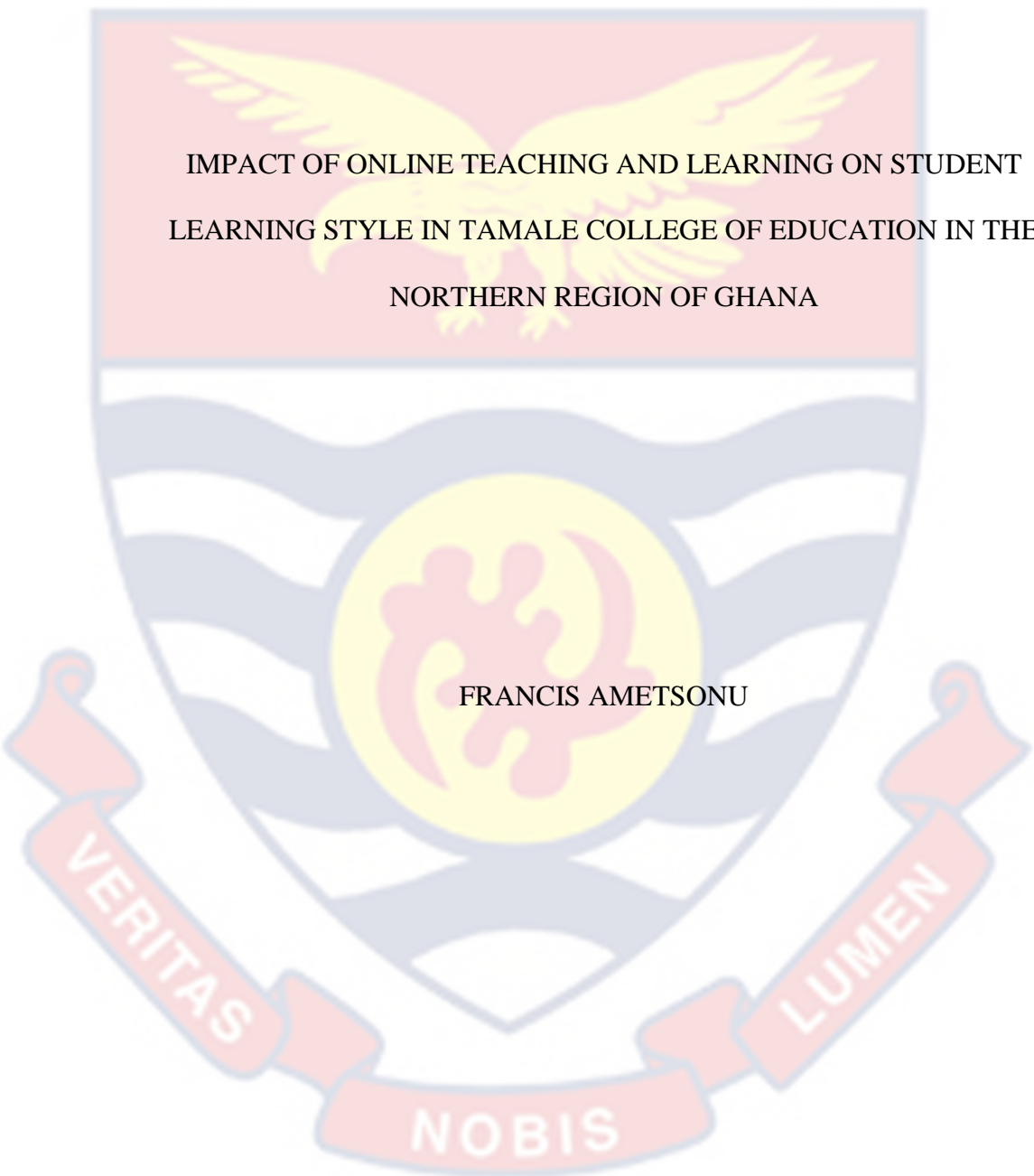


UNIVERSITY OF CAPE COAST



IMPACT OF ONLINE TEACHING AND LEARNING ON STUDENT
LEARNING STYLE IN TAMALE COLLEGE OF EDUCATION IN THE
NORTHERN REGION OF GHANA

FRANCIS AMETSONU

2023

UNIVERSITY OF CAPE COAST

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NORTHERN REGION OF GHANA

BY

FRANCIS AMETSONU

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

OCTOBER 2023

DECLARATION

Candidate's Declaration

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

Candidate's Signature: Date:

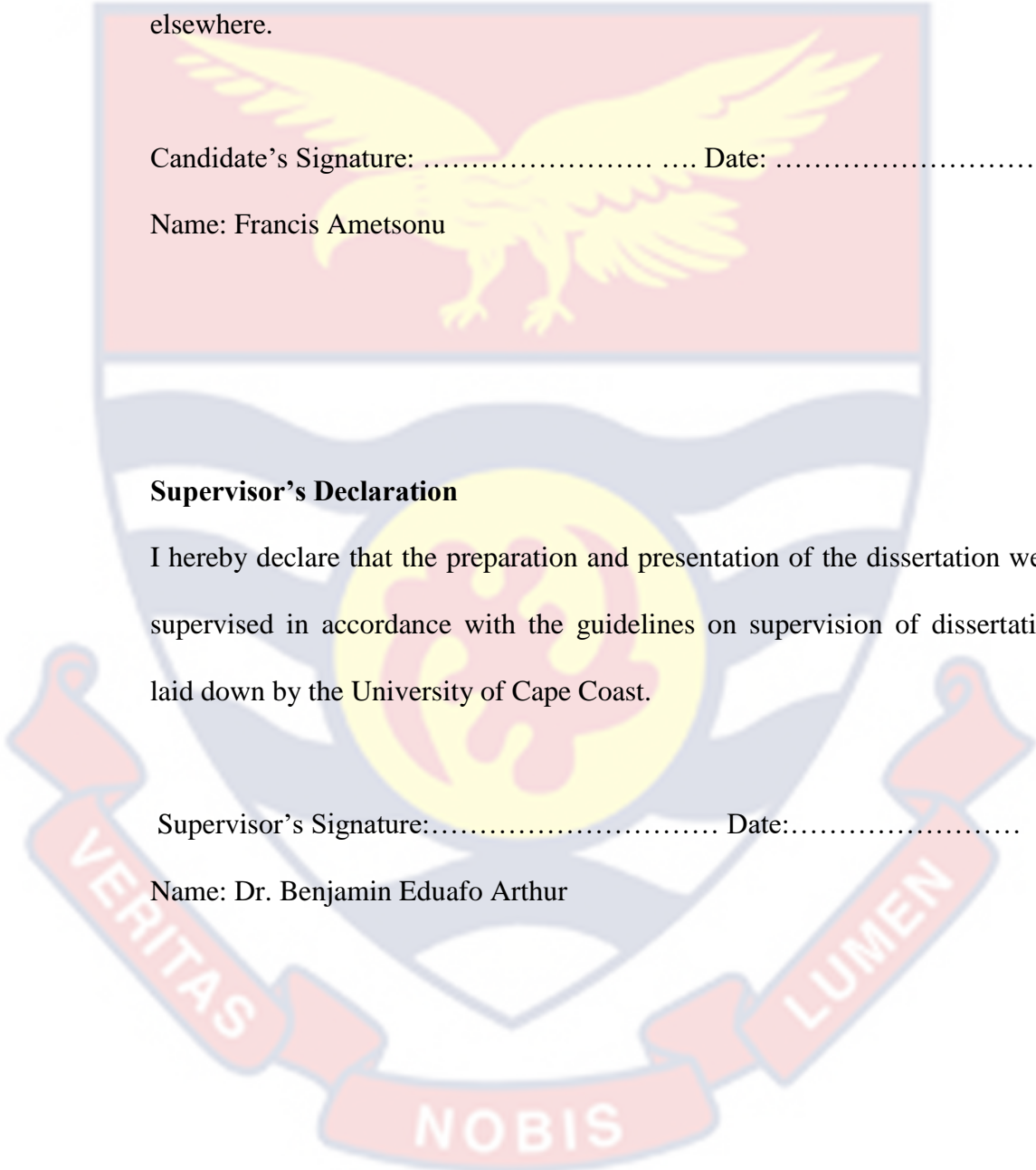
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Supervisor's Declaration

