AN ANALYSIS OF E-LEARNING AS A MODE OF CURRICULUM IMPLEMENTATION DURING THE COVID-19 PANDEMIC IN SELECTED ZAMBIAN UNIVERSITIES: PRACTICES, STANDARDS AND APPLICABILITY

By

BriAn Mphande

A dissertation submitted to the University of Zambia in partial fulfilment of the requirements for the award of the degree of Master of Education in Curriculum Studies

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DECLARATION

I, **BriAn Mphande**, do hereby solemnly declare that this dissertation is my work, except where otherwise acknowledged and that it has never been previously submitted for a degree at the University of Zambia or any other university.

Author's Signature: ……. Date: 26th March 2025

APPROVALS

This dissertation of **BriAn Mphande** has been approved as partial fulfilment of the requirements for the award of the degree of Master of Education in Curriculum Studies by the University of Zambia.

Examiner 1

Name: **Prof. Gift Masaiti, PhD.**

Signature: _____ Date: _____

Examiner 2

Name: **Dr. Nelly Mwale – Chita, PhD.**

Signature: _____ Date: _____

Examiner 3

Name: **Dr. Pauline Monde, PhD.**

Signature: _____ Date: _____

Chairperson, Board of Examiners

Name: **Dr. Goodwell Kaulu, PhD.**

Signature: _____ Date: _____

Supervisor

Name: **Prof. Innocent Mutale Mulenga, PhD.**

Signature: _____ Date: _____

ABSTRACT

University education is an important aspect that needs to be accessible to everyone. E-learning is one mode of ensuring access to education but requires well defined policies and standards to guide technologies, applicability, methodologies, as well as technological infrastructure. In Zambia, however, the extent to which e-learning should be integrated as a mode of curriculum implementation in universities had been left undefined. This cultivated concerns over the quality of university education provided by universities through e-learning across all study programmes. This study sought to analyse e-learning as a mode of curriculum implementation in Zambian universities to inform and guide the practices, standards, and applicability of e-learning amid the lack of concrete policies and standards on ICT selection and pedagogy. For comprehensiveness, the study was guided by three theories, the 'E-learning Systems' Theoretical Framework'; the Community of Inquiry (Col); and the 'Online Collaborative Learning' (OCL) theory. Guided by the Pragmatic research paradigm, the Mixed Methods approach, and particularly the Convergent Parallel Design, both interview guides and questionnaires were employed as data collection tools. There were 255 participants in total, out of whom 240 were randomly sampled undergraduate university students, 8 senior university lecturers, 6 university ICT administrators, and 1 Quality Assurance Director from HEA. The 6 universities, which included both public and private universities, were arrived at by clustering them into 3 groups from which 2 universities were randomly sampled. Collected qualitative and quantitative data sets were analysed using thematic analysis and descriptive statistics, respectively. Findings showed that e-learning practices varied across universities primarily due to classifications of programmes offered in universities, investments made by universities in ICT, as well as computer literacy among students and lecturers. Universities developed their own policies to guide e-learning implementation using guidance from HEA. It was also evident that e-learning had the most limitations in the delivery of natural science-based content, while it was effective in the delivery of social science-based programmes. Blended learning and synchronous modes were also confirmed as the most effective and applicable modes of learning virtually, while 93.7% of students recommended learner-centred methodologies, along with lecturers. The converging of qualitative and quantitative data led to the establishment of a framework for implementing e-learning in Zambia that centres on the Virtual Learning Environment (VLE) being informed by students, lecturers and content. It was concluded that the applicability of e-learning should be defined with respect to programmes of study in universities. The study also led to the recommendations of having HEA co-create e-learning policies with universities, restricting the application of e-learning to programmes with suitable pedagogical approached, as well as having HEA provide comprehensive technological standards to guide LMS adoptions.

Key Words: *Blended Learning, E-learning, E-learning Framework, Curriculum Implementation, Learning Management Systems, Virtual Learning Environment,*

DEDICATION

This work is dedicated to my parents, Mr. Goodfellow Chipewa Mphande and Mrs. Rose Mabuku-Mphande. Being educators, they played a vital role in setting up a strong foundation for my life and academic journey. Their support was a key driving force in my academic pursuits, and in my life in general. I also wish to express my sincere gratitude for the unwavering support they have always given me in all aspects of my life.

A journey of one's life is filled with various forces, moments, experiences, encounters with people, and critical decision-making points, among many other factors. But in the end, everything falls in place because of the Grace of our Almighty Father. My journey, thus far, is one in which God's interventions cannot go unmentioned, and His Grace has been part of each critical moment. For this and so much more, I will continue to acknowledge His presence, guidance, and mercies, and I will continue to dedicate my life's achievements to our Almighty Father.

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CHAPTER ONE: INTRODUCTION

1.1 Overview

The focus of this chapter was placed on setting the foundation of the intended study, beginning with the background of the study. Other components of the chapter include the statement of the problem, purpose of the study, research objectives and questions, theoretical approach, conceptual framework, significance of the study and delimitations. A summary of the chapter has then been given at the end.

1.2 Background

University education is one of the most vital components of education in Zambia and many other nations. This is so due to the significant role it plays in determining and shaping the direction of national development (Delanty, 2001). With regards to the importance of university education, it would be vital to ensure that it remains accessible to all, despite possible hindrances such as closures of institutions because of natural disasters, epidemics, political interference, or any other occurrences that would impede one from accessing it (Ramakrisnan, Yahya, Hasrol, and Aziz, 2011). It is for this reason that universities around the globe, in Africa and Zambia in particular, introduced Electronic Learning (e-learning) as a mode of Curriculum Implementation of university education. This was made possible by using Information and Communication Technologies (ICT). As a mode of curriculum implementation, e-learning is meant to serve as a mere channel of facilitating the teaching and learning process.

Ideally, e-learning unites two main aspects: Learning and Technology (Aparicio, Bacao, and Oliveira, 2016). The technological aspect of e-learning comprises of various hardware and software features such as writing technologies, internet connectivity, visualisation, storage of information, and audio-visual communication. These features are necessary in facilitating the teaching and learning processes which, as Oslon et al. (2011) suggested, could take different pedagogical approaches such as the one-to-many, one-to-one, many-to-many, or one-alone. Each pedagogical approach has particular focus which could be on either the learners or lecturers, thereby having limitations in their applicability. As such, e-learning could be said to have its own

limitations in its applicability across the different fields of education (i.e., natural sciences and social sciences). These limitations could be a result of the different and unique pedagogical approaches that could be employed when facilitating the teaching and learning process through e-learning.

The introduction of e-learning to an educational system as a mode of curriculum implementation requires that changes are made to educational curricular and technological infrastructure, and that professional staff development programmes are conducted (Oslon et al., 2011). According to Paige (2006), curricular, especially in the 21st century, should be well blended with knowledge, thinking, innovation skills, media, ICT literacy, and real-life experiences in the context of core academic courses. To achieve this, curriculum revision and change should be employed. However, since its introduction in most universities in Zambia in the early 2000s, e-learning could be considered as lacking such changes to the university curricular, technological infrastructure, as well as staff development programmes. This phenomenon could be attributed to the guiding principles of the ICT policy on education in Zambia which requires e-learning to be fitted into existing educational policies and ICT as indicated by Isaacs (2007). In other words, educational policies in Zambia entailed that e-learning was supposed to be integrated into the university curricular, instead of finding ways of instigating changes to university curricular as well, to account for all possible requirements for ensuring effectiveness and efficiency.

In e-learning, the management of the entire system is important because it determines the quality of education offered by any university or institution of higher education (Lee and Lee, 2008). To facilitate effectiveness in modes of e-learning, institutions employ the use of Learning Management Systems (LMS). The use of LMS would enable a university to integrate vital components such as student registration, assessments, teaching and learning resources, virtual lectures/seminars/tutorials, academic progress reports, and student support systems (Aparicio, Bacao, and Oliveira, 2016). By integrating these components, effectiveness in the provision of university education could be achieved, thereby leading to training students effectively and efficiently. However, Ramakrisnan et al. (2011) noted that e-learning is understood differently, and as such, some universities did not regard LMS as necessary to the delivery of effective education. For this reason, some universities that lacked LMS would still be found offering certain programmes through e-learning. In the actual sense, such universities, as well as those that did not

correctly use existing LMS, put reliance on Blended Learning and Knowledge Bases by using other software technologies independently (Ramakrisnan et al., 2011).

In Zambia and the world at large, there has been a continuous increase in technologies that could be utilised to facilitate e-learning. In this regard, institutions would be required to make necessary adjustments for the purpose of being on track with the latest and adopted technologies in the society (Andersson and Grönlund, 2009). Everyday advancements in science and technology would require institutions of higher education to maintain track of what technologies are trending, popular and easily accessible to the students and society at large. However, a study by Mwila et al. (2011) revealed that the adoption rate of ICT in Zambian tertiary institutions was very slow and not adequately responsive to the continuous advancements. For instance, while certain LMS are accessible through mobile phone applications, other LMS in other universities may require one to only use a computer to access the system with efficiency. For institutions that do not use LMS, however, staying on track with the latest technologies would even pose a greater challenge due to constant upgrades in certain hardware and software by the developers of the standalone ICTs that may have been employed.

Furthermore, Mwila et al. (2011) outlined that certain institutions of higher learning that offer programmes through distance education in Zambia were found lacking in terms of established standards to guide the teaching and learning process to distinguish whether it would be done asynchronously or synchronously. This suggests that there are various ways in which e-learning is practiced across the various institutions of higher learning in Zambia. The implication of this status would be that no standards define the use of e-learning as a mode of curriculum implementation in Zambian universities. In this regard, the students at such institutions may be placed at a disadvantage because of not being guided by the any standards that could have been established by either the regulatory authorities or the university administrations.

With the lack of established standards in the use of e-learning as a mode of curriculum implementation, the practices by universities are left unchecked. The policies that were established to regulate the quality of education offered by institution of higher learning, as revealed by the Higher Education Authority (2015), do not provide any deliberate guide on the type of technologies that would be most ideal for e-learning. The lack of deliberate policies to guide the

e-learning practices in Zambia could leave institutions with the liberty of choosing whether to employ open source or closed source LMS, or standalone software packages such as videoconferencing tools, discussion boards and other tools that enable dialogue between lecturers and students. Such a phenomenon could possibly lead to limitations in achieving effectiveness and efficiency in the provision of university education. For example, the use of an outsourced, yet paid for LMS could have a limitation of not exceeding 20 students in each virtual lesson to avoid congestion of the system.

Universities in Zambia offer various programmes that are deemed necessary in meeting the demands of society. However, like the case in many other countries around the world, each university has specific programmes that are offered to the students enrolled there (Raybould and Sheedy, 2005). The focus on offering defined study programmes by universities could be a contributing factor to the effectiveness in the training of students for societal roles in the sense that the institutions place focus on quality in the areas of study it would be concerned with. For example, Kwame Nkrumah University in Kabwe, which is focused on preparing teachers and educators, channels its resources towards ensuring that it graduates teachers with excellent standards in terms of knowledge, innovation, attitudes, skills, and values. In the same way, the utilisation of e-learning in universities would need to have a definition of the extent to which it could be used as a mode of curriculum implementation, as suggested by Andersson and Grönlund (2009).

However, the Ministry of Higher Education (2019) did not provide any deliberate policy on guiding universities in the implementation of e-learning. As such, universities are left to decide how they should implement e-learning, even without substantial guidance. In this case, the quality of education that students acquire by use of e-learning, when left unguided, could be compromised due to the limitations that e-learning comes with, as Ramakrisnan et al. (2011) suggested. In other words, the applicability of e-learning as a mode of curriculum implementation should be a well-defined and speak to the quality of university education.

Universities, ideally, are thought to be autonomous institutions due to their constant advancements in knowledge, understanding of phenomenon, as well as contributions to society. Through research and publications, universities make significant contributions to the society and can regulate

themselves as well. Nonetheless, due to the need for quality assurance in the provision of university education, the Higher Education Authority (HEA) was established to ensure that minimum standards are met by all institutions of higher education in Zambia, inclusive of universities (Ministry of Higher Education, 2019). In the quest to ensuring quality, the HEA established policies to respond to specific aspects of institutional requirements, such as physical infrastructure, staff, student admission and learner support, as well as financial resources (Higher Education Authority, 2015). However, for the aspect of e-learning, there seemed to have been no defined standard for ICT facilities to be used by universities in implementing curricular. Therefore, quality assurance in e-learning might have been worrisome.

1.3 Statement of the Problem

The introduction of e-learning in Zambian universities provided vast opportunities for learning. With continuous advancements in ICT, there are various alternatives to technologies for facilitating the teaching and learning process in universities. While the Higher Education Authority (2015) promoted the use and integration of e-learning, there was no deliberate policy to guide universities on the use of e-learning as a mode of curriculum implementation across the different programmes of study that are provided to students in Zambian universities. The applied policy was not comprehensive enough to provide guidance on the pedagogical approaches or the type of content to be delivered using e-learning. This situation of lacking comprehensive policies had the potential of compromising the quality of education provided by undermining programme classifications and the necessity of effective pedagogical approaches, as suggested in other studies. It is in this respect that it was deemed important to investigate the implementation of e-learning across different programmes of study in selected Zambian universities to establish its applicability as a mode of curriculum implementation.

E-learning as a mode of curriculum implementation has a wide variety of technologies for the implementation of curricular from which universities could choose. As such, different universities within the country could be found using different types of technologies in facilitating the teaching and learning process, even when some institutions offer similar programmes of study. However, several studies have showed that the use of certain technologies is not ideal for facilitating education through e-learning as they are not designed for that purpose. Additionally, the extent to

which technological facilities and features should be integrated into university e-learning curricula remained undefined for Zambian universities. In consideration of the assertion of Andersson and Grönlund (2009) that e-learning should be well integrated into educational curricular to ensure quality, there would be a risk of providing education using technologies that inhibit vital processes that could directly impact on how learners get stimulated to learn. This phenomenon prompted the need for an examination of the current practices among Zambian universities, which were left undefined in terms of how e-learning should be integrated in the university curriculum. Furthermore, there was need to examine the facilities that were being used in universities as e-learning platforms to establish standards of implementation in accordance with their effectiveness for the purposes of quality control by regulatory authorities and university administrators.

1.4 Purpose of Study

This study sought to analyse e-learning as a mode of curriculum implementation during the COVID-19 pandemic in both public and private universities in Zambia to inform and effectively guide practices, standards, and the application of e-learning.

1.5 Research Objectives

The objectives of this study were to:

i. examine the practices by HEA, university administrations, lecturers and students in the implementation of e-learning as a mode of curriculum implementation in some Zambian universities.
ii. assess the applicability of e-learning as a mode of curriculum implementation across different fields of study programmes from the perspectives of lecturers and students.
iii. investigate the appropriateness of the employed pedagogical approaches in the use of e-learning by lecturers and students.
iv. establish a framework to guide the implementation of e-learning in Zambian universities.

1.6 Research Questions

This study was be guided by the following questions:

i. What are the practices in the implementation of e-learning regarding ICT features and facilities, policies, and standards in Zambian universities according to the users?
ii. How applicable is e-learning mode in the delivery of curriculum implementation across the variety of university programmes of study?
iii. How appropriate are the employed pedagogical approaches in e-learning to university students and lecturers in Zambia?
iv. What framework could best guide the implementation of e-learning in Zambian universities?

1.7 Hypothesis

In consideration of the objectives guiding this study, as well as what other studies have established pertaining to the effectiveness of e-learning as a mode of curriculum implementation, two hypotheses were drawn. The first hypothesis focused on verifying the extent to which the modes of e-learning experienced by students were effective. In this regard, the *Null Hypothesis* to be tested was that '*there was no significant difference between the modes of e-learning as experienced by students'*, while the *Alternative Hypothesis* was that *'there was a significant difference between the modes of e-learning as experienced by students*.'

The second hypothesis in this study was that aimed at establishing the significance of programmes classifications with regards to students' perceptions on whether LMS usage could improve experiences of students using e-learning. The null hypothesis for this test was that '*there was no significant difference in the observed student perceptions on LMS with respect to their programme classifications'* while the alternative hypothesis which was that *there was a significant difference in the observed student perceptions on LMS according to programme classifications*. Substantiation of both hypotheses was crucial because of how they provided an opportunity for quantitative validations of objectives on the appropriateness of learning modes, and the effectiveness of the employed pedagogies.

1.8 Theoretical Framework

A theoretical framework, as explained by Adom, Hussein and Agyem (2018), is a guide that is based on an existing theory in a field of inquiry and serves as a blueprint in the construction of a study. This study was guided by three theories: The 'E-learning Systems' Theoretical Framework' by Aparicio, Bacao and Oliveira (2016); the Community of Inquiry (Col) by Garrison, Anderson, and Archer (2000); and the 'Online Collaborative Learning' (OCL) theory by Harasim (2012).

The e-learning systems' theory framework comprises of three main components: people, technologies, and services (Aparicio, Bacao and Oliveira 2016). While people interact with technology, the technologies provide support in integrating content, enabling communication, and providing collaborative tools. 'E-learning services integrate all the activities corresponding to pedagogical models and to teaching strategies… In other words, service specifications are e-learning activities aligned with the e-learning pedagogical models and the teaching strategies' (Aparicio, Bacao and Oliveira 2016: 301). Garrison, Anderson, and Archer (2000) described the community of inquiry framework as one that

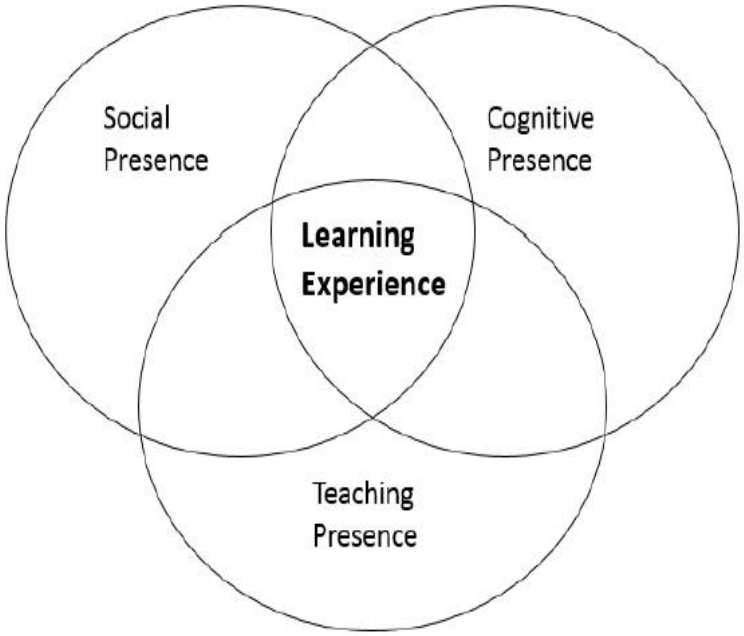

Figure 1.1: Community of Inquiry

is based on three distinct "presences": Cognitive, Social and Teaching. This theory supports the design of online and blended courses as active learning environments or communities that depend on the involvement and participation of both lecturers and students in sharing information, ideas,

and opinions (Picciano, 2017). The ‘social’ aspect in the framework is one that manifests itself through the interactions among students and lecturers through discussion boards, blogs, videoconferencing, wikis, and many other virtual learning features that facilitate communication.

