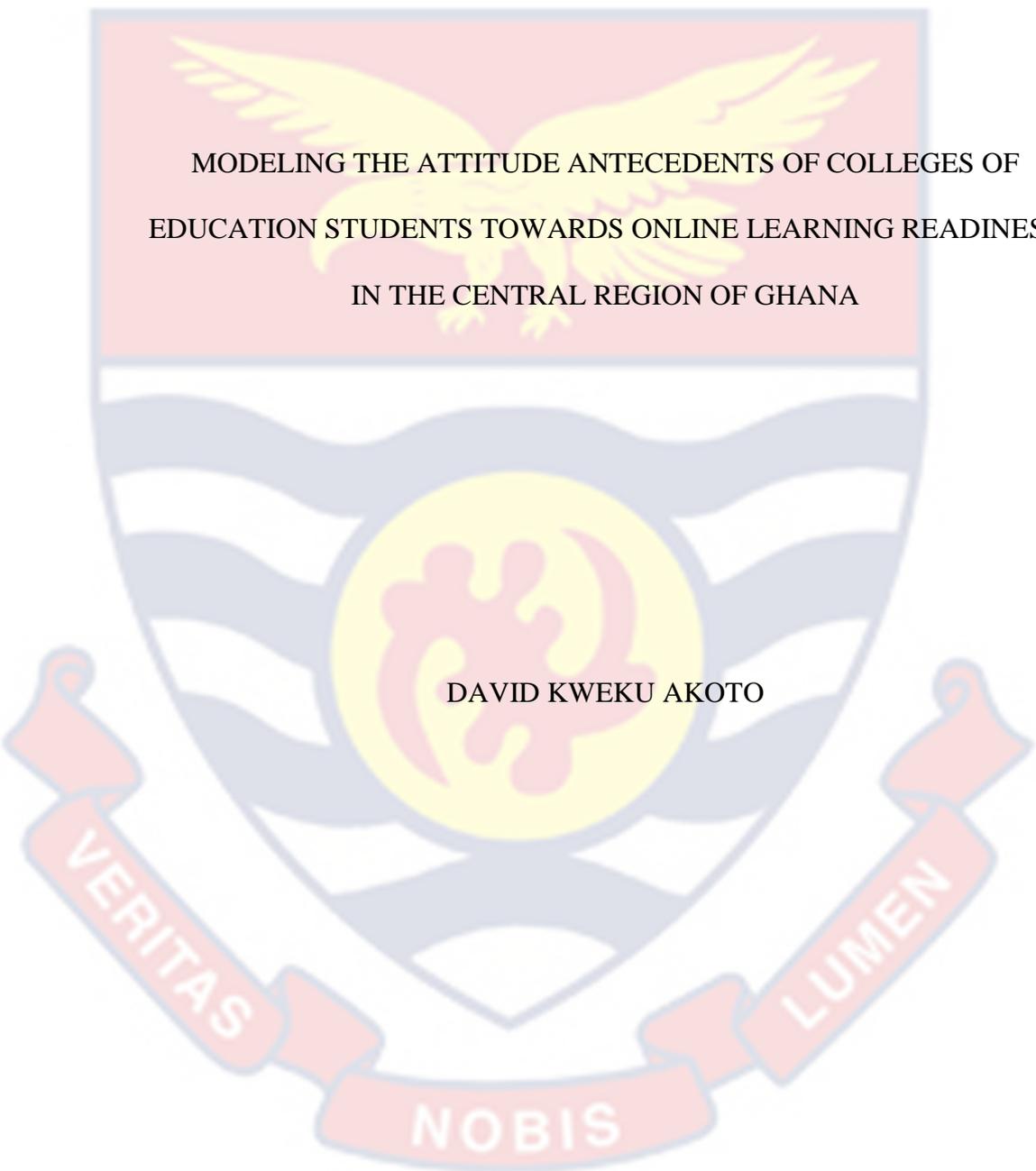UNIVERSITY OF CAPE COAST

MODELING THE ATTITUDE ANTECEDENTS OF COLLEGES OF

EDUCATION STUDENTS TOWARDS ONLINE LEARNING READINESS

IN THE CENTRAL REGION OF GHANA

DAVID KWEKU AKOTO

2023

UNIVERSITY OF CAPE COAST
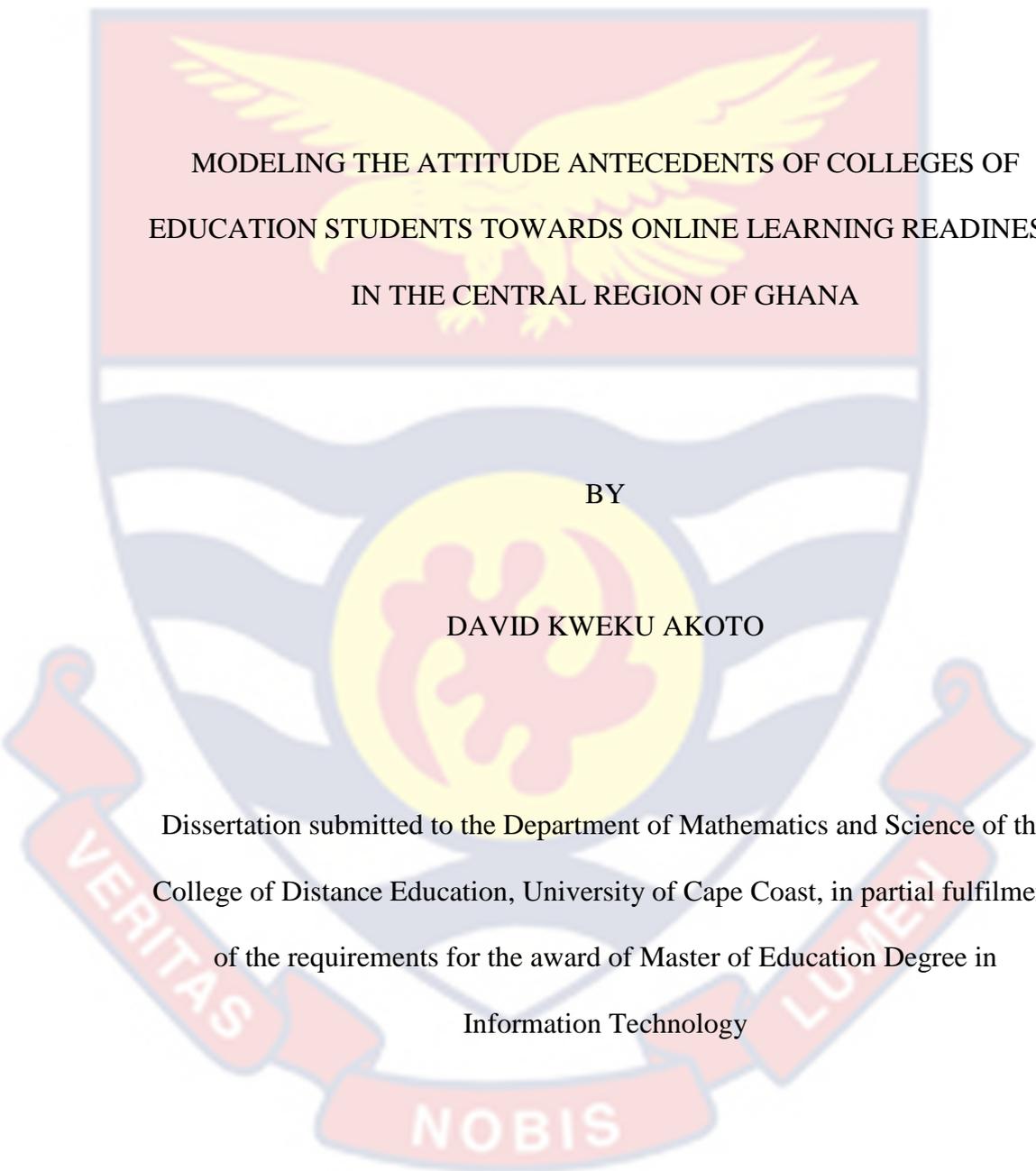
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IN THE CENTRAL REGION OF GHANA

BY

DAVID KWEKU AKOTO

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

JUNE 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.
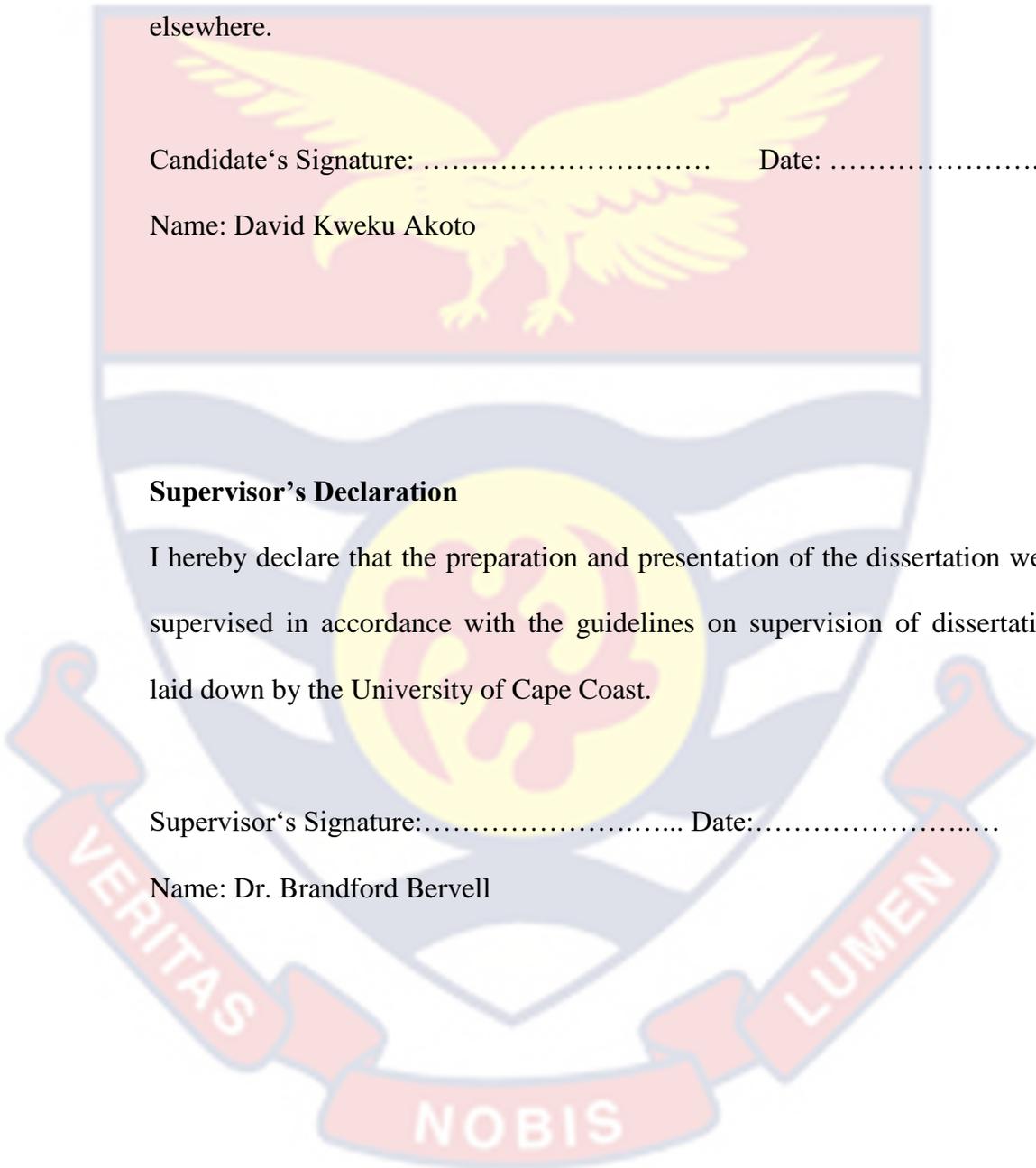
Candidate's Signature: …………………………   Date: ………………….

Name: David Kweku Akoto

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

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ABSTRACT

This study examined the attitude antecedents of Colleges of Education students towards online learning readiness. Specifically, the study tested nine hypotheses on how students' attitude towards computer, internet, LMS and online learning related to online learning readiness. The correlational research design from the positivist philosophical position and the quantitative approach was adopted for the study. A sample of 335 was drawn from a total population of 2,568 from three Colleges of Education in the Central Region of Ghana. Data were collected with structured questionnaire and were analysed with the Partial Least Square -Structural Equation Model (PLS-SEM). The study found that students' attitude towards computers, the internet, learning management systems and online learning significantly related to students' online learning readiness at Colleges of Education in the Central Region of Ghana. It was therefore recommended that authorities of Colleges of Education in the Central Region of Ghana should readily make available to their students' computers, internet facilities, learning management systems and online learning platforms. Equipping learners with the requisite basic skills to be able to use these platforms was also recommended to be able to influence students' positive attitudes towards online learning readiness at the Colleges of Education in Ghana.
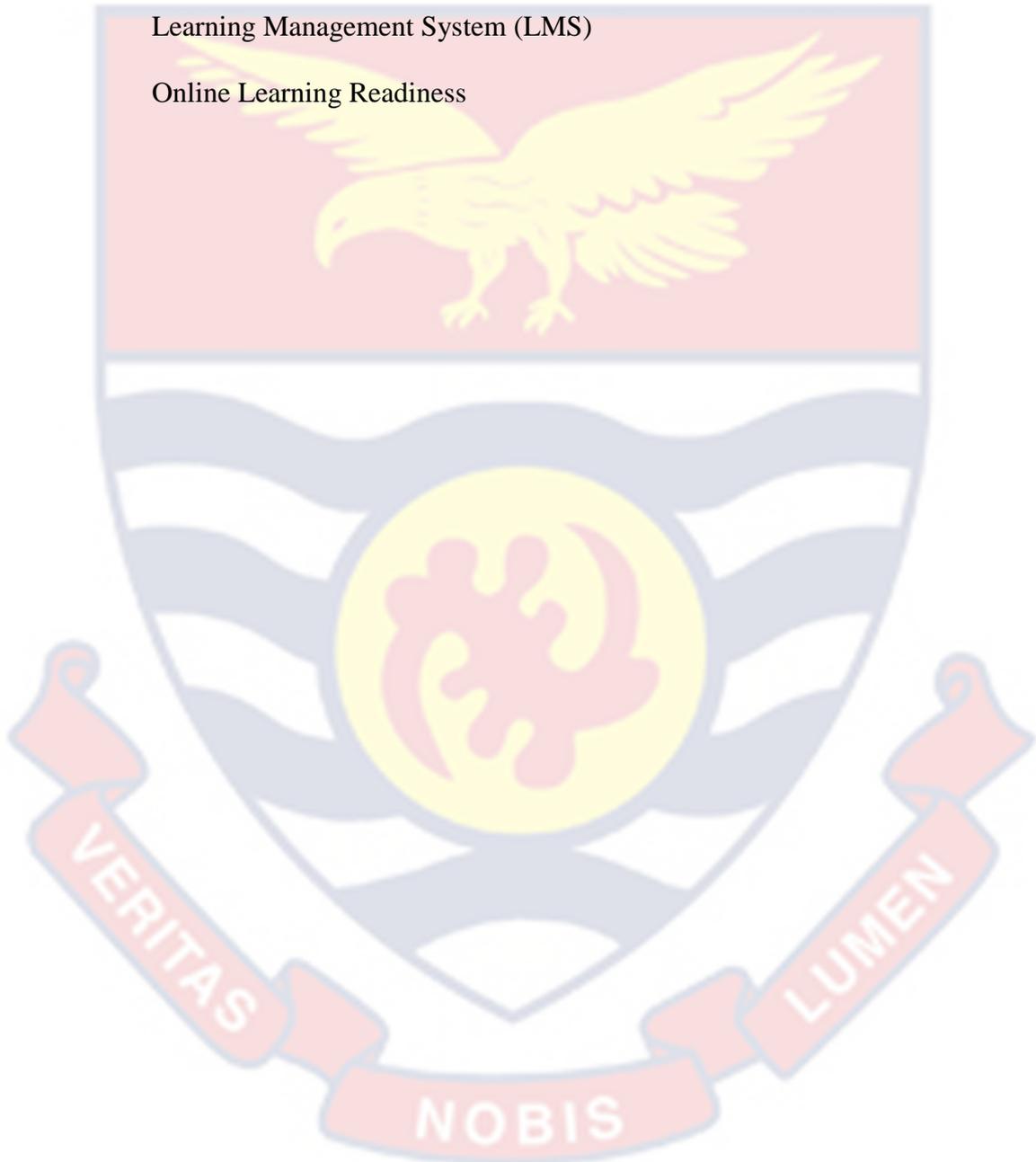
KEY WORDS

