e-books as learning material among undergraduates in Malaysia. They reported that students' attitude towards e-book influence their intention to integrate ICT into education.

Ratna and Mehra (2015) researched the acceptance and behavior of students towards e-learning using the technology acceptance model (TAM). The study's result suggested that attitude predicted students' behavioural intention to use ICT in education.

Chapter Summary

The literature review explored the attitude towards integrating IT in learning among students. Students recognize the potential of IT in enhancing their educational experience, improving access to information, and developing relevant digital skills. However, several factors influence this attitude, including the availability and accessibility of IT infrastructure and resources, the quality of IT training and support, and the perception of IT as a distraction. This study seeks to fill a gap in existing literature by specifically examining students' perceptions and attitude towards technology integration in the unique context of Senior High Schools in the Cape Coast Metropolis. While previous studies offer general insights into technology attitude in education, this research aims to provide a more contextualized understanding, considering factors such as the secondary education level, contemporary relevance, and the influence of cultural and socio-economic elements. The study also aspires to contribute insights into the pedagogical implications of students' attitude, addressing a potential gap in literature focusing on how these attitudes impact the learning process and educational outcomes.

CHAPTER THREE

RESEARCH METHODS

Introduction

The research procedure utilised for this study was covered in this chapter. This included the study design, the population, the sample and sampling procedure, the research instrument, data collection procedure, data analysis and ethical consideration.

Research Design

The research design is the strategy and structure that was used to carry out the study. It frees up the researcher's time and energy to concentrate on designing effective research methods (Sileyew, 2019). Research designs assist to clarify the methods to collect the data needed to solve a research topic, as validated by Malhotra and Birks (2007). A quantitative approach was used for this investigation. Research designs like the correlational survey are useful for analysing multi-level associations between and within a set of variables (Malhotra & Birks, 2007). It is a way to look at the connection between two or more variables that doesn't involve actual experiments. It is important to keep in mind that the researcher is not trying to establish causation. It is impossible for the researcher to influence or control the variables in a correlational study (Malhotra & Birks, 2007). The magnitude and/or direction of an association between two or more variables is reflected by their correlation.

This layout worked well since it played a significant part in investigating the factors that shape secondary students' attitude about their preparedness for online learning. When analysing the results of a correlational study, researchers should keep in mind the caveats outlined by Malhotra and Birks

(2007). Causation cannot be determined using a correlational study design. They are limited to discovering connections or correlations between factors. Simply because there is a correlation between two variables does not imply that one causes the other. The idea of a third variable impacting the two under study is ignored by correlations. An unobserved or uncontrollable factor may account for the observed relationship (Malhotra & Birks, 2007). However, efforts would be taken to lessen the impact of any survey design limitations that could exist in this investigation. One of them is avoiding touching on topics that some respondents found too personal.

Population

In research, a population refers to “the aggregate of the individuals or units from which a sample is drawn, and to which the results of any analysis are to apply-in other words the aggregate of persons or objects under investigation” (Krieger, 2012, p.2). Concerning the study, the population comprised all senior high school students in the Cape Coast Metropolis. However, the accessible population constituted 2844 students of Saint Augustine’s College, 2849 students from the Ghana National College, and 1818 students from Ogua Senior High School. The total population of the three schools was 7,511 students. These three schools are the schools of interest due to the challenge of limited resources like time and money.

These three schools were selected from the Cape Coast metropolis because they are schools that have more access to computers in order to have an integrated information technology in learning within the Cape Coast Metropolis.

Sample and Sampling Procedures

The primary goal of sampling is to choose samples that fairly represent the entire population from which they were chosen. With the combined population of the St. Augustine's College, Ghana National College and Ogua SHS which comprised of 7,511, the researcher settled on 367 sample size which is in line with Krejcie and Morgan's (1970) sample size table. The sample size table stipulated that a sample size of 367 is adequate for a population of 7,511.

Moreover, the multi-stage sampling technique was used to select the schools and the participants for the study. First, the stratified sampling was used to select the 3 senior high schools in Cape Coast metropolis. This was done by grouping all senior high schools in the metropolis into three subgroups called strata based on the existing school categories (category A, B and C) by the Ghana Education Service i.e., Saint Augustine's College with a population of 2844 was selected from category A, Ghana National College with a population of 2849 was also selected from category B while Ogua Senior High School with a population of 1818 was selected from category C.

Additionally, to ensure that the sample is more representative of the population in each school, the proportional stratified (allocation) sampling technique was further used to determine the sample of each stratum. Furthermore, in each school, the simple random sampling was done using the lottery technique. This method ensured that each student had an equal chance of being selected for the study. Table 1 shows the population and the proportionate allocation of each school.

Table 1: Break Down of the Population and Proportionate Allocation

S/N	Name of School	Population of Each School (Stratum)	Proportionate Stratified Sample Size
1	Saint Augustine's College	2844	139
2	Ghana National College	2849	139
3	Ogua Senior High School	1818	89
	Total	7,511	367

Data Collection Instrument

The study adapted the attitude and readiness scale of Herguner (2020). The questionnaire used had six sections in all. The first part (section A) gathered background data of the respondents. The second part (Section B) examined students' attitude towards computers. The third section (Section C) also looked at students' attitude towards internet. The fourth section (Section D) focused on students' attitude towards LMS. The fifth section (Section E) examined the students' attitude towards online learning. The last section (Section F) examined behavioural intention towards the integration of ICT in education.

Additionally, the questionnaire was designed on a 5-point Likert-type scale ranging from "Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree". The questionnaire's items were all closed-ended questions. The construction, coding, and analysis of the closed-ended questions are simple and uncomplicated; hence, its adoption for the study (Cohen, Manion & Morrison, 2017).

Validity and Reliability of Instruments

The researcher carried out Cronbach's alpha reliability analysis to ascertain the whether the instrument was reliable enough to be used for data collection. The overall coefficient of reliability was 0.85 which is regarded as reliable according to Ceyhan, Ceyhan and Gürcan (2007). The questionnaire was given to two experts in educational technology to determine whether it meets the face, construct, and content validity before it was finally administered to the respondents. Students were approached randomly and so those who consented were administered the questionnaires till the sample size was achieved in the school. This process was used in all three schools.

Data Collection Procedures

The researcher sought authorisation from each school prior to the data collection phase. This was done by submitting a letter of introduction obtained from the College of Distance Education, University of Cape Coast, to the three schools for permission to carry out the study. After approval from each school, the researcher visited students in the three schools to explain the rationale of the research and to seek their consent to participate in the study. Only students who consented to participate in the study were included as respondents.