Linda Harasim’s online collaborative learning (OCL) theory is one that focuses on collaborative learning, knowledge building, and internet use as a means of reshaping formal, non-formal, and informal education for the “Knowledge Age” (Picciano, 2017). The theory, as outlined by Harasim (2012) integrates the teaching and learning process with the internet networks to create educational networks through which knowledge construction could occur in three different phases. In the first phase, ‘idea generation’, divergent thoughts are gathered through brainstorming. The second phase, ‘idea organisation’, is where ideas are compared, analysed, and categorised through discussions and arguments. The third phase is where intellectual synthesis and consensus occurs, including agreeing to disagree, usually through an assignment, essay, or another joint piece of work. This phase is known as the ‘intellectual convergence’ (Picciano, 2017).

Additionally, Picciano (2017) outlined that the online collaborative learning theory regards the aspect of socialisation among students and in the presence of the lecturer. This was derived from social constructivism which encourages students to work collaboratively in solving problems through discourse, while the lecturer takes up the role of a facilitator. OCL is best applied to smaller instructional environments such as tutorials, where the interaction among students is well manageable within a given space of time.

The integration of the ‘e-learning systems’ theory framework’, the ‘community of inquiry’ framework and the ‘online collaborative learning’ theory collectively guided this study efficiently and effectively. This could be attributed to the uniqueness of each theory’s primary focus areas. The e-learning systems’ theory places focus on people, technologies and services that could be offered through e-learning (Aparicio, Bacao and Oliveira, 2016). As such, this theory guided this study to consider an e-learning platform as one that should be developed with considerations of the influence from e-learning stakeholders (people), the services to be offered (e-learning activities), as well as the technology to be utilised. In other words, for this study, the development of e-learning platforms for educational curricular should be inclusive of inputs from people

(beneficiaries), intended e-learning activities, and technologies. This would contribute to the effectiveness of the platforms/LMS.

The online collaborative learning theory (OCL), on the other hand, places its focus on collaborative learning, knowledge building, and internet usage (Harasim, 2012). This makes the theory unique from the e-learning systems' theoretical framework, thereby providing a different perspective on what e-learning should focus on. Furthermore, Harasim (2012) outlined that the focus points of the OCL seek to reshape formal, non-formal and informal education for the 'Knowledge Age'. As such, OCL was very important to this study because it guided the study into considering formal, non-formal and informal educational dimensions; aspects that most theories might have overlooked. Therefore, e-learning platforms, as guided by this theory, should be developed with the intention of enabling collaboration in both learning and knowledge building between and among students and lecturers.

The community of inquiry theory by Garrison, Anderson, and Archer (2000) has its major focus on the aspect of social interactions among the students. It supports the design of blended online courses, thereby fostering the realisation of the importance of socialisation among students and lecturers. Therefore, this theory was necessary to this study due to the guidance it provided on how social interactions between and among students and lecturers should be handled in a virtual learning environment. As such, this study, based on the contributions made by this theory, regarded an e-learning platform (LMS) as one that should have provisions for interactions synchronously and asynchronously.

The elements of each theory were not sufficient to support this study if each one of them was considered independently. However, with an integration of the three theories, there was support and guidance for each aspect of the study. Thus, the application of these theories guided this study into treating e-learning, and the virtual learning environments as complete, effective, and efficient if there is complete consideration of the focus aspects of each theory. The focus aspects, therefore, included people (stakeholders), cognitive development, knowledge building, social collaboration, teaching and learning, technologies and internet, and services.

1.9 Conceptual Framework

Adom, Hussein and Agyem (2018) defined a conceptual framework as the structure which the researcher believes would best explain the natural progression of the phenomenon to be studied. Figure 1.2 shows the conceptual framework for this study with a depiction of how students, lecturers, course content and knowledge, and the pedagogical approaches should interact with each other through the virtual learning environment that should be supported by a Learning Management System (LMS).

Figure 1.2: Conceptual Framework

The structure of this framework is such that there should be a combination of inputs from lecturers, students, course content and knowledge, pedagogical approaches to online teaching and learning, and library and information systems, towards the design of the virtual learning environment through the provision of information on the practices and applicability of e-learning, and in turn,

the virtual learning environment should be holistically responding to the needs of each of the five factors. These factors were drawn from the combination of the three theoretical frameworks that were selected to guide this study. At the same time, the development of the virtual learning environment should be guided by set standards that should be established through collaborated reviews by universities and their regulatory authorities. The universities, through their respective administrative bodies, should actively participate in the establishment of the e-learning standards of implementation for the purposes of 'shared' quality assurance. This, however, should be supported by jointly and independently conducted research.

In accordance with this conceptual framework, the virtual learning environment (or learning management system) should integrate all factors emanating from the university administrations, regulatory authorities, and the processes within the university, to effectively facilitate the teaching and learning process of university educational curricular. Furthermore, lecturers and students should be well trained and guided in the use of the LMS features, while course content should be curated to meet the standards of the LMS. In this regard, this conceptual framework guided the study to collect data from students, lecturers, ICT administrators, and HEA to have all key stakeholders in e-learning implementation. The study was also adapted to the conceptual framework by aligning the focus on establishing the lecturers' and students' practical experiences, perceptions on appropriate and effective pedagogies, compatibility of content with e-learning mode, and ideal standards. These factors were to be analysed to establish the VLE.

1.10 Significance of the Study

This study is likely to contribute to the existing literature on the implementation of university educational curricular through e-learning. The study findings could further lead to the development of an e-learning theoretical framework that would be tailored to meet the needs of Zambian universities and colleges.

Furthermore, this study may help guide regulatory authorities and university administrators in Zambia in the effective implementation of e-learning. University lecturers, through this study, could equally be informed on what pedagogical approaches would be most effective when lecturing through e-learning.

1.11 Delimitations

This study was restricted to both public and private universities that had at least one campus in Lusaka province of Zambia and employed the use of e-learning as a mode of delivery during the COVID-19 pandemic or before. This was due to the higher concentration of universities in Lusaka province which provided a wider range of programmes offered, as well as having universities that had at least one campus located in other provinces where the practices were similar. It was further delimited to analyse e-learning as a mode of university curriculum implementation, with particular focus on the practices, standards, and applicability.

1.12 Operational Definition of Terms

For this study, the following terms were defined and applied as follows:

Asynchronous Mode: The online learning mode in which the teaching and learning process occurs in real time using live audio-visual features, like the conventional brick-and-motor systems (Ramakrisnan et al., 2011).

Blended Learning: Learning through the combined use of online learning facilities and traditional learning experiences (Ramakrisnan et al., 2011).

E-Content: The course content that is uploaded on online platform by a lecturer for students to access (Anderson and Elloumi, 2004).

E-Learning: An online mode of curriculum implementation that uses information communication technologies (ICT) to facilitates the educational processes such as teaching, learning, research, consultations, or assessments using synchronous or asynchronous modes (Leontyeva, 2018).

Learning Management System (LMS): An internet-based software application system for the administration, tracking, academic reporting, automation and delivery of educational courses, training programmes, or learning and development programmes (Jamal and Shanaah, 2011).

Practical: Having components of experimental experiences or scenario simulations as a way of providing learners with real-world situations to enhance their learning (Davies and Pachler (2018).

Synchronous Mode: An online learning mode in which learners access pre-recorded or uploaded content online at their own time and pace (Ramakrisnan et al., 2011).

Virtual Learning Environment (VLE): The virtual space in which the teaching and learning process occurs alongside other interactive educational processes through established software systems (Tao, Yeh, and Sun, 2006).

1.13 Summary

The focus in this chapter was on the introduction of the study in general. While the background of the study provided a brief outline of the study, the statement of the problem showed what challenges needed to be addressed. The purpose of the study, objectives and research questions that shall guide the study were then provided. The last aspects to be presented in this chapter is the theoretical framework, conceptual framework, significance of the study, delimitations, limitations, and operational definition of terms. With this introduction to the intended study, the next chapter has the literature which is related to this study.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Overview

This chapter provides a review of literature on the implementation of e-learning as a mode of delivery of university education. The review shall begin with an attempt to establish an understanding of the concept of e-learning and what it really entails. An in-depth review of electronic technologies in university practices shall then be provided before exploring the educational trends of e-learning at an international level. This shall then be followed by a review of the literature in relation to the Zambian practices of e-learning in universities and other educational institutions. Additionally, a discussion on the standards and regulations of e-learning shall follow through to understand what studies reveal on the standards of e-learning in Zambia and the globe in general. The last aspect of this chapter shall be the identified research gap.

2.2 The Concept of Ideal E-Learning

Electronic Learning (e-learning) is a concept that has evolved over the years from the time of its inception. Hubackova (2015) tracked the inception of e-learning to the period between the mid and late 1900s. Initially, e-learning implied the use of electronic media for the purposes of facilitating effective teaching and learning. This was regarded as Computer-Based Training (CBT). However, the concept began to evolve in the early 1990s when the aspect of internet use was becoming more prominent due to the advancements in science and technology, as well as the introduction of the web system to the aspect of teaching and learning (Hubackova, 2015). The concept of e-learning became more vibrant due to the improvement of the web system, and the development and spread of the World Wide Web (WWW). By then, the concept of e-learning evolved to imply Web-Based Training (WBT).

With constant advancements in science and technology, the concept of e-learning evolved even further to include more aspects than what were considered as the requirements for the implementation of e-learning as a mode for the delivery of education in the early 2000s. In the light of all these aspects, Garrison & Anderson (2003) defined e-learning as teaching and learning that is facilitated through online network technologies. According to Oslon et al. (2011), e-learning technologies today comprise of hardware and software features such as writing technologies,

internet connectivity, visualisation, information storage systems and facilities, and audio-visual communication. In this respect, the most significant differences between the e-learning concepts of the twentieth, and twenty-first centuries could be said to lie in the accessibilities, applicability, capabilities, and speed of the most recently introduced technologies such as laptops, smartphones, audio-visual communication software, high speed internet connectivity, virtual laboratories, as well as online libraries. With such advancements constantly taking place, studies suggested that e-learning, became an irreplaceable part of the educational process, especially at tertiary levels (El-Seoud et al., 2014; Klimva & Poulová, 2012; and Oslon et al., 2011).

The concept of e-learning, ideally, was introduced as a way of improving the access and quality of education (Ramakrisnan et al., 2011) through the integration of two main aspects: learning and technology (Aparicio, Bacao, and Oliveira, 2016). In this regard, any educational intervention concerning e-learning should be concerned with the two aspects in mention, whilst focusing on the improvement and maintenance of quality. However, a study by El-Seoud et al. (2014) revealed that educational research on e-learning had not given enough attention to studies that attempted to focus on the aspects of understanding the learning needs and styles of the learners, and instructional design. As such, despite having a great variety of technologies that could be used in e-learning, not much had been done to understand the impacts made on the learner, the lecturer, as well as the teaching and learning process that is facilitated by e-learning (El-Seoud et al., 2014; and Pineda-Herrero, et al., 2011). This phenomenon suggested the need for further studies that would lead to the establishment of a balance between the aspects of technology and educational processes in any interventions concerning e-learning.

In the twenty-first century, the concept of e-learning evolved to comprise of different and vast teaching and learning technologies and strategies. In this respect, Picciano (2017) outlined that several theories were developed by various scholars in efforts to guide the teaching and learning process that is facilitated through e-learning platforms. Additionally, a review of literature showed that the initial concept of e-learning was thought to be a mode of learning that would have been beneficial to learners pursuing distance educational programmes only, rather than regular students who learn through the traditional brick-and-mortar system (Leontyeva, 2018; and Demiray, 2010). In view of this, one could conclude that e-learning was not initially considered a mode of teaching

and learning for full-time regular students as well. As such, there would be need to establish an e-learning framework that speaks directly to the needs of regular students of a particular society.

E-learning concepts come in different forms due to the diverse nature of the employed technologies. It is for this reason that there had been no one single adopted definition of e-learning that stood out (Aparicio, Bacao, and Oliveira, 2016; and Picciano, 2017), and why several theories, models and conceptualisations of the concept existed. In the light of the various theories on e-learning, studies revealed that learning processes supported by ICT could adopt either of the two teaching and learning modes: 'asynchronous' or 'synchronous' teaching and learning modes (Haythornthwaite, 2007; and Ramakrisnan et al., 2011). With asynchronous teaching and learning, one learns at one's convenience through access to pre-recorded lessons and e-content accessible through internet sources, as well as digital information storage devices such as CD-ROM-base. When teaching and learning is being done synchronously, on the other hand, the lecturers and students interact with each other using instant communication systems such as audio-visual conferencing software, discussion texts or blogs. However, Picciano (2017) revealed that there was no defined guide to what extent e-learning should be conducted, be it synchronously or asynchronously. As such, institutional administrations, and in some cases, lecturers, were left to decide whether to adopt synchronous or asynchronous teaching and learning styles, without any guiding principles.

E-learning, being a mode of curriculum implementation, should be designed in a manner that supports effective inclusion of educational processes such as teaching, individual and collaborative learning, research, consultation and dialogue, assessment, and evaluation (Leontyeva, 2018). In other words, an ideal e-learning implementation strategy should be holistic in the provision of educational experiences to its end users, regardless of whether they are regular or distance learners. However, a study by Xiao (2018) showed that most universities tended to treat distance learners using e-learning platforms differently from regular students by mostly focusing on the delivery of content and neglecting other vital aspects such as the institutional ethos, culture, structures as well as administration. Further review of literature revealed that e-learning is structured differently across different universities, in line with what each institution deems as the main purpose of using e-learning (Ma, 2010). For instance, universities in China designed and developed e-learning systems for the purposes of purely academic services such as teaching and learning, and

assessment, and not for other aspects such as social interactions. In this regard, it would be vital for each society to adopt e-learning principles of practice that allow for the provision of holistic educational experiences to all learners in the institutions of learning in that society.

In consideration of all the outlined factors on the concept of e-learning, Chaubey and Bhattacharya (2015) opined that for any institutions planning to operate traditional courses online, the use of a Learning Management System (LMS) should be the topmost necessity to facilitate proper organization of content, courses, faculty, students, assessments and grades. Therefore, the ideal concept of e-learning should be that which is supported by an efficient LMS which covers all aspects of teaching and learning, and administrative processes.

2.3 Technological Variations in E-learning

From the time of its inception, the concept of e-learning has generally transformed greatly due to advancements in science and technology. Before the twenty-first century, as Hubackova (2015) outlined, e-learning was more about providing a platform through which content could be transmitted from lecturers to students over long distances. At that stage, e-learning was considered as more useful to distance educational programmes, rather than full-time regular studies and relied on technologies that allowed for prerecording of lessons, or access to e-content via online platforms as Anderson and Elloumi (2004) observed. In this regard, the technology that was utilised sought to facilitate the teaching and learning process, asynchronously. However, the mere provision of platforms for the asynchronous exchange of information was criticised for not being supportive of effective teaching and learning approaches which, as argued by Anderson (2011), should comprise of opportunities for diverse options of pedagogical approaches. In addition, Hattie and Donoghue (2016) argued that any form of teaching and learning in an educational institution should have various options of pedagogical approaches to carter for both deep and surface learning, which are necessary in their respective natures (and may not be well supported by asynchronous teaching and learning).

Over the years, the number of e-learning technologies to facilitate teaching and learning has grown exponentially (Craig et al., 2012). In a study by UNESCO (2024), it was observed the use of e-learning continued to expand in terms of usage, technological advancements and application,

especially during the COVID-19 pandemic. However, there had been a great challenge of determining which technologies would be appropriate to support the teaching and learning needs for students, lecturers and institutional administrations. In a study conducted by Craig et al. (2012) at Deakin University in Australia, it was revealed that technologies that were not originally meant to serve as educational platforms (such as social-media platforms like Facebook, WhatsApp, Google Meet, or Zoom Meet) have been permeating the teaching and learning space. A similar phenomenon was observed in Zambian institutions of higher learning due to the outbreak of the COVID-19 virus which led to enforcement of closures of the institutions in a bid to curb the spread of the virus (Sintema, 2020). In another study that focused on digital learning in Mathematics, Mulenga and Marbán (2020) revealed that most lecturers in various Zambian universities that lacked or had inadequate LMS resorted to using open-source digital platforms such as Google Meet and Zoom Meet to facilitate lectures, as well as communication with their students. The most, of such platforms, however, do not allow for accountability in the teaching and learning process, which Pineda-Herrero et al. (2011) described as one of the advantages that e-learning should provide to educational development. Nonetheless, such platforms are being utilised in the educational teaching and learning process due to several reasons which include the presence of features that may be lacking in the employed educational systems, being easily accessible and affordable to both lecturers and students, and being user-friendly (Ghareb and Mohammed, 2016). This study, therefore, sought to establish the effects of using undefined, unintegrated, and non-education centred digital technological platforms on the teaching and learning process, lecturers, and student across the various recognized and registered universities in Lusaka Province of Zambia. The researcher further sought to establish the components of interest in the standalone digital platforms to the teaching and learning process across a variety of fields of study.

One of the major technological advancements in e-learning has been that of introducing Learning Management Systems (LMS) that are education-centred. LMS are internet-based educational platforms or software systems that allow instructors to manage and distribute content knowledge, conduct assessments, communicate with learners, as well as conduct other educational administration tasks (Jamal and Shanaah, 2011). The most common example of LMS that most institutions of higher education adopted in sub-Saharan Africa is Moodle (Mtebe, 2015). According to Mtebe (2015), universities use LMS to supplement face-to-face teaching and

learning, especially for distance education learners. Other studies have also revealed that LMS usage in universities also leads to better academic performance of students (Filippidi, Tselios, and Komis, 2010; Jo, Kim, and Yoon, 2014; and Palmer and Holt, 2009), but only if the LMS is appropriate and contains the necessary features that contribute to enhancing effectiveness (DeLone and McLean, 2003). Furthermore, DeLone and McLean, (2003) emphasised the need for students to use almost all LMS features if they are to yield excellent academic performance and exhibit acquisition of skills. However, Lee and Lee (2008) emphasised the need for LMS usage to be made easy, especially for the learners, because it determines the learners' levels of satisfaction in the virtual learning environment.

In addition, Mtebe (2015) stressed the need for institutions to ensure that the LMS they adopt are equipped with the necessary features that would support effective teaching and learning. This suggests that there should be an integration of various features into one LMS such as video conferencing tools, virtual simulators, assessment tools, proctoring features, e-content features, and all other features that would be necessary. However, in a study that focused on the efficacy of e-learning in Spain by Pineda-Herrero et al. (2011), it was revealed that some LMS do not get to comprise of all the features that would be ideal in supporting all vital aspects of e-learning. This phenomenon was observed to be most common in open-source LMS which have less than 80% usability due to lack of consistent quality control evaluations as Palmer and Holt (2009) revealed. Studies by Zulu (2019) and Chewe (2018) showed that the University of Zambia utilises Moodle and Astria Learning, which are outsourced LMS, and seem to be inadequate in meeting the expectations of the students. Another study by Mulenga and Marbán (2020) revealed that other universities in Zambia began migrating to e-learning platforms after the enforcement of closures on most institutions of higher education due to the COVID-19 pandemic. However, these studies (Chewe, 2018; Mulenga and Marbán, 2020; and Zulu, 2019) did not reveal the types of LMS that have been adopted by other universities. Therefore, it was the intention of the researcher in this study to establish the types of LMS that were adopted across the various universities in Zambia, as well as the how effective they were as modes of educational delivery from the perspectives of both lecturers and students.