Attitude Antecedents

Computer

Internet

Learning Management System (LMS)
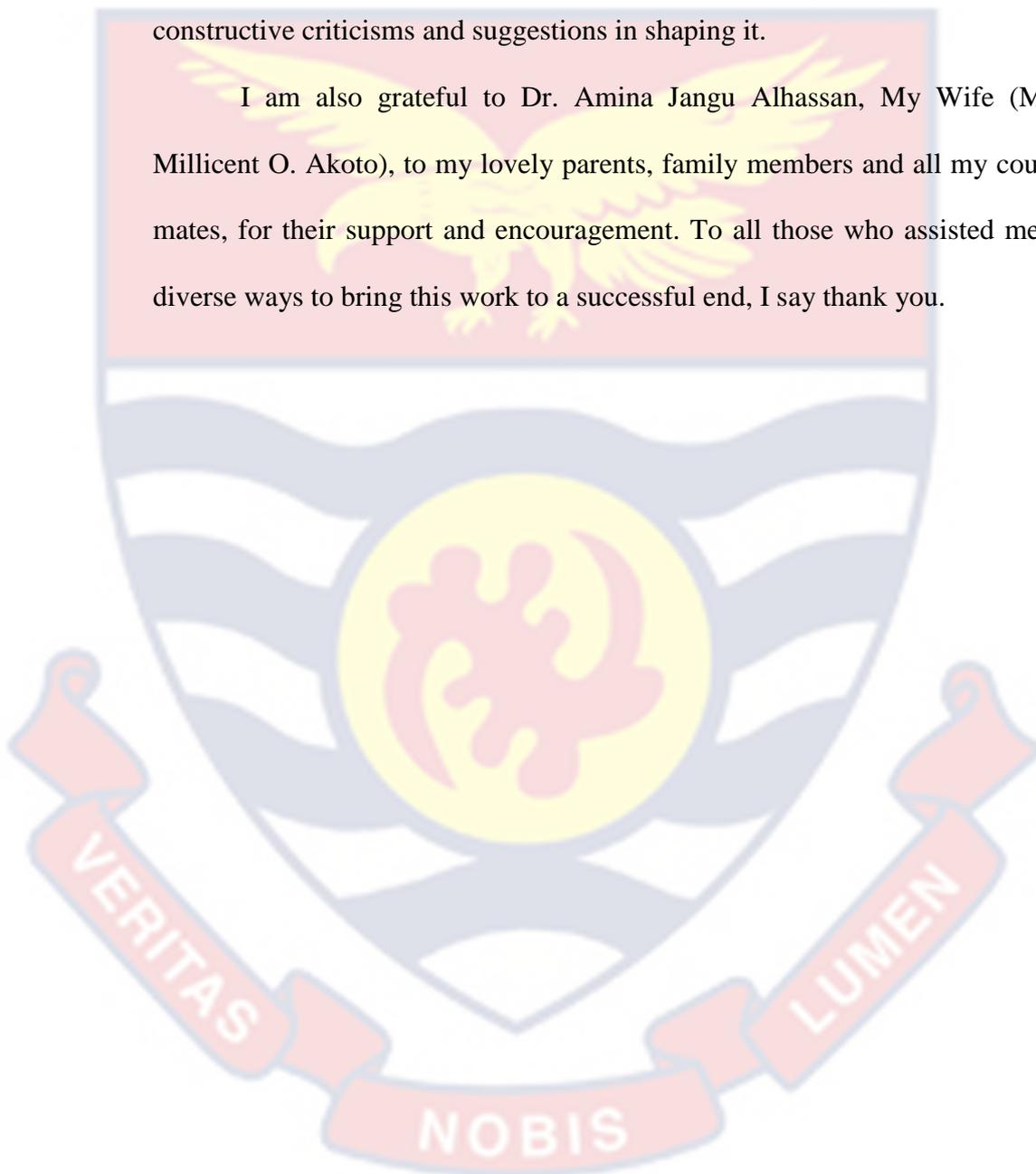
Online Learning Readiness

ACKNOWLEDGEMENTS

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 Dr. Amina Jangu Alhassan, My Wife (Mrs. Millicent O. Akoto), to my lovely parents, family members and all my course mates, for their 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 mother, Hunyametor Adzo Akoto.

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LIST OF ACRONYMS

C.A.I   Computer Assisted Instruction

C.D.L. P   California Distance Learning Project

G.S.O.E   Graduate School of Education

H.M.R   Heterotrait-Monotrait Ratio

I.C.T   Information and Communication Technology

I.T   Information Technology

L.M.S   Learning Management System

O.L   Online learning

O.L.R   Online Learning Readiness

P.I.S   Perceived Internet Self-Efficacy

S.U   Support to Use

T.M.I   Traditional Method of Instruction

V.L.E   Virtual Learning Environment

V.L.P   Virtual Learning Portal
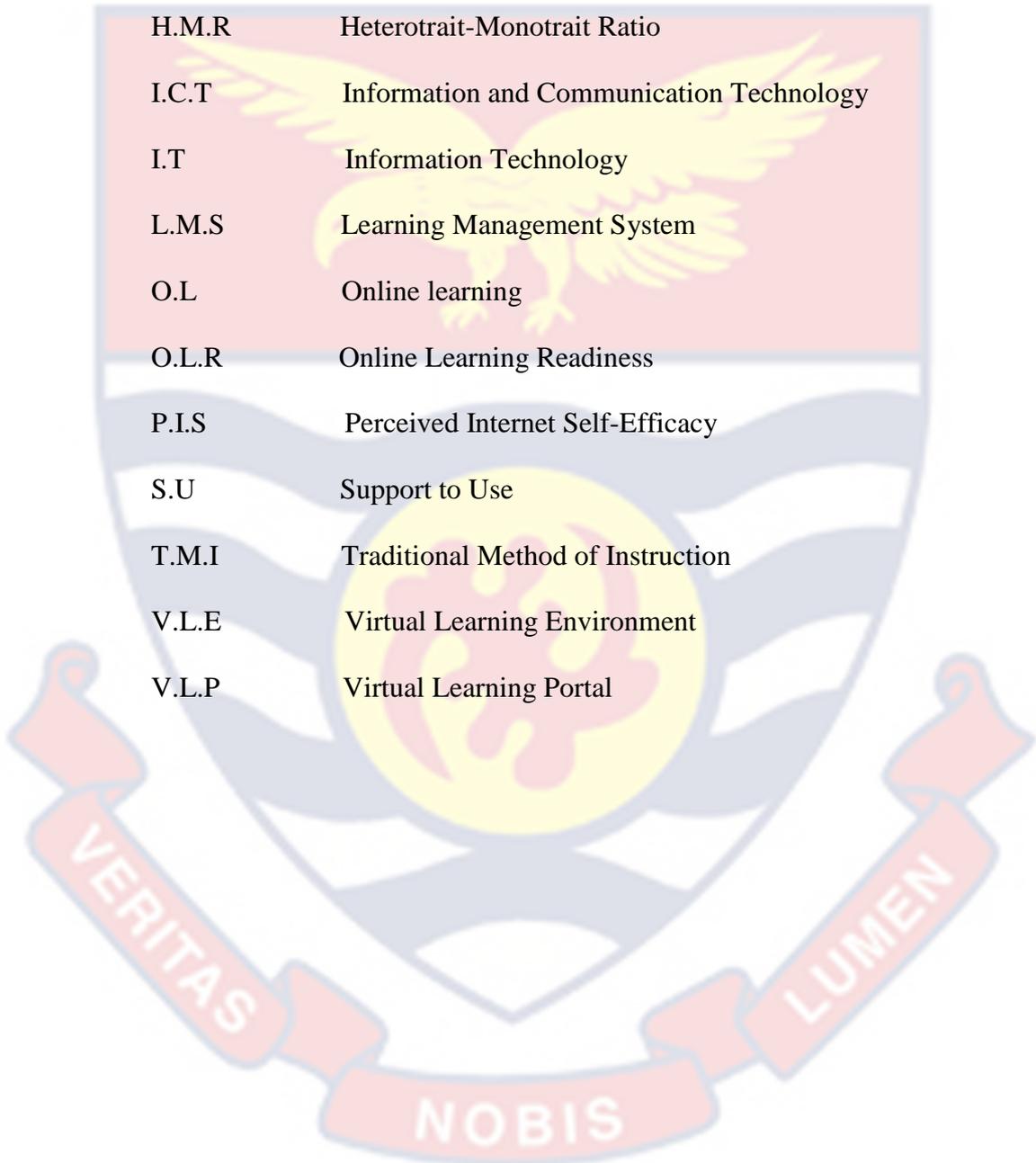
CHAPTER ONE

INTRODUCTION

Background to the Study

The usage of online learning upsurged during the outbreak of the novel Coronavirus (COVID-19) pandemic although the technology was selectively used by some educational institutions around the world (Al-Nuaimi, Al-Kabi, & Al-Emran, 2021). The lockdown instituted by various countries during the peak of COVID-19 restructured the way people behave thereby affecting educational institutions worldwide (Viner, Russell, Croker, Packer, Ward, Stansfield, Mytton, Bonell & Booy, 2020). To mitigate the challenges of the pandemic, many institutions of higher learning shifted from purely traditional teaching to blended learning and online learning for the meantime until students were vaccinated and were safe to return to the classroom (Kim, Park, Kim, Lee & Sigala, 2022). Indeed, the COVID-19 pandemic has created the opportunity to conduct a huge experiment with online classes in the university and the college settings.

According to Chitra and Raj (2018) online learning is the use of network technology to design, deliver, select, administer, and extend learning across geographical locations to improve learning. Online learning systems are utilised to deliver either a standalone instruction or blended learning instruction (Bervell, 2018) and it can be either asynchronous, synchronous, or hybrid mode to learners (Bervell, 2018). Online learning is convenient for the learner and cost-effective since the course content is reusable (Chitra & Raj, 2018). It is accessible, practical, and affordable (Yawson & Yamoah, 2020). Online learning is accessible because learners access learning content from

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anywhere (Bonsu, 2021). Other benefits of online learning include scalability, consistency, and personalisation (Bonsu, 2021; Guragain, 2016). According to Roman and Plopeanu (2021), these benefits made online learning the preferred choice during the crisis brought by the COVID-19 pandemic.

Online learning allowed for academic activities like lectures, assignments, quizzes, assessments, seminars, and workshops to be organised on WhatsApp Messenger, Learning Management Systems and Video conferencing like Zoom during the lockdown worldwide (Dhawan, 2020; Bonsu, Bervell, Armah, Aheto & Arkoful, 2021; Amankwa & Asiedu, 2022). Developed countries, particularly, continue to integrate online learning in education. In developing countries like Ghana for instance, some Colleges and Universities are adopting the use of the E-learning systems (Liguori & Winkler, 2020). Despite some success made in online learning implementation among colleges of Education in Ghana, inadequate ICT infrastructure in schools, power outages, high cost of internet, and slow internet speed affects its adoption rate (Adarkwa, 2021). According to Hall (2011), and Patterson, Mallett and McFadden (2012), in comparison with the face-to-face learning settings, online courses are often faced with low student readiness and consequently low completion rates.

A significant input for the learning-teaching system is readiness, which is crucial in the education-instruction process (Bloom, 1995). Change in behaviour of the student is based on his or her readiness. Online learning readiness thus refers to the degree to which a institution or organisation is prepared to use specific facets of e-learning technology before the entire e-learning environment is used for diverse purposes (Watkins, Leigh & Triner,

2004). Borotis and Poulymenakou (2004) also posited online learning readiness as "being mentally and physically ready for certain online learning experience and actions." According to Borotis and Poulymenakou (2004), online readiness is measured by user's capacity for adjusting to technological hurdles, collaborative learning and training, as well as synchronous and asynchronous self-paced learning.

However, concept of attitude plays a crucial role in online readiness (Chen & Li, 2010). Attitude refers to an individual's evaluative judgment or feeling towards an object, person, situation, or concept (Ajzen, 1991). It reflects a person's positive or negative disposition, beliefs, opinions, and emotions associated with the subject of interest. Attitude is a significant factor to consider because it influences students' willingness, motivation, and overall readiness to engage in online learning activities (Fishbein & Ajzen, 1975). Understanding the attitude antecedents becomes essential as they serve as the underlying factors that shape students' attitudes towards online learning readiness. Antecedents refer to the preceding factors that contribute to the development or formation of an attitude (Eagly & Chaiken, 1993). Several factors can serve as potential antecedents of attitude towards online learning readiness. These might include individual characteristics such as prior experience with technology, computer literacy skills, self-efficacy beliefs in using online platforms, perceived usefulness and ease of use of online learning systems, social influence from peers and instructors, perceived compatibility of online learning with educational goals and values, and institutional support for online learning initiatives (Davis, Bagozzi, & Warshaw, 1989; Venkatesh, Morris, Davis, & Davis, 2003).

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Usually, online learning readiness assessment is conducted prior to the introduction of online learning system to potential users. This online learning readiness measurement gauges a user's capacity for adjusting to technological hurdles, collaborative learning and training, as well as synchronous and asynchronous self-paced learning (Hashim & Tasir, 2014). According to Mosadegh, Kharazi, and Bazargan (2011), readiness is a key element in the implementation of online learning. In this study, individuals' skill application and access to technology are used to define preparedness. Therefore, the study seeks to examine the attitude antecedents of Colleges of Educations students towards online learning readiness.

Statement of the Problem

The importance of online learning has led to the need in assessing the mental and physical preparation of the users before adoption of a new online learning environment (Hashim & Tasir, 2014). Therefore, online learning readiness is required in making sure the users can use the online learning technology being implemented. This implies that online learning readiness is a key determinant of successful online learning adoption. The essential nature of students' readiness in online learning adoption has led to several research into students online learning readiness, especially during the COVID-19 era (Tang et al., 2021). McVay (2000), for example, posited that student's behaviour, and student attitudes, policy, technology, financial, human resources, infrastructures are the most significant factors that influence online learning readiness. Vilkonis, Bakanoveine and Turskiene (2013) emphasised readiness of students to learn using online learning is prompted by good computer literacy, by experience and other e-services. Then again, Eslaminejad, Masood

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and Ngah, (2010) found out that academic and technical readiness is the most critical factor to implement online-learning.

In Africa, research on students' readiness mainly focused on whether or not students are ready to use online learning. Mafunda and Swart (2020) assessed the e-learning readiness of engineering and information technology students in order to better support and improve their e-learning experience. They revealed that students were ready to use online learning in Africa. Pete and Soko (2020) also in their preparedness for online learning in the context of Covid-19 in selected Sub-Saharan African countries found that students from Kenya, Ghana and South Africa are prepared to use technology for education.