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. Benjamin Eduafo Arthur



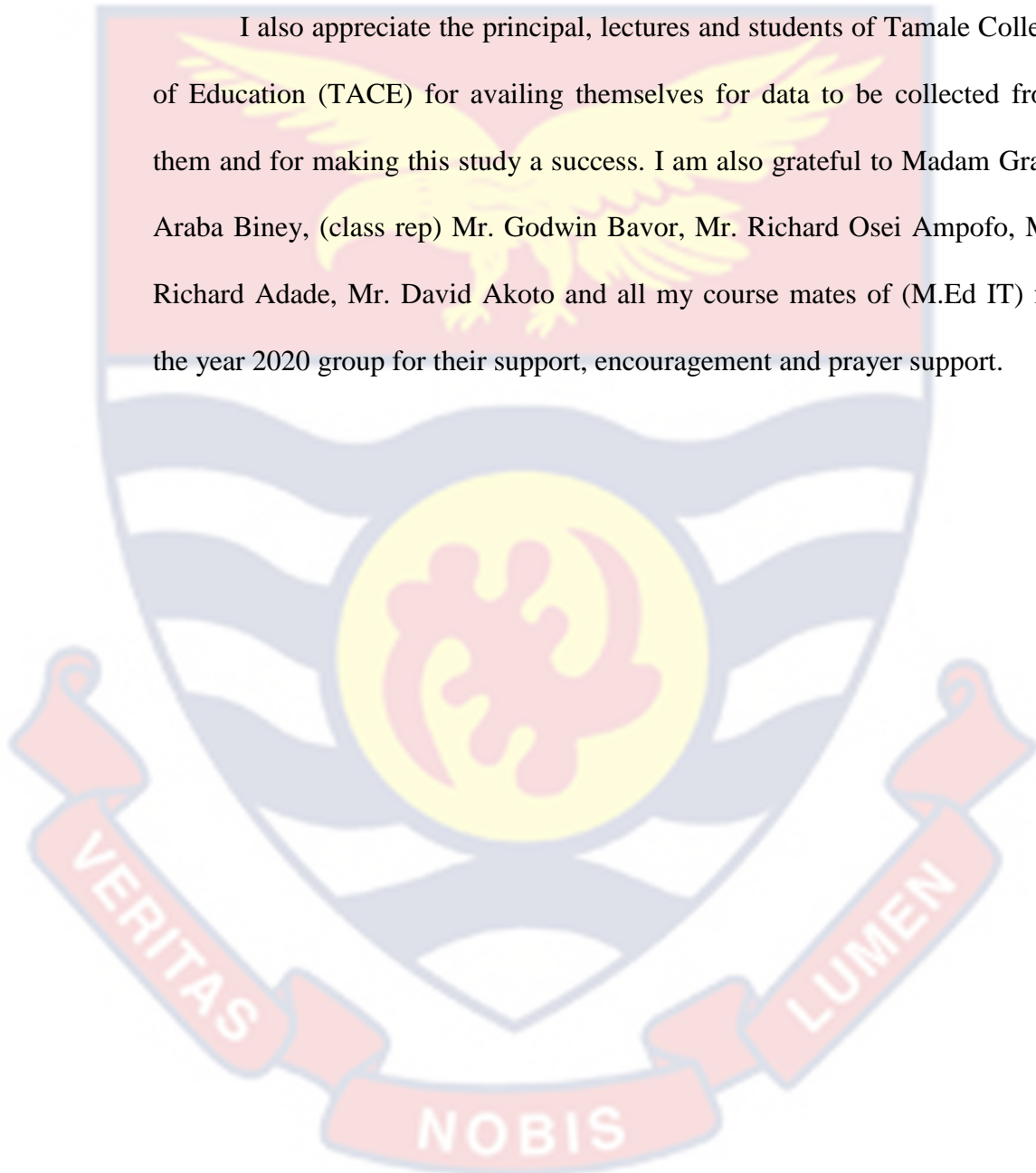
ABSTRACT

Globally, countries are engaged in finding ways to educate students using the Internet, which has resulted in many positive experiences. It is through this that the study assessed the impact of online teaching and learning in the Tamale College of Education. Specifically, the study was guided by three objectives; online teaching and learning at the college, differences in perceptions between teachers and students about online teaching and learning, and the impact of online teaching on teaching and learning styles. Descriptive study design using a qualitative approach was used. Interviews were conducted by purposively and conveniently selecting 40 students and 5 teachers for the study, and the data was analysed using the thematic analytical technique. It was found that online learning and teaching was poor due to lack of internet connectivity in most rural areas in the country where students resided. Students also indicated that classroom learning helps them to develop themselves, such that they can use the techniques used by teachers to also teach after the completion of their study. The study also found that students' access to learning materials relieved the teachers from extra responsibilities like reduplicating of course materials. It was concluded that even though online teaching and learning is recognized as a powerful tool for teaching and learning, it has not been effective in the Tamale College of Education due to poor internet connectivity, inadequate technological resources, low knowledge in information communication technology among teachers and students and unstable power.

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DEDICATION

To my lovely wife Angela Ayisha Aidoo and children Josiah Dumenyo Kojo

Ametsonu and Jessica Emefa Alah Ametsonu.



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LIST OF ABBREVIATIONS

GES	Ghana Education Service
ICT	Information Communication Technology
MoE	Ministry of Education
OTL	Online Teaching and Learning



CHAPTER ONE

INTRODUCTION

Background to the Study

Information technology has influenced almost all aspects of lives: the working environment, communication, information processing, storage and distribution, entertainment, and tourism and education (Palvia et al., 2018). Online learning, which is a method of content dissemination through the internet and information technologies is changing the approach to teaching and learning in recent time (Palvia et al., 2018). Online education has advanced swiftly worldwide and has steadily become a vital form of formal education, and countries and schools are keenly exploring effective ways to educate students with the use of these technologies (Zhou, Zhou & Li, 2020).

Online learning does not only inspire the use of technology for teaching and learning, but it promotes development of pedagogy focused on learning and digital resources and communication tool usage. This type of learning facilitates pedagogical decision-making (Mardesci, 2020). Using technology in education has become inevitable considering the positive outcomes (Ullah, Khan, & Khan, 2017).

While in general, internet-based learning is considered as an alternative to traditional learning, due to the vital role it played in school activities during the COVID-19 pandemic (Toader, Safta, Titirișcă, & Firtescu, 2021). The COVID-19 pandemic caused changes in the teaching and learning process, especially, in higher education institutions and influenced teacher-student interactions. Most universities adopted the online mode of teaching and learning during the pandemic and many governments took actions to prevent

the spread of the virus, while ensuring the continuity of the educational process (Coman et al., 2020).

Some studies have commented on students' enrollment onto online programs (Al-Okaily et al., 2020; Ana, 2020; de Boer, 2021). Al-Okaily et al. (2020) mentioned that the acceptance of college students in online learning programs in Jordan was positively associated with subjective ease, perceived ease of use of the online platform. Ana (2020) also found out in Malaysia and Indonesia that e-learning was completely accepted by students in these countries where many students were prepared for the unanticipated transition to remote learning.

Although online learning is supported by many students, Mladenova, Kalmukov and Valova (2020) indicated how some students face challenges to adjust to remote instructions (like guidelines, expectations, deadlines, etc.) associated with it during the pandemic. Also, although online learning allowed students to pursue their educational paths, financially challenged students, students with unstable internet connectivity, and students who lack self-discipline were disadvantaged (Ana, 2020; Kapasia, et al., 2020).

Notwithstanding, teachers were reported to have faced some challenges like absence of technical skills (Yusnilita, 2020). To aggravate these challenges, students gave numerous excuses which distracted the teachers (Yusnilita, 2020), and technological challenges, such as poor Internet connection which affected downloading, app installations, logins, virtual interactions (Sangeeta & Tandon, 2021).

In Ghana, colleges of education have transitioned to offering degree programs, resulting in a longer duration of study of four years instead of the

previous three years required for diploma programs. This has led to the introduction of online teaching in order to run the degree programs with the limited infrastructure meant for the three-year programs. Other tertiary institutions like the University of Ghana, University of Education, Kwame Nkrumah University of Science and Technology, Wisconsin International University College and Ashesi University and resorted to e-learning platform to engage students academically during the COVID-19 pandemic. However, with the reality of poor internet connectivity in the country couple with electricity fluctuation, it is necessary to holistically assess the impact of online learning and teaching in the country so as to ascertain how positive online teaching and learning (OTL) has so far impacted the Ghanaian educational system.

The advent of the digital age has fundamentally transformed various sectors globally, and education is no exception. The integration of online teaching and learning methodologies has become increasingly prominent, driven by technological advancements and the need for flexible, accessible education solutions. In Ghana, particularly at the Tamale College of Education in the Northern Region, the shift towards online education has been accelerated by various factors, including the COVID-19 pandemic, which necessitated the adoption of remote learning to ensure continuity of education. Online teaching and learning refer to the educational processes where instruction and learning occur through digital platforms, using the internet as the primary medium. This mode of education encompasses a range of tools and resources, including video lectures, interactive simulations, discussion

forums, and digital assessments, aimed at enhancing the learning experience and making education more accessible to a broader audience.

The Tamale College of Education, like many other institutions, has embraced online teaching as a strategic response to the challenges posed by the pandemic and the ongoing quest to modernize educational delivery. This shift has significant implications for student learning styles, which are the various approaches or ways of learning adopted by students, influenced by their individual preferences, experiences, and the educational environment. Understanding the impact of online teaching and learning on student learning styles is crucial for several reasons. Online teaching and learning provides insights into how students adapt to digital learning environments, which is essential for tailoring educational strategies to meet diverse learning needs. Different students may have varying levels of comfort and proficiency with online learning tools, influencing their engagement and overall academic performance.

Problem Statement

Online teaching and learning (OTL) have become a growing experience giving a great lift to the use of ICTs in tertiary institutions. In recent times, OTL is the fastest growing sector of higher education, gaining popularity both on and off campus (Markova, Glazkova, & Zaborova, 2017). While OTL seems flexible and convenient to both teachers and students, others indicate that students in online settings feel confused and isolated, which has affected their learning effectiveness and satisfaction (Pham, Le, & Do, 2021).

In Ghana, the poor technological infrastructure has caused the inability of many institutions to properly infuse technology into their activities. Higher education institutions in the country are faced with poor technical support, hence, the fear of most institutions to switch from campus-based activities where students have to attend face-to-face lecture to virtual lecture sessions. Indeed, some academic staff in higher institutions prefer the old teaching method as it is reported to be less challenging and direct (Slimi, 2020). Students on the other hand find it difficult to embrace technology but and prefer to stick to the old-fashioned method of learning and teaching (Slimi, 2020). Here, students felt they had a lot of supports from their teachers than the use of technology – online teaching.

There is a plethora of studies on OTL across the globe (Chen Cong, Peng, Yin, Rong, & Yang, 2020; Elcullada Encarnacion, Galang, & Hallar, 2021; Utomo, 2021; Yusuf, 2021) and this calls for more regional studies as well and why this study. This has therefore left a knowledge gap in literature as nothing is known on the impact of OTL in Ghana. To fill this knowledge gap, the current study assesses the impact of OTL in the Tamale College of Education.

Purpose of the Study

Mainly, the study assessed the impact of online teaching and learning in the Tamale College of Education.

Research Objectives

The specific objectives are to;

1. Identify the effectiveness of online teaching and learning in the Tamale College of Education.

2. Explore the differences in perceptions about online teaching and learning between teachers and students.
3. Assess the impact of online teaching on teaching and learning styles.

Research Questions

1. How effective is online teaching and learning in the Tamale College of Education?
2. What are the differences between teachers and students' perceptions about online teaching and learning?
3. How does online teaching affect teaching and learning styles?

Significance of the Study

Digitalization has impacted all aspects of lives one way or the other, and education is not exceptional. While online teaching and learning (OTL) has been adopted by several educational institutions in Ghana, the impact of this new technology has not been well documented. This study aims to fill that gap by providing comprehensive insights into how OTL affects teaching and learning at the Tamale College of Education. By documenting these impacts, the study will offer a valuable resource for understanding the effectiveness and challenges of OTL in this specific context. This study will bridge the knowledge gap by adding to the existing literature on OTL in Ghana and similar contexts.