E-learning technologies also comprise of other software and hardware systems that would enhance and make possible the teaching and learning process in practical fields of study. According to

Andrade (2015), teaching practical sciences such as physics, chemistry and technological studies would not be effectively done if entirely conducted through inadequate e-learning platforms due to the need for practical experiments that should be done within the same period as that for covering particular topics. On the hand, Liu et al. (2015) noted that one of the most effective ways of teaching sciences through e-learning would be by using Virtual Science Laboratory technologies. Virtual laboratories provide a virtual environment in which learners and lecturers participate through avatars in a 3D setup with augmented reality. Such technologies allow for practical experiments that need learners to acquire certain skill sets, by using simulation (Yang, 2013). However, access to virtual laboratories with high-quality realistic 3D graphics and a high level of interactivity is usually a challenge for most institutions, unless through the integration of university programmes with industries and military wings that have such facilities as a way of enhancing the teaching and learning process (Liu et al, 2015). This situation could be attributed to the limited investments in such technologies which would usually be acquired for educational purposes only. In this respect, the researcher intended to establish the practices in the teaching of practical sciences using e-learning in Zambian institutions of higher learning given that a good number of them have programmes which require students to conduct practical laboratory experiments and workshops.

Furthermore, in a desk-review focused on the impact of changing technologies in e-learning, Yusuf and Al-Banawi (2013) showed that e-learning limitations are usually evident in courses that require consistent guidance by the lecturer due to being practical in their nature, especially when there is no reliance on other technological features such as virtual laboratories, combined with underfunding for technological investments. This could mostly affect science-based courses and programmes. Yusuf and Al-Banawi (2013) suggested that learning should be a multichannel process, even when done through e-learning. Therefore, the implementation of e-learning should be conducted with the consideration of the extent to which the available technologies could be applied to certain courses and programmes of study that are to be offered. In this regard, the researcher in this study sought to investigate how online curricular are prepared and structured across the various universities in Zambia, as well as whether the existence of certain ICTs and their accessibility to students is a determining factor, especially where e-learning is adopted, adapted and implemented during the running of an already commenced programme of study. The

need for this investigation could be drawn from the findings in the study by Sintema (2020) who showed that Zambian universities were migrating to e-learning due to the imposed closures in efforts to curb the spread of the COVID-19 virus.

2.4 Educational Trends in the Application of E-learning in Universities

According to Ramakrisnan et al. (2011), e-learning was introduced as a way of improving access to quality education at tertiary level amidst impediments such as distance, limited student enrolment capacities, closure caused by pandemics, as well as financial constraints. In a quantitative study focused on the effects of e-learning on higher education in Egypt, El-Seoud et al. (2014) revealed that the enrolment of students to universities that introduced e-learning rose by about 12-14 percent annually for online learning over a five-year period: 2004-2009 after secondary education. The rise in enrolments was attributed to the provision of students with 'greater access to education in comparison to traditional methods of teaching as students can undertake their study from anywhere and at any time as well as being given the option to study part-time or full-time' (El-Seoud et al., 2014:20). In this respect, the usage of e-learning in universities around the globe has been categorised into two main modes of implementation. A study conducted in Poland by Górska (2016) showed that the two main modes of implementing e-learning are through: purely distance learning, and blended learning. These two modes of implementing e-learning were observed as being used both singularly and simultaneously in various institutions of higher education. In this regard, the researcher in this study wondered what modes of implementation of e-learning are being utilised, why they are preferred and how effective they may be as a mode of delivery for study programmes across various fields that are offered in Zambian universities.

Ideally, institutions of higher education that offer programmes through the distance mode of learning, as outlined by Ramakrisnan et al. (2011), are more likely to utilise e-learning on a full-time basis and for all programme activities, i.e., the teaching and learning process, assessments, administrative tasks, to mention but a few. In this respect, institutions of higher education around the globe that offer programmes through distance learning tend to establish fully-fledged e-learning systems to facilitate learning, though with different focus points that should dictate the design of the adopted LMS features (Jo, Kim and Yoon, 2014; and Lee and Lee, 2008). However,

in a study conducted at Kazan Federal University in Russia that focused on modern distance learning technologies in higher education, Leontyeva (2018) showed that not all learners would be adequately prepared to learn through e-learning and independently because of most e-learning systems being structured in a manner that needs the learner to learn independently. This phenomenon raised concerns of whether learners' choices and comfort with e-learning were considered, especially when they were initially enrolled as full-time regular students: a phenomenon which needed to be investigated in the Zambian context.

In a case study of Universitas 21 Global, an online graduate school owned by 16 member universities of Universitas 21 consortium institution which offers completely online programs to post-graduate students in more than 40 countries around the world, Teo and Williams (2005) illustrated how a theoretical framework for online learning could be operationalised. In their findings, the dual noted that there is a common trend of students facing possible alienation when pursuing educational programmes using e-learning platforms that lack adequate provisions for enabling a communicative environment. The two scholars further emphasised that alienation of learners may not be supportive of the development of teamwork attributes for the work environment. Also, the phenomenon of alienation, as suggested by Craig et al. (2012), may not be supportive of the provision of a holistic educational experience which should cater for formal, informal, and non-formal educational dimensions. In the light of similar observations made in Egypt, El-Seoud et al. (2014) suggested that provisions should be established for students to interact and collaborate virtually with well-defined features. Therefore, the virtual learning environment of each university should be well equipped with such features to always be effective. Furthermore Jandric (2012) outlined that e-learning in universities should be driven by pedagogy and management; with pedagogy accounting for the way learners are affected by the adopted system. Considering these aspects, the researcher in this study wondered if students learning through e-learning in Zambian universities do face alienation, and if their lecturers and administration do account for the need for a communicative virtual environment that supports interactions among students.

According to the findings in a qualitative study by Holmström and Pitkänen (2012) which focused on teachers' beliefs about e-learning in Bolivia, it was revealed that universities in developing countries (especially in Africa, Asia, and South America) do not invest in highly developed

technologies for e-learning. The use of e-learning in universities entails that resources should be channelled towards the investments in ICT. Unfortunately, as Alexiou et al. (2004) observed, not many institutions see investments in ICT as being sustainable and important. Making investments in e-learning facilities such as virtual laboratories would help institutions save on costs from the continuous acquisition of laboratory facilities such as chemical compounds, which would be in abundance in a virtual environment (Alexiou et al., 2004). Similarly, Mtebe (2015) also noted that the access to cheaper open-source LMS has deterred massive investments in ICT by African universities.

In their study that they conducted at one of London's institutions that trained students in the field of business studies, Love and Fry (2006) observed that colleges, universities, and other institutions of higher learning race to advance online course capabilities in a speedily developing cyber education market. Similarly, Arkorful and Abaidoo (2014) observed that e-learning, has become more and more important in institutions of higher education, to an extent of introducing and expanding the range of e-learning tools, and initiating several changes in higher educational institutions, particularly when it comes to the educational delivery and support processes. In this respect, the introduction of e-learning could be said to lead towards changes to university curricular, especially in the developed nations (Paige, 2006). However, the need for changes to university educational curricular, as suggested by Isaacs (2007), may not be observed by all universities, especially in sub-Saharan Africa. This could be attributed to the silence of the policies on the need for curriculum review and/change when introducing e-learning. As such, the researcher in this study was left curious as to whether universities in Zambia did practice constant curriculum reviews prompted by the use and introduction of ever changing and advancing technologies.

Universities in most developed nations, as outlined by Naveh, Tubin and Pliskin (2012), have used LMS to improve e-learning, to an extent of reducing dropout rates, and increasing enrolments of students. However, according to Mtebe, (2015:52), "the context of sub-Saharan Africa is different, and institutions face different challenges from those faced by institutions in the developed countries. As a result, the adoption and implementation of these systems do not guarantee that institutions will enjoy similar benefits as those institutions in the developed countries". In the same vein, the implementation of e-learning in universities around the globe puts reliance on the guidance provided by the existing e-learning models and theories that were developed based on

research studies mostly conducted in developed countries. However, most of these theories and models were developed based on research studies that were carried out in specific nations which have their own unique contexts and may be different from those of other countries (Isaacs, 2011). As such, the applicability of these theories, models and frameworks could be questioned due to the delimitations of the studies to contexts not like those of sub-Saharan Africa, and Zambia in particular. This situation called for the need to develop a model of e-learning implementation that speaks to the local Zambian needs.

In a study by Ghared and Mohammed (2016) which focused on the effects of new technologies on students' attainment of independence and mature thinking at University of Human Development in Iraq, it was revealed that the university administration suggested that when planning e-learning applications, the materials must be introduced by methodologies that would empower students to handle the materials proficiently. Therefore, institutions of higher education ought to establish methodologies from the onset to ensure that both lecturers and learners would be guided adequately. However, the introduction of e-learning in most Zambian institutions of higher learning was not guided by adequate methodologies that focused on learning needs of the learners (Chewe, 2018; Mwiinga, 2018; and Zulu, 2019). In this regard, it would be necessary to establish the online pedagogies being employed in Zambian universities to understand what is applicable and inapplicable, for the purposes of informing policies.

2.5 E-Learning Practices in Zambia

Zambia, like many other sub-Saharan African nations has its own types of learners, lecturers, knowledge and values that emanate from the local cultural practices and should be upheld and reflected in its educational systems. According to the perceptions of Nsamenang and Tchombe (2011), African indigenous education, which has been in practice in most of sub-Saharan Africa influences the African society and educational systems in the twenty-first century in a unique manner. Omolewa (2007:600) outlined that 'it is important to note that culture in traditional Africa can be seen as a spring of motivation, standard of judgement, basis of stratification, means of communication, patterns of production and consumption'. A study by Kaunda, Chembe and Mukupa (2018) also cited cultural factors as having an influence on some of the e-learning practices by lecturers at the University of Zambia, Copperbelt University and Mulungushi

University. In this regard, the influence exerted on the various stake holders in education, by aspects of indigenous knowledge may need to be accounted for. However, since most of the adopted models of e-learning were not developed with consideration of the influences of the Zambian culture, the influences of indigenous education on e-learning could have remained unchecked. Additionally, the study by Kaunda, Chembe and Mukupa (2018) left the researcher in this study with the curiosity of how private universities in Zambia were also affected by cultural factors when using e-learning, as well as whether these factors were considered by lecturers and university administrations.

The provision of educational programmes through e-learning in Zambia had spread across various institutions of higher education. This, however, had not been a smooth process due to the various challenges that have been encountered by all stakeholders in education. Mwila et al. (2011) showed that in Zambia, the introduction of e-learning has been faced with several challenges such as poor access to electricity, poor internet connectivity, insufficient ICT facilities, as well as inadequate e-learning platforms. However, over the years, there had been an increase in the accessibility of internet in most parts of Zambia, and by a relatively good percentage (39%) of the population (Mukosa and Mweemba, 2019). This increase indicated a significant improvement in the provision of internet across the nation by the Internet Service Providers (ISPs), as well an increase in the number of potential beneficiaries of e-learning. In this regard, there was need to ensure that attention was given the quality of education offered through e-learning platforms.

In accordance with the findings in a qualitative study on how training needs could be improved through the use of internet-based training in Taiwan of the Republic of China, Tao, Yeh, and Sun (2006) outlined that the virtual learning environment that is centred on electronic networks allowed e-learners to receive individualized support, and also to have learning schedules that are more suitable to them, as well as separate from other learners. It is believed that this facilitates a higher interaction and collaboration level between and among lecturers and their students, than the traditional brick-and-mortar environment for learning does (Arkorful and Abaidoo, 2014). However, a review of literature on e-learning in Zambia (Chewe, 2018; Mwiinga, 2018; Mwila et al., 2011; and Zulu, 2019) showed that little or no focus is placed on the need to facilitate individualized learner support. This suggested that e-learning practices in most institutions of higher learning in Zambia were likely to have overlooked the importance of learner support and

involvement when establishing e-learning systems. In other words, the learner was rarely considered as a key stakeholder who should be consulted when establishing e-learning facilities. Therefore, the researcher in this study sought to establish the perceptions of students, lecturers and university administrators on the importance of learner-support systems as a key component of e-learning Zambian university.

While science and technology have been evolving at a rapid scale, the study by Leontyeva (2018) also showed that not all lecturers at Kazan Federal University in Russia could be considered as having been well vested in the use of the adopted ICT. Similarly, in a study by Chewe (2018), it was revealed that about 31% of lecturers at the University of Zambia were not familiar with the use of Moodle, a LMS that the university employed to facilitate online teaching and learning. The study further showed that several universities tend to lack in both technological infrastructure and internal skills development programmes. In another study by Zulu (2019), it was revealed that both staff and lecturers at the University of Zambia (UNZA) were not provided with the adequate training in the use of Astria learning at the time it was being introduced in the Graduate School of Business. This could give rise to concerns of whether Zambian universities do take seriously the need to prepare students adequately by ensuring that lecturers are conversant with the new technologies that are being adopted. Additionally, literature on the use of LMS by lecturers in Zambian universities mostly focused on the University of Zambia and a few other public universities, yet there are many other public and private universities in the country that implement e-learning (Mukosa and Mweemba, 2019). The lack of sufficient technical support staff, therefore, could be considered as an impediment to quality education which one would be offered through e-learning, especially if the lecturer faces challenges in the effective use of ICT facilities. In this respect, through this study, the researcher wished to establish the practices in both public and private universities with regards to the provision of technical support and training to university staff and lecturers.

Yang (2013) opined that LMS are continuously transforming to meet the collaborative needs between and among learners and lecturers. At the University of Zambia, Moodle and Atria are the only LMS that have been utilised to facilitate e-learning (Chewe, 2018, and Zulu, 2019.) However, the use of such open-source LMS could lead to concerns of whether they are adequate in meeting the collaborative needs of lectures and students (Mtebe, 2015). Such concerns could be supported

by the findings of a study by Palmer and Holt (2009) who established that open-source LMS may tend to lack in certain features because of not being subjected to continuous quality control procedures. In addition, the dissatisfaction of some students in the use of Astria Learning at the University of Zambia (Zulu, 2019) could also be a contributing factor to the possible need for a review of the existing LMS in the various universities in the country. However, the identified lack of quality control procedures for LMS in universities in Zambia was only observed at the University of Zambia thereby creating the need to investigate this phenomenon in other universities in the country, an opportunity which this study provided.

According to a desk review by Yusuf and Al-Banawi (2013) that focused on the impact of changing technology in e-learning, it was established that e-learning may disadvantage learners who lack the motivation of learning virtually to an extent of lagging in course activities and deadlines. As revealed in a study by Masumba and Mulenga (2019), most learners in Zambian secondary schools completed general education with a poor orientation in the use of computers and other ICT facilities, due to the observed poor implementation of Computer Studies. As such, there was a likelihood that a significant number of learners being enrolled in universities and other institutions of higher learning commenced their tertiary education whilst having challenges in the use of computers and consequently having difficulties in the use of e-learning.

Students in Zambian universities face various challenges in the use of e-learning as a mode of curriculum implementation. A study by Zulu (2019) showed that students at the University of Zambia, in the Graduate School of Business reported having several challenges in their use of Astria Learning (the university's adopted LMS), such as loading content on the platform, system collapses during assessments within a stipulated time, as well as the lack of a dedicated customer service personnel to handle all their complaints and queries on time. The findings of the study brought out students' dissatisfaction rate of 68.7% on the delivery of the e-learning blended programmes using Astria Learning (Zulu, 2019). This suggests that there have been insufficient investments in e-learning in Zambian universities, and that the quality of teaching and learning using e-learning needs more attention. This also showed that the employed LMS was not designed to meet the collaborative needs of both learners and lecturers, which is contrary to the advice of Yang (2013). The study by Zulu (2019) only focused on the situation at the University of Zambia,

therefore, researcher in this study sought to investigate this phenomenon in other universities in Lusaka province as well.

In a study by Mwiinga (2018) on the challenges faced in e-learning by student nurses at Ndola School of Nursing, it was revealed that the e-content was not easy to understand, despite the establishments by some educational experts that the e-content was more interactive, as compared to the traditional delivery methods. This suggested that there existed a divide between the understanding of some educational experts and the actual needs of e-learning students. In the views of Martin et al. (2017:2), evaluation of 'quality in an online education programme' is also pivoted on the 'success in online student and faculty support'. Mukosa and Mweemba (2019) also cited this divide as being digital in that institutions were not equipped with sufficient ICT infrastructure. The findings by Mwiinga (2018) also showed that nursing students indicated the need for simulators to facilitate their learning but were not provided with any. In view of the findings by Mwiinga (2018), one could conclude that there existed a divide between needs of the learners and the understanding of some educational experts and administrators on what should be provided to the students. Subsequently, an investigation of this phenomenon among universities in Lusaka province, through this study, was deemed necessary to identify the existing divide in the implementation of e-learning that need to be addressed.

2.6 Regulations and Standards of E-Learning

In a study that outlined the main objectives of the teaching methods of e-learning, and at the same time, the legal status and the rules for the use of e-learning in Polish higher education, Górska (2016) revealed that first legislation authorizing e-learning implementation, and guiding the methods and techniques of distance learning at the universities in Poland was introduced by the Act of 27 July 2005 – Law on Higher Education Article. 164, § 3. This law 'determined by regulation, the conditions that must be met in order for classes to be conducted, ensuring proper accessibility for students of classes conducted using the methods and techniques of distance learning and an appropriate proportion of time of these classes, respectively for full-time and part-time studies, with the total time classes at the university' (Górska, 2016:37). The study showed just how possible it would be for any country to establish e-learning standards of practice, as a way of ensuring quality education, even when offered virtually. However, to accomplish this

in Zambia, there would be need for investigating what could lead to the outlining of the needs of all stakeholders such as learners, lecturers, institutional administrators, and regulatory authorities.

The study by Górska (2016) also considered other vital aspects such as cyber security due to the sensitivity of information that could be found in institutional networks and/or databases. The security of information should be well guided by a list of standards that should be adopted by institutions of higher education. In a comparative study by Martin et al. (2017), an analysis of 12 standards for e-learning from around the globe was conducted, with the focus having been on establishing standards that would enhance quality in e-learning and establish the common elements in these standards from across the globe. The findings of the analysis revealed that some 'sets of standards that were thorough, lengthy prescriptions of multiple elements related to online teaching. Meanwhile, other document authors created more general and shorter documents to provide loose guidelines' (Martin et al., 2017:6). Furthermore, it was established that each set of standards had its focus placed on certain themes which were found present in others, and some having certain unique themes. For the Zambian context, however, the researcher was left curious as to how issues of cyber security in e-learning were tackled by university administrations.

As revealed by Mtebe (2015), Sub-Saharan African countries, and Zambia in particular, had generally been on the receiving end of developed technologies. As end users, even the models of implementation of e-learning had generally been adopted as developed in the 'western world'. Similarly, most Zambian universities adopted the already existing standards for e-learning and did not alter them as much to meet the demands of the unique Zambian learner, as opined by Zulu (2019) and Isaacs (2007). Bari and Djoub (2014) showed that there are various e-learning quality frameworks worldwide. These include the Sharable Content Object Reference Model (SCORM), Learning Technology Standard Committee (LTSC), and the Instructional Management Systems (IMS). However, these standards, as Uţă (2007) and Diaz, Schiavoni and Banchoff (2008) articulated, mostly focused on guiding software development, rather than all aspects of e-learning such as online pedagogical content knowledge, administrative roles, or even the applicability of e-learning to each specific field of study. In addition, the Higher Education Authority (2015) did not provide any guidelines on the standards of e-learning to be followed by universities and colleges in Zambia, for the purposes of quality assurance. As such, the teaching and learning process done through e-learning in universities and colleges is left unchecked, yet it is vital to the aspect of

quality control. Therefore, the researcher in this study wondered what standards universities in Zambia had been using to guide the implementation of e-learning, the components of these standards and whether these adopted standards were driven by technological compatibility only, pedagogy only, or both aspects.