In Ghana, Tetteh-Richter (2015) evaluated the perceptions of adult learners' readiness, the extent to which instruction in Ghanaian universities employ andragogical principles online and, whether learners preferred online to traditional instruction. Findings from the study showed that only gender and educational background were perceived to have had any significant influence on adult learners' readiness for online instruction. Also, Banji, Frempong, Okyere, and Raji (2021) in their study of investigating the university student's readiness for E-learning during the Covid-19 Pandemic" revealed that more than half (62.9%) of the students were not ready for the use of e-learning platforms with a level of study associated with readiness. Amanor-Mfoafo, Akrofi, Edonu and Dowuona (2020) looked at e-learning readiness of Ghanaian parents during COVID-19. Their study unearthed that parents with a high socio-economic status were ready to guide their wards through online learning.

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From the foregoing, it could be seen that studies in Africa and Ghana on students' online learning readiness have not focused on examining the attitude antecedent of students towards online learning readiness and this could lead to the failure of the online learning practice. Thus, there is no current attempt to explore the attitude antecedents of student online learning readiness. It is against this backdrop that this current study examines the attitude antecedents of College of Education students in the Central Region of Ghana. Thus, this study seeks to model specifically students' attitudes towards computers, LMS, internet, online learning and how they determine their online learning readiness.

Purpose of the Study

The main purpose of the study was to assess the attitude antecedents of Colleges of Educations students towards online learning readiness. Specifically, the study sought to;

1. examine the relationships that exist among students' attitude towards computers, the internet, LMS and online learning.

2. examine the relationships between the various attitude antecedents and students' online learning readiness.

Research Questions

The following research questions guided the study:

1. What is the relationship that exist between students' attitude towards computers, the internet, LMS and online learning?

2. What are the predictors of students' online learning readiness?

Research Hypotheses

HO$_1$: There is no statistically significant relationship between students' attitude towards computer and their attitude towards the internet.

HO$_2$: There is no statistically significant relationship between students' attitude towards computer and their online learning readiness.

HO$_3$: There is no statistically significant relationship between students' attitude towards computer and their attitude towards LMS.

HO$_4$: There is no statistically significant relationship between students' attitude towards computer and their attitude towards online learning.

HO$_5$: There is no statistically significant relationship between students' attitude towards the internet and their attitude towards LMS.

HO$_6$: There is no statistically significant relationship between students' attitude towards LMS and their attitude towards online learning.

HO$_7$: There is no statistically significant relationship between students' attitude towards the internet and online learning readiness.

HO$_8$: There is no statistically significant relationship between students' attitude towards LMS and their online learning readiness

HO$_9$: There is no statistically significant relationship between students' attitude towards online learning and their online learning readiness.

Significance of the Study

The findings from this current study would create the awareness of the attitude antecedents of online learning readiness in the Colleges of Education in Ghana who are the major stakeholders in this study. Again, the research findings would assist the policy makers like the heads of colleges and the government to implement policies and schemes that will improve online

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learning readiness in the colleges of education and other tertiary institutions in the country. The research findings would also be beneficial to instructors who want to utilise online learning in their teaching and they would know how to best handle various attitudes of students during class. Lastly, this study will also be a source of reference or basis for other researchers intending to further study this area and beyond.

Delimitation

The study was delimited in scope to the modelling of the attitude antecedents of colleges of education students towards online learning readiness in the Central Region of Ghana. Geographically, the study was delimited to students of colleges of education in Central Region of Ghana. The study was limited to only attitude without considering the other possible factors that may influence online learning readiness.

Limitations

This study has inherent limitations. First, the close-ended questionnaire limited the responses of the respondents. Again, using a close-ended questionnaire can cause respondents to fake unwarranted responses.

Organisation of the Study

The study was organised in five chapters. Chapter One comprised the background to the study, statement of the problem, purpose of the study, research questions, significance of the study, delimitation, limitation, and organisation of the study. Chapter Two, dealt with an extensive review of conceptual and empirical literature related to the study. The methods of the study were clearly explained in Chapter Three. It comprised the research design, population, sample and sampling technique, instrument for data

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collection, instrument validity and reliability, data collection and analysis. Chapter Four focused on the presentation of results and findings of the study, and Chapter five highlighted the summary of the findings, conclusion, and recommendations as well as areas for further study.

Definition of Terms

The following definitions are provided to facilitate an understating of the terms that will be used throughout this study:

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.

Online Learning Readiness: Online learning readiness refers to the degree to which a institution or organisation is prepared to use specific facets of online learning technology before the entire e-learning environment is used for diverse purposes.

Attitude: Attitude refers to an individual's evaluative judgment or feeling towards an object, person, situation, or concept.

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

Readiness: refers to a proactive state indicating a level of preparedness that allows for a more effective and efficient response to whatever challenges or tasks may arise.

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CHAPTER TWO

LITERATURE REVIEW

Overview

This chapter presented the literature review of the study. It dwelt on review of concepts relating to online learning, benefits, challenges, characteristics of online learning, and Learning Management Systems such as Moodle and Google Classroom. The conceptual framework for the study was developed based on empirical review and depicted with the aid of a diagram. In addition, the study provided a theoretical basis that guided the entire work.

Theoretical Framework

The theoretical framework is a theory that supports research (Grant & Osanloo, 2014). This study utilised social constructivism as the theoretical basis. The theory pioneered by Lev Vygotsky argues that individuals are active participants in knowledge creation (Schreiber & Valle, 2013). Social constructivism explains learning as what goes on socio-culturally rather than solely within the learner (Schreiber & Valle, 2013). Thus, the development of scientific knowledge is determined by social forces (Detel, 2001). According to Johnson and Bradbury (2015), social constructivism focuses mainly on small groups of people. Additionally, instructors stimulate, facilitate, and guide knowledge acquisition in the classroom (Powell & Kalina, 2009). For instance, students learn primarily through interactions with their peers, instructors, and parents.

The study used frameworks to design, develop measurement instruments, and identify strategies in promoting positive attitudes and engagement in online learning environments. (Barfi et al., 2021; Bonsu, 2022).

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Theoretical perspectives provide a foundation for understanding the factors that contribute to attitudes towards online learning.

Conceptual Review

Online Learning

Online learning, also called virtual learning, has been given various definitions by various educational technologists relying on various contexts and their personal instructional philosophies. For instance, according to Nguyen (2015), online learning refers to lessons delivered over the internet, blended learning, or any learning supported by digital tools such as TV, radio, video, PowerPoint, zoom meetings, google meetings, or social media platforms. Online learning provides opportunities for distance learning. Online learning is a type of distance education or distance learning. According to Bariham (2022), the California Distance Learning Project (CDLP) views distance learning as teaching and learning that connects students with academic resources and instructors without expecting them to be physically present at a learning institution.

From the above definition, online learning means any academic activity supported by applied technologies such as the internet, video, zoom meetings, google meetings, radio, Learning Management Systems and social media. Online learning is a broad concept that consists of several educational environments and approaches. Learning is not all about teaching, but huge volumes of academic work involve researching, discovering, finding, questioning, reading, selecting, creating, drawing, and writing texts (Gourlay & Oliver, 2018). Online learning could be asynchronous online guides (where freshmen work at a distance with no category meeting time), synchronous

online programmes (where the instructor and all college students have instruction online simultaneously), or hybrid learning (where standard face-to face-instruction is combined with online interaction).

To achieve quality education for all, countries should ensure increasing access must be accompanied by strategies to improve the quality and relevance of education and lifelong learning. Education institutions and programmes must be adequately and equitably resourced with a safe learning environment, and easily accessible facilities; an adequate number of teachers and educators of quality using student-centred, active, and collaborative pedagogical approaches, including technology, to provide quality education for all (UNESCO, 2015). Presently, cloud technology has made it viable for quality instructions to be delivered online, reaching millions of novices throughout the globe. Thus, Senior High Schools should adopt online learning strategies to develop Ghana's human capital to become competent, globally competitive and engaged citizens.

Online learning not only equips learners with 21st century skills, but social skills and digital literacy which are core competencies in education. To achieve a sustainable integration of technology in education to boost the government's digitalisation agenda further, the Government of Ghana have rolled out some interventions such as "The One Teacher One Laptop Policy" which led to the distribution of 280,000 laptops to teachers across the country, rural telephony and digital inclusion project, girls in the ICT project, deployment of Learning Management Systems (LMS) to 25 public tertiary institutions, digitalization of lesson plans among others.

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Features of Online Learning

Some of the main features of online learning are outlined below:

(i) Connectivity or networking: This technology, i.e., computers and broadband internet, enable individuals who are separated by great distances to connect and network and to access audio-visual resources (Willis, 1994).

(ii) Flexibility: Due to potential occupations, learners' learning hours might vary from late at night to early in the morning. Such learners can have their demands met via e-learning. Students who are similarly disabled or unwell and find it challenging to attend regular classes might gain from this (Li, 2009).

(iii) Interactivity and collaboration: This is connectivity not just between the teacher and the students but also between the students themselves, allowing for information exchange, the publishing of comments, etc (Li, 2009).

(iv) Virtual Learning Environment (VLE): A virtual learning environment (VLE) or virtual learning portal (VLP) is frequently created to enable interested persons or learners to have access to educational material like texts, visuals, quizzes, etc. available on it. This is done in light of the special needs of learners and the scope this technology offers institutions and scholars (Bhatia, 2011).

Benefits of Online Learning

The literature on the advantage educators and first-year students derive from online learning has generated mixed findings. The most mixed of all studies is the Meta-analysis conducted by Nguyen (2015). Asarta and Schmidt

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(2017), pointed out that in some studies, students engaged in virtual or blended learning performed better, however in others, they recorded worse achievement. For some, there had been no significant variations between the performance of students taught online and those taught with the Traditional Methods of Instruction (TMI). However, lack failed to provide sufficient evidence to determine whether online learning was substantially more or much less advantageous and efficient than the TMI. Asarta and Schmidt (2017) have discovered positive findings associated with virtual learning including an increase in learners' achievement, inspiring students to learn, improving students' participation, providing immediate feedback, and an increase in cooperative learning, among others.

For instance, Parris (2012), in his mixed experimental study that applied PeerWise software online tool to study Political Science students, reported a significant improvement in students' achievement, strong motivation to learn, and a positive attitude towards online learning. Similarly, Sedega et al. (2017) carried out a quasi-experimental study on the impact of Computer Assisted Instruction (CAI) on Ghanaian senior high school students' performance in mathematics. The findings discovered a widespread improvement in the students' performance in mathematics.

Navarro and Shoemaker (2000) concluded that learners' fulfilment for online learning has been as good and better than TMI, regardless of the characteristics of students. This assertion could be problematic as student's backgrounds such as gender, geographical location and socioeconomic status greatly influence their propensity to access the internet for meaningful online learning. Means et al. (2010) cited in Nguyen (2015) reported that a study by

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the US Department of Education in 2017 involving a systematic review of literature across 1000 empirical studies on online learning from 1996-2008 concluded that significant variations in students' achievement were higher in learners taught with a blended learning approach. This finding strongly justified the need for blended learning as an effective approach to quality instruction delivery. The study also identified the combination of time spent, pedagogy, and curriculum in virtual learning format yielded the observed variations in students' learning outcomes. However, no sufficient evidence existed to conclude that online learning was a superior medium of instruction than the Traditional Medium of Instruction (TMI).

Kotoka (2012) conducted a study on the impact of computer-based stimulation on secondary school students' understanding and performance on the magnetic effect of electric current, found Computer Based Instruction successful as an instructional strategy. The study adopted Solomon-Four-Quasi Experimental Design, which involved comparing two controlled and two experimental groups. They concluded that using computer-assisted instructional strategies in various subject areas and across many countries has yielded positive results. Notwithstanding the above, other studies recorded unfavourable findings associated with online learning.

For example, in a survey commissioned to compare students' performance in Microeconomics courses, Brown and Liedholm (2002) observed that learners engaged in virtual learning performed significantly worse than those taught with the traditional methods and that the variations were more pronounced for complex test items and less pronounced for elementary test questions. They added that male students' achievement was

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significantly more significant than female students taught with the traditional method. However, there had been no vast differences in performance for the sexes when taught with online strategy. Bariham (2022), discovered sex as a moderating variable for students' performance when comparing virtual learning with the TMI.

Harmon and Lambrinos (2012) also hypothesised that students' performance might differ from graduate students who are more mature with superior, unbiased, and independent learning skills. Applying panel data and fixed effect model to eliminate biases from the observable variables, it was discovered that the impact of online learning was not significantly different from the TMI strategy for graduate students but could have a positive impact on students' performance. This implies that mature learners with higher independent studying abilities including senior high school learners are appropriate candidates for online learning. However, if effectively planned and blended with TMI pedagogies, online learning can benefit all students regardless of their level of education.

Challenges of Online Learning

E-learning adoption in higher education in Africa face several challenges. Eltahir (2019) indicated that the challenges of adopting e-learning systems in developing countries, however, remain a reality due to the digital divide within developing countries. Ideally, these challenges vary from one country to another country, due to different cultures, contexts, and tutors' and students' readiness. Attitudes can influence students' readiness, motivation, and engagement in the online learning environment. Thus, attitudes are resistance or skepticism towards online learning. Some students may hold

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negative attitudes or preconceived notions about online education, perceiving it as less effective or lacking in interaction compared to traditional face-to-face learning. Such negative attitudes can hinder students' willingness to fully engage in online learning activities and may lead to decreased motivation and effort.

Lack of information communication technology (ICT) knowledge, poor network infrastructure and weakness of content development were the main challenges of e-learning system adoption in developing countries (Aung & Khaing, 2015). Another study revealed that system characteristics, internet experience and computer self-efficacy were the main issues that impede the successful adoption of e-learning systems in Pakistan (Kanwal & Rehman, 2017). A similar study conducted in Kenya identified three main challenges of e-learning: inadequate ICT infrastructure, lack of technical skills and financial constraints (Tarus et al., 2015).

Similarly, a study by Mulhanga and Lima (2017) identified that poor interface design, inadequate technical support and lack of IT skills are the primary barriers that hinder the successful implementation of existing e-learning projects. Mulhanga and Lima (2017) claimed that cultural, political, and economic constraints are the main reasons to fail the e-learning initiatives in Libya. In the same way, Kenan et al., classified the challenges that affect the actual use of e-learning into four categories: management challenges, technological challenges, implementation challenges and cultural challenges.

To address these challenges, it is important for educators and institutions to understand and address students' attitudes towards online learning. Efforts can be made to provide accurate information about the benefits and

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effectiveness of online education, address concerns and misconceptions, and create a positive learning environment that fosters positive attitudes and motivation towards online learning.

Learning Management System

A Learning Management System (LMS) automates many of the processes associated with learning. It is a management software package enabling the delivery of learning content, resources and activities and also handles the associated administration tasks (Hobbs, 2005). It also gathers data to monitor the learning process (Bervell, 2018). LMS have been used for purely online, offline and blended learning all over the world. LMS as web-based learning which are synchronous, open-network structures created to facilitate collaborative, active, authentic, creative and constructive learning (Xin, Shibghatullah, Subaramaniam & Wahab, 2021). The majority of Learning Management Systems have the same general features (Collins & Moonen, 2001):

- general course organisation (including administration and record-keeping of student marks and absences, as well as general planning for the course)
- content (e.g., lectures, learning objects)
- self-study (including instructions, readings, practical exercises)
- assignments
- testing
- communication (teacher-to-student, student-to-teacher, student-to-student, group-to-teacher, teacher-to-group, etc.)

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LMS also has learning environment personalisation, web-driven tool for communication, and enabling best practice for instruction, allowing instructors to deliver instruction (Alnajjar & Asadi, 2020). 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 (Xin, Shibghatullah, Subaramaniam & Wahab, 2021).