The findings from this study will provide empirical evidence for policymakers in the educational sector, enabling them to formulate effective policies that support and enhance OTL across the country. Well-informed policies can address issues such as digital infrastructure, teacher training, and student support systems, ensuring that OTL is implemented in a way that

maximizes educational outcomes. In this way, the study will not only inform immediate practices and policies but also contribute to the ongoing evolution and improvement of online education in Ghana and beyond.

Limitations

The key limitation of this study on the impact of online teaching and learning on student learning styles at Tamale College of Education is the potential lack of comprehensive data due to varying levels of internet access and digital literacy among students. Given that the Northern Region of Ghana faces infrastructural challenges, including inconsistent internet connectivity and limited availability of digital devices, the study may not capture the full spectrum of student experiences. Additionally, self-reported data on learning styles and adaptability may be subject to bias, as students might not accurately reflect their true experiences or may be influenced by the novelty of online learning. These factors could result in an incomplete or skewed understanding of the actual impact, limiting the generalizability of the findings to other contexts with better digital infrastructure.

Delimitations

This study on the impact of online teaching and learning on student learning styles at Tamale College of Education is specifically delimited to the experiences and perceptions of students enrolled at this institution. It focuses exclusively on the context of the Northern Region of Ghana, thereby excluding other regions with potentially different socio-economic and educational landscapes. The research concentrates on the period from the onset of the COVID-19 pandemic to the present, capturing the immediate and short-term effects of the transition to online learning. The study is limited to

examining student learning styles without extending to broader academic outcomes or comparing with traditional in-person learning environments. This scope is intentionally narrow to provide an in-depth analysis of how online teaching methods influence learning preferences within this specific educational context.

Organization of the Study

The study was structured into five chapters, where the first chapter covered the study's background, statement of the problem, the study objectives and questions, the significance of the study, and the organization of the study. Chapter Two reviewed relevant literature and theories relating to the topic under discussion. Chapter Three elaborated the methods employed for the study. This involved the study design, study setting, target population, sample and sampling process, data collection methods and procedure, data analysis and presentation and ethical consideration. Chapter Four on the other hand presented the data and also discussed the results in light with the reviewed literature and theories. Chapter Five gave a summary of the study, conclusions, and some recommendations.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter reviews literature related to the topic. The chapter covers theoretical review, conceptual framework, conceptual review, and empirical review. The chapter also consists of summary of literature review.

Theoretical Review

Several theories relate to OTL. In this study however, three theories are reviewed; the cognitive learning theory, behaviorism learning theory and connectivism learning theory.

Cognitive Learning Theory

Cognitivism refers to the study of the mind and how it obtains, processes, and stores information (Stavredes, 2011). This theory was a response to behaviorism. It was argued that not all learning occurs through shaping and changing of behaviors. In this theory, learners are active participants in their learning, and the mind functions like a computer processor. Information comes in as input, the mind processes the information for the time being, and the information is stored away to be retrieved later. Learning is shaped by acquired learning strategies and prior knowledge and attitudes, called schemas. The cognitive view of learning is teacher-centered, and information must be presented in an organized manner in order to achieve the most efficient learning.

Cognitivism (also known as cognitive psychology) is the predominant theoretical perspective for studying human learning today. Its focus is on the cognitive processes; that is, “how people perceive, interpret, remember and in

other ways think about environmental events” (Ormrod, 2012). Whereas behaviorism focuses on observable behavioral changes, cognitivism expands the understanding of learning to include internal mental processes unique to each person, such as perception, insight, and meaning (Olson & Hergenhahn, 2013; Ormrod, 2016). Some underlying assumptions that support the cognitive view of learning follow (Ormrod, 2016).

Three German psychologists, Max Wertheimer (1880–1943), Wolfgang Köhler (1887–1967), and Kurt Koffka (1886–1941), departed from behaviorism and are considered the founders of Gestalt psychology. Later another German Gestalt psychologist, Kurt Lewin (1890–1947), developed a field theory of human learning. These psychologists insisted that behavior was much more than a conditioned response and that perception and memory can be studied by introspection in addition to external observation. Further, they posit that humans selectively perceive and react to complex patterns of stimuli as wholes, not as disconnected parts. It is the total pattern of stimuli that determines what a person perceives and learns (Olson & Hergenhahn, 2013; Ormrod, 2016).

Social Cognitive Theory (SCT) is a learning theory based on the idea that people learn by observing others. These learned behaviors can be central to one's personality. While social psychologists agree that the environment one grows up in contributes to behavior, the individual person (and therefore cognition) is just as important. People learn by observing others, with the environment, behavior, and cognition all as the chief factors in influencing development in a reciprocal triadic relationship. For example, each behavior witnessed can change a person's way of thinking (cognition). Similarly, the

environment one is raised in may influence later behaviors, just as a father's mindset (also cognition) determines the environment in which his children are raised.

Social Cognitive Theory posits that learning most likely occurs if there is a close identification between the observer and the model and if the observer also has a good deal of self-efficacy. Self-efficacy is the extent to which an individual believes that they can master a particular skill. Self-efficacy beliefs function as an important set of proximal determinants of human motivation, affect, and action-which operate on action through motivational, cognitive, and affective intervening processes (Bandura, 1989).

This theory examines how cognitive activities like thinking and mental processes can be induced by external and internal factors. With this theory, learning happens when the learner shows behaviour of ability to process cognitive structures. The theory acknowledges that all learners do not have the same cognitive ability level. Due to this, online students will not progress at the same level. Online studies inventors should therefore, allow individual students to structure the learning contents to fit their needs. Online programs should be organized such that students can skip certain lessons or repeat others, based on their individual comfort with the subject/course.

Cognitivism is suited well for problem solving, where the concepts are complex and must be broken down into smaller parts. Ideas and concepts from these problems are linked to prior knowledge, which in turn helps the learner develop a stronger comprehension. (Stavredes, 2011). The core of the cognitive theory explains how individuals think about what they are learning, hence, OTL content inventors must challenge students' minds to the fullest.

That is the only way to exhaust the science behind cognitive learning and make it relevant in the e-Learning setting.

Behaviorism Learning Theory

According to the learning theories propounded by behaviorists, learning is a mechanical process of associating the stimulus with response, which produces a new behavior. Such behavior is strengthened by the reinforcement. Main proponents of this theory were J.B. Watson and I. Pavlov. Behaviorists view the learner as a passive person who responds to the stimuli. According to them the learner starts as tabula rasa (which means clean slate) and the behavior is shaped by reinforcement. Positive as well as negative reinforcement increase the probability of the repetition of behavior. However, punishment decreases the chance of repetition of the behavior. Learning is therefore defined as a change in the behavior of the learner.

Behaviorists assert that the only behaviors worthy of study are those that can be directly observed; thus, it is actions, rather than thoughts or emotions, which are the legitimate object of study. Behaviorist theory does not explain abnormal behavior in terms of the brain or its inner workings. Rather, it posits that all behavior is learned habits, and attempts to account for how these habits are formed. In assuming that human behavior is learned, behaviorists also hold that all behaviors can also be unlearned, and replaced by new behaviors; that is, when a behavior becomes unacceptable, it can be replaced by an acceptable one. A key element to this theory of learning is the rewarded response. The desired response must be rewarded in order for learning to take place (Parkay & Hass, 2000).

In education, advocates of behaviorism have effectively adopted this system of rewards and punishments in their classrooms by rewarding desired behaviors and punishing inappropriate ones. Rewards vary, but must be important to the learner in some way. For example, if a teacher wishes to teach the behavior of remaining seated during the class period, the successful student's reward might be checking the teacher's mailbox, running an errand, or being allowed to go to the library to do homework at the end of the class period. As with all teaching methods, success depends on each student's stimulus and response, and on associations made by each learner.

The behaviorist school sees the mind as a “black box,” in the sense that a response to a stimulus can be observed quantitatively, totally ignoring the effect of thought processes occurring in the mind. The school, therefore, looks at overt behaviors that can be observed and measured as indicators of learning (Good & Brophy, 1990). Behaviorism focuses on tangible, observable behaviors, such as learning to give an injection, changing dietary practices, and safely bathing an infant.

Behaviorism focuses on the study of overt behaviours that are observable and measurable (Good & Brophy, 1990). It gives the idea that people behave based on their interaction with the environment they find themselves. By extension, teachers in a classroom can utilize positive reinforcement to help students better learn, as students are more likely to retain information through that, which is a direct result of the behaviorism theory. The complex process of learning is defined according to behaviorism, cognitivism, and constructivism. To them, learning is the visible behaviour that happens through experience (Eggen & Kauchak, 2001).

Learning for the behaviorist is focused on an observable change in the learner's behavior and is not concerned with the internal thought processes of the learner. The learner as a research subject is described as an organism rather than a person or human being. Behaviorists believe that the learner's behavior is shaped by elements in the environment that either precede the behavior (stimulus) or the consequences that follow it. These preceding events can precipitate the behavior, and the events that follow can have positive or negative consequences on the behavior. These events must occur closely in time so that a bond is formed, which is called the principle of contiguity (Olson & Hergenhahn, 2013). An example of a preceding event is a nurse approaching a child with a visible syringe, intending to vaccinate him. The sight of the syringe frightens the child, who anticipates pain, starts crying, and clings to his mother for protection. Thereafter the child may be frightened of syringes until he matures and learns differently. An example of a reinforcing event is a smile and hug from the child's mother that assures him he is safe and well. The child knows he can find solace and protection from his mother and will seek her out in future frightening situations.

Using behaviorist theory in the classroom can be rewarding for both students and teachers. Behavioral change occurs for a reason; students work for things that bring them positive feelings, and for approval from people they admire. They change behaviors to satisfy the desires they have learned to value. They generally avoid behaviors they associate with unpleasantness and develop habitual behaviors from those that are repeated often (Parkay & Hass, 2000). The entire rationale of behavior modification is that most behavior is learned. If behaviors can be learned, then they can also be unlearned or

relearned. A behavior that goes unrewarded will be extinguished. Consistently ignoring an undesirable behavior will go far toward eliminating it. When the teacher does not respond angrily, the problem is forced back to its source—the student. Other successful classroom strategies are contracts, consequences, punishment and others that have been described in detail earlier. Behaviorist learning theory is not only important in achieving desired behavior in mainstream education. Special education teachers have classroom behavior modification plans to implement for their students. These plans assure success for these students in and out of school.