Studies on e-learning in Zambia (Chewe, 2018; Isaacs, 2011; Ministry of Higher Education, 2019; and Mwila et al., 2011) showed that the application of e-learning across the various study disciplines remained undefined. Jandric (2012:68) articulated that 'curriculum for e-learning should equally introduce positivistic sciences and empirical-analytic methods, interpretive research and hermeneutic methods, critical social sciences, and critical theory methods.' Therefore, with the simultaneous usage of different and often mutually incommensurable theoretical frameworks, there could be profound consequences for the discipline of e-learning (Jandric, 2012). In this respect, it would be vital to establish principles for the various study disciplines. In other words, Zambian universities need to have well-defined and commensurable theoretical frameworks to guide the implementation of e-learning to an extent of being 'tailored according to specific contexts of each educational situation' (Jandric, 2012:69).

According to a study conducted at University College London (UCL) in London on how Chemistry could be taught using virtual laboratories, Davies and Pachler (2018) established that practical sciences require learners to be engaged in both theoretical and practical lessons if they are to be learnt effectively and sufficiently. The study also led to recommendations of using virtual laboratories with 3D graphical features. However, Mwila et al. (2011) revealed that the practice of e-learning across Zambian universities was not uniform. In the same vein, a review of the policy on e-learning in Zambian tertiary institutions (Higher Education Authority, 2015) showed that the policy did not provide guidance on the extent to which e-learning could be applied across the various fields of study. In this regard, e-learning in Zambia could be said to have lacked comprehensive standards that should guide the implementation of e-learning across the various tertiary institutions, and across the various fields of study. It is for this reason that in this study the research sought to investigate this aspect.

2.7 The Research Gap

The reviewed literature on e-learning as a mode of curriculum implementation in universities brought to light several aspects of great interest. Among the outstanding aspects in the reviewed literature was the lack of comprehensive standards and/or principles to guide both universities and the Higher Education Authority in the best e-learning practices in the Zambian context, with specific focus on aspects such as the nature of ICTs, time delimitations, pedagogical approaches, capacity limitations, and quality control aspects. It was also noted that the extent to which e-learning could be applicable across various study areas, disciplines, and courses, as well as across the various dimensions of education had been left undefined, with minimal considerations of inputs from students to guide deliberations. Furthermore, it was established that there were no initiatives that sought ascertainment of the e-learning practices across both public and private universities in Zambia, with the purpose of establishing comprehensive e-learning curriculum standards of practice. Hence, this study attempted to fill these gaps by analysing the implementation of e-learning as a mode or curriculum delivery in Zambian universities.

2.8 Summary

In this chapter, various literature in relation to the implementation of e-learning in universities was reviewed. The reviewed literature was deemed relevant to the intended study as it showed similar studies, as well as studies on aspects that are of great importance to the intended study. The chapter also included the identification of the gaps in the reviewed literature while providing illustrations of specific aspects the researcher in this study intended to investigate.

CHAPTER THREE: METHODOLGY

3.1 Overview

This chapter contains an explanation of the research methodology that was employed in this study. To begin with, descriptions and justifications of the adopted research paradigm and design have been provided and are then followed by descriptions of the study site, target population, sample size and sampling techniques. The latter part of this chapter provides an insight into the data collection instruments, issues of quality control, as well as ethical considerations that were considered by the researcher.

3.2 Research Paradigm

To ensure that this study was provided with a basis for sub-sequential choices of the research methodology, the selection of a research paradigm for the study was vital. According to Feilzer (2010) a research paradigm could be regarded as an organizing structure, a deeper philosophical position relating to the nature of social phenomena and social structures. There are various research paradigms that are at the disposal of any researcher. For this study, however, the pragmatic research paradigm was regarded as the most suitable for the analysis of e-learning as a mode of curriculum implementation in Zambian universities. The selection of the pragmatic paradigm was arrived at due to its strengths which Liu (2022) identified as lying in its abilities to account for perceptions and lived experiences of research participants. Furthermore, the adoption of the pragmatic paradigm provided an opportunity for conducting a study that would contribute to the body of knowledge and practices in the field of curriculum studies and implementation of e-learning in universities using both qualitative and quantitative data that depict actual experiences and perceptions. In this regard, the study's contributions were comprehensive.

3.3 Research Design

With the research approach being mixed methods, both quantitative and qualitative data were deemed vital to this study. However, how and when the data was collected and analysed is another aspect which needed to be well defined, and a research design serves that purpose. According to Kumar (2011) a research design is an illustration of the steps to be taken by a researcher to guide

the collection and analysis of research data. For this study, the adopted research design was the convergent parallel design which Creswell (2012) described as allowing for the simultaneous collection of both quantitative and qualitative data which are then merged and collectively used to understand phenomenon, as shown in figure 3.1. With this design, each data set was regarded as a major contributing factor to the study, thereby allowing for the merging, relating and comparison of the two data sets in attempts to arrive at adequate interpretations. This was essential in this study because of the need for quantitative and qualitative data to complement each other and draw interpretations that would be comprehensive in responding to all the objectives. By merging the two sets of data, there was room for a thorough review of the practices in universities according to both students and lecturers, while the inclusion of findings on the applicability of e-learning across different programmes, and the appropriateness of pedagogical approaches was set to inform the development of a comprehensive framework for e-learning in Zambia. This was also essential for establishing best practices in e-learning for the Zambian context.

3.4 Study Site

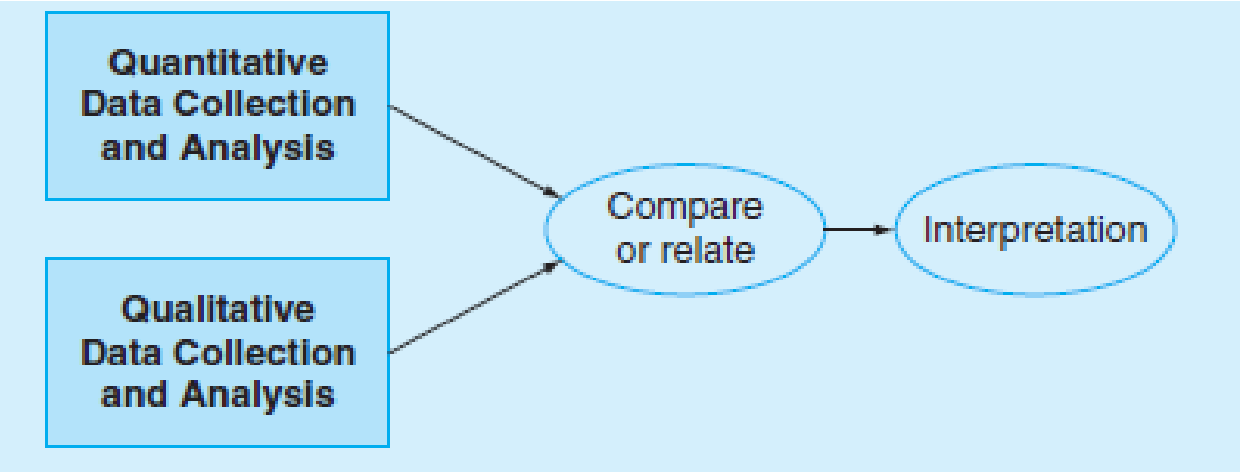

Figure 3.1: *Convergent Parallel Design*

This study was conducted in selected Zambian universities that had at least one campus located in Lusaka province. Lusaka province was deemed as most appropriate due to its composition of a variety of universities. A further review of the universities with at least a campus in Lusaka province revealed that the universities in Lusaka provided almost all programmes of study found in most Zambian universities, and that there were both public and private universities, two aspects that were key to this study.

The public universities that were sighted as having a campus in Lusaka province included Chalimbana University, Levy Mwanawasa Medical University (LMMU), National Institute for Public Administration (NIPA), and the University of Zambia (UNZA). On the other hand, list of private universities included Africa Research University, African Christian University, African Open University, Ambassador International, Blessings University of Excellence, Brook Besor University, Cavendish University, Chreso University, City University of Science and Technology, DMI-St Eugene University, Eden University, Gideon Robert University, Harvest University, Information and Communication University (ICU), Justo Mwale University, Kenneth Kaunda Metropolitan University, Kopaline University, LIUTEBM University, Lusaka Apex Medical University, MANCOSA, Mosa University, Oak University, Open Windows University, Rockview University, Rusangu University, South Valley University, St. Bonaventure University, St. Dominic's Major Seminary, Sunningdale University, Supershine University, Texila American University, Trinity University, Twin Palm Leadership University, UNICAF University-Zambia, University of Africa, University of Lusaka (UNILUS), Zambian Open University, Zambian Royal Medical University and ZCAS University. These were all the universities that had at least one campus in Lusaka province according to the Higher Education Authority list of accredited universities at the time.

3.5 Target Population

For this study, the target population comprised of the Director of Quality Assurance at Higher Education Authority (HEA), all Zambian universities with a campus in Lusaka province, all university administrators managing ICTs, all university senior lecturers and all university students learning through e-learning under a Lusaka province-based university campus. These targeted population groups were focused on because they each played a role in the process of implementing e-learning as a mode of curriculum delivery in universities, be it through policy formulation, ICT infrastructural provision and guidance, lecturing or learning.

3.6 Sample Size

The underlying premise in sampling, as outlined by Kumar (2011:21), 'is that a relatively small number of units, is selected in a manner that they genuinely represent the study population, can

provide – with a sufficiently high degree of probability – a fairly true reflection of the sampling population that is being studied'. For this study, the researcher sought to have a total of two hundred and fifty-five (255) participants from HEA and the universities all together. Out of the total number of two hundred and fifty-five (255) participants, there were two hundred and forty (240) undergraduate university students, eight (8) senior university lecturers, six (6) university administrators, and one (1) Director of Quality Assurance at HEA.

The sample size for the Higher Education Authority staff was kept at one (1) because one officer was deemed as being able to provide all the required data. In addition, the sample was limited to one because the structure institutional showed that there was only one Director of Quality Assurance to who the Heads of Departments reported to. On the other hand, the sample size for the university students was calculated using Yamen's formular which is such that:

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

In consideration of the need for an estimated university population, the researcher took time to check with selected universities on the possible number of students available at their Lusaka campuses. The universities that were selected for the purpose of this task were purposely selected because of their low student populations. The two universities that were contacted were Justo Mwale University and Texila American University which provided a minimum of 45 students at a campus. In this respect, taking *n* to be the desired target population per university, N to be the least total population of students per university estimated at 45 students, and e^2 to be the desired margin error at 0.05, the total number of students sampled per university was calculated as follows:

$$n = \frac{45}{(1 + 45(e^2)}$$

$$n = \frac{45}{(1 + 45(0.0025)}$$

$$n = \frac{45}{1.1125}$$

$$\underline{n = 40.4494}$$

Therefore, using Yamen's formular, the calculated value of students to be sampled per university was set at 40 students.

3.7 Sampling Techniques

To ensure validity in the data collection process, as well as reliability of the data to be collected, various sampling techniques were utilised to sample from the target population. As such, both non-probability and probability sampling techniques were employed for the various target populations.

3.7.1 Higher Education Authority

Established under the Ministry of Education, the Higher Education Authority (HEA) regulates all universities and colleges in Zambia in terms programme accreditation. As such, expert sampling, a type of purposive sampling, was employed in the selection of one quality assurance officer from HEA who was well vested with knowledge and information on the implementation of e-learning in Zambian universities. This is so because the researcher needed specific information regarding established policies on the use of e-learning in Zambian universities and colleges, as well as information on its practices in the aspect of quality assurance.

3.7.2 Universities

There are several universities in Zambia which have at least one campus in Lusaka province. These universities offer a variety of undergraduate degree programmes. Therefore, to ensure that each university would have an equal chance of being sampled for the study, the universities were first subjected to a probability sampling technique in which they were grouped into three clusters; Cluster 1 which comprised of universities that were established on the basis of offering natural science based programmes only, Cluster 2 which comprised of universities that were established to offer programmes that are based in social sciences only, and Cluster 3 which comprised of universities that offered programmes in both natural sciences and social sciences.

Having been grouped according to major types of programmes of study, each cluster was then subjected to simple random sampling to select two (2) universities. This led to the selection of a

total number of six (6) universities. Therefore, the selected universities were such that two universities had their focus on providing Natural Science Based (NSB) programmes, 2 other universities were those focused on the provision of Social Sciences Based (SSB) programmes, and the final 2 universities were those that offered programmes in both social sciences and natural sciences. The primary goal for this was to ensure that the findings of the study were representative of almost all types of university programmes. Furthermore, the creation of these clusters also allowed for the study to carter for both public and private universities, as well as catered for universities that offered programmes in one field and those that offered programmes across various fields of study. Tables 3.1 and 3.2 give a structural summary of the clusters at university level.

Table 3.1: *Structural Representation of Clusters 1 and 2*

Cluster 1				**Cluster 2**			
University 1		**University 2**		**University 1**		**University 2**	
ICT Administrator		ICT Administrator		ICT Administrator		ICT Administrator	
NSB Lecturer 1		NSB Lecturer 2		SSB Lecturer 1		SSB Lecturer 2	
Phy-Chem Students	Bio-Chem Students	Phy-Chem Students	Bio-Chem Students	Practical SSB Students	Theory Based SSB Students	Practical SSB Students	Theory Based SSB Students

Table 3.2: *Structural Representation of Cluster 3*

Cluster 3							
University 1				**University 2**			
ICT Administrator				ICT Administrator			
NSB Lecturer 1		SSB Lecturer 1		NSB Lecturer 1		NSB Lecturer 1	
Phy-Chem Students	Bio-Chem Students	Practical SSB Students	Theory Based SSB Students	Phy-Chem Students	Bio-Chem Students	Practical SSB Students	Theory Based SSB Students

3.7.3 University Administrators

For each selected university, an administrator who oversees the implementation and management of ICTs in that university was purposively sampled using expert sampling, based on each university's administrative structure. The university administrators that were targeted played a vital role in the running of universities' LMS were it was present, or those in charge of university curriculum policy implementation and evaluation, especially where LMS facilities had not yet been established. These administrators were those who could provide the researcher with adequate information on the practices of e-learning in their respective universities.

3.7.4 Senior Lecturers

As important stakeholders in curriculum implementation, lecturers were key informants in this study. The researcher purposively sampled eight (8) senior lecturers from the universities to be included in the study. Their sampling was done using expert sampling technique because the lecturers needed to be experts in their respective fields of study and should also be conversant with lecturing online. Out of the eight lecturers, four (4) lecturers were experts in natural science-based programmes while the other four (4) lecturers were experts in social science base study programmes, as illustrated in table 3.1 and 3.2. They were also required to have been actively lecturing their students using e-learning platforms.

The selection of the eight (8) senior lecturers from the six (6) universities was done in accordance with the cluster in which each university fell under. For Clusters 1 and 2, only one senior lecturer was sampled from each university. This accounted for four lecturers, i.e., two (2) each from Social Science Based (SSB) and Natural Science Based (NSB) fields of study. From Cluster 3, four (4) lecturers were selected in total; two from each university. This selection process catered for the selection of senior lecturers in both NSB and SSB programmes of study from universities that offered a wide variety of programmes of study.

3.7.5 Students

In any university, students are the direct beneficiaries of the undertaken educational interventions. Students play a vital role in determining the quality, success, and purpose of any educational

intervention in an institution of higher education. Subsequently, students from the universities in this study were regarded as key informants because their inputs were determining factors for several aspects concerning the use of e-learning as a mode of educational delivery.

The students who participated in this study, were drawn from lecture groups that were purposively sampled with the assistance of each of the eight (8) lecturers who participate in the study. For students at universities that were placed in Cluster 1 and comprised of Natural Science Based (NSB) programmes, the researcher, with the assistance and guidance of the lecturer who participated in the study, was to purposively sample at least two (2) different lecture groups; with one (1) lecture group having comprised of students who took courses that were biased towards Physical Sciences (such as engineering, mining, geology and radiography), and the other lecture group that comprised of students that took courses biased towards Biological Sciences (such as health courses, veterinary medicine courses and agricultural courses). The researcher collected email addresses and WhatsApp contact numbers of all potential student respondents according to their respective lecture groups, with their consent and willingness to participate. From the lecture groups of courses that were biased towards Physical Sciences, the researcher sampled a total of twenty (20) students at each university using randomisation sampling of the simple random sampling technique. The researcher applied the same principle to students in the lecture groups of courses that were biased towards Biological Sciences to sample another twenty (20) students. This approach was to lead to a sample size of forty (40) students from each university in Cluster 1, which was to subsequently lead to a total of eighty (80) students from the cluster.

To sample students from universities in Cluster 2, which comprised of universities that were biased towards social science, the researcher, with the aid of the participating lecturers, intended to purposively sample at least 2 lecture groups; one lecture group to be that of students taking theory-based courses (such as sociology, psychology, and philosophy), and the other lecturer group to comprise of students taking practical social science courses (such as accounting, economics, teaching methodology, demography, and commerce). The researcher was to then collect email addresses and WhatsApp contact numbers of all potential student participants in all lecture groups, with their consent and willingness to participate in the study. The researcher then sampled a total of twenty (20) students from each lecture group of students taking theory-based social science at each university using randomisation sampling. Using simple random sampling, another twenty

(20) students was to be sampled from the lecture groups of students taking practical social science courses. A sample size of forty (40) students from each university in Cluster 2 is what the researcher intended to obtain to arrive at total of eighty (80) student participants from the cluster.

From Cluster 3, a total of eighty (80) students was to be sampled. Owing to the intention of having universities that offer a wider variety of programmes spread across both social and natural science in Cluster 3, students were sampled from across the various programmes with the assistance of the participating lecturers from respective schools and departments. The researcher sought to sample twenty (20) participants from social science-based programmes, with ten (10) each from practical and theory-based social sciences. For natural science-based programmes, the researcher sought to sample twenty (20) students, such that ten (10) students were to be taking courses and programmes that were biased towards physical sciences, whilst the other half was to be that of students taking courses that were biased towards biological science. In total, from each university in Cluster 3, the researcher intends to sample forty (40) students.

At the end of the students sampling process, the intention was to have a total target of two hundred and forty (240) students. Half of that number of students was supposed to be of those students taking social sciences, and the other half to be of those taking natural sciences. The intention of this process was to ensure that the data that was to be collected would not be biased towards a particular type of study programmes.

Furthermore, the students in this study were required to be in their second (2^{nd}), third (3^{rd}), forth (4^{th}) or any other senior academic year of study. The purpose of delimiting the administering of this study to the students in senior academic years of study was supported by the understanding that senior students would have gained better ground into their respective fields of study, as well as the adopted modes of study. The researcher ensured that the students were able to provide substantial information necessary to this study.

3.8 Data Collection Instruments

In this study, the researcher intended to use interview guides and questionnaires for data collection. With these research instruments, both qualitative and quantitative data were to be collected by the researcher from the intended participants. Furthermore, both instruments were to be designed in a

manner that ensured that they were each adequate for the collection of data from the respective target participants.

3.8.1 Interview Guide

According to Ritchie and Lewis (2003), collection of qualitative data is best done using interview schedules, which are also referred to as topic guides. The use of interview guides in this study was necessary for the collection of qualitative data from the quality assurance officers from HEA, university administrators, and from the lectures. As such, there were three (3) different interview guides that were developed for this study. Ritchie and Lewis (2003) opined that an interview guide is ideal in qualitative research because of its ability to help a researcher obtain in-depth information that may be key to understanding a particular phenomenon.