Data Analysis

Prior to data analysis, the questionnaires retrieved from data collection were all serially numbered for easy identification before coding in Statistical Product for Service Solution version 21.0 (SPSS 21.0). Numerical values 1,2,3,4 and 5 were assigned to the five-point Likert scale: "Strongly Disagree (SD)", "Disagree (D)", "Agree (A)", and "Strongly Agree (SA)", respectively. After coding and data entry in Statistical Product for Service Solution (SPSS

21.0), the background of the respondents was analysed with frequency and percentages. The research hypotheses were analysed with Structural Equation Modelling using Smart PLS.

Research Ethics

To guarantee adherence of recognised ethical norms and practices in research, some steps were taken. These steps include: First, securing a letter of introduction from the University of Cape Coast's College of Distance Education and submitting to the three senior high schools in the Cape Coast Metropolis. Second, the introductory paragraph of the questionnaire also had a clause promising the respondents of their rights, privacy and confidentiality. Additionally, characteristics pertaining to the identification of the respondents were disregarded. Furthermore, a consent form detailing the study's goals, participants' rights, and confidentiality was produced for them to sign.

Chapter Summary

The main purpose of the study was to examine the attitude of students in integrating technology into learning in senior high school at the Cape Coast Metropolis. To achieve the main purpose of the study, a correlational research design was adapted. The main instrument for the data collection was a self-developed questionnaire which had 5-point Likert scale ranging from “strongly disagree to agree”. The Research hypotheses 1 to 8 and demographic were all analysed with a Structural Equation Modelling using Smart PLS.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The chapter focuses on the results and discussion of the empirical findings of the study. Specifically, the chapter starts with the demographic characteristics of respondents and continue with key findings for the hypotheses of the study. These hypotheses focused on establishing a relationship between students' attitude towards computers and their attitude towards the internet, online learning readiness, learning management systems (LMS), and behavioural intention to integrate ICT into their academic activities. Discussion of the findings and linking them to the literature reviewed was also featured in the chapter. The chapter concluded with the chapter summary.

Demographic Characteristics of Respondents

The two main demographic characteristics reported for this section of the results chapter are the gender of the respondents and the age of respondents. The results for respondents' demographic characteristics are therefore reported in Table 2. The results in Table 2 revealed that most of the students that participated in this study were male students (59.8%). This means that either most of the secondary schools that participated in this study from where these respondents were selected had more male population due to the nature of academic programmes run, or the applicant population in the area had more male applicants than their female counterparts.

The second demographic characteristic reported in this study was the age of respondents. The results, as shown in Table 2, revealed that most of the

respondents were 15-17 years old (72.7%). This age category perfectly agrees with the typical Ghanaian educational system, where the majority of pupils start primary at age six for the next six years (6+6) plus three years of junior high school. Thus, one ends his/her basic school in Ghana at age 15 and enters secondary school from age 15 years and above.

Table 2: Demographic Characteristics of Respondents

Demographic characteristics	Frequency	Percentage
Gender		
Male	219	59.8
Female	147	40.2
Total	366	100.0
Age		
15 to 17 years	266	72.7
18 years and above	100	27.3
Total	366	100.0

Source: Field data (2023)

Measurement Assessment to Test PLS-SEM Model

The main analysis started with checking the Internal consistency of the PLS-SEM model. This was done with the use of exploratory factor analysis. The algorithm results of the exploratory factor analysis are therefore presented in Figure 2 and Figure 3. The results presented in Figure 2 represent all the variables of the study with all their corresponding items used to measure them. The criteria used to determine acceptable thresholds for all the items used were based on the recommendations of Bervell et al. (2020) of 0.60 and above.

The results presented in Figure 2 revealed that SATI2 and SATI3 of the students' attitude towards internet (SATI) variables recorded loadings that were below the minimum threshold required. These items were, therefore, deleted because their values were below the 0.60 minimum thresholds. This

means that these two items were adequate or strong enough to contribute to the measuring of students' attitude towards the internet variable.

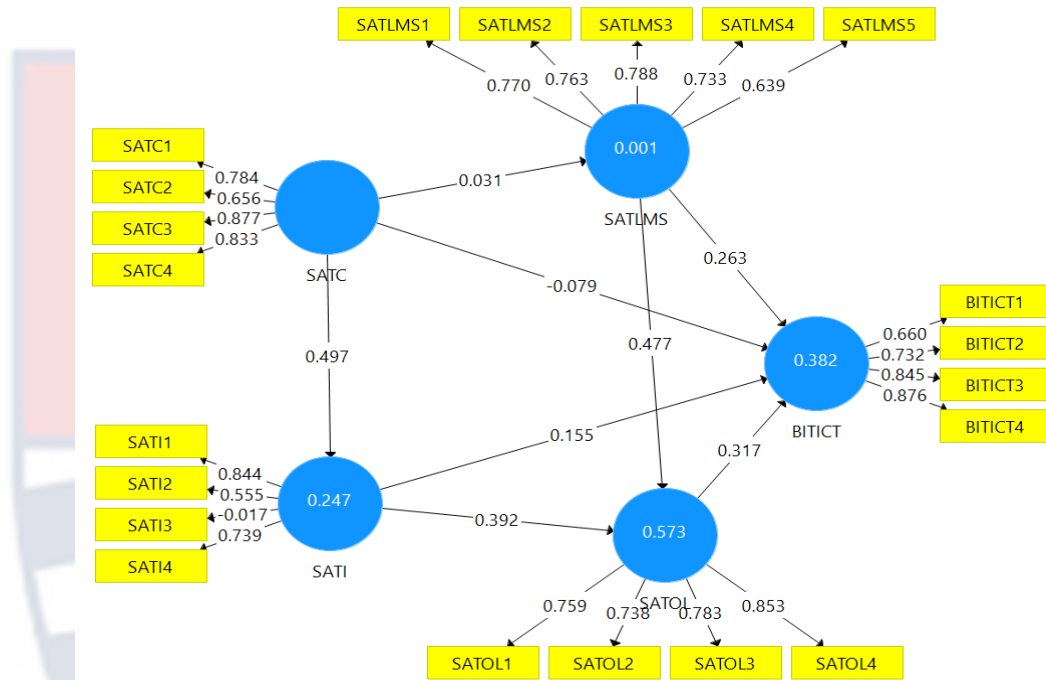


Figure 2: EFA Algorithm

The refined results after deleting the two items are presented in Figure 3. It can therefore be seen that all items measuring their respective variables of the study were all above the minimum threshold of 0.60 and above. That is, four well-loaded items were used to respectively measure students' attitude towards learning management system (SATLMS), students' attitude towards computers (SATC), students' attitude towards online learning (SATOL) and behavioural intention to integrate ICT into education. Two well-loaded items were also used to measure students' attitude towards the internet (SATI).