Conceptual Framework

One or more formal theories are included in a conceptual framework, either in full or in part, together with additional ideas and empirical data from the literature. It is employed to illustrate the connections between these concepts and how they relate to the research topic (Lemieux, 2023). According to Imenda (2014), a conceptual framework is a synthetization of interrelated components and variables which help in solving a real-world problem. It is thus the final lens used for viewing the deductive resolution of an identified issue (Imenda, 2014).   The conceptual framework for the study examines the relationship among students' attitude and their readiness to integrate ICT in education. Attitude, in this context, refers to "feelings, beliefs and reaction of an individual towards an event, phenomenon, objects or person" (Olufemi, 2012). Attitude are not innate character of mankind: They are either learnt and can be modified (Olufemi, 2012). Readiness, on the other

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hand, refers to the degree to which a particular institution or an individual is prepared to use specific facets of e-learning technology (Watkins, Leigh & Triner, 2004). Borotis and Poulymenakou (2004) also proposed online readiness as the idea of being physically and psychologically prepared for specific online learning experiences and behaviours. User adaptability to technological challenges, collaborative learning and training, as well as synchronous and asynchronous self-paced learning, are used to gauge an individual's preparation for the online environment. Figure 1 shows the conceptual framework for the study:
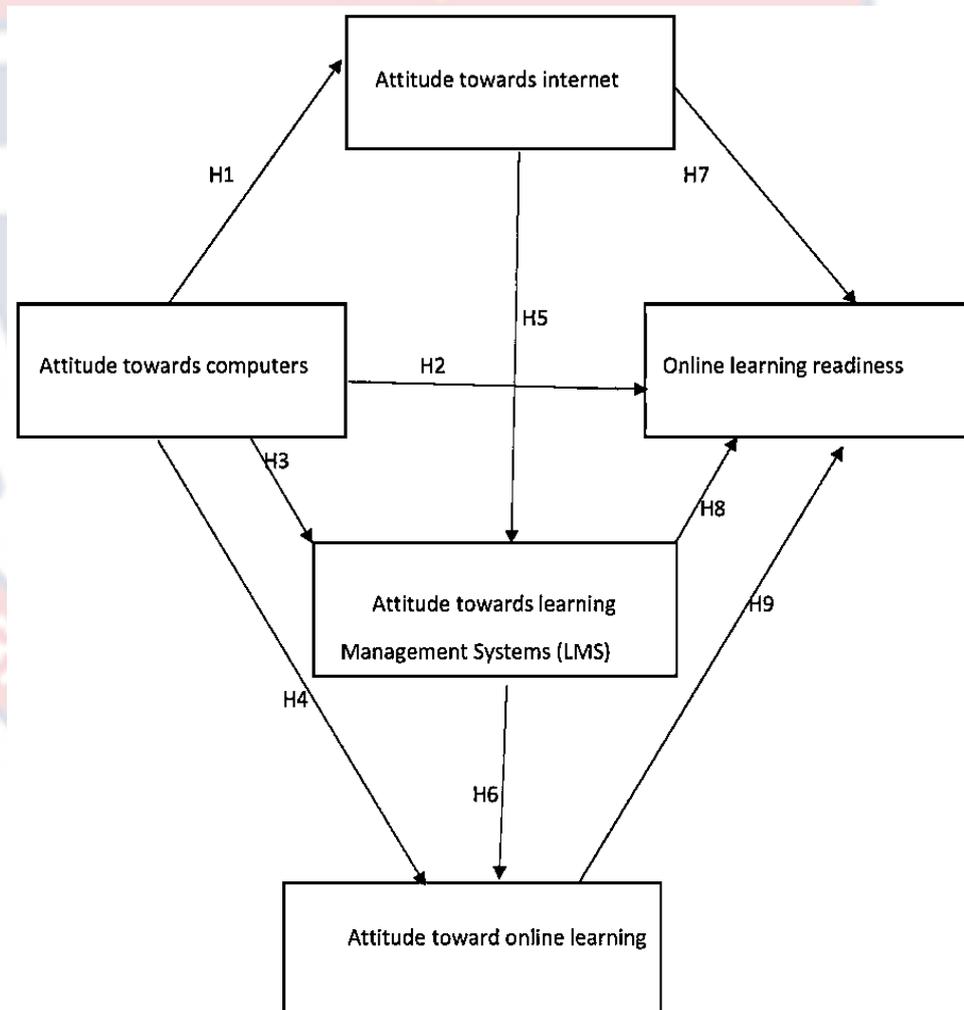
Figure 1: Conceptual Framework

Empirical Review

Relationship between Students' Attitude Towards Computers and their

Attitude towards the Internet

Studies have consistently shown that students' attitudes towards computers are positively correlated with their attitudes towards the internet. For example, a study by Wang *et al*. (2011) found that students who had a positive attitude towards computers were more likely to have a positive attitude towards the internet. Similarly, a study by Akcaoglu (2008) found that students who had a positive attitude towards computers were more likely to have a positive attitude towards the internet, and that this relationship was mediated by students' perceived usefulness of the internet. Other studies have investigated the specific aspects of students' attitudes towards computers that are related to their attitudes towards the internet. For example, a study by Lai, Huang, Lu, and Chang (2013) found that students' perceived ease of use of computers was positively related to their perceived ease of use of the internet. Similarly, a study by Chen, Lu and Wang (2016) found that students' perceived enjoyment of using computers was positively related to their perceived enjoyment of using the internet.

Several studies have also investigated the role of gender in the relationship between students' attitudes towards computers and their attitudes towards the internet. A study by Kurniawan and Zaphiris (2001) found that female students had more positive attitudes towards computers than male students, but that this gender difference was not significant for attitudes towards the internet. However, a more recent study by Chen *et al*. (2016) found that male students had more positive attitudes towards the internet than

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female students. Some studies have investigated the relationship between students' attitudes towards computers and their actual use of the internet. For example, a study by Ari, Gok, Uzun, Yildiz, Cagiltay and Yildirim (2008) found that students who had positive attitudes towards computers were more likely to use the internet for educational purposes. Similarly, a study by Wang et al. (2011) found that students who had positive attitudes towards computers were more likely to use the internet for social networking.

Additional studies have investigated the relationship between students' attitudes towards computers and their attitudes towards the internet in specific educational contexts. For example, a study by Said, Lee and Tan (2010) found that students' attitudes towards computers were positively related to their attitudes towards the internet in the context of a computer-based assessment. They again found that students' attitudes towards computers were positively related to their attitudes towards the internet in the context of a web-based learning environment. Another important aspect that has been explored in the literature is the impact of technology-related experiences on students' attitudes towards computers and the internet. For example, a study by Lin (2011) found that students who had more experience with using computers and the internet had more positive attitudes towards both. Similarly, a study by Selwyn (2003) found that students who had more positive experiences with using computers in the classroom had more positive attitudes towards the internet.

Furthermore, some studies have investigated the role of cultural factors in the relationship between students' attitudes towards computers and their attitudes towards the internet. For example, a study by Warschauer, Zheng, Niiya, Cotton and Farkas (2014) found that Chinese students' attitudes

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towards computers were positively related to their attitudes towards the internet, but that this relationship was weaker than it was for American students. The authors suggest that this may be due to differences in cultural values and beliefs about technology. Finally, some studies have investigated the impact of interventions aimed at improving students' attitudes towards computers on their attitudes towards the internet. For example, a study by Chuang and Chen (2009) found that a computer literacy program improved students' attitudes towards computers, and that this improvement was associated with an improvement in their attitudes towards the internet. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

Relationship between Students' Attitude towards Computers and their Attitude towards Online Learning Readiness

Studies have investigated the relationship between students' attitudes towards computers and their readiness for online learning. One study by Al-Fraihat, Joy, and Sinclair (2020) examined the relationship between students' attitudes towards computers and their readiness for online learning during the COVID-19 pandemic. They found that students who had positive attitudes towards computers were more likely to be ready for online learning, as they were more comfortable and confident with using technology. In contrast, students who had negative attitudes towards computers were less likely to be ready for online learning, as they were less comfortable and less confident with technology.

Similarly, a study by Adams, Ngampornchai, Saisomboon and Akkanit (2015) investigated the relationship between students' attitudes towards

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computers and their readiness for online learning in a blended learning environment. They found that students who had positive attitudes towards computers were more likely to be ready for online learning, as they were more comfortable and familiar with technology. In contrast, students who had negative attitudes towards computers were less likely to be ready for online learning, as they tended to struggle with using technology. They again found that students who had positive attitudes towards computers were more likely to have higher levels of satisfaction with online learning and perform better academically. In contrast, students who had negative attitudes towards computers were more likely to have lower levels of satisfaction with online learning and perform worse academically. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

Relationship between Students' Attitude towards Computers and their Attitude towards LMS

There have been several studies that look at how students feel about LMS and how they feel about computers in general. Tella, Ayeni, and Popoola (2007) conducted a research to see whether there was a connection between students' impressions of computers and their impressions of LMS. Students who reported higher levels of comfort and familiarity with utilising technology were also more likely to report higher levels of comfort and familiarity with LMS. Students who had a poor outlook on computers were also less likely to have a good outlook on LMS since they had more difficulty with technology in general.

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Students who saw computers favourably were also more inclined to view LMS favourably because they saw it as a useful instrument for education. On the other hand, students who had a negative view of computers were less likely to have a favourable view of LMS because they saw it as a complicated and challenging instrument. Chen and Jang's (2010) research looked at how students' feelings towards technology influenced their views on using a LMS in a hybrid setting. Students who viewed computers favourably were also more inclined to view LMS favourably because they saw it as a useful instrument for fostering dialogue and teamwork. Students who had a poor view of computers were also less likely to have a favourable view of LMS, perhaps because they saw it as a time-consuming and difficult technology. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

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

Multiple studies have looked at how students feel about using computers in class and how it relates to how they feel about studying online. Menchaca and Bekele (2008) conducted research on how community college students felt about using computers and how they felt about online education. They discovered that students who had a favourable view of computers were also inclined to have a favourable view of online learning since they saw it as a useful instrument for improving their education. Conversely, pupils who had a negative outlook on computers were less likely to have a good outlook on online learning since they had more difficulty with the technology.

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Similar research was conducted by Al-Fraihat, Joy, and Sinclair (2020), who looked at how students' feelings towards computers affected their perceptions of online education during the COVID-19 epidemic. Students who reported higher levels of comfort and confidence with utilising technology were also more likely to report higher levels of comfort and confidence with online learning. Students who already had a bad impression of computers were also less likely to have a favourable impression of online learning because of the difficulty they associated with it. Students who viewed computers favourably reported more happiness with online learning and achieved higher levels of academic success. However, students who had a negative view of computers were more likely to report dissatisfaction with online education and to have worse academic outcomes. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

Relationship between Students' Attitude towards Internet and their Attitude towards LMS

Learning management systems have been the subject of numerous studies that have investigated the connection between students' views of the internet and their views of LMS. One research by Al-Khasawneh (2023) at a Jordanian university looked at how students' views of the internet affected their views of utilising a learning management system. The researchers discovered that students who had a favourable view of the internet were also more likely to have a favourable view of LMS, with the latter being seen as a useful tool for improving students' educational experiences. In contrast, students whose internet opinions were neutral or unfavourable were less likely

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to have good attitudes about utilising LMS because they saw it as a complicated and challenging technology.

Kuo and Belland (2016) conducted research on the connection between students' views of the internet and their views of utilising LMS in a blended learning setting. Students who viewed the internet favourably were also more likely to view LMS favourably, with the researchers concluding that these students saw LMS as a useful tool for fostering communication and teamwork. Students who had a poor view of the internet were also less likely to have a good view of LMS because they saw it as a cumbersome and time-consuming resource. Adams, Ngampornchai, Saisomboon and Akkanit, (2015) conducted research to determine whether and how students' internet-related beliefs and behaviours influenced their preparation for online learning in a mixed setting. Students who already had a favourable impression of the internet were shown to be better prepared for online learning due to their familiarity with and comfort with the medium. However, pupils who had a negative view of the internet were less prepared for online education and more likely to have technical difficulties. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

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

Studies have looked at how students feel about LMS and how that compares to how they feel about online education in general. Tella, Ayeni, and Popoola (2007) conducted research on how students at a Nigerian university felt about LMS and how they felt about distance education generally. According to their research, students who viewed their LMS positively were

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more likely to have a favourable outlook on online education in general. In contrast, students who had an unfavourable view of LMS were less likely to have a favourable view of online education.

Researchers discovered that students who viewed learning management systems (LMS) favourably were more likely to have favourable views about online education overall. Student perceptions of LMS as a time-consuming and complex tool to use correlate negatively with a favourable attitude towards online learning. Another research looked at how students felt about using an LMS and how they felt about online learning in a hybrid setting, this time by Chen and Jang (2010). Students who saw LMS as a useful instrument for communication and cooperation were more likely to have favourable views of online learning, the researchers found. Students who had a poor view of LMS were less likely to have a favourable view of online education because they saw LMS as a cumbersome and time-consuming resource. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

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

The preparedness of students for online learning has been studied in connection to their views about the internet. The preparation of pupils for online learning during the COVID-19 epidemic was investigated in a research by Al-Fraihat, Joy, and Sinclair (2020). Students who viewed the internet favourably were found to be more technically proficient and so better prepared for online learning. In contrast, students whose views about the internet were

more pessimistic were less prepared for online learning because they saw it as more of a struggle.

Adams, Ngampornchai, Saisomboon and Akkanit (2015) conducted research on how students' internet-related beliefs and behaviours influenced their preparedness for online learning in a mixed setting. Students who already had a favourable impression of the internet were shown to be better prepared for online learning due to their familiarity with and comfort with the medium. However, pupils who had a negative view of the internet were less prepared for online education and more likely to have technical difficulties. Wu and Chen (2017) conducted research that linked students' online learning success to their outlooks on the medium. Positive internet attitudes were associated with greater levels of satisfaction with online learning and better academic performance, the researchers found. Students who had a negative view of the internet were also more likely to report feeling dissatisfied with their academic progress when using an online learning platform. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

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

The outcomes exhibited a constructive influence on critical thinking skills, problem-solving skills and student learning. There is a connection between technical capabilities and students' attitude towards e-learning. Attitude is also impacted by time dedicated to computer use, showing computer experience. Attitude differences were found between hired students and the unemployed ones. Jamil, Sethi and Ali (2016) conducted a study on

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nursing students to learn their attitude towards E-learning. In this quantitative and cross-sectional study, 120 nursing students participated. A questionnaire was distributed to all students to measure their attitudes towards E-learning. The result confirmed the readiness of students to adopt E-learning and recognized its use in education. Though, technical support and stress of using technology were noted to be discouraging factors to adopt E-learning.

Dhamija (2014), tried to evaluate undergraduate students' attitude towards the academic utilization of E-learning. An attitude scale was developed, and the study was carried out on 300 students belonging to arts, commerce and science streams. Differences in attitude between different stream students were observed. The findings revealed that overall it was affirmative approach towards E-learning among most of the students. There were no differences in attitude between arts and commerce students as well as arts and science students. Also, no differences were reported between commerce and science students. Though, significant difference was reported among students with respect to gender and rural and urban residence. But all these empirical studies provided failed to explore the attitude antecedents of student online learning readiness.

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

Several researches have looked at how students' mindsets towards online education affect their level of preparedness for it. The attitudes of students towards online learning and their preparedness for online learning were studied by Al-Fraihat, Joy, and Sinclair (2020) during the COVID-19 pandemic. Their research showed that students who see online education as a

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valuable resource for improving their academic performance are better prepared for it. Negatively disposed students, on the other hand, were less likely to be prepared for online learning since they saw it as more of a challenge than it really was. Wu and Chen's (2017) research looked at how students' mindsets towards distance education influenced their performance. They discovered that students who had optimistic expectations about online education were more likely to have favourable outcomes from their time spent there. Students who had a negative outlook on online education were more likely to be dissatisfied with their experience and to have worse academic outcomes.