3.8.1.1 Semi- Structured Interview Guide for the Quality Assurance Officers from HEA

The researcher intended to use a semi-structured interview guide for the collection of data from the HEA officer in charge of quality assurance in universities and other institutions of higher education. The primary focus of the researcher in the use of this guide was to obtain information on any established policies and standards of implementing e-learning in Zambian universities. Furthermore, the researcher sought to use this guide to find out the regulations that were being followed in the implementation of e-learning across Zambian universities. Therefore, the interview guide was very important as it was helpful to the researcher in the efforts to understand the guiding principles in the practices by universities in the implementation of e-learning.

3.8.1.2 Semi- Structured Interview Guide for University Administrators

To guide the interviewing of the university administrators, the researcher sought to use an interview guide to establish the university administrative policies, standards and practices in implementing e-learning. Through this guide, the researcher could find out whether the selected universities had LMS or not, and what other ICT facilities each university administration approved for its staff and lecturers to utilise. The researcher intended to use the guide to establish whether university administrations do arrange for orientations or trainings in the use of the adopted ICTs for their lecturers. In a nutshell, the use of this guide was deemed helpful to the researcher in

establishing the practices by university administrations in the implementation of e-learning in Zambia.

3.8.1.3 Semi- Structured Interview Guide for University Lecturers

As key stakeholders in the implementation of e-learning in universities, lecturers should be able to provide in-depth information that would be vital to this study. Therefore, semi-structured interview for lecturers served as a key guide in obtaining data on the practices by lecturers in accordance with their respective fields of specialisation. The researcher used this guide to establish the applicability of e-learning in the effective delivery of content knowledge according to specific fields of study. Furthermore, the interview guide was necessary to the researcher in establishing the pedagogical approaches that were applicable in online lecturing, and other facts that may be regarded as necessary to this study.

3.8.2 Questionnaire

The use of questionnaires in this study was vital, especially for the collection of quantitative data. Kumar (2011:17) described a questionnaire as 'a written list of questions, the answers to which are recorded by respondents. In this study, a questionnaire was to be administered to th+e students to be sampled from the six universities. The use of a questionnaire in this study was for enabling the researcher to obtain data for conducting statistical tests that could account for the students' experiences. In this respect, the questionnaire comprised of both open-ended and closed-ended questions. The open-ended questions were to serve as a way of accounting for the students' perceptions on the use of e-learning in universities, with respect to their respective fields of specialisation. On the other hand, the closed-ended questions were to be used to account for the students' experiences in the use of e-learning. These questions were meant to account for aspects such as how conversant the students were in using the adopted platforms, how effective the methods of lecturing had been in their respective fields of study, as well as whether the platforms accounted for possibilities of alienation from other students.

As a way of ensuring that the students to be sampled were familiar with the use of ICTs, the questionnaire was uploaded onto and shared as a Google-Form, an online software system with provisions for conducting assessment and surveys, among other options. The questionnaire was

accessible through a link provided to the respondents through an email from the researcher, with respect to each students' university. All responses to the questionnaire were recorded into an auto-generated Excel Sheet for the researcher to analyse.

3.9 Quality Control

Quality control in this study was ensured by emphasising the aspects of validity, reliability and trustworthiness. The importance of ensuring quality could be tallied to the need to ensure that the outcomes of this study are applicable as they would play a key role in determining the relevance of the research outcomes to various stakeholders of higher educational institutions in Zambia that have or are yet to include e-learning as a mode or curriculum implementation.

3.9.1 Reliability and Validity

As a way of ensuring validity in this study, the researcher made audio recordings of interviews, with the permission of the respondents, to ensure that what was to be considered during the interview was in line with the actual responses of the participants. The researcher further intended to rely on triangulation of data with the conviction that inconsistencies would be dealt with. Data collection instruments for this study were also to be subjected to scrutiny by experts to check for possible errors, as well as would be required alterations.

To ensure reliability, the researcher carried out a pilot study in which the questionnaires was administered to twenty (20) e-learning students at Kwame Nkrumah University in Kabwe. The students were sampled using purposive sampling. Administering of the questionnaire was done using Google Forms, with a link being sent to them using their respective email addresses. Once conducted, the responses were used to analyse the reliability of the questionnaire and necessary adjustments were made.

3.9.2 Trustworthiness

In a bid to ensure trustworthiness of the findings in this study, the researcher relied on triangulation, recording of interviews, provision of clear and distinct descriptions of the research context, as well as accounting for the respondents. In doing so, the researcher accounted for credibility,

dependability, conformability, and transferability of the research findings. Each of these aspects plays a vital role in ensuring trustworthiness.

3.9.2.1 Credibility

The researcher in this study intended to achieve credibility by utilising various methods of data collection. The importance of ensuring credibility could be drawn from the need to establish that the findings of the study shall be acceptable as being reflective of the actual phenomenon in the Zambian universities. In this regard, the researcher tried to ensure that the data to be collected was a rich dataset.

3.9.2.2 Dependability

Dependability, as outlined by Cohen, Manion and Morrison (2007), is one way of ensuring trustworthiness in a study. Dependability refers to the stability of the findings over time. In this study, it was achieved by conducting an audit inquiry, necessitated by the qualitative data to be obtained. Carcary (2009) noted that it is necessary to conduct an audit inquiry in qualitative research to ensure that the research methodological and analytical processes are dependable.

3.9.2.3 Conformability

In this study, the researcher sought to ensure confirmability by projecting the responses of the participants without personal biases. Confirmability, as outlined by Nowell et al. (2017:3) 'is concerned with establishing that the researcher's interpretations and findings are clearly derived from the data, requiring the researcher to demonstrate how conclusions and interpretations have been reached'. Therefore, confirmability in this study was vital in ensuring neutrality in the research findings.

3.9.2.4 Transferability

The researcher in this study sought to achieve transferability of the research findings from one context to another of similar characteristics by ensuring to utilise thick descriptions in the analysis of qualitative data. Ideally, the findings of this study should be applicable to any Zambian university.

3.10 Data Collection Procedure

In this study, the researcher obtained clearance from the Ethics Committee of the University of Zambia (UNZA), as well as consent in the form of an introductory letter from the Assistant Dean Postgraduate Office in the School of Education. This was done to ensure that the researcher had the clearance to collect data from the targeted respondents.

The researcher began by seeking permission from university administrators through the university registrars' offices before approaching any administrators or targeted respondents at each university. This was done at each university that was sampled for the study. Furthermore, consent was sought from each participant before any attempt to administer any data collection instruments. This was then be followed by arranging for and conducting of the interviews with the university administrator in charge of ICTs and the lecturers to be selected, respectively.

For the students the researcher first sought their permission to collect their email addresses and WhatsApp contact numbers for them to be considered as possible participants for the study. The permission was collected both physically by researcher when given the opportunity of meeting with the students during physical lectures, as well as through their respective lecturers where their lectures were being conducted virtually. Therefore, students' email addresses were only collected and considered for the study when the student provided their own email address or permitted the lecturer to provide their respective email addresses to the researcher for consideration in the study. Furthermore, this process helped the researcher to reduce on the numbers of possible participants did not intend to attend to the questionnaire. After the email addresses of the students were collected, the researcher then sent a link to the questionnaire uploaded to a Google Form to randomly sampled students with further guidance on the study.

3.11 Data Analysis

The analysis of data followed the already adopted convergent parallel design in which the data was analysed separately as qualitative and quantitative data and later be merged for interpretation.

3.11.1 Quantitative Data Analysis

The data in quantitative form was obtained from the students. The data was first sorted according to the two main categories: NSB (for students taking natural sciences) and SSB (for students taking

social sciences). Codes were also accorded to the various aspects to allow for specificity of findings where necessary. The data set was then be subjected to descriptive statistics to provide various descriptions of the data set as a whole.

Furthermore, quantitative data was also subjected to appropriate measures of dispersion and inferential statistics in which some comparisons were made. These were done using three computer software applications: Microsoft Excel, Statistical Package for Social Sciences (SPSS) and Stata. The core purpose of these measures was to compare and merge the statistical outcomes with the qualitative outcomes.

3.11.2 Qualitative Data Analysis

Qualitative data, as earlier indicated, was obtained through both interviews and questionnaires. The analysis of this data was done in accordance with the respondents' respective groups. In the case of all three groups, however, the responses from the respondents were sorted according to topics, emerging patterns, concepts, explanations, experiences, and perceptions.

In the case of the expert informants (HEA officer, lecturers, and ICT administrators), themes were drawn from the focus points of their respective questions thereby capturing diverse experiences and drawing well informed deductions. In the case of students, themes were drawn from the written submissions to clarify and justify their selections where ratings were provided. The written responses were then merged with scores and ratings to draw consolidated conclusions. The qualitative data and quantitative data from students were 3then merged with the qualitative data from expert informants to draw comprehensive interpretations on e-learning practices, standards and applicability across different fields.

3.12 Ethical Considerations

Ethical issues in educational research, as outlined by Cohen, Manion and Morrison (2007:51), 'may stem from the kinds of problems investigated by soci33al scientists and the methods they use to obtain valid and reliable data. This means that each stage in the research sequence raises ethical issues.' Ethical issues may include matters of anonymity and confidentiality of the respondents,

reciprocity, voluntary participation, as well as informed consent to conduct the study. The researcher also considered the safety of the respondents due to health concerns.

3.12.1 Confidentiality

To ensure confidentiality in this study, students did not indicate their names anywhere in the questionnaires. The names of the lecturers, university administrators and quality assurance officers who were interviewed were equally withheld. In addition, the researcher treated as confidential information what was provided by the research participants. Maintaining confidentiality was necessary to avoid repercussions on the participants as they were required to provide truthful responses.

3.12.2 Reciprocity

Reciprocity refers to the relationship between the researcher and the research participants in which the participants are expected to devote some time and effort towards contributing to the research study. This, however, would require that the quality of the research findings could not be compromised. As such, the researcher sought to maintain quality by not providing any form of compensation to the research participants.

3.12.3 Voluntary Participation

According to Gakuu Kidombo and Keiyoro (2016), voluntary participation entails that it is the subject's choice to be or not to be part of a study. In this respect, the researcher in this study ensured that there was no element of force, fraud, deceit, duress, ulterior form of constraint or coercion to get any subject to participate. As a means of enacting this, the researcher only collected email addresses of students who voluntarily provided them.

3.12.4 Informed Consent

The researcher sought consent from all respondents by informing them on all possible benefits and risks of their participation in the study. Informed consent is vital because it would guide the possible research participants in deciding whether to participate in the study or not. Furthermore, steps were taken to ensure that all ethical grounds were adhered to, as was guided by the Ethics Committee of the University of Zambia.

3.12.5 Health Safety of Respondents

In consideration of the outbreak of the COVID-19 virus, the researcher took precautionary measures to ensure the health and safety of the participants and of self. The measures that were observed by the researcher included the maintenance of social distance during interviews, inquiries, and engagements; always wearing of a face mask during interactions with participants; washing and sanitising of hands; as well as avoiding unnecessary contact. The researcher also embarked on the collection of data from student participants using online Google Forms as a way of reducing the risk of spreading or contracting the virus.

3.13 Summary

The researcher in this chapter provides an outline of how the study was executed. The provided explanation serves as a guide to a successful conducting of this study in the outlined context. It would also be imperative to note that the chapter provided detailed justification for the selection of each step of the study. The execution of this study was able to lead to the obtaining of data which was key to meeting the objectives of the study.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.1 Overview

The previous chapter provided a description of how this study was conducted as the research methodology. Moving forward, this chapter contains the findings of the study in accordance with the guidelines highlighted in the introduction and methodology. The findings, in this chapter, reflect the analysis of the data that was collected from the students, lecturers, university administrators in charge of ICT, as well as the director of quality assurance at HEA. The presentation of these findings has been guided by both the respective sources of the data and the research questions of the study which were as follows:

i. What are the practices in the implementation of e-learning regarding ICT features and facilities, policies, and standards in Zambian universities according to the users?
ii. How applicable is e-learning mode in the delivery of curriculum implementation across the variety of university programmes of study?
iii. How appropriate are the employed pedagogical approaches in e-learning to university students and lecturers in Zambia?
iv. What framework could best guide the implementation of e-learning in Zambian universities?

4.2 Characteristics of Respondents in the Study

Demographics of participants in this study were vital as they provided an opportunity of attributing the findings to different aspects such as age groups and gender. The collection of demographic data was conducted using the questionnaire in the case of the students.

4.2.1 Universities

In this study, there were forty-four (44) universities accredited to HEA in Lusaka province and six (6) universities were sampled in accordance with the adopted criteria. Out of the 44 universities, there were 4 public universities and 40 privately owned universities. The 6 sampled universities for this study in accordance with their respective cluster are shown in table 4.1.

Table 4.1: *Structural Representation Sampled Universities According to Clusters.*

Cluster 1: Natural Science-based Universities		**Cluster 2: Social Science-based Universities**		**Cluster 3: Universities with both Natural and Social Science Programmes**	
NSB-1	NSB-2	SSB-1	SSB-2	NSSS-1	NSSS-2

As shown in the table, for universities with programmes that had Natural Sciences, two (2) universities were sampled. In the case of universities that primarily offered social science-based programmes, two (2) other universities were also selected. For cluster 3 which comprised of universities offering programmes in both social and natural sciences, again two (2) universities were the selected. This led to the selection of two (2) universities from each cluster. Furthermore, out of the 6 universities, there were 2 public universities and 4 privately owned universities.

4.2.2 University Lecturers Administrators, and HEA

In accordance with the proposed target participants, there were six (6) university administrators in-charge of or taking a leading role in the ICT department of each respective university who participated from each selected university. Out of the 6 administrators, an observation made was that 5 administrators were males while only one was female. On the other hand, the number of lecturers who were interviewed was eight (8) as planned. Out of the 8 lecturers, there were four (4) lecturers each from Natural Science-based programmes and social science-based programmes from across the 6 universities.

4.2.3 Students' Demographics

The students who participated in the study by responding to the online questionnaire provided demographic information by filling in the first section of the questionnaire accordingly. The students provided their respective university name, gender, classification of programme of study, and individually applicable age group.

4.2.3.1 Students' Age and Gender Distributions

Table 4.2: *Students' Age Group Distribution According to Gender per University*

Age Groups	Female	Male	Grand Total	Age Group Count per University					
				NSSS-1	NSSS-2	SSB-2	SSB-1	NSB-1	NSB-1
16 – 20	29	15	44	10	4	5	10	6	8
21 – 25	69	52	121	20	17	19	20	22	16
26 – 30	26	18	44	6	10	10	6	9	8
31 & above	15	16	31	4	9	6	4	3	8
Grand Total	**139 (57.92%)**	**101 (42.08%)**	**240**	**40**	**40**	**40**	**40**	**40**	**40**

As shown in table 4.2, the distribution of students in according to the age groups was such that the most students were those aged between 21 – 25 years accounting for 50.42%. With the total number of students being 240, the remaining distribution of participants according to age groups was 18.33% for ages 16 – 20, 18.33% for ages 26 – 30, and 12.92% for ages 30 and above.

4.2.3.2 Student Gender Demographics Per University

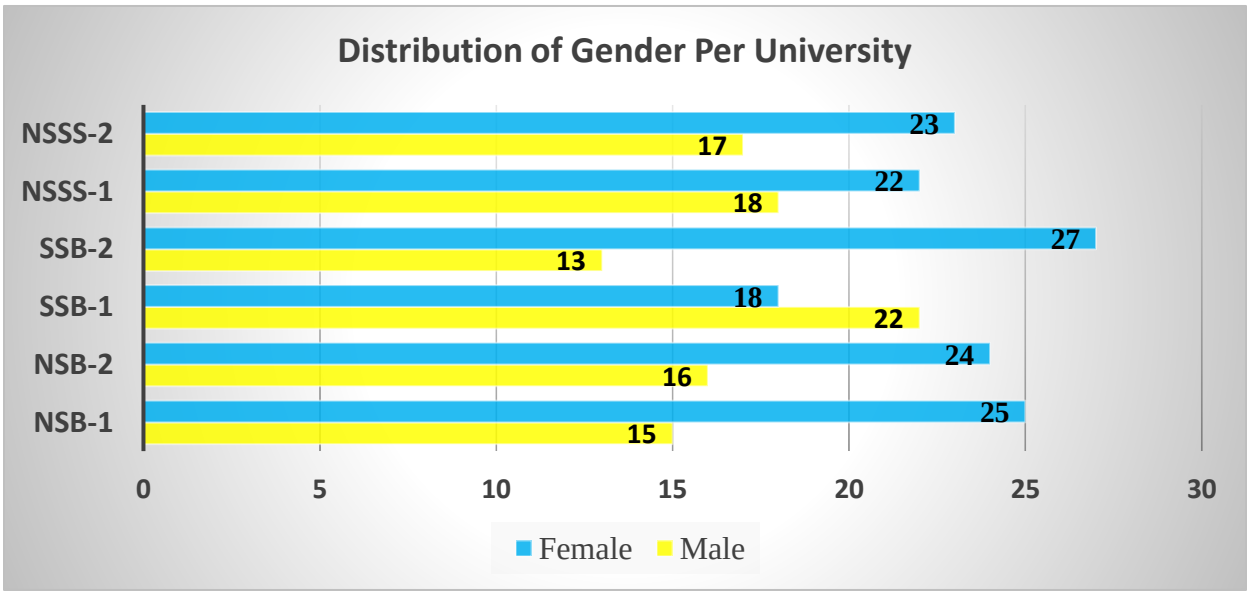

Figure 4.1: Distribution of Gender per University

The gender distribution of student participants was assessed according per university and collectively. As shown in figure 4.2.3, there were 139 female participants representing 57.92% of the total student participants, while the males accounted for 42.08% at a count of 101 out of the total of 240 students.

A review of gender distribution according to each university showed that there were more female participants in most universities than there were male participants. The only exception observed was at SSB-1 where there were more male participants as compared to females, even though the margin was minimal. Nonetheless, the contribution of participants per university was equal across the board with each university accounting for 16.66% (i.e., 40 students).

4.2.3.3 Programmes Classification

In accordance with the proposed target, the participation of students was supposed to be equally distributed among the four (4) classifications of university programmes. This, however, was not the outcome of things due how certain programmes were structured in various universities. Among other contributing factors was the fact that some programmes comprised of courses from two or more classifications in accordance with this study. As such, it was found that some student participants who were available to participate in the study belonged to other programme classifications rather than the targeted classification in each case as was referred by the lecturer.

Table 4.3: *Distribution of Programme Classifications Among Students*

Programme Classification	*f*	%
Natural Sciences based in Physics	39	16.
Natural Sciences based in Biology	89	37.1
Social Sciences based in Theory only	48	20.0
Social Sciences based in Theory and Practice	64	26.6
Total	**240**	**100.0**

As shown in table 4.3, the distribution of programme classifications among the participants was such that Natural Sciences based in Physics accounted for 16.3%, Natural Sciences based in Biology accounted for 37.1%, Social Sciences based in Theory only accounted for 20%, and Social

Science based in both Theory and Practice accounted for 26.6%. These values were contrary to the intended distribution of 25% for each programme classification across the board. However, the distribution still allowed for an analysis of data according to programme classifications owing to the nearly equal distribution between combined social sciences (which had a cumulative total of 53.4%) and combined natural sciences (which cumulatively accounted for 46.6%). This, therefore, implied that the dataset could be subjected to an analysis by comparing means of combined social sciences (which are representative of both Physical and Biological sciences) and combined natural sciences (which catered for both practical and theory based social sciences.