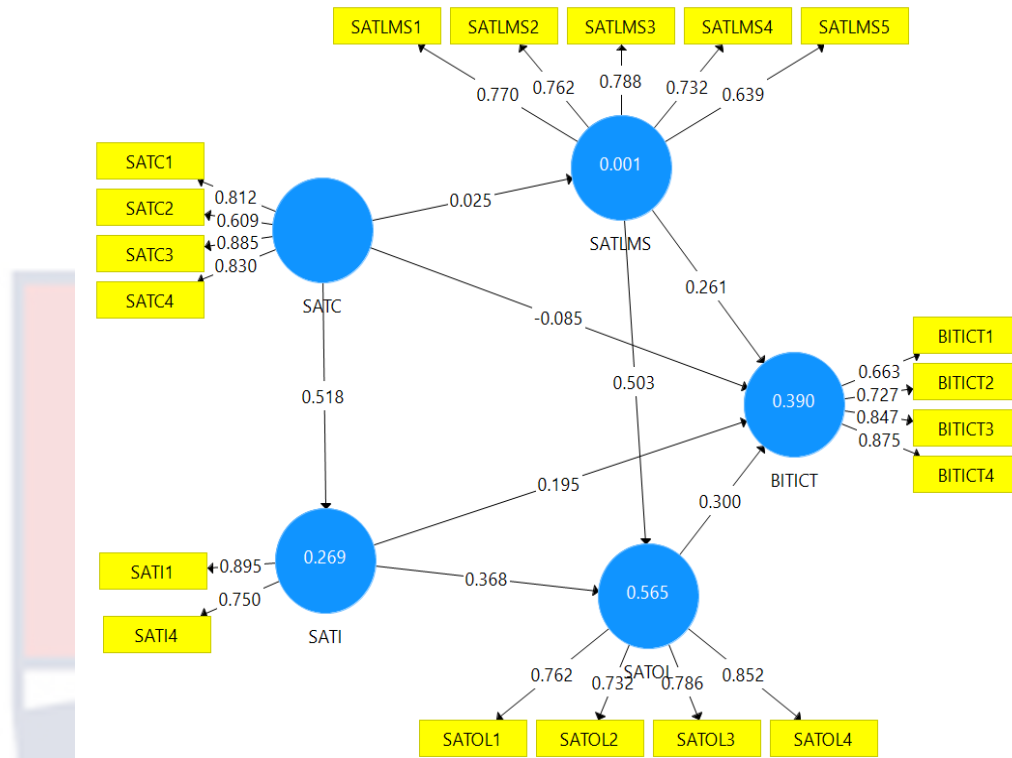


Figure 3: CFA Algorithm

Source: Field data (2023)

Construct Reliability and Validity

An internal consistency test of the PLS-SEM model was conducted to determine the construct validity and reliability of the model. Indicators used to achieve this were Cronbach's Alpha, rho-A, Composite Reliability, and Average Variance Extracted (AVE). A criterion recommended of a minimum threshold of 0.7 was used for the first three indicators (rho-A, Cronbach's Alpha, and Composite Reliability) as recommended by Bervell et al. (2020). The criterion used for the last indicator (Average Variance Extracted) was a minimum threshold of 0.50 (Bervell et al., 2020). The results are therefore presented in Table 3.

The results presented in Table 3 show that values obtained for Cronbach's Alpha were between 0.785 and 0.797, which were above the

minimum threshold of 0.70. Variable SATI (students' attitude towards the internet), however, recorded 0.602, which was below the recommended threshold. Also, values recorded for rho_A ranged between 0.796 and 0.838 for four out of the five variables of the study. Variable SATI (students' attitude towards the internet), again, recorded a rho_A value of 0.601 which is below the recommended minimum threshold of 0.70.

The third indicator (Composite Reliability) also recorded values ranging from 0.809 to 0.868 for all the five variables of the study. The last indicator- Average Variance Extracted (AVE), also recorded values ranging from 0.548 to 0.681, which were also above the minimum threshold of 0.50. Though the SATI variable under Cronbach's Alpha and rho_A measured below the recommended threshold, the variable was not deleted because it measured well on the remaining superior indicators. Thus, the SATI variable was maintained for further analysis.

Table 3: Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BITICT	0.785	0.812	0.862	0.613
SATC	0.797	0.838	0.868	0.626
SATI	0.602	0.601	0.809	0.681
SATLMS	0.796	0.816	0.858	0.548
SATOL	0.791	0.796	0.864	0.615

Source: Field data (2023)

Discriminant Validity

The study went further to check for discriminant validity after checking for construct reliability and validity. Heterotrait-Monotrait Ratio (HTMT) was used to conduct the discriminant validity. Hair et al. (2017) recommended a

maximum acceptable threshold of 0.850. That is, any value above the recommended threshold is not acceptable. Values obtained for the recommended HTMT, as captured in Table 4, were all below the maximum threshold of 0.850. Thus, the model achieves discriminant validity since the variables in the study were very distinct from each other based on the results presented.

Table 4: Heterotrait-Monotrait Ratio (HTMT)

	BITICT	SATC	SATI	SATLMS	SATOL
BITICT	0				
SATC	0.199	0			
SATI	0.661	0.710	0		
SATLMS	0.669	0.157	0.715	0	
SATOL	0.691	0.552	0.821	0.827	0

Source: Field data (2023).

Multicollinearity Analysis

The presence of multicollinearity can further lead to indeterminate or erroneous path relationships between variables (Bervell et al., 2020; and Kock, 2017). The presence of multicollinearity in the model can also lead to Type 1 or Type 2 errors. Therefore, the inner variance inflated factor (VIF) was used to check for the presence of multicollinearity in the PLS-SEM model used for the analysis, and the results are presented in Table 5.