Kuo and Belland (2016) conducted research to see whether and how students' perceptions of online learning influenced their engagement in virtual classroom dialogue. Students who viewed online education favourably were more inclined to take part in class discussions because they saw it as a viable means of reaching out to others and working together. Students who had a negative outlook on online education were less likely to take part in class discussions because they found it too difficult and preferred to observe rather than engage.

Chapter Summary

The literature review examined the attitude antecedents of students in Colleges of Education towards online learning readiness in the Central Region of Ghana. Some studies have investigated the impact of interventions aimed at improving students' attitudes towards computers on their attitudes towards the internet. Others too investigated the relationship between students' attitudes towards computers and their readiness for online learning in a blended

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learning environment. Lastly, some studies have investigated the impact of interventions aimed at improving students' attitudes towards computers on their attitudes towards the internet. But they all failed to explore the attitude antecedents of student online learning readiness.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter explains the technique and procedures employed by the researcher for the data collection and analysis. It defines every step that was taken by the researcher to reach the objectives of the study. Thus, the chapter emphasized the research design, study area, study population, sample and sampling procedure, source of data and data collection instrument, pilot study and data collection procedure, data processing, and analysis.

Research Design

The research design is a plan and framework for conducting a research project. It allows the researcher to focus on developing research techniques appropriate for the topic and set up their investigations for success (Sileyew, 2019). Malhotra and Birks (2007) confirmed that research designs help explains the steps to take to get the data you need to address a specific research problem (Malhotra & Birks, 2007). The study adopted the positivist philosophical position and quantitative approach. Specifically, the study used the correlational research design. The correlational survey, as research design, for examining the relationships between or among two or more variables in a single group, which can occur at several levels. It is a type of non-experimental design that examines the relationship between two or more variables. It should be remembered that the researcher is not testing the cause-and-effect relationship. A correlational research design investigates relationships between variables without the researcher controlling or

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manipulating any of them. A correlation reflects the strength and/or direction of the relationship between two or more variables.

This design was ideal because it provided a valuable role in exploring relationships between attitude antecedents of Colleges of Educations students towards online learning readiness. Bhandari (2021) posited that, correlational research designs have several weaknesses that researchers should be aware of when interpreting their findings. Correlational designs cannot establish causality. They can only identify relationships or associations between variables. Just because two variables are correlated does not mean that one variable causes the other. Correlations do not account for the possibility of a third variable influencing both variables being studied. It is possible that the observed correlation is because of an unmeasured or uncontrolled variable. However, attempts would be made to minimize the limitation(s) of the survey design in this study.

Population

A population in research refers to a group of people with common observable features that a researcher hopes to apply in research (Fraenkel & Wallen, 1990). As per Fink (1995), a unit's inclusion measures depend on the respondents' characteristics and criterion interest in the study. For this reason, the general population of about 4,173 of which a target population for the study consisted of level 200 and 300 students from Komenda College of Education, Assin Fosu College of Education and Ola College of Education (all in the Central Region of Ghana) with a comprising population of 2,568. This target population was chosen because these target populations are the people

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who are involved with online learning. The summary of the population is presented in Table 1.

Table 1: Population of the Study

S/N	Name of College	Level	Population
1	Komenda College of Education	200	400
		300	400
2	OLA College of Education	200	518
		300	422
3	Fosu College of Education	200	432
		300	396
	Total		**2568**

Source**:** Field data, Akoto (2023)

Sample and Sampling Procedures

According to Breakwell, Harmond, Fife-Shaw and Smith (2006), a population is frequently infinitely huge, making research impractical or prohibitively expensive. They recommend that a sample be taken from the population as a result. In addition to the financial savings this brings, Breakwell et al. (2006) stated that it is typically acceptable to make increasingly in-depth observations of each sampled element. A sample is a set of elements taken from a more significant population. It is, usually, a smaller group the researcher studies.

In this study, to ensure a more detailed study of the element involved, a sample size of 335 was used out of the total population of 2568. The sample size was determined using the table for determining sample size from a given population provided by Krejcie and Morgan (1970). The sample size table indicates that a sample size of 335 is adequate for 2568 population.

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Additionally, a multi-stage technique was adopted in the selection of the sample for the study. Firstly, stratified sampling technique was used to divide the population into subgroups, thus each college of education formed a stratum. Next, within each stratum, a proportionate (allocation) stratified sample was used to select a sample proportional to the stratum population. The proportional allocation ensured that the sample was actual representation of the population of the stratum (Saunders, Lewis & Thornhill, 2007). Lastly, the researcher employed simple random sampling to select the sample of each stratum. This ensured that each participant in a stratum has an equal chance of being chosen. Therefore, 167 students were chosen from level 200 and 168 from level 300. The detail of the proportionate stratified sample is depicted in Table 2:

Table 2: Breakdown of the Population and their Corresponding Sample Size

S/N	Name of College	Stratum Population	Proportionate Stratified sample Size
1	Komenda College of Education	800	104
2	OLA College of Education	940	123
3	Fosu College of Education	828	108
	Total	**2568**	**335**

Source: Field data, Akoto (2023)

Data Collection Instrument

The data gathering instrument used was a self-administered questionnaire. The first part (section A) gathered background data of the respondents. The second part (Section B) elicited data on students' attitude towards computers. The third section (Section C) also gathered data on students' attitude towards internet. The fourth section (Section D) focused on

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students' attitude towards LMS. The fifth section (Section E) examined the students' attitude towards online learning. The last section (Section F) examined students' online learning readiness.

The questionnaire had a Four-point Likert scale as the measuring scale ranging from Strongly disagree to strongly agree. A self-administered questionnaire was utilised because it is low cost and easy to use (Cohen, Manion & Morrison, 2013).

Validity and Reliability of Instrument

A pilot test of the instrument was done with a small number of the respondents in Atebubu College of Education in the Atebubu-Amantin Municipal. The Atebubu College of Education was chosen for the pilot test because the researcher is an old student of this college and the college is also closer to place of residence of the researcher. The purpose of the pilot test was to ascertain the reliability of the questionnaire adopted for the study. Thirty-four (34) participants were used for the pilot test which is in line with Baker (1994) who postulated that 10 to 20 percent of the actual sample size is adequate for a pilot test. The data gathered from the pilot test was analysed with Cronbach's Alpha to check if the instrument was reliable. The reliability coefficient of 0.92 was obtained indicating that the instrument was reliable. There was also a 100% return rate. Thus, all the questionnaires administered were returned.

Data Collection Procedure

The researcher sought authorisation from each school prior to 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

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Colleges of Education 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.

Consequently, the researcher administered the questionnaires to the students. It took one week for the data collection stage. Within each school, the researcher used two days to administer and retrieved all the questionnaires.

Data Processing and 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 (SPSS 21.0). Numerical values 1,2,3, and 4 were assigned to the four-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. All two research objectives were analysed and research hypotheses were all tested with Partial Least Squares Structural Equation Modelling using Smart PLS software.

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 submitted to the three Colleges of Education seeking for approval. 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

To achieve the main purpose of the study, a correlational research design was adopted. The main instrument for the data collection was a self-developed questionnaire which had Four-point Likert scale ranging from "strongly disagree to strongly agree". Research hypotheses were analysed with Partial Least Squares Structural Equation Modelling using Smart PLS.

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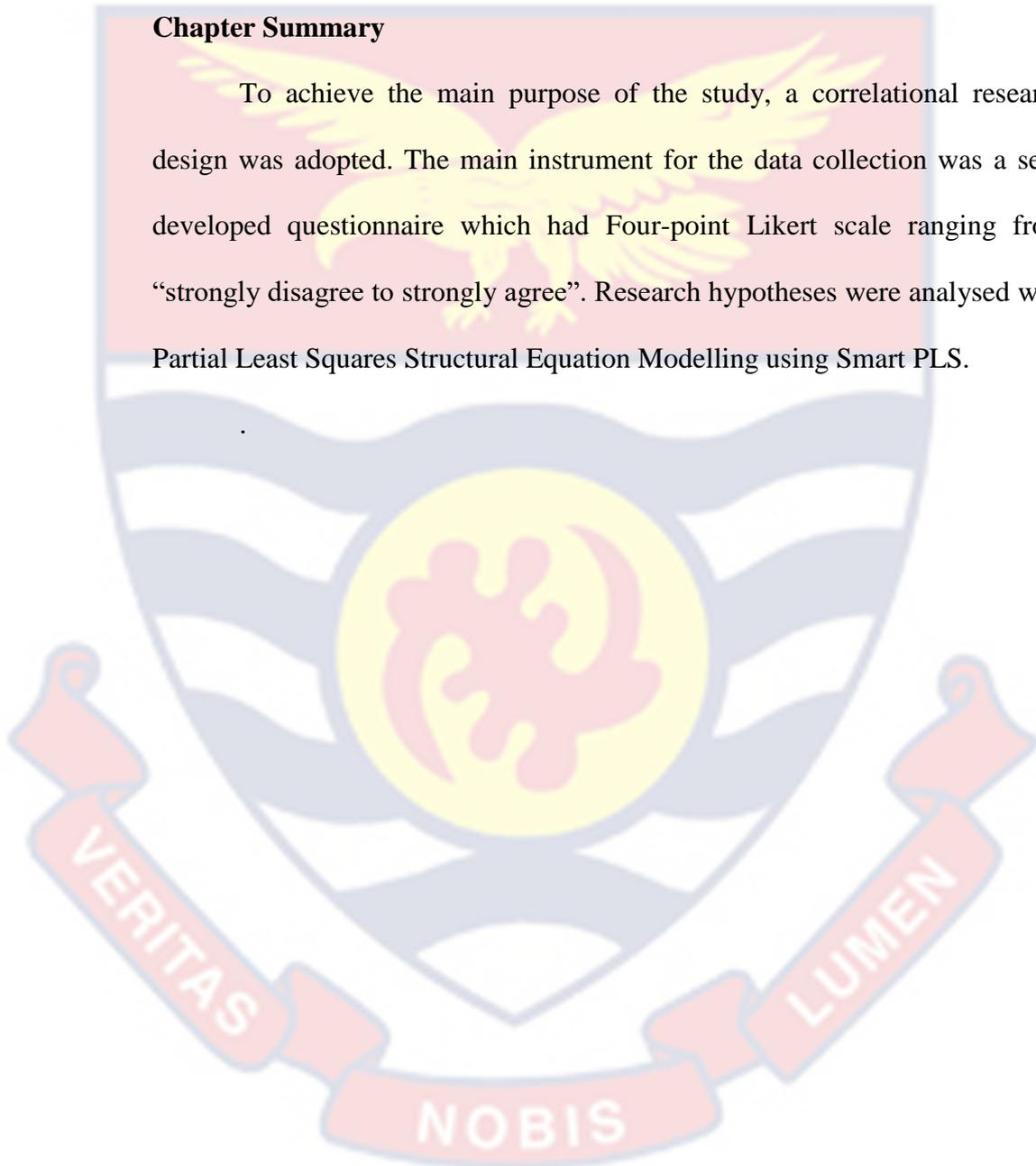
CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The focus of this chapter of the study is to present the empirical findings based on the hypotheses guiding the study. The chapter will focus on the results and discussion of the empirical findings of the study. Specifically, the chapter will start with the demographic characteristics of respondents and continue with key findings for the hypotheses of the study. Discussion of the findings and linking them to the literature reviewed will also feature in the chapter. The chapter will conclude with the chapter summary.

Demographic Characteristics

The demographic characteristics of respondents reported in this section of the chapter are two. These are the gender and the age of respondents involved in the study. The results for the demographic characteristics of the respondents are presented in Table 1.

Table 1: Demographic Characteristics

Demographic characteristics	Frequency (N = 335)	Percentage (% = 100)
Gender		
Male	137	40.9
Female	198	59.1
Age of Respondents		
18 Years and below	15	4.5
19 to 23 Years	128	38.2
24 to 28 Years	177	52.8
29 Years and above	15	4.5

Source: Field data (2023)

From Table 1, the results revealed that most respondents or students involved in this study were females (59.1%). This means that most of the students in the college of education that participated in this study were females compared to their male counterparts (40.9%).

The second demographic characteristic reported in Table 1 is the age of the respondents. It is clear from the Table that most respondents were 24-28 years old (52.8%), followed by those who were 19-23 years old (38.2%). That means that almost all students considered in this study were 28 years and below, and it generally agrees with the age bracket of tertiary students in the colleges of education in Ghana.

Main Data Analysis

The main data were analyzed based on a two-step approach, that is measurement model and structural model analyses according to the recommendation by Hair et al. (2017).

Measurement Assessment of Conceptual Model

Internal consistency of the conceptual model used was with confirmatory factor analysis and internal consistency. The algorithm results presented in Figure 2 and Figure 3 were used to address both the exploratory and confirmatory factor analysis issues with the item loadings of the constructs within the model. Thus, in Figure 1, all items used to measure the five variables of the study and their individual performance in relation to their contribution to the measuring power of the respective variable is demonstrated. The criteria used to determine acceptable thresholds for all the items used were based on the recommendations of Segbenya (2012), Bervell (2018) and Hair et al. (2017) of 0.50 and above.

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It is clear from Figure 1 that some items scored below the 0.5 thresholds. These are items SROL5 and SROL1 for students' readiness to use online learning (SROL) variable; SATOL1 for students' attitudes towards online learning (SATOL) variable, SATLMS2 for students' attitudes towards learning management systems (SATLMS) variable and SATI4 for students' attitude towards internet (SATI) variables.
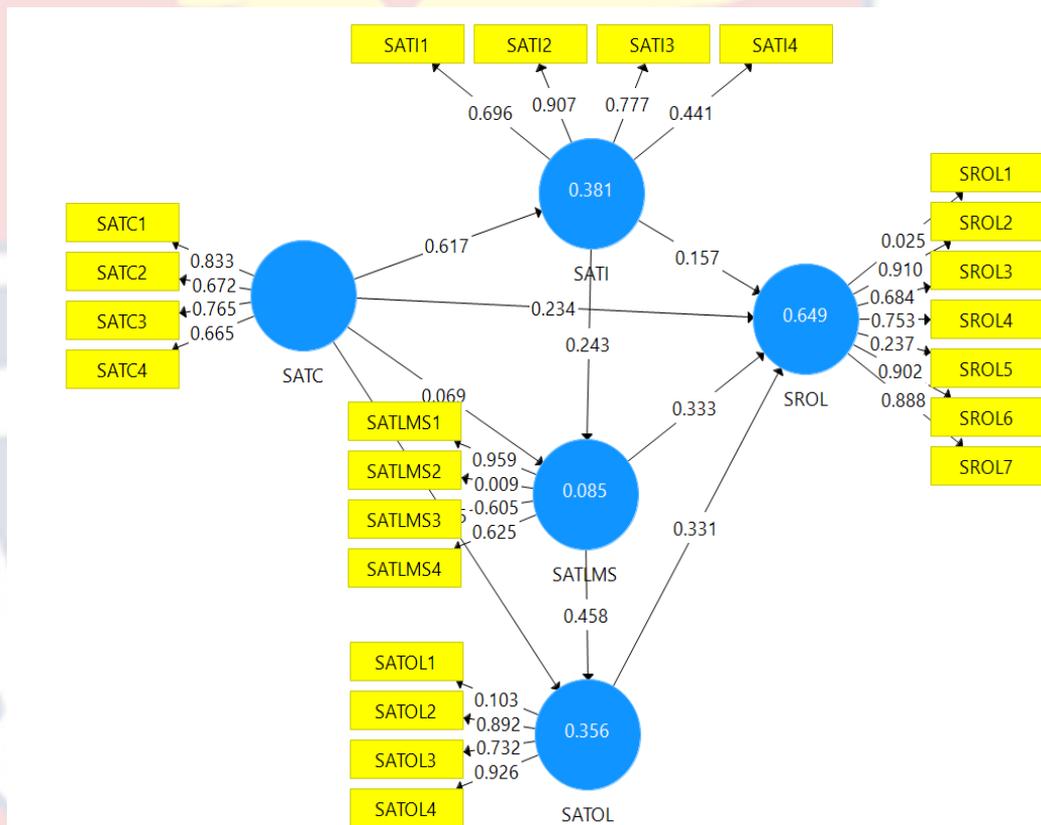
Figure 2: EFA Algorithm
Source: Field data (2023)