4.3 Pilot Study

A pilot of the study focused on the students' questionnaire was conducted among 20 undergraduate students from Kwame Nkrumah University and Mulungushi University from Kabwe. From each university, the students' questionnaire was administered to 10 students who represented all four programme classifications. The importance of conducting the pilot study was drawn from the need to ensure that the students' questionnaire was valid and contained relevant questions to avoid ambiguity. The pilot provided an opportunity for the researcher to ensure that the questionnaire was going to measure the intended aspects and was appropriately prepared in terms of wording and length.

The pilot proved very vital as it led to adjustments to some questions in the questionnaire to make them responsive and clearer. The pilot study also showed that there were some significant differences in effectiveness of e-learning in relation to the classification of programmes, thereby contributing to the basis for conducting the study.

4.4 Student's E-learning Practical Experiences

With the contribution of students being cardinal to this study, there was need to explore the various aspects surrounding students' experiences regarding e-learning. For meticulousness, the assessment of students' experiences began with a check on their e-learning background with regards to ICT literacy and accessibility.

4.4.1 Computer Skills Ratings

Table 4.4: *Students' Computer Skills Ratings*

Computer Skill Rate	Assigned Score	*f*	%
Know Nothing	1	2	0.83
Basic Usage	2	30	12.50
Moderate Usage	3	117	48.75
Advanced Usage	4	75	31.25
Expert Usage	5	16	6.67
Total		**240**	**100.0**

In a bid to understand students' computer literacy, data was collected from students on their computer skills using five (5) different levels of operation. The scores showed that only 6.67% of the students rated themselves as experts, while 48.75 of students rated their computer skills as Moderate. Those who rated their skills as Basic Usage and Knowing Nothing accounted for 12.5% and 0.83% respectively. As shown in table 4.4, all 240 student participants had to rate their computer skills to provide a base for understanding the influencing factors in the students' submissions. Further reviews showed that a cumulative total of 84.21% (208) of the 240 students participants scored a minimum of moderate computer skills.

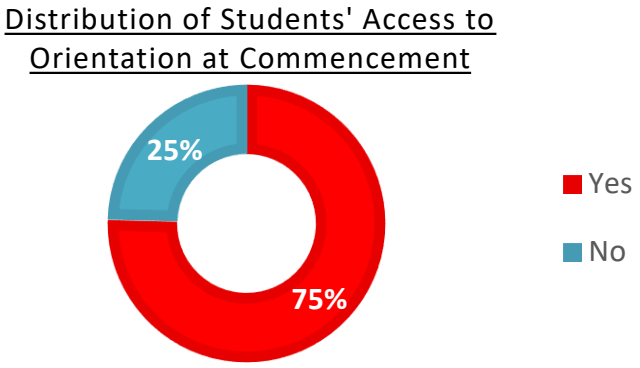

Figure 4.2: *Distribution of Students' Access to Orientation at Commencement*

Another key aspect of the students' ICT background which was vital to this study was the aspect of their perceptions on the need for orientations to the university adopted e-learning platforms. As shown in the figure 4.2, out of the 240 student participants, 181 students accounting for 75.42% said that they received proper orientation to the adopted e-learning platforms, while 59 students who represent 24.58% of the total number of said that they did not receive proper orientation to

the adopted e-learning platforms. For the student who did not receive orientation, various reasons were provided for not receiving it. For instance, one student said that:

> *The orientation was available, but it was not clear, because even the lecturers themselves did not know how to use the platforms that were provided for E-learning.*

Another interesting response from students on why they did not receive orientation alluded to the competence levels of those who led the orientation process. One student stated that:

> *They themselves didn't know how to use the platforms as well.*

Other reasons that were cited by students included aspects such as assumptions that students were computer literate and able to navigate platforms with ease, students not being aware of the orientation in good time, institutions not having ITC experts to lead the process, universities not providing the orientation due to the way e-learning was introduced (as an emergency solution), as well as the assumption that the platforms were user-friendly for students and orientation was not necessary.

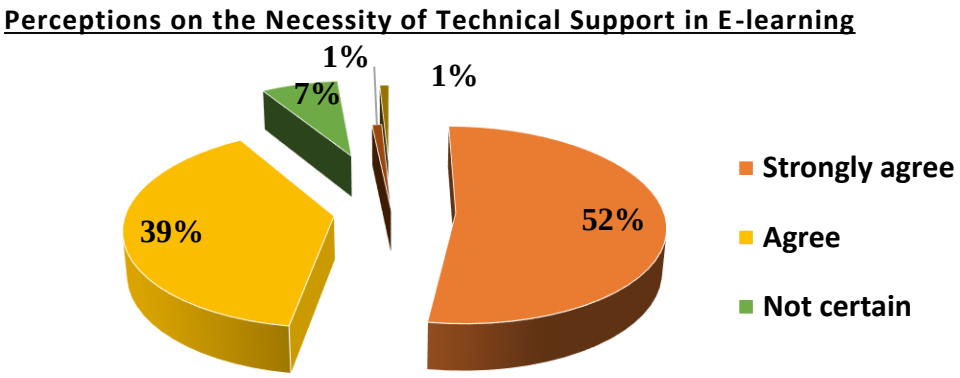

Figure 4.3: *Perceptions of Students on the Necessity of Technical Assistance*

To further understand the necessity of the orientation process to students, they were probed on whether they deemed it necessary or not. The findings were as shown in figure 4.3 were such that out of the 240 students, 222 students (92.5%) said that they needed the orientation, and only 18 students (7.5%) said that they did not need the orientation. For those who agreed to needing orientation, various reasons were provided, these included aspects such as the need to have navigation skills on the platforms, the need to stay on course and participate fully in lectures, the

lack of advanced computer skills among most students, and the lack of alignment of certain programmes of study with ICTs. Aligned with these concepts are the following examples of responses from students on why orientation was deemed necessary.

One social sciences student stated that:

> *An orientation is important as it provides the basic information on how to navigate through the system and manage any challenges that may arise in the process. In as much as I have skills in using ICTs, every platform comes with its own unique features which require an orientation on how to access and manage them system.*

A medical student also noted that:

> *Technology advances every day. As science students, we rarely need to keep up with that, so it was necessary to orient medical students.*

Like the views of most students, another student stated that:

> *'Because there are certain individuals who are not conversant with using computers, they find it a challenge, hence the need for introducing the orientation process.*'

On the other hand, the 18 students who expressed not needing orientation alluded their choice to aspects such as being already conversant with the e-learning platforms, the platforms being user-friendly, orientation being unnecessary, as well as having been taught most aspects through computer lessons. A further review of these students also showed that their computer skills rates were also mostly spread across moderate usage, advanced usage, and expert usage. Most students amongst these had moderate usage computer skill.

4.4.2 Students' Experiences with ICT Facilities through E-learning

To understand the experience of students with e-learning in accordance with their interactions with ICT facilities such as accessibility gadgets and university platforms, the researcher also went on to query students on these aspects. An in-depth review of each of these aspects provided findings which were specific to each component.

4.4.2.1 Experiences with Accessibility Devices

One component which was of importance in this aspect of the study was that of the adopted mode of e-learning at classroom level according to the experiences of the students. With 2 modes of e-learning available to both the students and lecturers, the findings showed that only 22 students (9.2%) of the 240 students had an experience of learning virtually only in all aspects of learning whereas 218 students (90.8%) experienced blended learning in which virtual learning was combined with physical lessons and assessments.

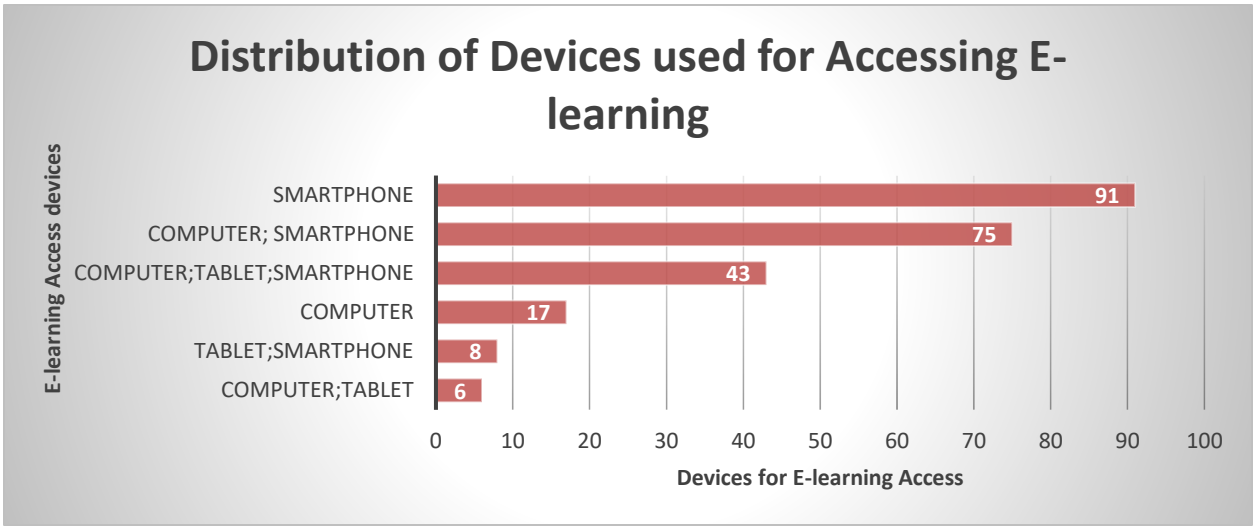

Figure 4.4: Distribution of Devices used to Access E-learning Platforms.

Two other aspects of students' e-learning experiences that were under review were the devices that were used by students to access the various e-learning platforms, as well as the students' perceptions on the most convenient devices for accessing e-learning platforms. In both cases, the categories that were availed to the students included smartphones, tablets, laptops, and a combination of either category. As shown in figure 4.4, smartphones were the most popular category for accessing e-learning with 91 students (37.92%) using them singularly while computers were only used by 17 students (26.67%) singularly. Overall, a cumulative total of 217 students, accounting for 90.42% used smartphones to access the university e-learning platforms. The distribution of scores over all categories was as follows: 91 students for smartphones only; 75 students for a combination of computers and smartphones; 43 students for a combination of smartphones, computers and tablets; 17 students for a computer only, 8 students for a combination of smartphones and tablets; and 6 students for a combination of computers and tablets.

With regards to the students' perceptions on the most convenient devices for accessing institutional e-learning platforms, the findings as shown in figure 4.5 showed that students preferred smartphones the most, whereas computers were rated second, and a combination of computers, tablets and smartphones being the rated third. Singularly, smartphones accounted for 109 students while the intersectional selection of smartphones was at 171 students which accounted for a cumulative total of 71.25% of students. Computers, on the other hand accounted for an intersectional score of 125 students which represents 52.08% of students. Tablets accounted for the least score on the list of most convenient devices with an intersectional count of only 38 students (15.83%) out of the 240 students.

4.4.2.2 Experiences with University Adopted Platforms

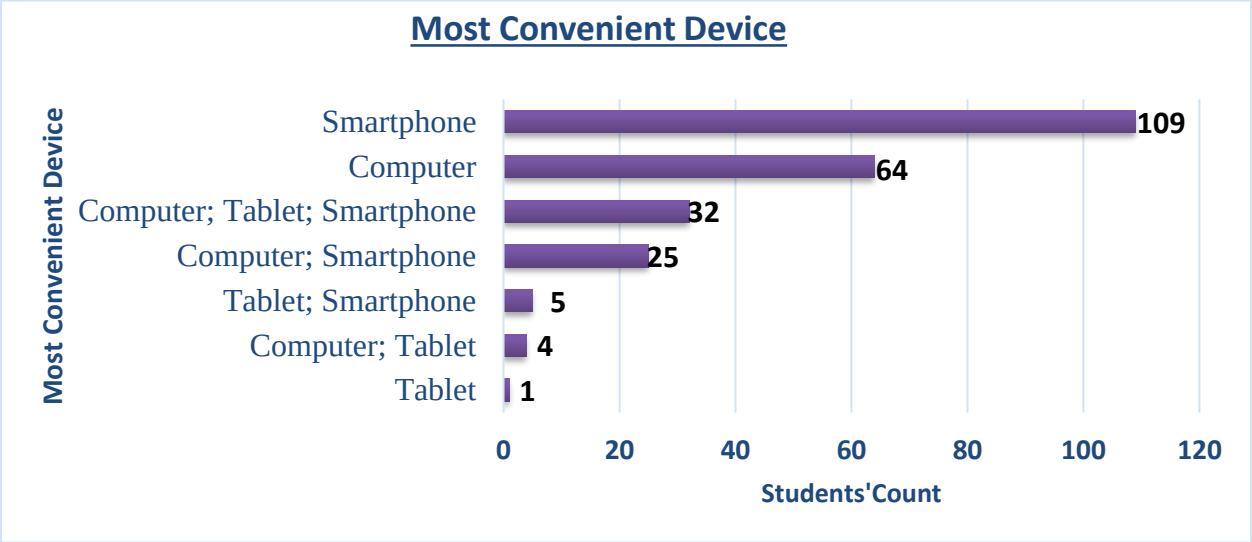

Figure 4.5: Perceptions on the Convenience of ICT Gadgets.

In a quest to understand how e-learning was conducted with respect to the university adopted software technologies and according to students' experiences, the students recorded the online platforms that they were recommended by and incorporated to facilitate their e-learning lectures. The findings showed that students interacted with various online platforms, and all of which were either open-source platforms or paid for platform, or both in some cases. The platforms that students identified as having been recommended by their universities included Google Classroom, Google Meet, Zoom, Moodle, and Astria.

The findings, on the other hand, showed that e-learning platforms that students interacted with the most were Zoom, Google Classroom, Google Meet, and Moodle respectively. Other platforms which immerged as alternative options included applications such as Microsoft Teams, WhatsApp, Telegram, Big Blue Button, and the Invigilator Application. The submissions showed frequent use of 2 or more options of platforms across all 6 universities.

Table 4.5: Students' Distribution in Experiences of Challenges

Response	Faced Challenges in Platforms Use	Accessed Instant Technical Support Services	Regarding Technical Support E-learning Necessary
Yes	150	129	221
No	90	111	2
Not Certain	0	0	17
	240	**240**	**240**

In consideration of the possibilities of having faced challenges in the use of the institutional recommended e-learning platforms, the researcher also probed the students on whether the face and challenges in their use and access to these platforms, as well as what kind of challenges the faced if any. As reflected in table 4.5, the findings showed that 150 students acknowledged having faced challenges, while the remaining 90 students said that they did not face challenges in their use and access of the e-learning platforms. From the 150 students, the major challenges that were encountered included poor internet connectivity (low bandwidth), limitations in attendance slots for open-source platforms, difficulties in engaging with lecturers, having different applications open on one device, as well as overloading and crushing of platforms during assessments. For instance, one student said that:

> *Google meet would reach the maximum number of participants, while Big blue button would just log you out without you knowing the reason. Zoom was far much better compared to the other two but was not used as much.*

In line with the issue of challenges, students also submitted their experiences of having been provided with access to technical support to resolve identified issues. As shown in table 4.5, only

129 students acknowledged receiving on-demand technical support from their respective ICT departments, while 111 students denied having been provided with instant technical support.

The perceptions of students on the need for technical support also showed that 221 student (92%) regarded technical support as necessary, while only 2 students (0.83%) said that it was not necessary. 17 students remained uncertain about the necessity of technical support during the use of institutional e-learning platforms. While the 2 students gave reasons that spoke to the simplicity of the platform and the waste of time in getting technical support, the 221 students gave a range of reasons which spoke to aspects such as low computer literacy levels among students and lecturers; system failures and malfunctioning due to overloads; constant software upgrades; as well as facilitating smooth learning, especially where lecturers are not as conversant with the platforms. One example of these responses came from a student at one of the Social Scienced-based universities (SSB-1) who said:

> *I agree because it would be helpful to have assistance for circumstances that are unfamiliar to students.*

Another student at SSB-2 strongly agreed to needing technical support and drew from a practical experience with the institution's platform as he gave his reason that:

> *Technical support is needed because not everyone is familiar with the e-learning.*

The students also provided feedback on their perceptions of how effective the adopted e-learning platforms were for studies in their respective programmes of study. The findings in showed a distribution of responses across the following option: effective; very effective; moderately effective; ineffective; and very ineffective. As shown in figure 4.6, moderately effective had the highest score of 120 students, thereby accounting for 50% of the students. 57 students (23.75%)

rated the platforms the interacted with as effective, while 37 students (15.42% accounted for those who selected the option of ineffective. The least scores on the effectiveness scale were very effective and very ineffective with 21 students and 5 students respectively.

4.4.2.3 Software Technologies from Students' Perceptions

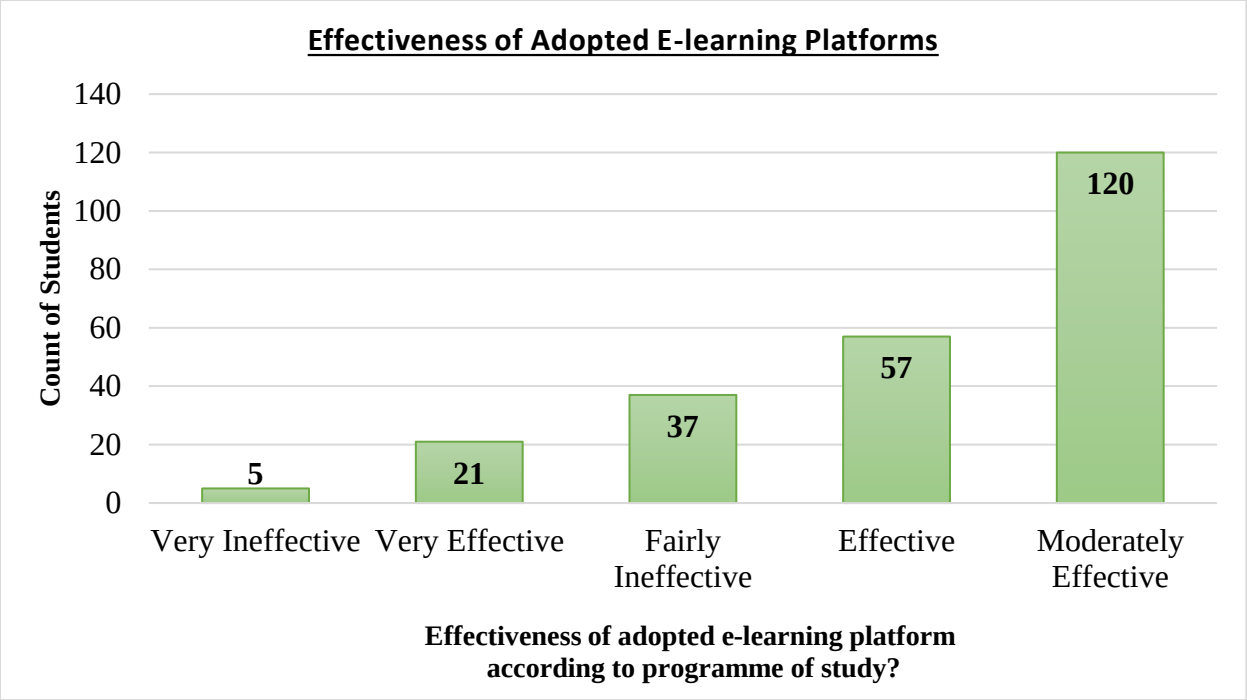

Figure 4.6: *Students' Perceptions on Effectiveness of E-learning Platforms*

Another interesting component to the researcher in this study was the perceptions students had on the software features they interacted with during their e-learning experiences. In this respect, standard LMS features were grouped into 8 options from which students were to indicate the features that they interacted with most during their lectures. The 8 features provided as options to students were Audio/Visual Conferencing tools; Asynchronous discussion tools; Assessment tools; Content sharing tools; Screen-sharing features; Polling tools; Virtual Simulators; and White board features. With students having the option to select any number of features from the options, the findings showed that the top 4 features which were each selected by more than 50% of the population in descending order were Audio/Visual Conferencing tools, Screen Sharing features, Content sharing, and Assessment tools. These four were selected as the most utilized features by lecturers during lectures.