Results obtained for multicollinearity as reported in Table 5 ranged from 1.000 to 2.739 which were below the recommended maximum threshold of 3.3. The results suggest that the PLS-SEM model used was without the presence of multicollinearity. Thus, Type 1 and Type 2 errors are avoided, and the path relationship yet to be established will not be erroneous. Based on this, the model further conducted other inferential analyses.

Table 5: Collinearity Statistics (VIF) Inner VIF Values

	BITICT	SATC	SATI	SATLMS	SATOL
BITICT					
SATC	1.783		1.000	1.000	
SATI	2.001				1.293
SATLMS	2.389				1.293
SATOL	2.739				

Source: Field data (2023)

Testing of hypotheses for path relationship

The main analysis to test the eight hypotheses guiding the study was conducted. Beta values, t-statistics values, alpha values, confidence intervals, and effect size denoted with f^2 were used to determine the strength of the path relationship between the study variables based on the eight hypotheses guiding the study. The path relationship results are, therefore, presented in Table 6. Six out of the eight hypotheses guiding the study were accepted because they were significant and validated, while the remaining two were rejected because they were not significant.

Specifically, there was a statistically non-significant relationship between students' attitude towards computers (SATC) and Behavioural Intention Towards ICT integration in Education (BIICT) for hypothesis one at ($\beta=0.085$, $t=1.237$, $p=0.217$). Hypothesis two, however, attained a significant relationship between students' attitude towards computers (SATC) and students' attitude towards the internet (SATI) at ($\beta=0.518$, $t=11.998$, $p=0.000$). The third hypothesis also recorded a non-significant relationship between students' attitude towards computers (SATC) and students' attitude towards learning management systems (SATLMS) at ($\beta=0.025$, $t=0.370$, $p=0.711$).

It is very important to note that the study accepted hypothesis four because it established that students' attitude towards the internet (SATI) significantly influence Behavioural Intention Towards ICT integration in Education (BIICT) at ($\beta=0.195$, $t=2.807$, $p= 0.005$). Furthermore, students' attitude towards the internet (SATI) were found to have significantly related to students' attitude towards online learning (SATOL) for the fifth hypothesis of the study at ($\beta=0.368$, $t=6.780$, $p= 0.000$). Also, the study further accepted hypothesis six of the study because it was validated.

That is, hypothesis six establishes that there was a significant relationship students' attitude towards learning management systems (SATLMS) and Behavioural Intention Towards ICT integration in Education (BIICT) at ($\beta=0.261$, $t=4.732$, $p= 0.000$). Results presented in Table 6 further revealed that there was a significant relationship between students' attitude towards learning management systems (SATLMS) and students' attitude towards online learning (SATOL) for hypothesis seven at ($\beta=0.503$, $t=8.317$, $p= 0.000$). The last hypothesis of the study (hypothesis eight) was also validated because it established that there was a significant relationship between students' attitude towards online learning (SATOL) and Behavioural Intention Towards ICT integration in Education (BIICT) at ($\beta=0.300$, $t=4.481$, $p= 0.000$).

The effect sizes obtained for each of the significant paths reported in the model were based on Cohen's (2017) suggestion that an effect size of 0.010 to 0.401 was acceptable. The unidimensional nature of the confidence intervals for the variables for all significant paths also revealed valid and reliable significance. Additionally, the significant results were further

strengthened by the confidence level of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries, respectively.



Table 6: Path Relationship

Hypothesized Relationships	Original Sample	Sample Mean	Standard Deviation	T - Statistics	P Values	Confidence Intervals		f ²
						2.5%	97.5%	
SATC -> BITICT	-0.085	-0.084	0.068	1.237	0.217	-0.209	0.049	0.007
SATC -> SATI	0.518	0.519	0.043	11.998	0.000*	0.426	0.602	0.367
SATC -> SATLMS	0.025	0.026	0.069	0.370	0.711	-0.101	0.172	0.001
SATI -> BITICT	0.195	0.197	0.070	2.807	0.005*	0.065	0.330	0.031
SATI -> SATOL	0.368	0.368	0.054	6.780	0.000*	0.271	0.478	0.240
SATLMS -> BITICT	0.261	0.268	0.055	4.732	0.000*	0.153	0.367	0.047
SATLMS -> SATOL	0.503	0.504	0.061	8.317	0.000*	0.375	0.615	0.450
SATOL -> BITICT	0.300	0.292	0.067	4.481	0.000*	0.142	0.413	0.054

Source: Field data (2023) p<0.01 significant level

Figure 4 presents results for the pictorial view of the path relationship among the variables of the study. The bootstrapping results in Figure 4, further confirm the results presented in Table 6 on the path relationship of the five variables of the study. The values and the arrows in Figure 4 further enhance and confirm the significant relationship between six out of eight hypotheses of the study and a non-significant relationship between the two hypotheses.