Constructivism Learning Theory

Constructivism is the study of a learner's own construction of knowledge. This knowledge is constructed through one's own personal experiences and interactions with the outside world. The learner takes in new information and gives meaning to it using his or her own prior attitudes, beliefs, and experiences as references (Stavredes, 2011). Learners are active participants in the construction of knowledge while the instructor serves as a facilitator. Two types of constructivism emerged beginning in the late 1970s. Lev Vygotsky introduced social constructivism, in which social interaction with others helps the learner put meaning to information.

Vygotsky noted a Zone of Proximal development in which learners can develop a certain level of meaning on their own but can grow even greater after interacting with classmates and instructors. In 1985, Jean Piaget introduced cognitive constructivism, in which knowledge is constructed by either assimilation or accommodation. In assimilation, incoming information is associated with a schema, and in accommodation, incoming information

does not match a schema. Thus, the schema must be changed to accommodate this conflict (Stavredes, 2011).

Constructivists see learners as being active rather than passive. Knowledge is not received from the outside or from someone else; rather, it is the individual learner's interpretation and processing of what is received through the senses that creates knowledge. The learner is the center of the learning, with the instructor playing an advising and facilitating role. Learners should be allowed to construct knowledge rather than being given knowledge through instruction (Duffy & Cunningham, 1996).

A major emphasis of constructivists is situated learning, which sees learning as contextual. Learning activities that allow learners to contextualize the information should be used in online instruction. If the information has to be applied in many contexts, then learning strategies that promote multi-contextual learning should be used to make sure that learners can indeed apply the information broadly. Learning is moving away from one-way instruction to construction and discovery of knowledge (Tapscott, 1998).

Constructivism is best utilized when learners take control of the learning situation, such as in Problem-Based Learning. As learners engage themselves in an activity like this, they develop an understanding of the importance of the problem, comprehend the relevance of the topic, and construct knowledge through their experiences. It is more important to focus on the whole rather than the individual parts in constructivist learning (Stavredes, 2011). Constructivism is sometimes misconstrued as a theory that compels students to reinvent the wheel, but instead, it implores students to

attempt to learn how it functions and apply this to real-world learning. (Educational Broadcasting, 2004).

Conceptual Framework

The conceptual framework for this study was derived and refined from Dewey (1938) who postulated that interactions lie in the center of any learning experience. Dewey (1938) maintained that education is based on interaction of individual's internal and external conditions. There is no separation between interaction and the condition through which one experiences it because the context of interaction is based on that condition. Dewey argued that an experience is a transaction between an individual and his/her environment at the moment. The transaction concept indicates the inter subjectivity between the individual himself, other people, and the environment.

The framework contains the following content (which include the program or course structure, learner's self-discipline, social presence, and dialogue. Teacher and technology are the two important components of context as they shape the learning environment in ways that learners will gain knowledge from their teachers and peers (Ertmer, & Ottenbreit-Leftwich, 2010).

Technologies used in OTL include broadcast computers, television, telephones or mobile phones. Through these technologies, different documents to be communicated. In this case, technologies like computer conferencing and interactive video allow for two-way interactions (Smyth, 2011).

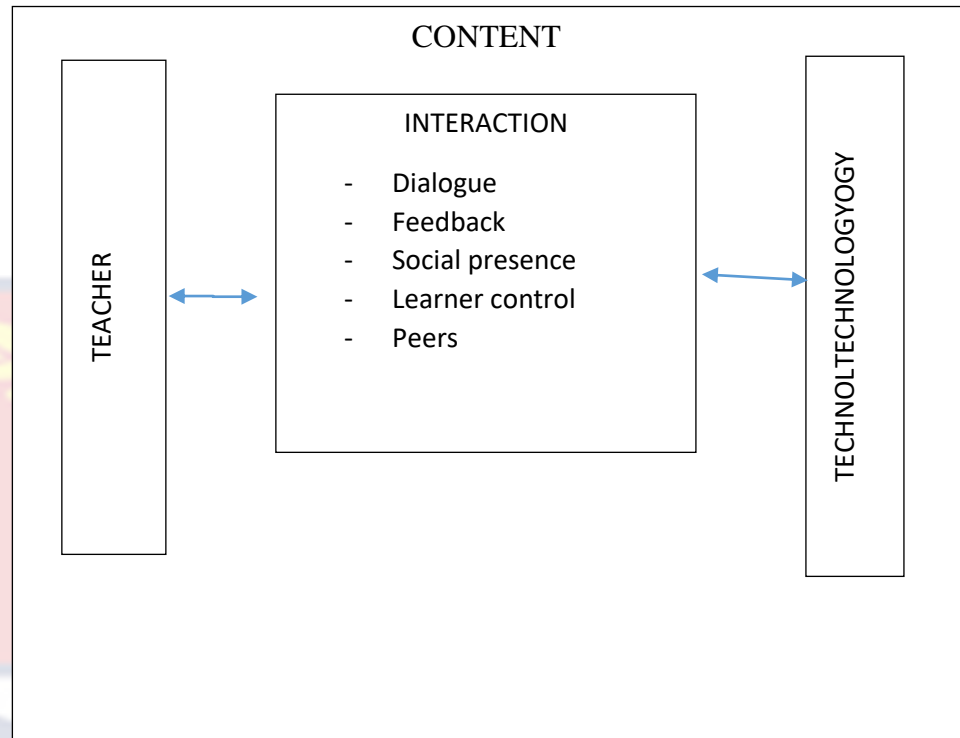


Figure 1: Conceptual framework for OTL (Dewey, 1938).

Conceptual Review

Online Teaching and Learning

Online education refers to students' ability to learn with devices connected to an internet at any time and from anywhere (Dhawan, 2020). It is used interchangeably with online learning, which was also defined by Singh and Thurman (2019) as the "learning experiences in synchronous or asynchronous environments using different devices (e.g., mobile phones, laptops, etc.) with internet access. In these environments, students can be anywhere (independent) to learn and interact with instructors and other students."

Online education is defined as the use of technology and network interaction for teaching and learning. Here, classes are held via virtual space (online). It is also referred to as a technology-enabled transmission of

knowledge. It is the fastest growing trend in the education and has caused a changed in pedagogical strategies (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2019) as ICT tools are now utilized for teaching and learning.

The OTL is one way to address educational challenges during disease outbreaks like the COVID-19 pandemic. OTL make use of the internet for learners to learn from a distance. Facilities and resources needed for online learning include tablets/computers, servers, smartphones, and web support. These ease the education procedure by making it student-centered, creative and flexible (Singh & Thurman, 2019). This has increased equality as education is made reachable to all, especially, students in distant areas.

Online learning utilizes benefits of modern education technology to offer quality, non-delayed, and live teaching in interactive classrooms. Teachers in this case use Internet technology and electronic teaching resources to enhance teaching contents for enriched, hands-on, and exciting interaction (Luo & Zou, 2022). Learners also use the internet for diverse learning options, personalize, and to access these platforms at their own convenience.

Despite the realized positive implications of OTL, it is not a flawless process that can run without obstacles. Fortune, Spielman and Pangelinan (2011) identified some obstacles associated with OTL achievement, students' interaction, and learning resources. This notifies relevant stakeholders the need to find solutions for the obstacles to improve the quality of online learning. For example, inadequate OTL resources can negatively influence students' learning achievement. Therefore, to help students in this situation, possible obstacles in OTL should be anticipated and managed for the benefit of both teachers and students.

Online Teaching and Learning Media

Learning media was defined by Sariffuddin, Astuti and Arthur, (2017) to include teaching and learning instruments used to stimulate student skills, thoughts and feelings. Communication process in learning will not run efficiently without media. Media plays major role in the classroom learning process, as it utilizes several learning styles, invents authentic learning experiences, and enhances critical thinking skills (Williams, 2020).

The OTL media include WhatsApp Messenger, Google Classroom, Zoom Meeting and many more. Tools like the Google classroom facilitates cooperation between students and teachers, where teachers have the opportunity create, distribute and receive assignments, and make announcements to their students (Beal, 2017, as cited in Syafi'i, 2020). Google Classroom is one of the active mediums for the students learning in the 21st century which facilitates video projects (Apriana & Hidajat, 2020).

Google classroom provides easy-to-use learning features for students and ensure student-centeredness. Its benefits include facilitation of communication between teachers and students, offers feedback to learners, and class could be held anytime and anywhere once there is computer and access to internet. WhatsApp messenger is a prompt messaging online application that allows users to share information through text, pictures, video, and audios (Church & de Oliveira, 2013). This application is convenient, easy to use, and fast. WhatsApp functions on windows, IOS, Androids, Microsoft, etc. and it is commonly utilized for OTL to send images, videos, audios, and basic text messages (Chan & Holosko, 2017). Bounnik and Deshen (2014)

noted that using WhatsApp in teaching helps students to support themselves, and makes the teaching and learning process simple, and enjoyable.

Empirical Review

Numerous scholars compared the effectiveness of OTL with conventional teaching and learning. These two settings differ substantially, and the impact of communicating within these settings have a direct effect on students' attitudes and thoughts. Areas explored include the nature and interactions available online (Muspiroh, 2016), flexibility and accessibility of online teaching (Shearer et al., 2020), skills, motivations, and perceptions of learners and instructors (Wang, 2020) and whether some or all of these areas could be connected to students' academic achievements (Agustina & Cahyono, 2017).

Zainuddin and Attaran (2016) retrieved positive responses from student beneficiaries of the OTL in Malaysia. The students recommended that the videos used in teaching should be more engaging and shorter. Online class was identified to worked well for quiet and shy learners, and foreign students who were not fluent in English language. Muspiroh (2016) mentioned three (3) items to show effectiveness of learning; students' practices, their reactions to instructions, and their understanding of topics taught. To achieve these, Muspiroh suggested the need for a collaborative partnership between students and teachers on the appropriate and practical philosophy of education, purpose, and the technology and learning media necessary to ensure progress.