From Figure 2, the items did not adequately measure the respective variables of the study. Hence, these items were further deleted from the model and the refined results are presented in Figure 2 for confirmatory factor analysis. Therefore, the results presented in Figure 2 revealed all items used met the minimum threshold of 0.60 and above. Thus, three acceptable items were used to measure students' attitudes towards the internet (SATI), online

learning (SATOL), and learning management systems (SATLMS). Four and five items were used to measure the remaining two variables of the study: students' attitude towards computers (SATC) and readiness to use online learning respectively.
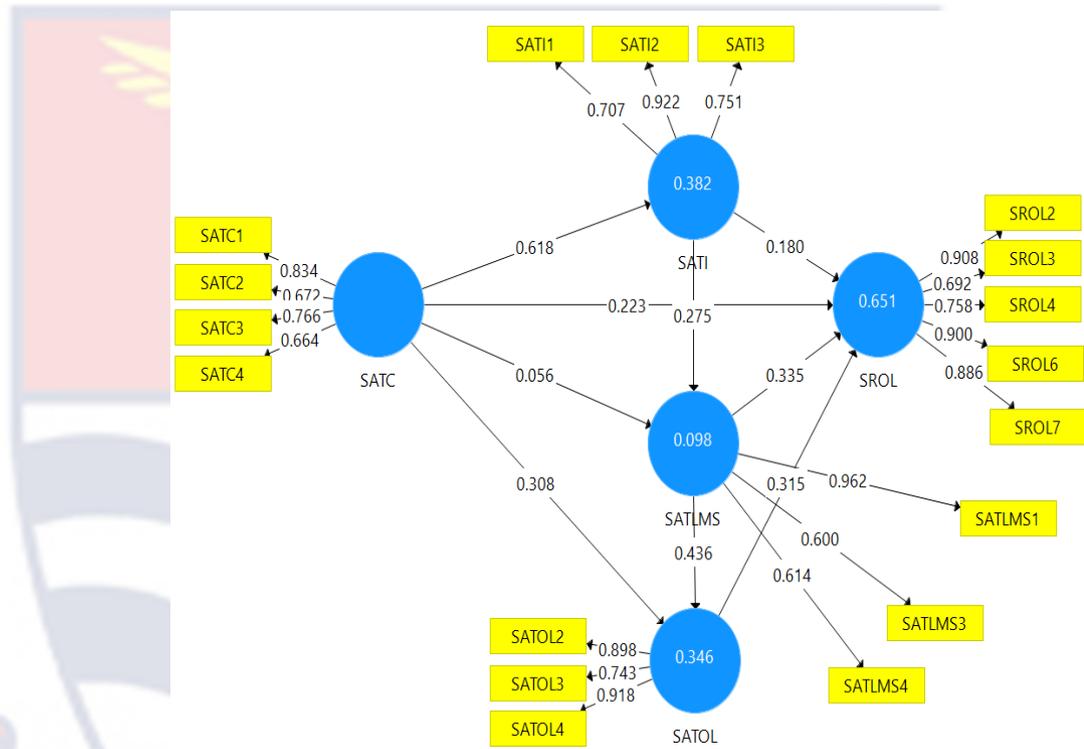
Figure 3: CFA Algorithm
Source: Field data (2023)

Outer Loadings

Apart from the pictorial representation of accepted items in Figure 2, the study also presented all the accepted items in Table 2. Thus, the results in the Table 2 on outer loading are clear confirmation that these items really measured or contributed to the measuring power of their respective variables. These items were therefore accepted and used for the subsequent analysis.

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Table 2: Outer Loadings

ITEMS	SATC	SATI	SATLMS	SATOL	SROL
SATC1	0.834				
SATC2	0.672				
SATC3	0.766				
SATC4	0.664				
SATI1		0.707			
SATI2		0.922			
SATI3		0.751			
SATLMS1			0.962		
SATLMS3			0.600		
SATLMS4			0.614		
SATOL2				0.898	
SATOL3				0.743	
SATOL4				0.918	
SROL2					0.908
SROL3					0.692
SROL4					0.758
SROL6					0.900
SROL7					0.886

Source: Field data (2023)

Construct Reliability and Validity

Further internal consistency test of the model was conducted to determine the construct validity and reliability of the model. Indices used to achieve this were Average Variance Extracted (AVE), rho-A, Cronbach's Alpha, and Composite Reliability. The criterion used for the first indicator (Average Variance Extracted) was a minimum threshold of 0.50 (Hair et al., 2017; Bervell, 2018; Segbenya, 2012). A criterion recommended by Hair et al. (2017), Bervell (2018) and Segbenya (2012) of a minimum threshold of 0.70 was used for the last three indicators (rho-A, Cronbach's Alpha, and Composite Reliability). The results are therefore presented in Table 3.

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Table 3: Construct Reliability and Validity

Variables	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
SATC	0.724	0.748	0.825	0.544
SATI	0.728	0.917	0.839	0.638
SATLMS	0.749	0.735	0.780	0.554
SATOL	0.825	0.904	0.891	0.734
SROL	0.888	0.914	0.918	0.694

Source: Field data (2023)

The results presented in Table 3 revealed values ranging from 0.544 to 0.734 were obtained for the Average Variance Extracted (AVE) of the construct validity and reliability. The results clearly show that the values were above the minimum threshold of 0.50 used for this study. Additionally, the values obtained for Cronbach's Alpha for all the five variables of the study were between 0.724 and 0.888 which were all above the minimum threshold of 0.70 recommended by Hair et al. (2017), Bervell et al. (2022) and Segbenya et al. (2022). The third indicator for measuring construct reliability and validity was Composite Reliability.

Values obtained for the Composite Reliability ranged from 0.780 to 0.918, which are also higher than the recommended thresholds of 0.70. The last indicator under the construct validity and reliability for the internal consistency of the conceptual model used was rho A, and the values obtained were between 0.735 and 0.917. These values for the rho A were equally above the minimum threshold of 0.70 recommended by Hair et al. (2017), Bervell et al. (2022) and Segbenya et al. (2022). The results presented in Table 3 for the construct validity under the four indices suggest that the model attained

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construct validity and reliability and could be used for further inferential analysis.

Discriminant Validity

Apart from using the construct reliability and validity to check for the internal consistency of the hypothesised model, the study went further to check the discriminant validity of the variables of the study. The results for the discriminant validity using the Heterotrait-Monotrait Ratio (HTMT), as suggested by Hair et al. (2017), Bervell et al. (2022) and Segbenya et al. (2022) are presented in Table 4.

Table 4: Heterotrait-Monotrait Ratio (HTMT)

Variables	SATC	SATI	SATLMS	SATOL	SROL
SATC	0				
SATI	0.825	0			
SATLMS	0.293	0.267	0		
SATOL	0.517	0.735	0.396	0	
SROL	0.641	0.665	0.448	0.752	0

Source: Field data (2023)

The acceptable criteria used was a maximum threshold of 0.850 recommended by Hair et al. (2017), Bervell et al. (2022) and Segbenya et al. (2022). The results presented in Table 6, therefore, revealed that the values obtained for the discriminant validity are all below the maximum threshold of 0.850 since all these values were between 0.267 and 0.825. Thus, the model achieved discriminant validity since the variables in the study were very distinct from each other.

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Multicollinearity Analysis

Both Type 1 and Type 2 errors can be committed if there is the presence of multicollinearity in the model. The presence of multicollinearity can further lead to uncertain or erroneous path relationships between variables (Segbenya et al., 2022, Bervell, 2022; and Kock, 2016). For this reason, multicollinearity was checked using the inner variance inflated factor (VIF); the results are presented in Table 5.

The maximum acceptable threshold used was 3.30, recommended by Henseler et al. (2015), Segbenya et al. (2022), and Bervell et al. (2022).

Table 5: Inner VIF Values

Variables	SATC	SATI	SATLMS	SATOL	SROL
SATC		1.000	1.618	1.054	1.622
SATI			1.618		2.260
SATLMS				1.054	1.346
SATOL					2.029
SROL					

Source: Field data (2022); SATC = Student Attitude Towards Computer, SATI = Student Attitude Towards Internet, SATLMS = Student Attitude Towards Learning Management System, SATOL = Student Attitude Towards Online Learning and SROL = Student Readiness Towards Online Learning.

The results displayed in the Table 5 ranged between 1.000 to 2.260, which is below the maximum limit. This means that there was no multicollinearity in the model or between the study variables. It is therefore concluded that the path relation to be determined will not be based on an erroneous foundation and that there will not be any Type 1 and Type 2 errors.

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Structural Model Analysis

The structural model was tested for significance across the hypothesised paths. This was done through a 5000 samples bootstrap sequence to reveal the beta values, t-statistics, p-values, f-squared, and confidence intervals.

Testing of hypotheses for path relationships

After all the preliminary analysis and the results presented so far, the estimated model met all the necessary requirements and can be used for further inferential analysis. For that reason, an analysis of the path relationships between variables of the study was conducted, and the results are presented in Table 6. Beta values, t-statistics values, alpha values, confidence intervals as well as effect size denoted with f^2 were used to determine the strength of the path relationship between the variables of the study based on the nine hypotheses guiding the study.

The pictorial presentation of the significant relationship between the variables of the study is presented in Figure 4. Thus, Figure 4 represents the bootstrapping and pictorial representation of the path relationship results reported in Table 6. The values and the arrows in Figure 4 further enhance and confirm a significant relationship between the eight hypotheses of the study and a non-significant relationship for hypothesis two.

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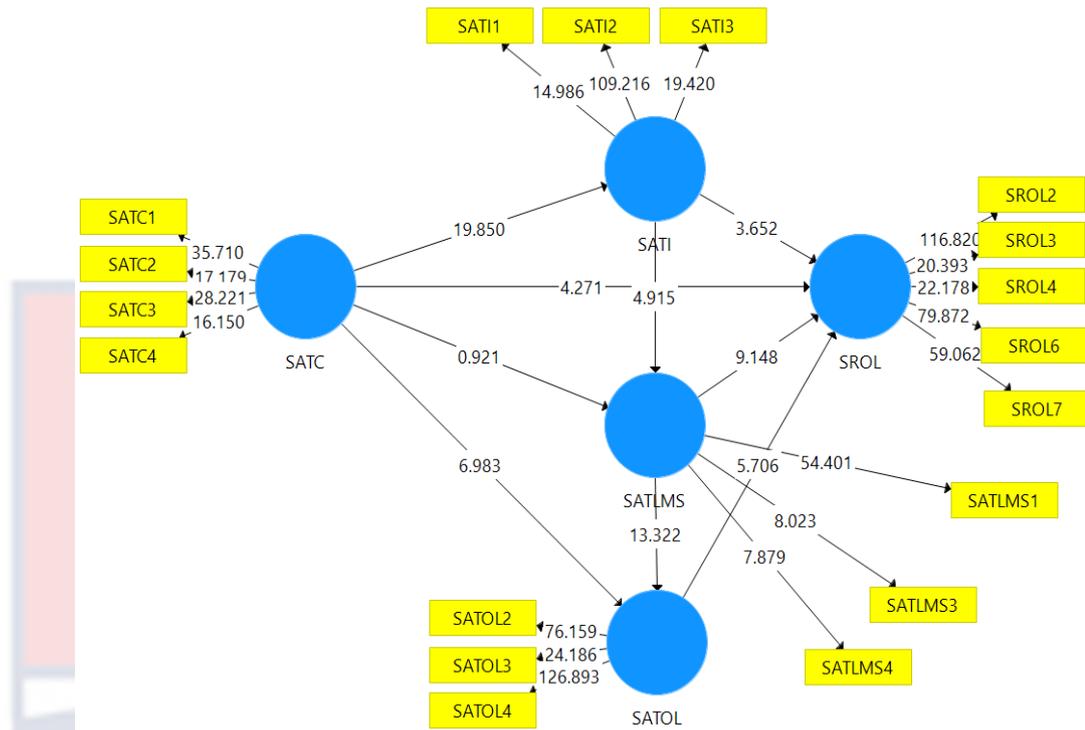
Figure 4: Bootstrapping
Source: Field data (2023)
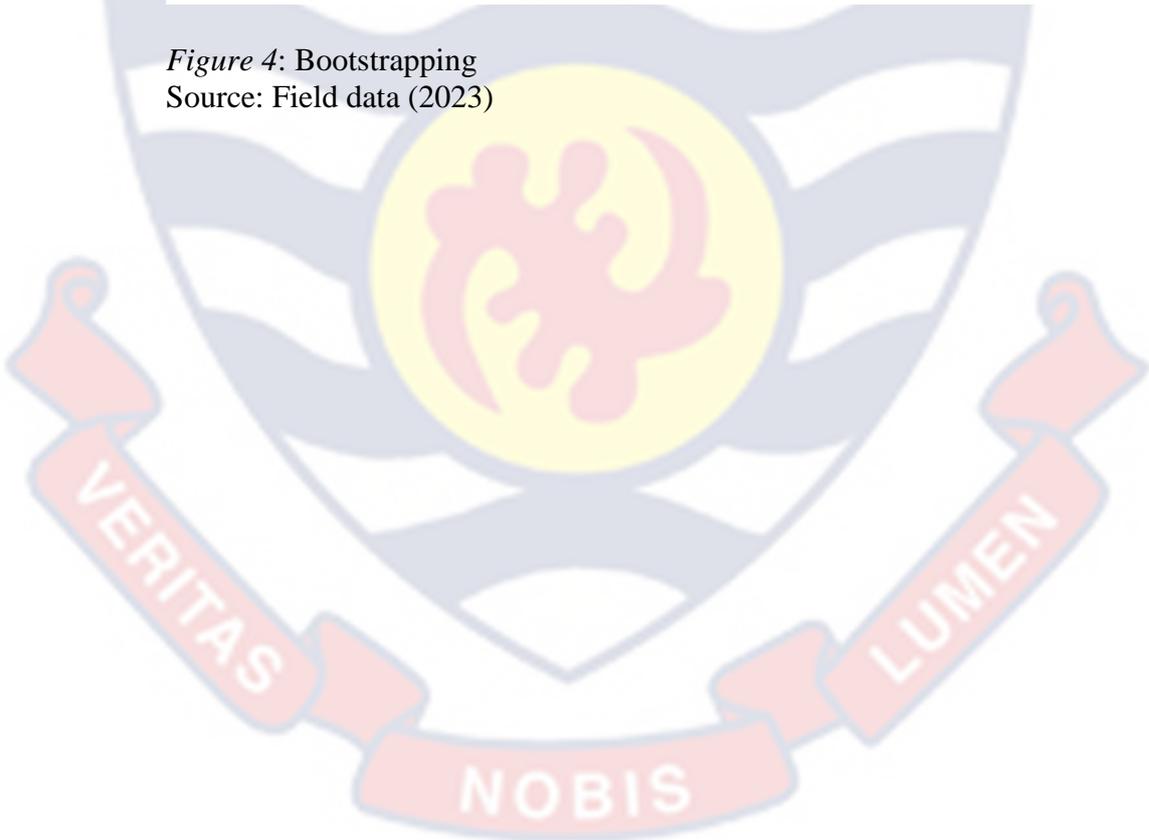
Table 6: Path Significance

Hypotheses	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Confidence Intervals		f^2
						2.5%	97.5%	
1.SATC -> SATI	0.618	0.622	0.033	18.992	0.000	0.561	0.691	0.618
2.SATC -> SROL	0.223	0.224	0.052	4.274	0.000	0.115	0.324	0.088
3.SATC -> SATLMS	0.056	0.058	0.065	0.866	0.387	-0.074	0.178	0.002
4.SATC -> SATOL	0.308	0.310	0.047	6.515	0.000	0.215	0.411	0.138
5.SATI -> SATLMS	0.275	0.279	0.058	4.697	0.000	0.153	0.382	0.052
6.SATLMS -> SATOL	0.436	0.436	0.037	11.864	0.000	0.356	0.503	0.275
7.SATI -> SROL	0.180	0.179	0.048	3.732	0.000	0.083	0.269	0.041
8.SATLMS -> SROL	0.335	0.332	0.039	8.544	0.000	0.254	0.405	0.240
9. SATOL -> SROL	0.315	0.318	0.054	5.874	0.000	0.203	0.410	0.140

Source: Field data (2023)

Hypothesis 1: *There is no statistically significant relationship between students' attitude towards computer and their attitude towards the internet.*

The results of hypothesis one of the studies, which sought to establish a relationship between students' attitudes toward computers and students' attitudes towards the internet are presented in Table 6. The results revealed that there was a statistically significant relationship between student attitudes towards computers (SATC) and students' attitudes towards internet (SATI) at (β=0.618, t=18.992, p= 0.000) for the first hypothesis. Therefore, we reject the null hypothesis that there is no statistically significant relationship between students' attitude towards computer and their attitude towards the internet.