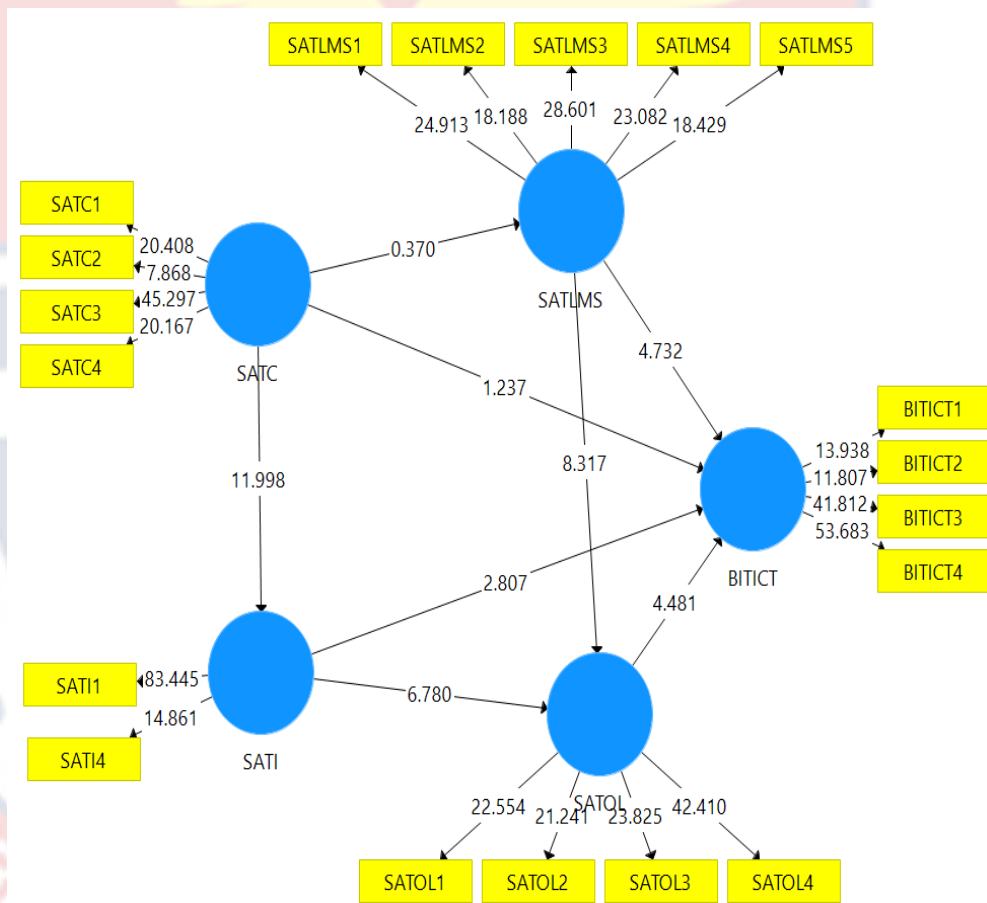


Figure 4: Bootstrapping

Source: Field data (2023)

Total Variance Explained by Model

Despite the individual contribution of the individual exogenous variables of the study reported with the beta values in the path relationship in Table 6, composite findings with regards to all the exogenous variables and how they explained the variances in the endogenous variables of the study

were also analysed. The results for the total variance explained by the model are therefore presented in Table 7. The results in Table 7 show that the PLS-SEM explains approximately about 39 percent variance in s Behavioural Intention Towards ICT integration in Education (BIICT) variable of the study.

Furthermore, the model explains about nine (27%) students' attitude towards the internet (SATI) and explains approximately 0.1 percent of the variance in students' attitude towards learning management systems (SATLMS). Lastly, the model explains about 57 percent of the variance in students' attitude towards online learning (SATOL). Using the criteria of Hair (2017) and Kline (2016) of variance above fifty percent (50%) as high, it can be concluded that the total variance explained by the model of study is very significant and high for SATOL and moderate for the key endogenous remaining variable, BITICT.

Table 7: Total Variance Explained by Model

	R Square	R Square Adjusted
BITICT	0.390	0.383
SATI	0.269	0.266
SATLMS	0.001	-0.002
SATOL	0.565	0.563

Source: Field data (2023)

Discussion of Results

Further explanations are provided here for the findings in relation to the hypotheses of the study. The detailed explanations are also lined with a literature review on the subject. The findings for the first hypothesis were that there was a statistically non-significant relationship between students' attitude towards computers (SATC) and behavioural intention towards ICT integration

in education (BIICT). These results mean that the influence of students' behaviour towards to integration of ICT into educational purposes in secondary schools in Ghana does not largely depend on such students' attitude towards computers.

A positive attitude towards computers among students is ascertained when these learners will prefer to use computers for academic purposes. Also, a positive attitude among students towards computers is demonstrated when these learners think that using computers for learning is better than using face-to-face teaching only. However, these elements of attitude on the part of learners are not adequate for ensuring ICT integration into academic activities among secondary students in Ghana. This means that computers were not enough to predict the use of ICT tools for educational purposes. These findings disagree with the findings of José Carlos and Ana Maria (2011) that a positive attitude among learners towards computers is a panacea for ICT integration in academic activities among learners.

The findings for hypothesis two that students' attitude towards computers (SATC) significantly relates to students' attitude towards the internet (SATI), mean a lot. The results mean that students' attitude towards computers do not only influence ICT usage for academic purposes but also influence students' attitude towards internet. That means that computer usage is linked to internet usage. Thus, a percentage increase in the effort to increase students' attitude towards computers will lead to the same percentage increase in the use of the internet for academic activities. A positive attitude towards a computer is demonstrated when students desire to use the computer for learning. This positive attitude towards the computer is needed to develop the

same positive attitude towards the internet among students. The finding agrees with previous findings of Also, Li, and Lee (2016) that a positive attitude towards computers leads to the same attitude towards the internet.

A negative attitude towards computer among learners also means that such learners will demonstrate a negative attitude towards the internet. Thus, students who have a negative attitude towards the internet equally had also developed a negative attitude towards computers. The results are in tandem with previous findings of Gibbs (2008) that a negative attitude towards computers leads to a negative attitude towards the internet.

Hypothesis three also established that students' attitude towards computers (SATC) does not significantly relate to students' attitude towards learning management system (SATLMS). The results suggest that if students hold a favourable view on using computers for learning, they will not necessarily develop a positive attitude towards learning management systems. The findings disagree with the conclusion by Link and Marz (2006), who found a significant relationship between attitude towards computers and attitude towards learning management systems.

Additional explanation can be provided for the findings for hypothesis four that there was a significant relationship between students' attitude towards internet and behavioural intention towards ICT integration in education (BIICT). This means that any percentage increase in students' attitude towards the internet leads to the same percentage increase in behavioural intention towards ICT integration in education (BIICT). A positive attitude towards the internet among students is demonstrated by learners when they prefer to use the internet for academic purpose. Also, students who think that using the

internet for learning is better than using only offline can be said to have developed a positive attitude towards the internet. This finding agrees with the findings of Sujeet and Jyoti (2013) that a positive attitude towards the internet leads to the integration of ICT for education.

Alternatively, students who failed to integrate ICT into their academic activities can be said to have developed a negative attitude towards the internet. Internet, thus, play a significant role in the adoption of ICT for education purpose. The findings of this study further support earlier conclusions by Ahmed et al. (2011) That negative attitude towards the internet leads to the failure of the adoption of ICT in academic activities.

Hypothesis five established that there was a significant relationship between students' attitude toward the internet and students' attitude towards online learning. This means that attitude towards internet is not only relevant for influencing students' usage of ICT for academic activities but also useful for influencing students' attitude towards online learning.

A percentage increase in students' attitude towards internet will lead to a percentage increase in students' attitude towards online learning. Students who hold the view that it is good to use the internet to access materials for learning could be said to have a positive attitude towards internet learning. Such students stand a better chance of developing a positive attitude towards online learning. Thus, online learning is dependent on internet usage. Alternatively, a negative attitude towards the internet will lead to a negative attitude towards online learning. Failure to adopt online learning among students could be traced to a negative attitude towards internet learning. The

findings of this study corroborate the findings of Taraj (2021) attitude of students towards internet leads to their attitude towards online learning.