Technology play critical role in online learning, and it is vital for teachers to increase students' interest to use learning media in this era of technology (Tuzahra, Sofendi, & Vianty, 2021). Choice of the right and

appropriate media that suits the convenience of students has always been a challenge, though factors such as feasible time and students' readiness cannot be overlooked. This is because conducive time and place make teaching and learning easier for both the teacher and student, respectively. Inderawati, Petrus, and Jaya (2019) insist that teacher and students should take advantage to learn by utilizing available technologies as many people have positive perceptions of online learning.

Education through the virtual space (online) need to be accepted by all relevant stakeholders, including schools, students, teachers, administrators, parents, and other agencies, before its implementation will be successful. Shearer et al. (2020) examined students' perceptions and motivation towards online education and reported the need for curriculum designers and policymakers to understand the perspective of students to develop student-centric instructional techniques while at the same time, increasing students' engagements and satisfaction.

Alsaaty, Carter, Abrahams, and Alshameri (2016) added from their study on the perceptions of business students on OTL in higher education. From their study, approximately 30 per cent of the students said the online class materials were convenient, easy and understandable, while approximately 69 per cent were uncomfortable with the online materials. Martin, Sun, and Westine (2020) also examined students' experience with online courses and reported that students were not satisfied with their teachers and suggested their teachers should adapt the online environment to make the process convenient. Based on this, Wang (2020) advised the need to treat and redesign the online teaching model to suit students to ensure success. That is,

it should be student-centered with the goal to develop students. Therefore, teachers need to select online resources which are appropriate to their subjects, and design activities to help learners learn independently.

Further, Loh et al. (2016) also assessed students' perception of e-learning. The authors investigated the effectiveness of use of distinctive technologies in teaching. They reported that distance learning students enjoyed the flexible and convenience (in terms of time and location) nature of the program; but, were not satisfied with the quality of the Learning Management System (LMS), web-based materials, and interaction between students and teachers. Cakrawati (2017) also found positive responses which showed students' satisfaction regarding the effectiveness of online learning process in his study. Despite the students' expressed dissatisfactions, they were pleased to take e-learning courses because of their convenient features (Loh et al., 2016).

Agrawal, Agrawal, and Agrawal (2016) assessed the factors that affect e-learning by studying students' perceptions towards the use of e-learning in some universities. Main issues that emerged from their study to influence e-learning were the instructor's perspective on e-learning, and service, and system quality. Burns (2013) advised the need for schools to consider the impact of online classes as it plays an important role in the learning process. However, most schools implement online teaching without correct planning (Abhinandan, 2018). It has been observed that students enroll on an online class because of convenience, and flexibility within the teaching and learning space.

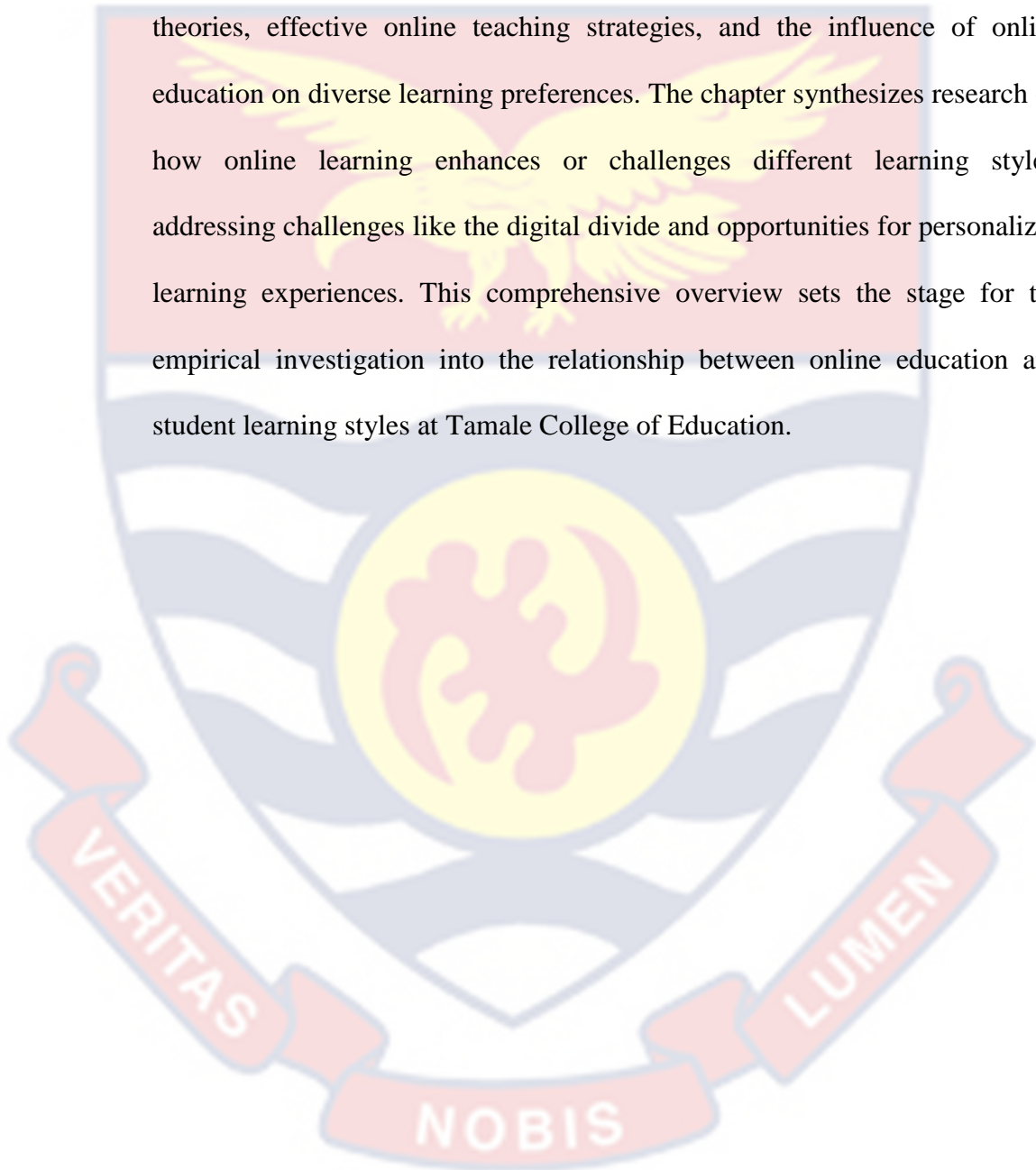
To ensure effectiveness of online classes, teachers should analyze the content and find better ways to present the subject for students to understand the course through training and mentoring (Agustina & Cahyono, 2017). Ballew (2017) revealed that 74% of online instructor support the idea that development program should be organized by schools to enrich their teaching abilities. Online learning supports students to learn independently and collaboratively by utilizing various online learning platforms, and it reduces students' dependence on teachers (Kumi-Yeboah, Dogbey, & Yuan, 2017).

A survey by Mansor and Ismail (2012) with 136 engineering students of a in Malaysia on students' learning styles and their perceptions towards online teaching, revealed that there were different students' learning styles. However, all the students had positive perceptions on towards its correlated benefits. That means there is no impact of students' learning styles on online learning, and vice versa. Visvizi and Daniela (2019) also identified some methods of teaching and learning which mix technologies to improve the quality of higher education and creativity in teaching pedagogy.

Phutela and Dwivedi (2020) highlighted on the factors and hindrances of e-learning looking at teaching styles, effectiveness, and pedagogy. Santally, Rajabalee, Sungkur, Maudarbocus, and Greller (2020) also attributed the progress of e-learning practices to technology in Mauritius. Wongwuttiwat, Buraphadeja and Tantontrakul (2020) in a study on blended e-learning and face-to-face learning (TDL) examined learning achievements among university students. From the survey, the blended group performed better, and there was no significant difference between the learning achievements of males and females.

Chapter Summary

The literature review chapter offers an in-depth exploration of online teaching and learning's impact on student learning styles at Tamale College of Education in the Northern Region of Ghana. It covers student learning style theories, effective online teaching strategies, and the influence of online education on diverse learning preferences. The chapter synthesizes research on how online learning enhances or challenges different learning styles, addressing challenges like the digital divide and opportunities for personalized learning experiences. This comprehensive overview sets the stage for the empirical investigation into the relationship between online education and student learning styles at Tamale College of Education.



CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

This chapter presents the methods used to conduct the study. It throws lights on research study design, study setting, population and sampling process, research instrument, data collection process, and data analysis employed in the research study.

Study Design

The study employed descriptive design using a qualitative approach. This strategy enabled the investigator to identify and describe the effectiveness of OTL on the students, as well as the perceptions of the students and teachers on the OTL. Omta, Trienekens and Beers (2001) denoted that descriptive study concerns itself with relationships that exist, like the nature conditions, cause, effects, practices, and attitudes of certain events or trends. They also argued that descriptive studies make inference beyond the chosen sample and situation. The design was therefore considered the most appropriate for the research as it aimed at identifying the perceptions and impact of OTL on students at the Tamale College of Education.

Study Area

The study was conducted at the Tamale College of Education. The College is one of the three (3) teacher education colleges in the Northern Region and one of the 46 public colleges of education in Ghana. Tamale College of Education was opened in 1958 by the late, Dr. Kwamu Nkrumah, the first president of Ghana. The school started with 60 female students, and it continued as female-based institution until 1977, when male students were

admitted together with the female to pursue the certificate 'A' Post Middle Programme.

Study Population

The target population in this study consists of both students and teachers at Tamale College of Education in the Northern Region of Ghana. For the 2022/2023 academic year, the college has a total student population of 1,350, including first, second, and third-year students. This diverse student body provides a comprehensive view of the impact of online teaching and learning (OTL) across different academic stages. Additionally, the study includes teachers responsible for designing and delivering online courses, encompassing both experienced faculty and new teachers. The inclusion criteria are students enrolled in any program and teachers involved in online teaching during the 2022/2023 academic year, while those not participating in online courses are excluded.

Sample and Sampling Technique

In a qualitative study, the sample size is reached when there is information saturation. Burmeister and Aitken (2012) suggests that having a sample size of at least 15 in a qualitative research is acceptable for theory and in-depth analysis of the participants. In all 45 participants were involved in the study, and this comprised 40 students and 5 teachers of the Tamale College of Education.