Hypothesis 2: *There is no statistically significant relationship between students' attitude towards computer and their attitude towards online learning.*

The second hypothesis of the study was also further validated since students' readiness towards online learning (SROL) was significantly related to students' attitude towards computers (SATC) at (β=0.223, t=4.274, p= 0.000). Therefore, we reject the null hypothesis that there is no statistically significant relationship between students' attitude towards computer and their attitude towards online learning.

Hypothesis 3: *There is no statistically significant relationship between students' attitude towards computer and their online learning readiness.*

However, students' attitude towards computers (SATC) was found to have non-significantly influenced students' attitude towards learning management systems (SATLMS) at (β=0.056, t=0.866, p= 0.387) for the third hypothesis of the study. Therefore, we fail to reject the null hypothesis that

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there is no statistically significant relationship between students' attitude towards computer and their online learning readiness.

Hypothesis 4: *There is no statistically significant relationship between students' attitude towards computer and their attitude towards LMS.*

The results presented in Table 6 further revealed that students' attitude towards online learning (SATOL) was significantly influenced by students' attitude towards computers (SATC) at (β=0.308, t=6.515, p= 0.000) for the fourth hypothesis of the study. Therefore, we reject the null hypothesis that there is no statistically significant relationship between students' attitude towards computer and their attitude towards LMS.

Hypothesis 5: *There is no statistically significant relationship between students' attitude towards the internet and their attitude towards LMS.*

Results presented in Table 6 further revealed that there was a significant relationship between students' attitude towards internet (SATI) and students' attitude towards learning management systems (SATLMS) at (β=0.275, t=4.697, p= 0.000) for hypothesis five. Therefore, we reject the null hypothesis that there is no statistically significant relationship between students' attitude towards the internet and their attitude towards LMS.

Hypothesis 6: *There is no statistically significant relationship between students' attitude towards the internet and online learning readiness.*

That is, students' attitudes towards learning management systems (SATLMS) significantly influenced students' attitudes towards online learning (SATOL) for the sixth hypothesis at (β=0.436, t=11.864, p= 0.000). Therefore, we reject the null hypothesis that there is no statistically significant

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relationship between students' attitude towards the internet and online learning readiness.

Hypothesis 7: *There is no statistically significant relationship between students' attitude towards LMS and their attitude towards online learning.*

Students attitude towards internet (SATI) was found to have a significant relationship with students' readiness for online learning (SROL) at (β=0.180, t=3.732, p= 0.000) for hypothesis seven. Therefore, we reject the null hypothesis that there is no statistically significant relationship between students' attitude towards LMS and their attitude towards online learning.

Hypothesis 8: *There is no statistically significant relationship between students' attitude towards LMS and their online learning readiness.*

Furthermore, students' attitude towards learning management systems (SATLMS) was found to have significantly influenced students' readiness for online learning (SROL) for hypothesis eight at (β=0.335, t=8.544, p= 0.000). Therefore, we reject the null hypothesis that there is no statistically significant relationship between students' attitude towards LMS and their online learning readiness.

Hypothesis 9: *There is no statistically significant relationship between students' attitude towards online learning and their online learning readiness.*

The last hypothesis of the study was also validated since it attained a statistically significant relationship between students' attitudes towards online learning (SATOL) and students' readiness for online learning (SROL) at (β=0.315, t=5.874, p= 0.000). It is, therefore, clear from the results presented for the testing of hypotheses of the study that apart from hypothesis three, which failed to be rejected due to non-significance, all the remaining eight

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hypotheses were rejected and validated because they attained statistical significance.

Effect Sizes

The effect sizes obtained for each of the significant paths reported in the model were based on Cohen's (1988) 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.

Total Variance Explained by the Derived Model

Apart from the individual contribution of the individual exogenous variables of the study, aggregated results in terms of the overall contribution of all the exogenous variables to explain the variances in the endogenous variables of the study were also checked. The results are therefore reported in Table 9.

Table 7: Total Variance Explained by Derived Model

Variables	R Square Adjusted	R Square
SATI	0.380	0.382
SATLMS	0.092	0.098
SATOL	0.342	0.346
SROL	0.647	0.651

Source: Field data (2023)

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The results in Table 7 show that the derived model explains approximately about 38 percent variance in students' attitudes towards the internet (SATI) variable of the study.

Furthermore, the model explained about nine (9%) percent of students' attitudes towards learning management systems (SATLMS) and explained approximately 34 percent of the variance in students' attitudes towards online learning (SATOL). Lastly, the model explains 65 percent of the variance in student readiness for online learning (SROL). 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.

Discussion of Results

This section provides a deeper reflection on the findings of the study and how they relate to the literature reviewed earlier in the study. Therefore, the first finding that there was a significant relationship between students' attitude towards computers (SATC) and students' attitudes towards internet(SATI) is explained further. The results mean that any effort towards enhancing students' attitudes towards computers will result in the same percentage improvement in students' attitudes towards the internet. Students' positive attitude towards internet usage for academic purposes at the colleges of education in the central region is therefore dependent on enhancing positive attitudes of students towards computers. Thus, students with a positive attitude towards computers would like to use computers for academic purposes because to such students, using computers for learning is better than chalk and talk teaching. Thus, the desire and the use of computers for the academic

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purpose among students indicate a positive attitude among them and also significantly inculcates a positive attitude towards internet usage among students at the colleges of education in the Central Region of Ghana. The results corroborate the findings of Li and Lee (2016) that positive attitudes among students towards computer usage for academic purposes significantly influence positive attitudes towards internet usage among learners.

Alternatively, it is important to note that a negative attitude towards computers among students will equally result in a negative attitude towards the internet. That is, students who do not desire to use computers for academic purposes will be classified as having a negative attitude towards computers. Such students could be using computers for non-academic related activities. Therefore, students with a negative attitude towards computer usage for academic activities will be less likely to use the internet for academic purposes. The internet and computers are intricately connected and influence each other. The results agree with the findings of Herguner et al. (2020) that the negative attitude of students towards computers negatively influences their use of the internet.

The second finding of the study that students' attitude towards computers does not significantly influence students' attitude towards learning management systems can be explained further. The results mean that students' attitude towards computers was limited to and only relevant for influencing attitude towards the internet for academic purposes. Students' attitudes towards computers have been found to have a non-significant relationship with students' attitudes towards learning management systems at the Colleges of Education in Ghana. That is, any percentage increase in efforts to develop a

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positive attitude of students towards computers will not lead to developing a positive attitude of students towards learning management systems. This could mean that computers do not play a significant role in using learning management systems at the Colleges of Education in Ghana. The findings of this study disagree with the earlier findings of Taraj (2021) who found a significant relationship with students' attitudes towards computers and learning management systems.

The third hypothesis of the study that student attitude towards computers significantly relates to student attitude towards online learning is further supported by the findings for the earlier two hypotheses. As found earlier, the influence of students' attitudes towards computers goes beyond just influencing attitudes towards the internet and learning management system. Rather it further leads to ensuring students develop an attitude towards online learning. Therefore, if proper attention is given to students' attitudes towards computers, educational institutions will end up also achieving the same influence on students developing attitudes towards online learning. The results further confirm the findings of Limenie (2022) that students' attitude towards computers leads to positive attitude towards online learning.

Alternatively, the negative attitude of learners towards computers can also lead to a negative attitude towards online learning. Computers are, therefore, seamlessly linked to the internet, learning management systems and online learning. Thus, any negative attitudes towards computers could easily lead to negative attitudes towards online learning among the College of Education students. The findings of this study, therefore, corroborate the

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previous findings of Limenie (2022) that negative attitude toward computers leads to a negative attitude towards online learning.

It is also important to highlight the findings for hypothesis four, which found a significant relationship between students' attitude towards computers and readiness for online learning. Readiness for online learning is distinguished from students' attitudes towards online learning in this study. Thus, an attitude towards a thing precedes the real intention to use it. Thus, students' readiness to use or indulge in online learning is contingent on their attitude towards computers. Positive attitudes of learners towards computers will therefore lead to making students ready for introduction and acceptance of online learning. The findings of Ibrahim and Nat (2019) that a positive attitude towards computers leads to students' readiness for online learning are corroborated with the findings of this study.

However, a student with a negative attitude towards computers will hardly opt for online learning. Such students will continue to postpone or procrastinate the use of online learning for academic purposes. That is, students who do not currently want to use online learning because they claim not to be ready suggest that they have a negative attitude towards computers. The findings of Uden, Sulaiman and Lamun (2022) that negative attitude towards computers further lead to a negative attitude towards online learning, therefore, corroborated with the findings of this study.

Further explanation is also provided for the findings of hypothesis five, which established that students' attitudes towards the internet significantly influenced students' attitudes towards learning management systems at the Colleges of Education in Ghana. The results mean that the learning

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management system is not only influenced by attitude towards computers, as established by hypothesis two but also by students' attitude towards the internet. Students' positive attitude towards the internet is seen when they (students) would like to use the internet for academic purposes and feel that the use of internet for learning is better than using only offline instruction. Thus, students' positive attitude towards learning management system was found to be dependent on a positive attitude towards internet usage for academic purposes. The findings of this study agree with the conclusion of Bervell (2018) that positive attitude towards internet usage for academic purposes will result in a positive attitude towards the use of a learning management system for academic purposes.

However, students with a negative attitude towards internet can also lead to a negative attitude towards learning management systems. Students with a negative attitude will demonstrate that using the internet to access materials for learning from anywhere is very undesirable and will further have a negative view on using the internet for learning at any time. Thus, such a negative attitude towards the internet will result in a negative attitude towards the learning management system. The findings of Xin, Shibghatullah, Subaramaniam and Wahab (2021) that negative attitude towards internet lead to negative attitudes towards learning management systems among students are therefore upheld by the findings of this study.

Hypothesis six established that students' attitudes towards internet significantly influenced students' readiness for online learning is also further explained. The results mean that the influence of students' attitudes towards the internet goes beyond just influencing learning management systems, as

found for hypothesis five. However, it further significantly influences students' readiness to opt for online learning. That is, any percentage increase in students' positive attitude towards the internet will result in the same percentage increase in students' readiness for online learning. The findings of this study confirm previous findings of Thach and Lai (2021) that students' positive attitude towards the internet significantly influences positive attitude towards online readiness among learners.

The results also suggest that if learners develop a negative attitude towards internet, it will be very difficult for such students to be ready for online learning. Thus, it can be concluded that the inability of Colleges of Education to organise online learning for their students could be traced to a negative attitude towards internet. This is because the internet can serve as a conduit for online learning, and a negative attitude towards the internet suggests that learners are not ready for online learning. The results corroborate previous findings of Thach and Lai (2021) who established that negative attitude towards the internet affects the readiness of students for online learning.

There are two perspectives for the findings of hypothesis seven that students' attitude towards learning management systems significantly influences students' attitudes towards online learning. These perspectives are both negative and positive attitude perspectives towards learning management systems. The results revealed that any percentage increase in the positive attitude of learners towards learning management systems at the Colleges of Education in Ghana would result in a commensurate positive attitude among learners towards online learning.

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Students' positive attitudes towards learning management systems can be seen when learners would like to use a learning management system (LMS) for learning. Also, students can be said to have developed a positive attitude towards online learning management system if they think the use of LMS for instruction is better than using only traditional classroom instruction. Authorities of Colleges of Education in Ghana can inculcate a positive attitude towards online learning among their students if these students think they can use LMS for learning in the classroom. The results for this study, therefore, agree with the findings of Pete and Soko (2020) that students' attitude towards online learning is influenced by attitude towards LMS.

The negative effect perspective of the findings for hypothesis seven also means that if learners have a negative attitude towards LMS, they will eventually develop the same negative attitude toward online learning. The findings of this study agree with the findings of Uden, Sulaiman and Lamun (2022) that negative attitude towards online learning among learners was adduced by learners' negative attitude towards learning management systems.

The relevance of students' attitudes towards the learning management system has been further enhanced by the findings for hypothesis eight, which established that it has a significant relationship with students' readiness for online learning. This means that student's attitude toward learning management systems is not only limited to influencing students' attitudes toward online learning but also influences students' readiness for online learning.

A positive attitude towards LMS among learners is seen when learners hold positive views on using LMS for learning and are convinced that it is

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desirable to access learning materials from teachers/instructors and collaborate with peers on the LMS. The findings further support the results of Uden, Sulaiman and Lamun (2022) that positive attitudes toward LMS among learners significantly influence online learning readiness. It can therefore be deduced that a negative attitude among learners towards LMS will eventually affect online learning readiness among students. This implies that learners who do not want to patronise online learning for academic purposes might have also developed a negative attitude towards LMS. This finding further corroborates the findings of Bonsu et al., (2022) that online learning readiness among learners is restricted or curtailed due to negative attitude of LMS among learners.

It is also important to explain the findings for the last hypothesis (hypothesis nine) that students' attitude towards online learning significantly relates to students' readiness for online learning among students. A student is said to have developed a positive attitude towards online learning when such a learner likes to use online learning for his studies and thinks using online learning is better than using only face-to-face teaching. A learner is, therefore, ready for online learning only when such a learner demonstrates these characteristics. This finding is in tandem with earlier findings of Bonsu et al., (2022) that a positive attitude towards online learning is an indicator that students are ready for online learning.

Learners who also demonstrate that accessing learning materials online at any time and everywhere is undesirable and hold a negative view towards online learning anywhere without geographical barriers can be said to have a negative attitude towards online learning. Such learners can best be described

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as not prepared for online learning. Thus, the findings of Bervell (2018) that negative attitude towards online learning significantly relate to unpreparedness for online learning among students. Hence, educational institutions that want to provide online learning will need to check the online learning readiness of students, and a key to this deduction is students' attitude towards online learning.

Chapter Summary

This study's results and analysis chapter 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. Eight hypotheses of the study were validated or supported by the findings of this study, and one hypothesis was not supported or validated because of non-significance.