Students were also queried on their perceptions as to whether the use of LMS with integrated features (in reference to the list of 8) would improve their e-learning experience or not. Considering that not all students had an encounter with an actual LMS, a description was used to ensure that they understood the question. As shown in figure 4.7, 25% of the students strongly agreed that while 37% just agreed to the notion that LMS could improve e-learning. This accounted for a cumulative total of 62% of students who agreed with the notion. 36% of students were uncertain about, and only 2% disagreed to the notion.

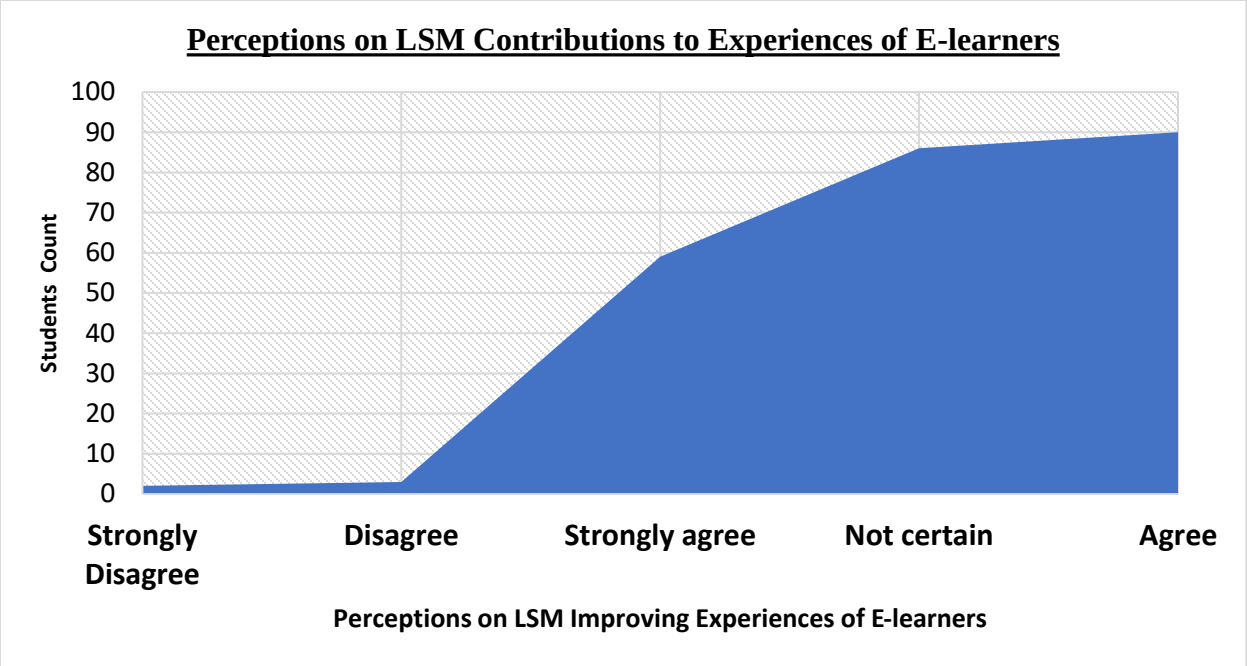

Figure 4.7: *Students Perceptions on the LMS Impacting E-learning Experiences.*

4.4.3 Students' Perceptions on Appropriateness of Adopted Pedagogical Approaches

Students' reviews on the adopted and experienced pedagogical approaches are a cardinal aspect in the quest to understand e-learning in universities from a wholistic perspective. In this respect, the researcher probed the students on various aspects regarding the employed pedagogical approaches in their e-learning experiences.

4.4.3.1 Experiences with Adopted E-learning Modes

The first aspect the researcher investigated regarded the preferred modes of learning as dictated by lecturers. With only 3 options to pick from, the students had to indicate the option preferred by

their lecturers. As shown in table 4.6, the 3 options of lecturing modes were Asynchronous mode, Synchronous mode, and the Blended Learning mode. The findings also showed that the combined selection of both asynchronous and synchronous learning (blending learning mode) was the most employed mode with 162 students having been subjected to it. Synchronous and Asynchronous modes had counts of 72 students and 6 students, respectively, as the numbers of students who were subjected to the two modes.

Table 4.6: *E-learning Modes in Lectures*

		Number of Students Subjected to Mode	Students' Preferred Mode of E-learning	Observed Change
Synchronous Mode only	*f*	72	36	-36
	%	30	15	-15
Asynchronous Mode only	*f*	6	5	-1
		2.5	2.08	-0.42
Blended Learning Mode	*f*	162	199	+37
	%	67.5	82.92	15.42
Totals		**240**	**240**	

In addition to stating the modes of e-learning that students were subjected to by their lecturers, the students were also asked to provide descriptions of how lecturers conducted lectures. The descriptions provided by students were clustered into three themes, with each of them being aligned with one or two of the adopted modes of e-learning.

a. Asynchronous Mode

For 6 students who indicated asynchronous mode only, the general feedback was that lecturers posted pre-recorded videos and notes for students to access the content in their own time through platforms such as Moodle. For instance, a student at NSB-1 made a submission that said:

> *They recorded videos and sent them, sometimes they shared their notes, and we would read containing diagrams.*

With regards to the selection of asynchronous mode as a preferred option, only 5 students selected it and provided reasons which included accessing content at convenient times, learning and individual paces. For example, one student said that:

> *When using asynchronous mode, it is better because one can keep watching the video to better once understanding.*

Another student provided a response that spoke to issues of connectivity he submitted that:

> *We can learn at our own pace, without internet interfering with the lecture.*

b. Synchronous Mode

For students who experienced the synchronous mode of e-learning, the submitted descriptions included practices such as using live audio/visual features, using screen sharing features, allocating time for feedback and questions from students, use chat box features to ask questions and make comments, as well as have students conduct presentations during lectures. One example of a submission is from a student at SSB-2 who said:

> *They would first post a link which would direct us to where we will have class from, then the lecturer would admit individual students who would want to join the class. Further, the lecturer would encourage students to type in questions and they would lecture that class whilst recording the class for the students who are not able or find it difficult to attend the class.*

A male student from SSB-1 also made a submission in which he said that:

> *Usually as students, we play a passive role unless you are called upon.*

In an interesting practice, a female student from SSB-2 described the practices by her lecturers by saying the:

> *They circulated notes to everyone before the lecture, then they explained online using live video and audio conferencing.*

As indicated in table 4.6, 36 students selected synchronous mode as the preferred mode of learning. The students also provided a variety of reasons for their choice which included interactive communication between lecturers and students which enhances feedback, having updated and well-informed lessons and interactions, provision of opportunities for getting clarity, interactions with fellow students, as well as keeping shared time tracking. An example of a reason from one student could be drawn from a submission by a student who said that:

> *Interaction is a vital aspect of learning as it enables one to ask questions where they are not clear.*

c. Blending Learning Mode

In the case of descriptions associated with the selection of blended learning mode, the submissions depicted a combination of characteristics from both asynchronous and synchronous modes such as live audio/visual conferencing, posted notes without or outside lecture times, discussions through chat platform, as well as sharing pre-recorded videos. For instance, in her description of how lecturers conducted blended lectures, a female student from a university with both Natural and Social Science-based programmes said that:

> *The lectures were conducted via live video with screen sharing and after classes, the recordings were uploaded on Moodle for ease of access by the students.*

In another submission, a student said that:

> *Sometimes the lecture just shared pre-recorded videos to our WhatsApp groups. Then sometimes we would have live videos where they are talking and sharing their screen.*

4.4.3.2 Perceptions on the Adopted E-learning Modes

Students were also asked to indicate their preference of lecturing modes. According to the findings, the students had a higher preference for having the mode with both asynchronous and synchronous components. Table 4.7 shows that blended learning mode had a cumulative selection of 199 students, while synchronous and asynchronous modes had 36 and 5 students, respectively. The table also shows that there were some significant changes observed in the two streams of data on the modes of e-learning that the students experience.

Table 4.7: *Effectiveness of Adopted Modes of E-learning*

	Blended Learning Mode	Synchronous Mode	Asynchronous Mode	Total
Moderately Effective	91	42	4	137
Effective	46	19	1	66
Ineffective	19	7	0	26
Very Effective	5	4	0	9
Very Ineffective	1	0	1	2
Total	**162**	**72**	**6**	**240**

In a bid to understand the gravity of the modes which the students were subjected to, they were also asked to rate the effectiveness of the adopted mode of e-learning according to their experiences. As shown in table 4.7, blended education mode was the most preferred mode with a cumulative total of 142 students scoring it as either very effective, moderately effective, or effective, against 20 students who rated is as ineffective or very ineffective. Asynchronous mode, on the other hand had the least scores with only 5 students regarding it as effective, and 1 rating its use as very ineffective.

4.4.3.3 Participation of Students in Online Lectures

Table 4.8: Student Participation in and Perceptions on Online Lectures

Response	Participation During Lectures		Participation in Lectures Impacting Performance		Perceptions on Engagement with Lectures impacting Performance	
	f	%	f	%	f	%
YES	184	76.6	225	93.75	230	95.83
NO	56	23.33	15	6.25	10	4.17
Total	240	100	240	100	240	100%

Key to understanding the impact of e-learning as a mode of curriculum implementation in this study were the perceptions of students on their participation in the processes that they were

involved in. The researcher probed the students on 3 main aspects of participation in lectures, as well as on contributing factors that deter them from participation in lectures, all in a bid to obtain an in-depth understanding of the factors at play in virtual learning.

a. Participation During Lectures

The findings displayed in table 4.8 show that out of the 240 students who participated in this study, 184 students (76.67%) acknowledged that having participated during online lectures by means of asking or responding to questions, making presentations, or making comments during discussions. Only 56 students (23.33%) of students acknowledged being either passive participants or not having the ability to participate in lectures. When queried on why students who did participate in lectures were passive participants, they provided varying reasons such as having poor internet connectivity; limited participation owing to platform limitations; personal preferences; time limitations; lack of practical experiences (for natural sciences); limitations by lecturers to ask questions at end of lectures; as well as poor learning environments for those who preferred to be in a physical classroom. In one instance, a student gave her reason for not participating in lectures saying that:

> *We were too many students, and I was usually disturbed.*

One medical student also gave his reason for not participating in lectures by saying that:

> *For most people, it was the environment that they were found in. Some people could be in a noisy area and wouldn't want to disrupt the lessons.*

Another student from the natural science-based programmes said that:

> *As students, we never had enough time to ask questions due to time limits on platforms such as zoom.*

b. Participation in Lectures and Students' Academic Performance

As shown in table 4.8, when students were probed on their perceptions on their participation in lectures impacting their academic performances, 93.75% of student participants acknowledged their performance being impacted on by their participation in lectures and 6.25% of students

thought that their participation in lectures had not impact on their academic performance. The 15 students who said that no relation existed between performance and participation in lectures sited reasons which suggested that their performance was dependent on individual abilities and understanding of concepts, and not on their participation in lectures. An interesting characteristic of these students was that their programmes of study were spread as follows: 10 social science-based students and 5 natural science-based students.

The students who gave a response of 'Yes' also provided a range of reasons for which included enhancement of understanding through clarifications; provision of lecturers with the level of conceptualisation of phenomena by students; increase in ways for students to understand concepts; reduces need for further studies; as well as getting a practical sense of phenomena. For example, one social science student said that:

> *Sometimes learners ask questions that makes the lecturer explain concepts in a way we all understand.*

Another student also gave the following reason:

> *This would provide the learner with a broader view on what they are learning as they would be required to do a lot more research if working learning individually.*

With reference to the assessment of the effectiveness of employed lecturing methodologies, one student submitted her reason being that:

> *Participation shows how a student understands what he or she is learning, thereby helping the lecturer determine how he or she should be teaching to help students.*

c. Determents to Participation of Students in Online Lectures

Students were also questioned on what factors they thought deterred their participation in lectures for the purpose of having guided conclusions on what affects their participation. Generally, the responses that were provided by students included reasons such as having poor internet connectivity, unplanned costs of internet bundles, being in unconducive environments for learning due to distractions such as house chores and noise, lacking self-confidence and motivation, not

being prepared for e-learning, poor learning schedules, using wrong platforms, as well as poor choices of lecturing methods by lecturers. For example, in one submission a student stated that:

> *Sometimes virtual class feels boring because you are not seeing the lecturer which puts one in a position to do anything else to keep themselves busy and leads to not participating.*

Another student shared a view that spoke to two aspects. In his submission, he said it was due to:

> *Poor internet connectivity and limited time for lecturers. Also, lack of opportunities for interaction with fellow students or lecturers.*

Similarly, one student provided a submission which also spoke to peer interaction saying that:

> *Difficulties in interacting with fellow students for both learning and social purposes.*

d. Students' Academic Performance and Lecturer Engagement

The relationship between lecturers and students in relation to their academic performance was another aspect the researcher sought to understand. In this regard, the students were asked to share their assumptions on the impact of engagements with their lecturers during online lectures. Interestingly, 95.83% of students agreed to the assumption that their engagements with lecturers impacted their academic performance. On the other hand, only 4.17% (10) of students assumed that engagements with lecturers had no impact on their academic performance. The 10 students whose responses to the question was 'No', gave a general impressions of time unnecessary consumption of time; not liking e-learning; and having preferences for learning by observing the lecturers, especially for practical courses. For example, as the reason for not perceiving engagement with lecturers as vital to academic performance, a student from one of the public universities said that:

> *It's because we are not learning to know our lecturers but to have access to the skills and knowledge that they share with us.*

Another submission made to support the view of there being no connection between the two aspects was drawn from a female student who said that:

Because the course is now more practical, it needs more of observing the lecturer when one does not understand the lesson.

For students who supported the notion that their academic performance was impacted by their engagement with lecturers, several reasons for this choice were give. Among the reasons given by students included aspects such as the need for and access to instant consultations; the enhancement of students' comprehension of concepts; aiding the assessment of students' conceptualisation to guide lessons progression; being an effective way of learning; enhanced concentration; promoting student led research; knowledge sharing between lecturers and students; as well as getting instant feedback. For instance, one student's submission stated that:

Engaging with lectures provides more insight to the learner and addresses any queries the learner might have right there and then.

In another submission, a medical student justified her selection by basing it on the nature of her programme of study by stating that:

…medicine is supposed to be practical and not theoretical.'

The submissions made by students were observed to have been based on their experiences with respect to the adopted e-learning modes and platforms per university.

4.4.4 Emerging Themes from the Perspectives of Students

To validate students' ratings of various aspects of e-learning according to their respective experiences, the researcher provided students with the options of submitting suggestions on interventions that could contribute to the effectiveness of their lecturers in their work, as well as to the effectiveness of e-learning to their respective programmes of study. Students' submissions led to the drawing of themes with respect to the specific aspects.

Submissions by students on interventions that could contribute to the effectiveness of lecturers led to the establishment of three (3) themes, Technological Interventions, Pedagogical Interventions, and Operational Standard. Under each theme, as shown in table 4.9, major summaries were drawn from students' submission.

Table 4.9: Interventions Suggested by Students for Effective Online Lecturing

	Technological Interventions	**Pedagogical Interventions**	**Operational Standards**
1)	Utilising SCORM standards with considerations for possible audio/visual impairments among students.	Embarking on learner centred lecturing approaches that engage learners more during lectures.	Having standardised time frames allocated for online lectures, with two hours being the upper limit for online lectures.
2)	Having locally owned integrated LMS to house all e-learning processes and features, with multiple device options for access it.	Allowing for student practical sessions in online lectures (for social science-based programmes).	Limiting lectures to live lectures which must be recorded and remain accessible for set time periods to students.
3)	Including social platforms for students to enhance social interactions within academic spheres.	Providing students with course outlines on the platform to guide students accordingly.	Limiting the number of students per lecture to allow for interactions between lecturers and students during lectures.
4)	Having educational internet service provision agreements with ISPs.	Using asynchronous continuous assessment for progress measuring.	Providing lecturers with ICT trainings, or trained assistants to handle technical issues.
5)	Having asynchronous consultation features in LMS.	Using Blended Learning mode.	Making live video features compulsory for students.

As shown in table 4.9, students made several submissions to aid the effectiveness of lectures and lecturers in their works. With regards to the suggestions that spoke to programme specific interventions, students provided the suggestions as shown in table 4.10.

Table 4.10: Programme Specific Intervention Suggestions by Students

	Suggestions for Social-Science based Programmes	**Suggestion for Natural-Science Programmes**
1)	Establish guidelines for both students and lecturer physical environments from where to attend online lectures.	Availing lecturers with models for practical demonstrations during lectures.
2)	Use visual aids where possible and have interacting features through which students would always participate.	Having a system integrated with all requirements such as notes, videos resources, books, and synchronous lectures.
3)	Providing access to transcriptions of lectures as well as well stocked electronic libraries	Restricting practical lectures to physical meetings and only allowing theoretical courses on e-learning platforms and having a strict timetable to allow for chronological coverage of content.
4)	Ensure that tools such as whiteboards and screen-sharing are always available for both lecturer and students.	Introducing virtual laboratories with three-dimensional simulation features.

The suggestions in table 4.10 were summaries of the various suggestions which were submitted by students. An example of one submission is that of a medical student who stated that:

> *The use of synchronous and asynchronous teaching in all courses would provide a better guideline throughout the course when done right. Unfortunately, not all lecturers would teach according to shared videos, if that could be sorted then the problem would be no more.*

In another example, a social science-based student suggested an intervention by stating that:

> *Have guidelines for lecturers conducting lectures to ensure a conducive environment that will not disturb both the lecturers and students during the sessions.*

Additionally, students made suggestions that spoke to aspects such as improving internet access, fully orienting both students and lecturers, having larger room to accommodate all students in compulsory and larger lectures, as well as having subsidised internet bundles to curb cost. These suggestions were spread across all classifications of programmes of study.

4.4.5 Comparative Reviews Across Students' Fields of Study

In consideration of the wide range of obtained descriptive statistics across a variety of aspects concerning students' experiences with e-learning, the researcher sought to understand the distribution of the collected data through comparisons across key student background components and experiences. The need for this was to understand any patterns in the distribution of the obtained data, as well as verify the significance of observation for reaching comprehensive conclusions.

4.4.5.1 Significance of Observations in the Effectiveness of E-learning Modes

In attempts to understand the distribution of the obtained scores of effectiveness of the adopted modes of lecturing as adopted by lecturers and as experienced by students across all universities, the researcher subjected the findings depicted in table 4.7 to a non-parametric test, Chi-square, for the purpose of determining the significance of the observed differences in the scores between the three modes of e-learning.