Two (2) non-probability sampling techniques were employed to select the participants; purposive and convenience sampling techniques. Purposively, students in levels 300 and 400 and some teachers were engaged for the study. These cohorts of students and teachers were engaged because they were

considered as pioneers of the OTL, and so could give adequate information about it based on their prolonged experience with it. It should be noted that the purposive sampling technique allows the researcher to consciously and purposefully choose individuals who can provide best information needed for a study (Polit & Beck, 2010), hence, the reason for its use.

The individuals involved in this study were all homogeneous, meaning they were either students or teachers who utilised the OTL tools, the researchers opted to utilise the convenience sample technique. This was imperative so to reach the targeted population at ease, and also employ those who were available during the time of the study and willing to participate too. This technique gave the flexibility to reach out to all the suitable participants.

Data Collection Instrument

An in-depth interview guide was employed to collect the data. It was structured into three sections, the first section collected data on the effectiveness of OTL, the second section covered the perceptions between teachers and students regarding OTL, and the last dealt with data on impact of OTL on teaching and learning styles.

The interview guide is divided into three main sections to comprehensively assess the impact of online teaching and learning at Tamale College of Education. Section A evaluates the overall effectiveness of online education at the college, considering factors such as internet connectivity, device availability, electricity supply, and ICT knowledge of teachers and students. Section B explores the differences in perceptions between teachers and students regarding online teaching and learning, discussing issues related to classroom/virtual space interactions, opportunities for self-development,

difficulties in using online platforms for learning, and concerns about plagiarism. Section C focuses on assessing the impact of online teaching and learning on teaching and learning styles, with questions aimed at determining whether participants consider online education to have any impact on teachers' teaching styles and students' learning styles, and the reasons for their opinions. The interview guide concludes with an open-ended question allowing participants to share any other relevant information related to the interview, ensuring a comprehensive understanding of the impact of online teaching and learning at Tamale College of Education.

Data Collection Procedure

The data were collected through one-on-one interviews. The objective of the study was explained to all the participants, and they were assured of utmost confidentiality of information that was to be collected. Verbal consents were taken from all the participants, and the interviews were conducted at their places of conveniences. In this case, some interviews were conducted in the classrooms, hostels, and offices. Each interview lasted between 15-20minutes, and were recorded for onwards transcription and analysis. Some notes were also taken alongside.

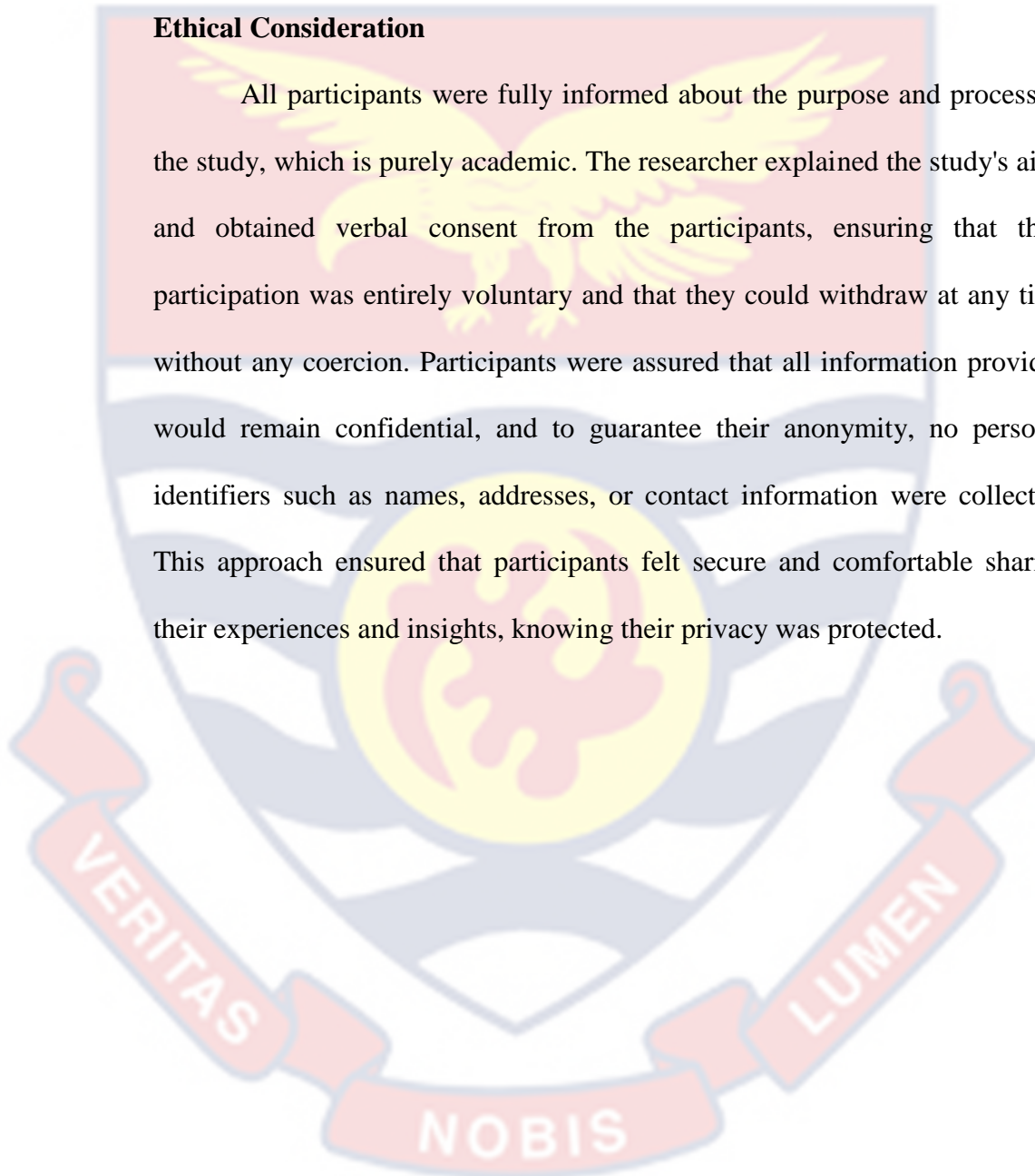
Data Processing and Analysis

The recorded interview was transcribed by the researcher. The transcripts were read and proof-read for familiarization. Initial codes were generated from the data, and from the codes, sub-themes and the main themes emerged based on the objectives. Thematic data analysis technique was used for the analysis. This analytical tool helped to identify the various themes (that is, patterns in the data that are important or interesting) based on the research

objectives. This goes beyond just summarizing the data; as a good thematic analysis interprets and makes sense of its themes developed (Clarke & Braun, 2013). A detailed report of the results was written highlighting the key findings of the study by quoting responses of participants in verbatim.

Ethical Consideration

All participants were fully informed about the purpose and process of the study, which is purely academic. The researcher explained the study's aims and obtained verbal consent from the participants, ensuring that their participation was entirely voluntary and that they could withdraw at any time without any coercion. Participants were assured that all information provided would remain confidential, and to guarantee their anonymity, no personal identifiers such as names, addresses, or contact information were collected. This approach ensured that participants felt secure and comfortable sharing their experiences and insights, knowing their privacy was protected.



CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter presents the results of the data collected and the discussion of the findings with reference to the literature reviewed. The results are presented in accordance with study's objectives.

The Effectiveness of Online Teaching and Learning

The following themes were identified under the effectiveness of OTL:

- i. Poor or no internet connectivity
- ii. Lack of technological devices
- iii. Inadequate stable electricity power supply
- iv. Low ICT knowledge among teacher

Poor or no internet connectivity

Interviewees were asked to indicate their thoughts on the effectiveness on online learning and teaching. All of them were of the view that online learning and teaching was poor due to poor or lack of internet connectivity in most rural areas in the country. One thing that came out in all the interviews was the fact that most students could not actively participate in the online learning and teaching while at home during the COVID-19 pandemic because of poor internet access in their various communities. Besides, most students could not afford the high cost of internet bundles the telecommunication services charge.

“...one of the main challenges effecting the effectiveness of online education in this country is poor or no internet connectivity. The internet connection in most of our rural communities are very bad, you can't even open the browser how then to do join I zoom lecture? (Student 2).

“...you know we are all students and these days the allowances do not come very regular, how then we buy data even if the internet connectivity is good. Most of us even struggle to pay our school fees. So you see that paying data for online lessons are just feasible to most of us (Student 23).

Lack of or poor internet connectivity had negative impact on the effectiveness of OTL during the COVID-19 pandemic. Those in rural areas where signals are weak were affected most, which made it difficult for them to participate in class work. As a result, the poor status of the internet interrupted students' learning. Participant 12 indicated that,

“...of course, lack of internet was a significant obstacle. Therefore, the online process didn't run very well during the COVID-19 pandemic.”

Of the 40 student participants, only 12 said they effectively participated in online learning, while the remaining participants were not able to participate due to the lack of internet access. These findings agree with many others studies. An Iranian study by Amin (2021) examined the effect of educational policy change in Iraqi Kurdistan area during the COVID-19. Amin stated that though online subscription charges were low during the lockdown

days, many students still missed classes because of poor internet accessibility. Consequently, many students joined the class when technical and service teams gave them some assistance with the internet connection. Other researchers like Kibuku (2020) and Budur (2020) have also reiterated that access to internet as an important item that enables online learning, but for students to get access to join online classes is the concern.

The findings of this study also corroborate the connectivism theory reviewed in this study. The theory describes how ICT have empowered people to learn and share knowledge across the world through the World Wide Web. The main reason is that people get to learn through interactions and networking with others, and this happen over the web space in recent years. We need to note that these forms of interactions and networks access are enabled only through to proper internet facilities. With many learners facing challenges with internet connection in the school, it means they cannot participate to learn. Therefore, implementing online education would negatively affect teaching and learning processes.

Lack of technological devices

Lack of technological devices was unanimous across all the interviews. All the students were of the view that the school has no proper technological devices and equipment that support effective OTL. It was also noted that majority of students did not have advance technology devices that will enable them participate in the OTL.

“...every student needs an appropriate device for online studies. Generally, students have devices, especially mobile-phones, but how many students have the appropriate device

that are suitable for online studies? Some students do not have these devices for different reasons, like poverty. Ghanaian college students do not learn with computers, so some did not have the appropriate gadgets which has an impact on the online learning.” (Student 7).