Further explanation is also provided for the findings for hypothesis six that established that students' attitude towards learning management systems (SATLMS) significantly influence students' behavioural intention towards ICT integration in education (BIICT). Students attitude towards the learning management system is demonstrated if such students like to use the learning management system (LMS) for academic purposes and think that using LMS for learning is better than using just the marker and markerboard. Such students stand to develop an attitude towards integrating ICT in their academic activities. This means that a negative attitude towards the learning management system among students will lead to failure to integrate ICT into academic purpose and the opposite is also true. The finding of this study agrees with previous findings of Bervell et al. (2020) that attitude towards learning management systems among learners influence the adoption of ICT for academic activities.

Findings for hypothesis seven further expand the role of students' attitude towards the learning management system. The findings for hypothesis seven established that there was a significant relationship between students' attitude towards learning management system (SATLMS) and students' attitude towards online learning (SATOL). The results mean that students' attitude towards the internet is not the only variable that influences students' attitude towards online learning, but students' attitude towards learning management also plays a significant role.

That is, a percentage increase in students' attitude towards learning management systems will lead to the same percentage increase in student's attitude towards online learning. Online learning, therefore, shares its potency and relevance with a learning management system. This suggests that a positive or negative attitude among learners towards the learning management system will lead to a positive or negative attitude towards online learning. Thus, failure to patronise online learning could be due to students' negative attitude towards the learning management system. Therefore, this study's findings agree with the findings of Stantchev, Colomo-Palacios, Soto-Acosta, and Misra (2014) that failure to use online learning for academic activities among students could be explained by attitude towards learning management systems.

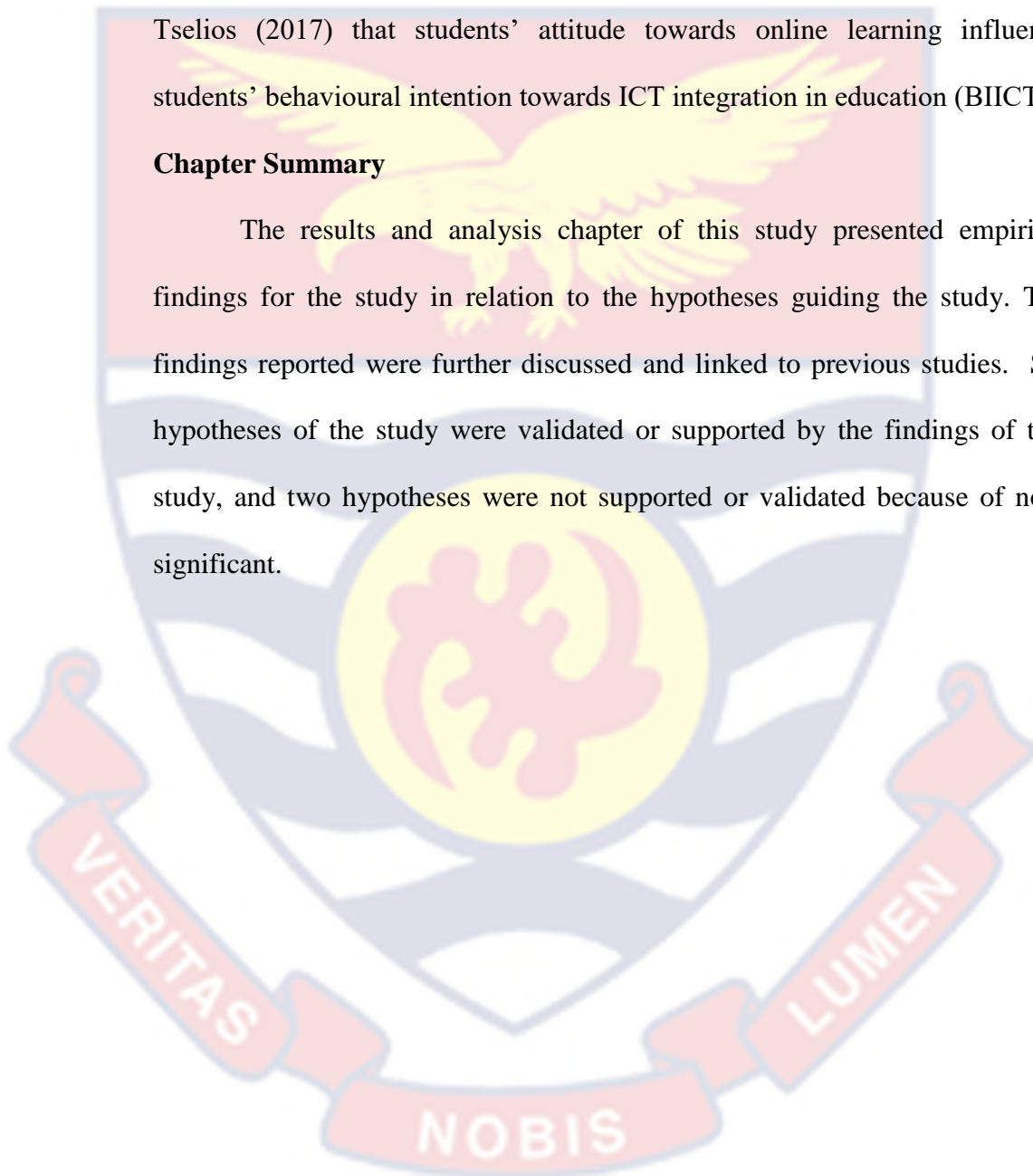
Findings for hypothesis eight of the study that there was a significant relationship between students' attitude towards online learning (SATOL) significantly influence behavioural intention towards ICT integration in education (BIICT) is explained further. The results mean that behavioural intention towards ICT integration in education (BIICT) is not only influenced by students' attitude towards the internet (hypothesis four) and students' attitude towards learning management systems (hypothesis six). Rather a behavioural intention towards ICT integration in education (BIICT) is also influenced by students' attitude towards online learning.