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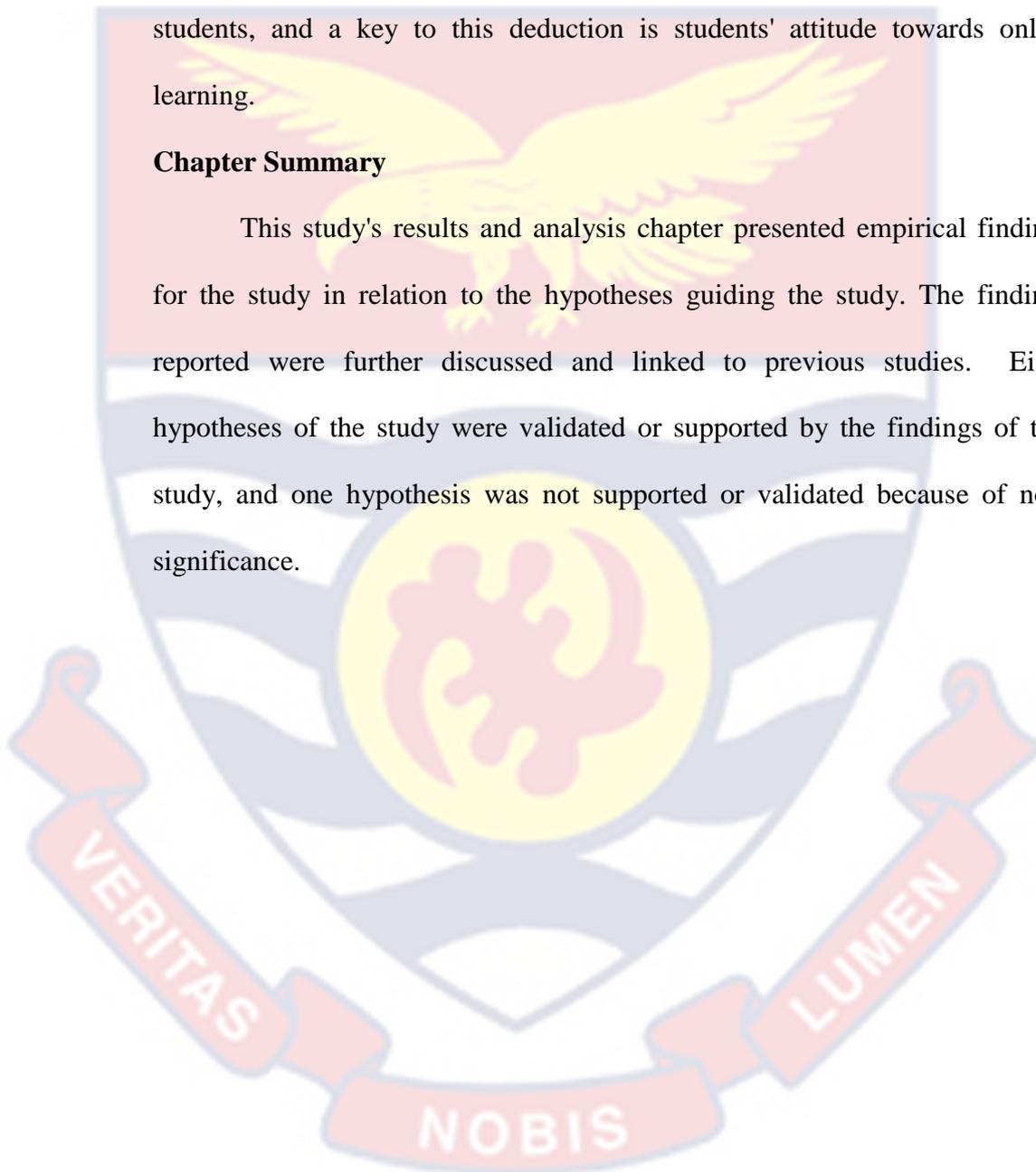
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

Chapter five of the study focused on three main issues. These are a summary of key findings, conclusions and recommendations. Specifically, the chapter begins with a brief overview of the study, which encapsulated the purpose and hypotheses guiding the study as well as key issues on the methodology of the study. This was followed with a summary of the key findings of the study based on specific hypotheses guiding the study. Based on the specific findings for each hypothesis, a conclusion was drawn, and specific recommendations was proffered to stakeholders in relation to the conclusions drawn.

Overview of the Study

The main purpose of the study was to examine the antecedents of the attitude of Colleges of Education students towards online learning readiness. Specifically, the study sought to test nine hypotheses for which the study conjectured that there is a statistically significant relationship between students' attitude towards LMS and their online learning readiness; there is a statistically significant relationship between students' attitude towards the internet and online learning readiness; there is a statistically significant relationship between students' attitude towards LMS and their attitude towards online learning; other hypotheses of the study were that: There is a statistically significant relationship between students' attitude towards the internet and their attitude towards LMS.

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Also, there is a statistically significant relationship between students' attitude towards computer and their attitude towards online learning. Finally, the study conjectured that there is a statistically significant relationship between students' attitude towards computer and their attitude towards LMS, there is a statistically significant relationship between students' attitude towards computer and their online learning readiness and there is a statistically significant relationship between students' attitude towards computer and their attitude towards the internet.

The study adopted the positivist philosophical position and quantitative approach. Specifically, the study used the correlational research design, and a sample size of 335 was drawn from a total population of 2568 from three Colleges of Education in the Central Region of Ghana. A multi-stage sampling technique was adopted in the selection of the sample for the study. These sampling techniques adopted were stratified and simple random sampling techniques. A questionnaire with six parts measured on a five-point Likert scale was used for the data collection for the study. Data collected were screened, coded and analysed with the Partial Least Square -Structural Equation Model (PLS-SEM).

Summary of key Findings

Key findings reported in this section are based on the nine 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' attitudes towards computer and their attitudes towards the internet for hypothesis one.

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2. There is a statistically significant relationship between students' attitude towards computers and their online learning readiness for hypothesis two.

3. Students' attitude towards computers was found to have no statistically significant relationship with attitude towards LMS for hypothesis three.

4. Students' attitude towards computers was found to have a statistically significant relationship with attitudes towards online learning for hypothesis four.

5. There was a statistically significant relationship between students' attitudes towards the internet and attitude towards LMS for hypothesis five.

6. Students' attitude towards online learning was found to have been significantly influenced by students' attitude towards LMS for hypothesis six.

7. Students' attitude towards the internet was also found to have a significant relationship with students' online learning readiness for hypothesis seven.

8. There was a statistically significant relationship between students' attitude towards LMS and their online learning readiness for hypothesis eight.

9. Students' attitude towards online learning was found to have a significant relationship with students' online learning readiness.

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Conclusions

Based on the key findings reported for the study, it can be concluded out of the nine hypotheses guiding the study, eight of them were supported and validated because they attained a statistically significant relationship status. Hypothesis two however was not supported because of its non-significant relationship status. It can further be concluded that students' attitudes towards computers are significantly related to students' attitudes towards the internet, online learning, and online learning readiness.

Students' attitudes towards the internet also significantly related to students' attitudes towards learning management systems and online learning readiness. Students' attitudes towards learning management systems are significantly related to students' attitudes towards online learning and online learning readiness, students' attitude towards online learning significantly influenced students' online learning readiness. Thus, this study concluded that the four independent variables of the study (students' attitude towards computers, the internet, learning management systems and online learning) significantly relate with students' online learning readiness at Colleges of Education in the Central Region of Ghana.

Recommendations

Based on the conclusions and the key findings reported, key steps will need to be taken by specific stakeholders like the government and the heads of colleges to ensure students of Colleges of Education in the Central Region of Ghana are fully prepared for online learning even after the post Covid-19 pandemic. It is therefore recommended that:

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Authorities of Colleges of Education in the Central Region of Ghana should readily make computers available to their students by stocking their computer laboratories. Apart from the availability of computers, students will also need training in basic ICT skills to enhance their ability to use a computer for their academic activities. This could be done through incorporating content on some basic ICT skills in the academic curriculum. These are very necessary to develop a positive attitude towards computers among students of the Colleges to better prepare them for online learning.

It is also recommended that authorities of Colleges of Education in the Central Region of Ghana should provide or improve upon internet connectivity available in their colleges to enhance online learning readiness among their students. This can be done by providing a solid Wi-Fi connectivity in the Colleges to support students' academic work or help students by arranging with telecommunication companies that will provide SIM cards with Zero rated cost for the students to access their personal internet at a very reduced rate. It is expected that these will lead to inculcating positive attitudes among learners at the Colleges of Education in the Central Region of Ghana so as to prepare them for online learning.

It is also expected that to inculcate a positive attitude among students of Colleges of Education in the Central Region of Ghana towards learning management systems, the management of these colleges should provide orientation on how to use this medium for academic activities. Students should be encouraged and supported to use the LMS to participate in delivering some academic content. Students will also need online tools and the internet to be

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able to participate or use LMS for academic activities. To this end, the support of parents and management of these colleges are highly recommended.

The positive attitude among students of Colleges of Education in the Central Region of Ghana towards online learning was found to be a panacea for readiness towards online learning. Thus, it is recommended that management Colleges of Education in the Central Region of Ghana should educate and train how to navigate online platforms for academic purposes. Specific databases and how to use some search engines to search for learning materials among students should be encouraged.

Limitations and Suggestions for Further Studies

The total contribution of the four independent variables of the study to the explanation of the variance in the dependent variable (Online learning readiness among Colleges of Education) was approximately 65 percent. This means that there are about 35 percent explained by other variables not included in this study. Thus, further studies should consider other variables in their studies that could explain the remaining variances.

Additionally, this study was limited to Colleges of Education in the Central Region of Ghana. Further studies could also compare online learning readiness among private and public Colleges of Education or based on a regional grouping or type of university supervising these colleges. Further studies could also consider online learning preparedness among learners at a different level of education, such as pre-tertiary and university students.

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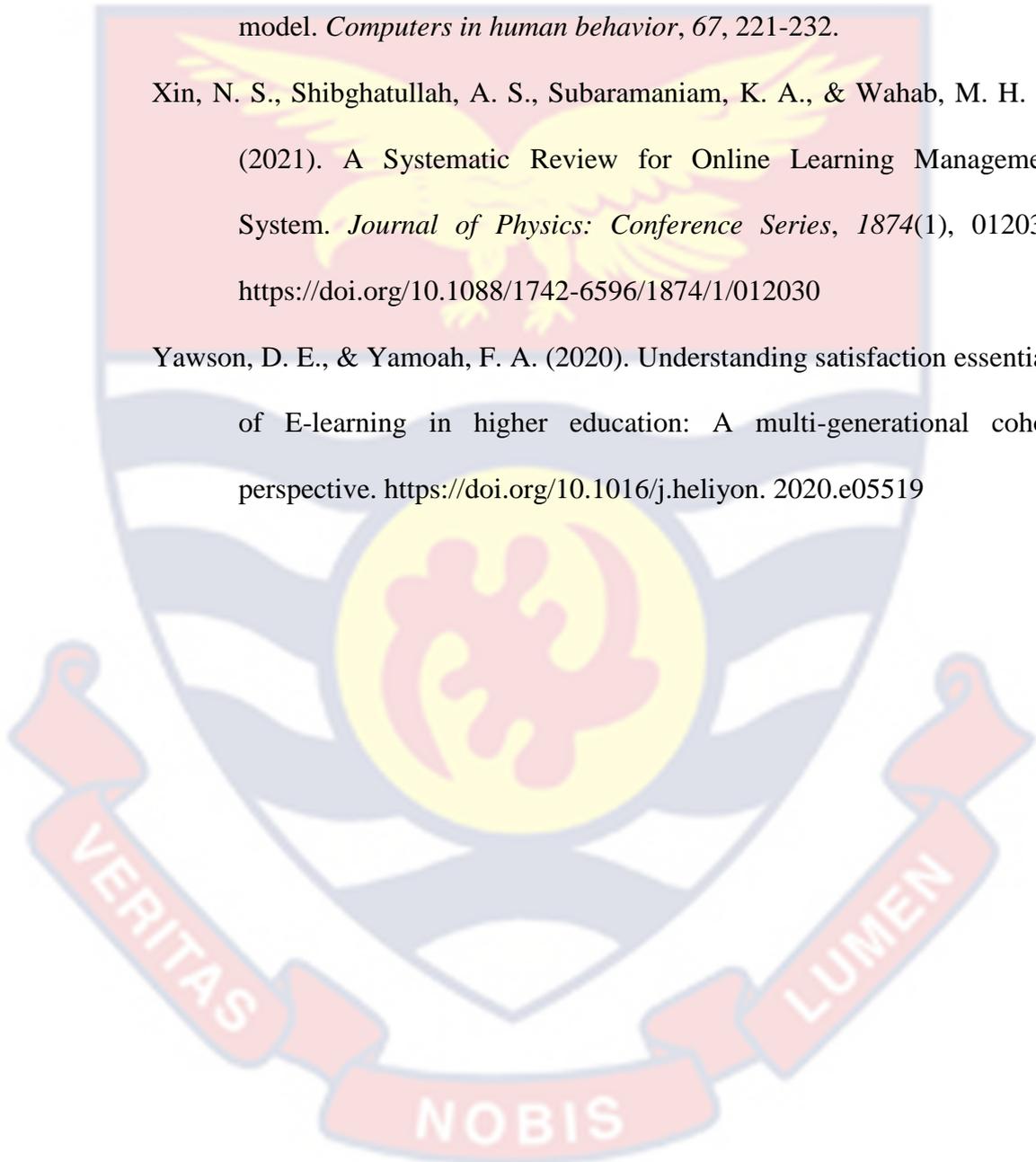
APPENDIX A

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 "Modeling the Attitude Antecedents of Colleges of Education Students Towards Online Learning Readiness in the Central Region of Ghana." I, 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

    Male [   ]

     Female [   ]

2. Age Group

    18 years and Below [   ]

    19-23 years [   ]

    24 -28years [   ]

    29 years and Above [   ]

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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

Scale:

1= Strongly Disagree (SD)

2=Disagree (D)

3= Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

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

Scale:

1= Strongly Disagree (SD)

2=Disagree (D)

3= Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Statement	SD	D	N	A	SA
7	I would like to use the internet for academic purposes.					
8	I think the use of internet for learning is better than using only offline instruction.					
9	It is desirable to use the internet to access materials for learning from anywhere.					
10	I hold a positive view on the use of the internet for learning at any time.					

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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

Scale:

1= Strongly Disagree (SD)

2=Disagree (D)

3= Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Statement	SD	D	N	A	SA
11	I would like to use Learning management system (LMS) for learning.					
12	I think the use of LMS for instruction is better than using only traditional classroom instruction.					
13	It is desirable to access learning materials from teachers/instructors on the LMS.					
14	I hold a positive view on using LMS for learning.					

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SECTION E: Students' Attitude towards online learning

Please, tick [√] the appropriate column to indicate the extent to which you

agree or disagree with the following statements

Scale:

1= Strongly Disagree (SD)

2=Disagree (D)

3= Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Statement	SD	D	N	A	SA
15	I would like to use online learning for my studies.					
16	I think using online learning is better than using only face-to-face teaching.					
17	It is desirable to access learning materials online at any time and everywhere.					
18	I hold a positive view towards online learning anywhere without geographical barriers.					

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SECTION E: Students' Readiness to Use Online Learning

Please, tick [√] the appropriate column to indicate the extent to which you

agree or disagree with the following statements

Scale:

1= Strongly Disagree (SD)

2=Disagree (D)

3= Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Statement	SD	D	N	A	SA
18	I will be able to easily access online learning as needed for my studies.					
19	I am comfortable communicating electronically.					
20	I am willing to actively communicate with my classmates and instructors electronically.					
21	I am a self-directed person when it comes to online learning and studying.					
22	I am self-disciplined online learner and find it easy to set aside reading and homework time.					
23	I am able to manage my study time effectively and easily complete assignments on time during online instruction.					
24	I have the necessary gadgets/devices to learn in an online learning.					

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