The economic challenges the country is passing through in the past few years has further worsen the financial status of most families in the country and students basically depends on their parents/guidance for most of their needs. This was another reason cited by respondents as to why most students lack the recommended technological devices for online sessions.

“...most of us are from low income class families, parents have to sometimes go in for loans to be able to pay our school fees, some of us only rely on student loans to pay our fees. How do we then acquire these devices to enable us join OTL session?” (Student 35).

These findings are in consistent with that of earlier studies which also agreed that lack of appropriate devices posed major difficulty to the implementation of online learning (Ahmad, Hussain, S., & Farid, 2018; Elzainy, El Sadik, & Al Abdulmonem, 2020; Yusuf, & Ahmad, 2020). While majority of the students in this study have smartphones, most of them had no laptops. Elzainy, et al. (2020) reported in his study the inadequacy of devices in schools toppled with poor internet connection in the Kurdish universities. This affected the effective communication between the teachers and learners outside the traditional classroom.

Inadequate stable electricity power supply

The research participants indicated unstable electricity as another major obstacle faced during online sessions. This came up in all the 45 interviews, and Student 1 indicated in the narration below:

“...the effectiveness of OTL is not possible in this country for now due to two main reasons. One is unstable electricity which is often not announced. So, you start the session and the light goes off. Two is, most of the rural communities are not connected to the national grid. So, when you are out of campus and you happen to live in a rural community where there is no power, you are disconnected from the rest of the world. Even if you have a laptop or smartphone but there is no light, you are back to square zero.”

The Northern part of the country is faced with inadequate electricity supply. People in this area face power cuts especially in the dry season. Electricity supply is better in regional capitals and cities, unlike the small towns and villages. This make it difficult for students in these areas to accept online learning.

Most governments in developing countries struggle to connect electricity across their countries (Barnes, 2010), hence, its resultant effect on students' (especially, those in remote areas) inability to take advantage of online programs. For the people facing electricity outage at homes, they are excluded from online education. We need to understand that electricity is also a major structure of online education.

Low ICT knowledge among teachers and students

While the use of information communication technology has seen a tremendous increase globally, participants cited low ICT knowledge among some teachers and students as a major obstruction to the effectiveness of OTL

“...majority of we the students don’t have much knowledge on the use of technology devices, especially when it comes to this online session. Likewise, some teachers are not able to navigate it, especially, the older ones (FGD 2).

To have a successful OTL, it is important for both teachers and students to have sufficient knowledge on information communication technology. Similar to this, a research by Muthuprasad, Aiswarya, Aditya, and Jha (2021) identified the students and teachers’ ability to use electronic devices and the internet as the sole elements of OTL success. It was also observed that smartphones provide multiple functions which has caused the neglect of computers by most people. Therefore, most teachers and students are less conversant with computers since it is not part of their daily activities.

Difference in Perception between Teachers and Students Regarding Online Teaching and Learning

Regarding the differences in perception between students and teachers, most of the responses revolved around the students perceived OTL to be for advanced countries with well-established internet connectivity and standard ICT devices for both teachers and students. However, the teacher on the other side perceives the introduction of OTL to be in the right direction regardless of the numerous challenges. Thus, students perceive OTL to be difficult and will want to continue with the face-to-face.

Themes identified regarding perception included: interaction, self-development, difficult to learn using a new platform, and plagiarism.

Interaction

Respondents indicated that the preferred face-face interaction to e-learning as face-face gives the learner direct feedback compared to e-learning as some of them narrated.

“...face-to-face is interactive than virtual classes. It gives you the opportunity to interact with the lecturers, with prompt feedback, and no technical issues like invalid link, slow network, etc.” (Student 8).

Contrary to this, Atwa et al. (2022) found that online students participate much in discussions than their face-to-face colleagues. These findings were on the bases that online class offers students and teachers more time to think and research to engage in discussions. They also get time to go over their answers, and validate their sources.

It was further observed that students perceived a blend of online with face-to-face classes to be effective than using only online for an entire course based on the narration below.

“...we prefer the combination, because courses that involve practical, must not be done online, but no practical is electronically welcome. There are certain things that may not be understood using e-learning but with the help of face-to-face [classroom session], it will be better understood.” (Student 6).

Similar to these findings, Savenye (2005) indicated that interaction and communication are critical elements for the success of online learning, and

students' motivation and satisfaction. This interaction can occur in three dynamics; learner-instructor, learner-learners, and learner-content. In this case, if the interaction between students and teachers do not go well, it will negatively affect the success of the online learning. This was corroborated by a teacher as he narrated:

"...I think online learning is not effective. During the session, students seem passive and not motivated to participate. They only take the materials and tasks without any relevant discussion" (Teacher 3).

Contrariwise, teachers were of the view that OTL is convenient and comfortable to both teachers and students as it will allow them to teach and learn at the comfort of their homes.

"...you know, OTL allows students to learn at their own convenience; either at dawn or late in the night or even after work. As a teacher, I feel comfortable when using e-learning [online learning] than face-to-face. It is less stressful as compared to the normal classroom or campus affairs" (Teacher 1).

This finding however is contrary to that of Rapanta et al. (2020) who indicated that online teaching is more difficult and need more preparation. Rapanta et al. further stated that face-to-face instruction gives room for discussion and lively guidance to students. This encourages students' engagement and reflects positively on their performance.

Self-development

The participants indicated that classroom learning helps them to improve themselves, so that they can use the techniques used by teachers to also teach after the completion of their study.

“...the face-to-face will help you develop courage to talk in public. With that, the teachers will correct you when you make a mistake in your speech.” (Student 14)

Findings from this study are in line with that of Wongwuttivat et al. (2020) who discovered that the combination of online and face to face had a better performance than the using one of the two. While the online provide comfortability and convenience, the face-to-face teaching and learning helps the students to learn from the moves and gestures used in teaching by the teacher. This finding is so important in this study due to the fact that the study was conducted in a teacher training college, where the students adapts some of the presentation techniques from their teachers which may not be possible with the online session.

Difficult to learn using a new platform

Though both teachers and students had different perceptions on benefits of OTL, both also had the same perception that using new platform to learn is often difficult, boring and sometimes ineffective at the initial state. A female teacher corroborated this when she said she tried different platforms to avoid dullness.

“...it’s not difficult to use new learning platforms. I had to learn how to use Google classroom and Zoom meeting. I learn

by myself and it is not difficult, and, I want to learn other platforms too.” (Teacher 5).

The older teachers especially, observed that online learning system is not easy to manage; the process was not straightforward and difficult to understand. They needed a longer time to learn to become competent with its use. Some older teachers felt their ICT skills was not as good, so they found it difficult to learn the new online learning system. One of them narrated that, “...It was quite a leap to the unknown. I participated right away in a couple of good online facilitation workshops and got some tools and eagerness to start experimenting” (Teacher 4).

Perception of teachers can be considered as critical to describe the environment or platform through which the teaching and learning is carried out. Ali (2020), Selim (2007), and Sun, Tsai, Finger, Chen, and Yeh (2008) cited that for online education to succeed, the educational institutes must accept and implement technologies that support it. Teachers should also know how to use these online learning applications and platforms. Unfortunately, teachers in this study had some challenges with its use. Deducing from the findings, awareness of these technologies was low among the teachers.

Plagiarism

Other teachers were of the view that OTL could encourage plagiarism. They were of the view that everything is easy and possible on the internet, as students may easily copy and paste answers from other sources when a task is given by the teacher.

“...In online learning, students can cheat or view answers on the internet because there is no supervision. I cannot supervise

the student in an assignment, they can easily cheat or found the answers by browsing the internet.” (Teacher 3)

Plagiarism has been an issue of which tertiary institutions and lecturers are taking conscious efforts to address among students. In the case of the lecturers in this study, they believed that OTL will not help in their attempts towards addressing plagiarism among students. This is because, students will have access to the web to copy and paste without making any deductions from what they copy and paste.

Impact of Online Teaching on Teaching and Learning Styles

On the impact of online teaching on teaching and learning styles, three themes were identified. Shifts information search at the library to the use of internet for information search, modification of assessment approaches used by teachers, and the use of ICT devices in organizing learning materials among teachers, thus, a shift from manual to computerized system.

Shift from library to internet

The student-participants indicated progressive changes they had observed in their learning styles as a result of the OTL. Student 11 mentioned that,

“...The use of e-learning greatly helped us to improve our learning skills including analyzing and solving problems, answering online quizzes, and submitting assignments and projects. The integration of technology made us comfortable in using computer and web-based resources which helps us to explore more ideas and enrich our knowledge”

Modification of assessment approach

The most frequently reported change to the teaching style mentioned by teachers was the modification in their assessment process, like having smaller quizzes rather than larger tests to avoid plagiarism.

“...instead of giving test like we do in the traditional way, I spread them out instead of giving two major exams i.e., mid-semester and end of semester, I turn them into multiple quizzes throughout the semester, because I thought it would be easier for them to deal with a small amount of material each time and keep them engaged more than waiting for a big exam and then maybe getting negative feedback and then, you know, things fall apart.” (Teacher 1).

“Often, I definitely had to make directions more explicit, and so any kind of direction that students were getting had to be very explicit because they didn’t have the opportunity to ask follow-up questions as quickly, and it seemed that they were more likely to just go ahead and do it the way they thought it was instead of asking by email or something like that.” (Teacher 5)

When teachers were questioned if they were successful in applying their teaching practices in the virtual class, and whether they were able to teach as they wished, all of them stated that virtual courses were instructionally restrictive:

“...There are a number of in-class role-playing games that teachers often use depending on the size of their class that

helps to reinforce some instructions. This is not very possible with the online session” (Teacher 4).

“...A Socratic teaching style does not work well in an online class so you have to take a little bit more directive, platonic approach, which more teachers are terribly uncomfortable with doing” (Teacher 2).

Easy organization of lesson material through the internet

The teachers confirmed that technology helped them to arrange their teaching resources and made their teaching styles interesting. Also, when learning resources are available and students have access to it, teachers get relieved of extra duties like running copies of these resources. In addition, the teachers had learnt about several online resources they could employ to develop their courses.