The results also mean that any percentage increase in students' attitude towards online learning will lead to an increase in students' behavioural intention towards ICT integration in education (BIICT). Thus, students' attitude towards online learning could be positive or negative. Students'

attitude towards online learning is demonstrated by students when such students favour the use of the online environment for learning and feel that it is good to use the online environment to access learning materials. The findings of this study further agree with the finding of Altanopoulou and Tselios (2017) that students' attitude towards online learning influence students' behavioural intention towards ICT integration in education (BIICT).

Chapter Summary

The results and analysis chapter of this study presented empirical findings for the study in relation to the hypotheses guiding the study. The findings reported were further discussed and linked to previous studies. Six hypotheses of the study were validated or supported by the findings of this study, and two hypotheses were not supported or validated because of non-significant.



CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The focus of this last chapter of the study is based on three key areas: key findings, conclusions and recommendations. The chapter starts with an overview which captures the purpose and hypotheses guiding the study as well as key issues on the methodology of the study. Additionally, the chapter also looks at the key findings for each hypothesis and based on the specific findings for each hypothesis, a conclusion was drawn. Lastly, the chapter ends with specific recommendations for key stakeholders to improve the attitude of students in integrating technology into learning in senior high school at the Cape Coast Metropolis.

Overview of the Study

This study sought to examine the attitude of students in integrating technology into learning in senior high school at the Cape Coast Metropolis. The study tested eight hypotheses: There is a statistically significant relationship between students' attitude towards computers and their attitude towards the internet, and learning management systems (LMS). Other hypotheses were: students' attitude towards the internet, and learning management systems (LMS) significantly relate to students' attitude towards online learning. Lastly, the study further hypothesized that students' behaviour intention towards ICT integration in education is significantly influenced by students' attitude towards LMS, computers, the internet, and online learning.

The study adopted the positivist philosophical position and quantitative approach. Specifically, the study used the correlational survey design, and a

sample size of 366 from a study population of 7,511 students from three senior high schools in the Central Region of Ghana (Saint Augustine's College, Ghana National College, Ogua Senior High School). Data collection instrument was a questionnaire measured on a five-point Likert scale. The analytical tool deployed for the data collected was the Partial Least Square - Structural Equation Model (PLS-SEM).

Summary of Key Findings

The presentation of key findings in this subsection is based on the eight hypotheses guiding the study. Each key finding reported in this subsection represents a key finding for a hypothesis guiding the study. Thus, the study found that:

1. There was a statistically significant relationship between students' attitude towards computers and their attitude towards the internet.
2. There was a statistically significant relationship between students' attitude towards computers and their attitude towards learning management systems (LMS).
3. Students' attitude towards online learning had a statistically significant relationship with students' attitude towards the internet.
4. There was a statistically significant relationship between students' attitude towards LMS and their attitude towards online learning.
5. There was a statistically significant relationship between students' attitude towards LMS and their behavioural intention towards ICT integration in education.

6. Behavioural intention towards ICT integration in education was not statistically significantly influenced by students' attitude towards computers
7. Students' attitude towards the internet had a significant relationship with their behavioural intention towards ICT integration in education.
8. Behavioural intention towards ICT integration in education was significantly influenced by students' attitude towards online learning.

Conclusion

Based on the key findings reported for the eight hypotheses guiding the study, it can be concluded that behavioral intention towards ICT integration in education was significantly predicted by students' attitude towards, internet, learning management systems, and online learning.

Furthermore, students' attitude towards internet and learning management systems significantly influenced students' attitude towards online learning. The overall contribution of the four variables of (students' attitude towards computers, the internet, learning management systems and online learning) predicted about a 39 per cent variance of behavioral intention towards ICT integration in education.

Recommendations

The conclusion drawn above calls for some specific actions to be taken by specific stakeholders to influence the behavioral intention towards ICT integration in education by students of the secondary schools in the Central Region of Ghana. It is therefore recommended that:

Management of secondary schools in the Central Region of Ghana should provide support for internet usage among students. This support could

come in the form of providing strong wifi internet connectivity on campuses of these secondary schools to enable learners to patronise internet services for academic activities.

Furthermore, it is recommended that secondary school authorities should adopt measures to introduce and encourage positive attitude among learners towards the use of learning management systems for academic activities. This can be done by providing LMS on campuses for academic activities. Meanwhile, the provision of the LMS is not enough but the training for the use of the LMS for academic activities is very crucial. To this end the need to train the two most important stakeholders, teachers and students is essential. Some courses or components of academic programmes could be delivered through the LMS platforms for students while away from campus or during non-classes hours to help students really develop a positive attitude towards LMS use for academic activities.