These findings imply that OTL is regarded as a probable virtual tool to foster effective teaching and learning. This finding confirms earlier studies who also reported similar conclusion (Coman et al., 2020; Selvaraj et al., 2021). Teachers at the same time demanded active attention, participation and collaboration of their students with the use of the e-learning resources. However, teachers should recognize their students’ learning styles and integrate range of media like videos and movie excerpts for students to utilize for their own blended learning.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The study was conducted to assess the impact of OTL on the performance of students in the Tamale College of Education. The objectives of the study were to identify the effectiveness of OTL in the Tamale College of Education, to explore the difference in perception between teachers and students regarding OTL, and to assess the impact of online teaching on teaching styles and learning styles.

Descriptive study design using a qualitative approach and interviews were conducted using 45 participants, consisting 40 levels 300 and 400 students and 5 teachers. The participants were recruited using both purposive and convenience sampling techniques, and the analysis was done using thematic analytical technique. Summary of the main findings that emerged from the study, as well as conclusions and appropriate recommendation made are presented in the subsequent sections.

Summary of Key Findings

This section recapitulates the study's findings in themes under the broad objectives that guided the study.

Effectiveness of Online Teaching and Learning

It was found that online learning and teaching was poor due to lack or poor internet connectivity in most rural areas in the country where studies reside. Respondents bemoaned the fact that most students could not actively participate in the online learning and teaching while at home during the

COVID-19 pandemic because of poor internet access in their various communities.

The study also revealed that the school had no proper technological devices and equipment that supported effective OTL. It was noted that majority of students had no advanced technology devices that enabled them participant in OTL effectively.

The participants also indicated that stable power was one main obstacle that students and educators faced during online classes. Participants also cited low ICT knowledge among some teachers and students as a major hindrance to effective OTL.

Perception between teachers and students regarding online teaching and learning

While students perceived the combination of OTL with face-to-face teaching and learning to be effective than using only online for an entire course, teachers were of the view that OTL was convenient and comfortable to both teachers and students as it allowed them to teach and learn at the comfort of their homes. Students also mentioned that classroom learning helps them to develop themselves, to even use the techniques used by teachers to teach others.

Although teachers and students had different perception on the benefits of OTL, both had the same perception that using new platform to learn was often difficult, boring and sometimes ineffective at the initial state. Some teachers also perceived OTL could encourage plagiarism.

Impact of Online Teaching on Teaching and Learning Styles

Teachers had to adapt their teaching approach by subdividing larger assessments into smaller quizzes in order to prevent plagiarism. The study also found that students' access to available learning materials eases teachers' burden of running copies of course materials. The findings indicate that students' activeness and participation were needed by the teachers in the virtual learning process. Teachers need to recognize students' varying learning styles and integrate range of media like videos and movie excerpts for students to utilize for their blended learning.

Conclusion

Based on the findings regarding the impact of online teaching and learning (OTL), the study concludes that while OTL is recognized as a powerful educational tool, it has not been fully effective at Tamale College of Education. This ineffectiveness is primarily due to several significant challenges, including poor internet connectivity, inadequate technological resources, low levels of information and communication technology (ICT) literacy among both teachers and students, and unstable power supply. These barriers have hindered the seamless integration and utilization of OTL, preventing it from reaching its full potential in enhancing the educational experience at the college.

The study also explored the perceptions of both teachers and students regarding OTL and concludes that both groups generally have positive attitudes towards this mode of education. Students and teachers alike recognize the benefits and potential of OTL in providing flexible and accessible learning opportunities. However, some teachers expressed concerns

that online teaching could facilitate plagiarism among students unless effective measures are devised to mitigate this issue. These concerns highlight the need for developing robust strategies to ensure academic integrity in an online learning environment.

Finally, the study concludes that OTL has a significant impact on teaching and learning styles at Tamale College of Education. Despite the challenges, OTL has shown the potential to transform traditional educational methods, promoting more interactive and student-centered learning approaches. The study suggests that with improvements in infrastructure, increased ICT training for teachers and students, and stable power supply, OTL can be further enhanced to fully realize its benefits. By addressing these issues, the college can leverage OTL to provide a more effective and enriching educational experience.

Recommendations

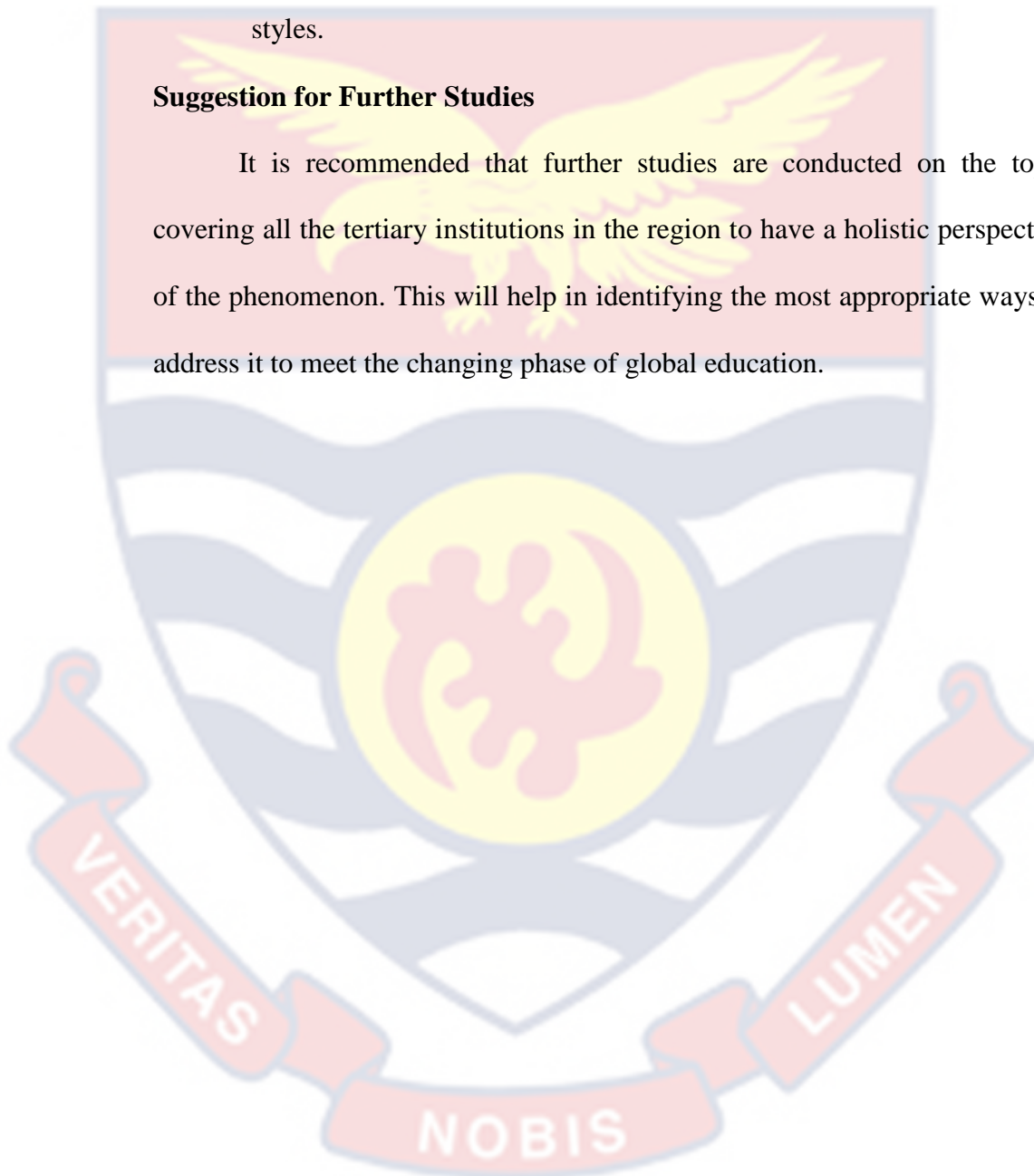
The following recommendations were made based on the conclusions of the study to the various stakeholders of education, that is, the Ministry of Education (MoE), Ghana Education Service (GES), the Tamale College of Education, teachers, as well as students to ensure effective OTL.

1. The MoE and GES should equip schools with the needed modern technological devices and equipment necessary for effective OTL. This should include back-up power source (electricity) and improved internet connectivity (wireless internet service) on the campus to assist both teachers and students for the online sessions.
2. Also, the study recommends that the MoE and GES should organize regular workshop and seminars for teachers as well as students on

trending virtual teaching tools or platforms that are more convenient to use, and how to use it to sustain the interest of the users. This will also correct ill-perceptions associated with these teaching and learning platforms, and also positively influence their teaching and learning styles.

Suggestion for Further Studies

It is recommended that further studies are conducted on the topic covering all the tertiary institutions in the region to have a holistic perspective of the phenomenon. This will help in identifying the most appropriate ways to address it to meet the changing phase of global education.



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APPENDIX A

INTERVIEW GUIDE FOR PARTICIPANTS

University of Cape Coast

College of Distance Education

Topic: The Impact of Online Teaching and Learning in the Tamale**College of Education in the Northern Region of Ghana****Introduction**

This research assesses online teaching and learning in the Tamale College of Education from thematic areas: its effectiveness, perceptions of teachers and students about it, and its impact on teaching and learning styles. Your participation is voluntary, and providing answers will help towards the success of this research work.

Section A: Effectiveness of Online Teaching and Learning in the Tamale College of Education

1. What is your view about the online teaching and learning introduced by the college?
2. How effective is the online teaching and learning at the college?

(Prompts: consider issues that affect the initiative like internet connections, devices, electricity, ICT knowledge, etc.)

Section B: Difference in Perceptions between Teachers and Students about Online Teaching and Learning

3. How do you think the students perceive the online teaching and learning at the college?
4. How do you think the teachers perceive the online teaching and learning at the college?

(Prompts: consider discussion issues related to classroom/virtual space interactions, avenue for self-development, difficulty in its usage to learn, plagiarism, etc.)

Section C: The Impact of Online Teaching on Teaching and Learning

Styles.

5. Do you consider the online teaching and learning to have any impact on the teachers' teaching styles? Yss/No
6. Why do you think so?
7. Do you consider the online teaching and learning to have any impact on the students' learning styles? Yss/No
8. Why do you think so?
9. Is there any other thing related to the interview that you would like to share?

Thank you for your time