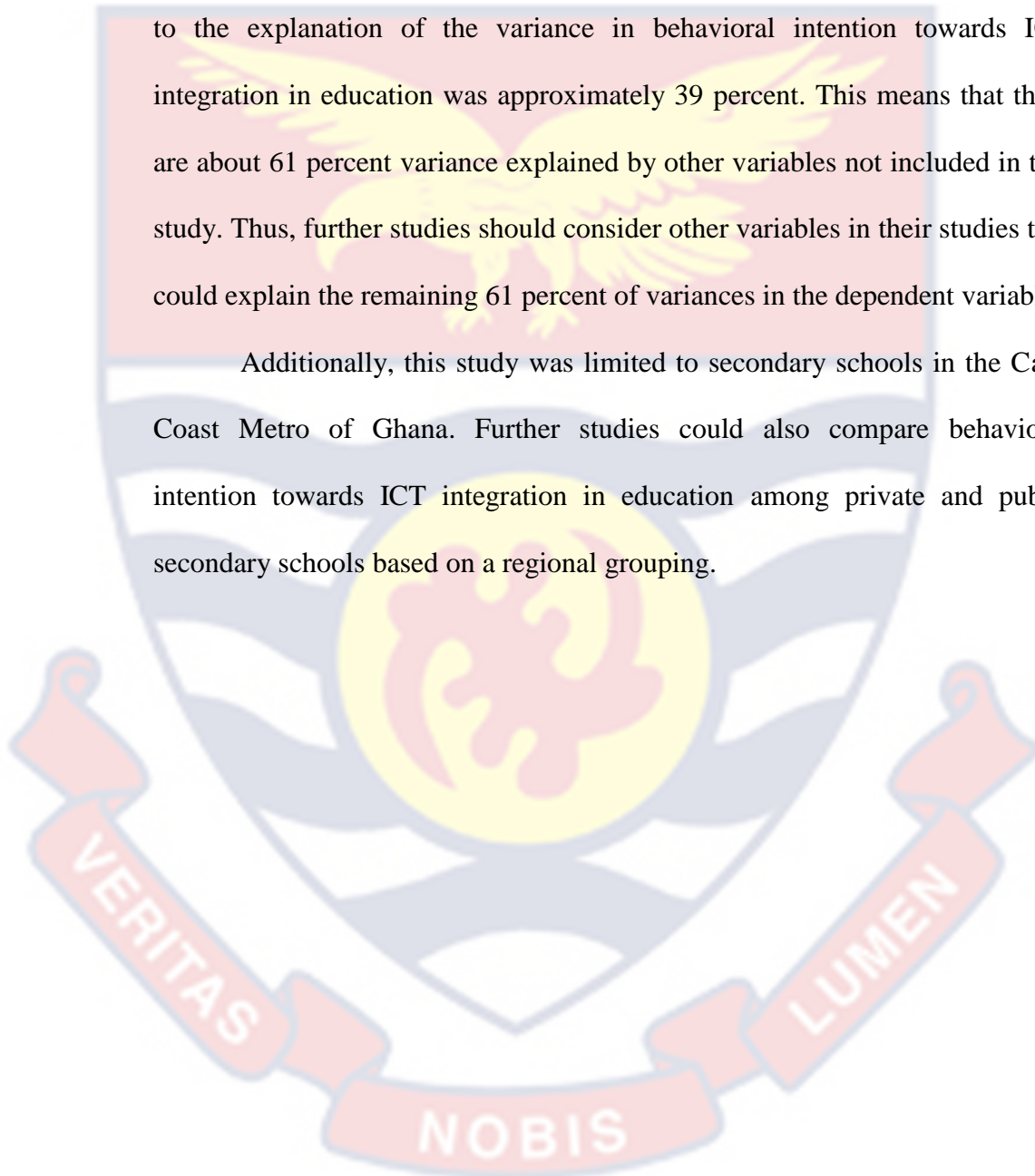
Finally, the need for influencing the positive attitude of learners towards online learning to influence behavioral intention towards ICT integration in education. For this reason, it is recommended that educational authorities in these secondary schools should provide online learning platforms for academic activities and these platforms should be brought to the attention of both learners and teachers. Availability and awareness are also not adequate to influence positive attitude towards online learning. Rather additional efforts should be brought on board to educate and orient these stakeholders on basic skills required for navigation on the online learning platforms. These online platforms could also help to deliver some academic

content during odd hours or while students are away from campus or from the classroom.

Limitations and Suggestions for Further Studies

The general contribution of the four independent variables of the study to the explanation of the variance in behavioral intention towards ICT integration in education was approximately 39 percent. This means that there are about 61 percent variance explained by other variables not included in this study. Thus, further studies should consider other variables in their studies that could explain the remaining 61 percent of variances in the dependent variable.

Additionally, this study was limited to secondary schools in the Cape Coast Metro of Ghana. Further studies could also compare behavioral intention towards ICT integration in education among private and public secondary schools based on a regional grouping.



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APPENDICES**APPENDIX A****UNIVERSITY OF CAPE COAST****COLLEGE OF DISTANCE EDUCATION****DEPARTMENT OF MATHEMATICS, SCIENCE AND ICT****EDUCATION****QUESTIONNAIRE FOR STUDENTS**

Dear Student,

You are invited to participate in the study “Attitude of Students towards Integrating Information Technology into Learning in Senior High School within the Cape Coast Metropolis.” I will therefore solicit your cooperation and consent to participate in this study. The confidentiality of your response is assured. You are kindly entreated to provide accurate responses by ticking items on this questionnaire. Thank you.

SECTION A**DEMOGRAPHIC INFORMATION**

Instruction: please, tick [] the appropriate box [

1. Gender

A. Male [] B. Female [

2. Age Group

A. 12 -14 years [] B. 15-17 years [] C. 18 years and above [

SECTION B: Students' attitude towards Computers

Please, tick [√] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

Strongly Disagree: SD

Disagree : D

Neutral : N

Agree : A

Strongly Agree : SA

S/N	Statement	SD	D	N	A	SA
3	I would like to use computers for academic purpose.					
4	I think that using computers for learning is better than using face-to-face teaching only.					
5	In my opinion, it is desirable to use a computer for learning.					
6	I hold a favourable view on the use of computers for learning.					

SECTION C: Students' attitude towards the Internet

Please, tick [] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

Strongly Disagree: SD

Disagree : D

Neutral : N

Agree : A

Strongly Agree : SA

S/N	Statement	SD	D	N	A	SA
7	I would like to use the internet for academic purpose.					
8	I think that using the internet for learning is better than using only offline.					
9	In my opinion, it is good to use the internet to access materials for learning.					
10	I hold a positive view on the use of the internet for learning.					

SECTION D: Students' attitude towards the Learning Management System

Please, tick [√] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

Strongly Disagree: SD

Disagree : D

Neutral : N

Agree : A

Strongly Agree : SA

S/N	Statement	SD	D	N	A	SA
11	I would like to use Learning management system (LMS) for academic purpose.					
12	I think that using LMS for learning is better than using just the marker and markerboard.					
13	In my opinion, it is effective to use LMS to access learning materials.					
14	In my opinion, it is convenient to use LMS to submit assignments.					
15	I think using LMS for examination is effective for quick feedback.					

16	I have a positive feel towards the use of the LMS for learning.					
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SECTION E: Students' attitude towards online learning

Please, tick [\surd] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

Strongly Disagree: SD

Disagree : D

Neutral : N

Agree : A

Strongly Agree : SA

S/N	Statement	SD	D	N	A	SA
17	I would like to use online learning for academic purpose.					
18	I think that using online learning is better than using only face-to-face teaching and learning.					
19	In my view, it is good to use online environment to access learning materials.					
20	I favour the use of online environment for learning.					

SECTION F: Students' Behavioural Intention towards ICT integration in Education

Please, tick [\surd] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

Strongly Disagree: SD

Disagree : D

Neutral : N

Agree : A

Strongly Agree : SA

S/N	Statement	SD	D	N	A	SA
18	I intend to use information communication technology (ICT) to support face-to-face in the next term if the school fully implements that.					
19	I predict I would use ICT system in the next academic year in addition to face-to-face sessions if the school fully implements that.					
20	I predict I would use ICT to complement face-to-face in future academic year sessions if it is fully implemented at school.					
21	I plan to use ICT for online activities as a support for face-to-face whenever possible.					

Thanks for time and effort.