Table 4.11: Chi-Square Test for Significance Outcomes on Effectiveness of E-learning Modes

Effectiveness of Lecturing Mode	E-learning Mode Experienced by Students			Total
	Synchronous	Blended	Asynchronous	
Effective	19	46	1	66
Fairly Effective	7	19	0	26
Moderately	42	91	4	137
Very Effective	4	5	0	9
Very Ineffective	0	1	1	2
	72	162	6	240
Pearson Chi^2 (8) = 21.1091 Pr = 0.007				

With the data comprising predictor and outcome variables that were both categorical, the researcher embarked on conducting a chi square test of independence. Using a 95% mark for

testing confidence, the *Null Hypothesis* for this test was that '*there was no significant difference between the modes of e-learning as experienced by students'*, while the *Alternative Hypothesis* was that *'there was a significant difference between the modes of e-learning as experienced by students*.'

After the test was run, the obtained p-value was 0.007, while 21.10191 was the Person chi^2 value as shown in table 4.11. With these values, and at 95% confidence, we failed to reject the null hypothesis. Therefore, the findings of this test showed that there was a significant difference between the 3 modes of e-learning with respect to the effectiveness of the adopted modes of e-learning.

4.4.5.2 Significance of LMS in Programme Classifications

Table 4.12: Chi-Square Test for Significance in E-learning Effectiveness according to programmes

LMS can Improve Experiences of E-learners	E-learning Mode Experienced by Students		Total
	Natural Science	Social Science	
Agree	44	46	90
Disagree	2	1	3
Not Certain	52	34	86
Strongly Disagree	1	1	2
Strongly Agree	29	30	59
	128	112	240
Pearson Chi^2 (8) = 3.1093 Pr = 0.540			

The second test that was conducted was meant to establish the significance of programmes classifications on the students' perceptions on LMS improving e-learner experiences. As show in table 4.13, the p-value that was obtained was 0.540 while the statistical value was at 3.1093. The null hypothesis for this test was that *there was no significant difference in the observed student perceptions on LMS with respect to their programme classifications.* At a percentage confidence of 95%, however, the researcher rejected the null hypothesis and opted for the alternative

hypothesis which was that *there was a significant difference in the observed student perceptions on LMS according to programme classifications.*

4.5 Lecturers' E-learning Experiences

Lecturers' inputs in this study were very important in establishing conclusions that reflected e-learning practices from a wholistic point of view. For this reason, the researcher conducted interviews with 8 lecturers from across the 6 universities. The 8 lecturers included 4 lecturers from social science fields (law, journalism, psychology, and business) and 4 lecturers from natural science fields (human medicine, agricultural science, and computer science).

4.5.1 E-learning for Social Science Based Programmes

Through the interviews with lecturers of social science-based programmes and course, it was established that lecturers were generally comfortable with the e-learning platforms that were adopted by their respective universities. They also demonstrated understanding of wh at e-learning is by referring to it as a medium of learning remotely either in real time or asynchronously.

4.5.1.1 E-learning Backgrounds for Social Science-based Lecturers

In reference to being comfortable with using e-learning for lecturing in their respective social science-based programmes, all lecturers expressed comfort with delivering lectures and discharging other duties. However, some lecturers indicated having faced some challenges in selected practical aspects of learning which relied more on demonstrations, and easy reference to materials such as newspapers and other hardcopy documents. For example, one lecturer said that:

> *When law students required to make exhibits, opportunities for referring to them were limited as it was not possible to do so. This limited the use of e-learning platforms to covering theoretical aspects of courses only and preserving the practical aspects for in-person meetings with students. This was a limitation that was faced.*

With regards to making inputs in the university administration decisions around the implementation of e-learning, the submissions made showed that initially, decisions were not necessarily made through consultations with lecturers as there was a consensus to embark on the use of e-learning platforms as a way of facilitating learning amidst the COVID-19 pandemic. This,

however, was not the case for all lecturers and universities because e-learning was already being implemented in some of the universities. Lecturers in some universities were engaged at departmental levels to provide guidance on the technical assistance they would need to facilitate effective e-learning implementation. But with time, the lecturers were being provided with a platform for consultations to guide the implementation of e-learning.

4.5.1.2 Social Science-based Lecturers' Pedagogical Experiences and Perceptions

The researcher in this study also probed the lecturers on the technological features that lecturers considered as most important to their respective fields of specialisation. The responses across the board referred to audio-visual features in real time, screen sharing tools, and content uploading/sharing tool. The importance of each feature varied across each programme, but emphasis was placed on the need for instant feedback. For instance, one lecturer stated that:

> *Having a good video and microphone would be ideal, especially in Moot Court for law students. This would be needed especially when it comes to ensuring that personal presentations are in line with the standards that students ought to abide to.*

When queried on the modes of e-learning, lecturers from the social science-based fields emphasised on blended learning as having been the most employed mode, especially for practical courses. Nonetheless, it was made clear that there were some theoretical courses that were conducted asynchronously and synchronously only to the point of conducting final assessments (examinations) through online platforms with the aid of remote proctoring technologies in two universities.

In the case of lecturing methodologies, all lecturers could not single out methodologies to have worked best for them as they employed various learner-centred lecturing methodologies in their works. They, however, noted that methodologies such as group discussions were a challenge for some of them due to technological challenges such as not being well vested in the technologies. They also went on to sited having used methodologies such as lecture methods, group presentations, discussions (only for small groups), as well as peer-based teaching. Some lecturers also mentioned that noted that lecturing methodology choices were best determined by putting into consideration the needs of lecturers and students.

4.5.2 E-learning for Natural Science Based Programmes

Findings obtained through key informant interviews with Natural Science-based lecturers who also created a unique trend of responses to the same questions administered to social science-based lecturers. While some questions generated similar responses as those of social science-based lecturers, key aspects such as pedagogical practices, e-learning backgrounds and student engagements generated some unique trends.

4.5.2.1 Background of Lecturers in Natural Science-based Fields

Responses to the questions that sought to establish patterns in the background of lecturers of lecturers showed that lecturers in natural sciences understood e-learning in the same way with lecturers from social science-based fields. However, with regards to their level of comfort with the use of e-learning in their respective fields of study, all lecturers indicated that e-learning platforms were only adequate for theory-based programmes and courses. On the average, the lecturers sited the e-learning platforms they had at their disposal as being limited for meaningful interactions with students. For instance, one lecturer in agricultural science said that:

> *The platform (Moodle) that was given to us as on option was okay for courses where most of the information is shared verbally. But for courses where one must demonstrate calculations, it was a challenge. It also posed a challenge of having to prepare demonstrations (such as calculations) as it needed extra time to do so.*

Another professor in medicine said that:

> *In medicine, there are two types of aspects: the practical part and the theory part. The theory part can easily be carried forward to e-learning platforms. The practical part still poses a challenge because it is hands-on. For instance, no one in the world offers medicine online because it is practical. People can look at videos for learning, but that is not enough because one needs to hold a knife by oneself and see a blood spout in real-time. E-learning has its limitations in the practical aspects which I do not see being overcome in the distant future.*

Another thing I find difficult about e-learning is that it does not give you the opportunity of reading the expressions of students for confirmation of whether they have understood the content or not. In physical lecturers, there is an opportunity to assess the students' assimilation through the interaction between lecturers and students.

In response to the question on contributions to the university decisions regarding e-learning, most lecturers indicated that e-learning was an emergency response at initial stages and options were limited. With the passage of time, however, as indicated by most senior lecturers, there were opportunities of being consulted before decisions were made on the continued use of e-learning platforms within their respective universities.

4.5.2.2 Pedagogical Issues for Natural Science Lecturers

When asked to state the most important technological features to online lecturing, natural science-based lecturers alluded to synchronous e-learning features such as real-time audio-visual features, content upload and sharing tools, and virtual whiteboards, as well as asynchronous tools such as feedback tools/options. Key to note in this aspect was the overall submission of medicine lecturers that even advance simulations that they knew of would not be ideal for practical parts. These submissions, therefore, were limited to theoretical aspects of medicine and other field of study.

Another unique trend in the findings obtained through these key informant interviews was that of the mode of implementation that worked best. All lecturers from the natural science-based fields sited blended learning as having been the most practical and effective mode of e-learning. For most lecturers, blended learning worked best by aligning the timetables in a manner that allowed for practical lessons to be conducted in accordance with the flow of content. This approach was commended on different levels by the different lecturers, with one lecturer saying that:

In a sense, e-learning expanded our timetables and enabled us to cover more content effectively by providing opportunities for learning beyond daytime schedules. We get to meet with our students online at a time we collectively agree to maximise on physical meetings for the practical part.

In terms of lecturing methodologies, the submissions of all lecturers alluded to how sciences as based on facts which require very little need for student led discussions of facts. With respect to this perception, lecturers sited a traditional and interactive lecture method, presentations, and demonstrations as being the most effective methodologies. However, there were expressions of limitations of the use of demonstrations for most courses and topics, especially in medicine. Demonstrations were regarded as possible in only a few courses, and only if the lecturers were well vested in the use of e-learning technologies.

Furthermore, concerns were also raised by some lecturers on the need for checking the retention of students in both physical and online lectures. The expressions made in this line led to suggestions of conducting comparative studies between online and physical lectures to have conclusive data that would guide the methodologies more adequately, especially for e-learning.

4.5.3 Technical Aspects from Lecturers Perspectives

The technical aspects which all lecturers addressed started with an attempt to define the number of students that an online class should constitute. On the average, most lecturers considered 35 as an upper limit for students in practical social science-based courses, while suggesting having a leeway to accommodate as many as 100 students in theory based social sciences. Emphasis was made by most lecturers that smaller numbers would be much easier to manage and in ensuring quality as compared to having larger numbers of students in lecture groups.

Lecturers also indicated having been provided with technical support through the ICT departments inf the forms of receiving orientation trainings, being provided with on demand technical support, being provided with technical devices (laptops, MiFi, and data bundle), as well as through upgrades of software systems. This technical support increased after e-learning was made part of most university normal learning plans (post COVID-19 pandemic period).

With regards to the academic performance of students, submission by lecturers showed that most students performed poorly across most of the universities. Evidence for this situation was pointed at some of the pronouncements by institutional administration to have supplementary examinations even in schools and programmes that did not have such provisions.

4.6 University ICT Administration Strategies

To understand how e-learning is guided and implemented by university administrators, an interview with one staff member from the department managing ICT in each of the 6 universities was conducted. These interviews were focused on exploring key aspects that dictated how e-learning was being implemented at each university such as policies, capacity building, technological investments, as well as collaborative works.

4.6.1 E-learning Policies and Practices

To address the objective speaking to e-learning practices, ICT staff from each university were asked to give clarity on the policies their respective institutions were using to guide the use of e-learning as a mode of curriculum implementation. The findings showed that out of the 6 universities, 4 universities had some policy documents which were being followed to guide the use and management of ICT. The other 2 universities did not have any established policies to guide the use of ICT because e-learning was an emergency response to the COVID-19 pandemic.

At the 3 universities with some forms of ICT policy documents, it was observed that the policy documents were mostly general policies which were not specific to guiding e-learning as a mode of curriculum implementation. Further enquiries also revealed that the policies were developed at a much higher level with little or no input from the technicians, lecturers, or students. In 3 out of the 4 universities, e-learning was initially meant for distance learning only and was undergoing constant reviews through established steering committees. In this regard, one ICT staff said that:

> *We have an ICT steering committee where any decisions that need to be made as far as e-learning, or the implementation of e-learning is concerned are discussed. It is not necessarily about following policies per say, but more of a committee that meets regularly to make decisions around e-learning.*

According to the submission made by the other ICT staff, decisions around the implementation of e-learning were made on a much higher level of the university's bureaucratic system, thereby having less input of ICT staff managing the university's ICT systems. Instead, the ICT staff were on the receiving end of instructions on operations. This submission was consistent with other submissions in showing that high level committees made decisions on e-learning implementation.

Additionally, in the universities where some form of policies on ICT existed, it was noted that the policies were either developed by the universities or adopted from other universities they collaborated with, and not by the Ministry of Education (MoE) or Higher Education Authority (HEA). These policies did not directly address speak to e-learning processes and focused on management of university systems and equipment.

4.6.2 University Investments in ICTs and E-learning

When asked to state the level of investments made in ICT by each university, it was clear that only 4 universities had made significant investments in ICT to facilitate the implementation of e-learning as a mode of curriculum implementation. The investments that were made in the 4 universities included but were not limited to purchased and outsourced LMS (such as Moodle) and Student Record Management Systems (SRMS) such as Astria Learning, purchasing of latest computers and MiFi devices for lecturers and staff, acquiring and expanding of server storage space (hosted outside), increasing bandwidth, acquiring simulators, as well as e-libraries.

The findings also showed that none of universities had its own LMS with local server to host the LMS. All acquired LMS, even though paid for were being hosted on servers that are in Europe or North America. Therefore, the ICT staff were simply managing the LMS systems had limitations as to the extent they could make certain alterations to the LMS. Certain functions were largely dependent on engaging the hosts.

4.6.3 Programme Specific E-learning Implementation

The researcher also enquired on how e-learning was being implemented across the various programmes of study with respect to programme specific requirements. The findings on how this was achieved across the 6 universities showed that different approaches were followed. In 4 universities, the ICT staff showed that lecturers were given the options of indicating what they required to make e-learning more effective for their specific programmes and courses, and that support was granted to them by the department. For instance, one ICT staff said that:

> *Here, we offer a range of programmes which include quantitative courses, qualitative courses, and what we call BIG courses. So, for each type of programme, there are a*

range of plugins which we get to purchase and install on demand of lecturers to facilitate effective delivery of lectures.

In the same submission, the ICT staff also noted that lecturers were engaged at departmental level to understand their demands to attend to them. Where departmental submissions were not responsive to all requirements, individual lecturers were engaged by the department to find solutions. In other 2 universities, however, lecturers were left to explore options withing the provisions of the LMS or outside the LMS to facilitate learning. This was attributed to the limited investments made in ITC infrastructure and e-learning by these universities.

4.6.4 University E-learning Quality Control

With quality being a key issue in this study, the researcher also investigated how quality assurance was being conducted by ICT departments in each university. The findings showed that quality assurance was done in various ways which included training both lecturers and students in the use of the e-learning platforms that were adopted by the universities, providing feedback options to both lecturers and students (often through surveys), as well as through tracking usage for adopted e-learning platforms by both lecturers and students. One staff said that:

Moodle generates monthly reports on the usage of the platforms by both lecturers and students. Through the reports, it is possible to check if lecturers having been posting content and conducting lectures, and whether students have been able to login and access content and lectures.

From the perspective of technical support to contribute to quality assurance, submissions from all 6 universities were that students and lecturers were provided with technical support by focal persons. The technical support came through training of staff and students, managing the platforms to ensure smooth running, as well as attending to cases as submitted by students and lecturers in the event of technical difficulties. The provision of on-demand technical support to students, however, was only possible during normal working hours (as dictated by each university) and was mostly focused on resolving technical glitches in the systems and providing guidance on how to operate certain features.

With regards to trainings, each institution had its own time frame for conducting trainings in the use of the adopted e-learning platforms. Furthermore, only universities with paid for outsourced LMS had ICT staff to provide technical support to both lecturers and students. The universities with limited investments relied heavily on technology champions among the present staff.

4.6.5 ICT Centred Stakeholder Collaborations

The researcher in this study also made efforts to enquire on what collaborations were made by the universities in their quests to implement or improve the use of e-learning where already existing. The findings showed that all universities were engaged in some form of collaborations with various stakeholders such as Internet Service Providers (ISPs), other universities, e-libraries, and international institutions and companies.

The collaborations made with the various institutions included consultations on how to best implement e-learning as well as negotiations to make e-learning platforms easily accessible and affordable to students. Overall, the ICT staff from all institutions indicated that the collaborations were vital to the establishment and improvement of e-learning platforms in their respective universities. In engagements with ISPs, agreements were made to make affordable the access of e-learning platforms that were adopted by most institutions. This, however, was not extended to social and cooperate platforms which some institutions were relying own as they were not academic platforms.

4.7 Higher Education Authority E-learning Standards and Practices

On the premise that all universities in Zambia are overseen by Higher Education Authority (HEA), the researcher also conducted on hey informant interview with the Director of Quality Assurance to get an in-depth understand of the extent to which the authority is involved in the implementation of e-learning in Zambian universities. The interview focused on two major aspects: e-learning guiding policies, as well as overall quality assurance.

4.7.1 Policies and Guidelines

The findings of the interview showed that HEA did not necessarily have any standing policies on e-learning for institutions of higher learning to follow. However, the researcher was further guided

that the authority had a set of guidelines and standards for institutions follow in line with their respective adopted modes of delivery. These guidelines were extracted from the national policy on higher education and were used to check whether an institution could be registered if new or whether it was fit to maintain the registration status if already in existence, and the operation standards in line with the mode of delivery.

Establishment of e-learning practices, as guided by the director, was not a duty of HEA as per say. Instead, the authority gives a certain level of autonomy to both public and private universities to establish policies on e-learning at institutional levels, within the provisions of HEA guidelines. For private universities, however, having policies for ICTs is a requirement which should be met from the onset. HEA checks the quality of the formulated policies using standard guidelines. In this respect, the extent to which HEA in ensures effectiveness in the implementation of e-learning in Zambian universities only goes as far as physical infrastructure, policy assessment, technological infrastructure, as well as human resource adequacy.

With regards to the guidelines on ICT infrastructure, HEA has set standards of the hardware and software technologies which universities need to acquire and have in place for them to operate as e-learning facilities. The guidelines speak to various aspects of technology such as speed, compatibility, capacity, modules, accessibility, staff facilities, student records and archives, subscription to content and e-library, and security. However, the researcher was guided that HEA does not specify whether the platforms should be outsourced or inhouse LMS. Furthermore, the option of either having one comprehensive LMS to house all features or having multiple LMS systems for different functions was left open to universities.

4.7.2 Quality Assurance

According to the findings, HEA strives to ensure quality in the use of e-learning as a mode of curriculum implementation in universities through the regular quality assurance checks which include the accreditation of learning programmes in totality. In terms of delivery, the director outlined that:

> *First, we ensure that their learning programme is accredited… The learning programme is the totality of the content as well as the accessibility and delivery. In a*

conventional system, we seek the notion hours (lecture hours) and credits a learner achieves in form of contact with lecturers… We conduct audits in the institutions by cross checking what is being implement against what is in the learning programme according to the submissions for accreditation.

The audits in the institutions are thorough enough to covers all aspects of accreditation such as qualification of lecturing staff, standards of infrastructure, allocation of time for coverage of course content, as qualifications aligned with methodology. The findings also revealed that the auditing standards were consistent for both online programme delivery and the traditional brick and motor delivery of learning programmes.

However, the extent to which the authority conducts audits was limited to the administrative level of operations. HEA did not conduct audits to the level of inspecting lectures to check the practices during the teaching and learning process. Instead, universities are required to have an internal Quality Assurance Units which is guided by the accreditation guidelines to ensure compliance of the university. Students were only engaged when sampled to verify the implementation of accredited learning programmes. This was done in this manner to avoid micro-managing, The audits are meant to identify areas of improvement for each institution, and not for fault finding or suspension of operations (as it is the last resort).

4.7.3 Stakeholder Engagement

In a bid to understand the extent to which HEA engages with universities, the researcher also probed on how universities were engaged by HEA. The findings were that the authority engaged with universities through various ways which included quality assurance checks, capacity building ventures, module development, as well as teaching and learning training workshops. The quality assurance performed does not seek to control standards only, but to also build the capacity of universities and institutions of higher.

From the perspective of universities making contributions to HEA, a submission showed that universities had opportunities of contributing to the decisions made regarding standards and policies. The submission was that:

> *When we develop standards, we get to have consultative meetings of validation with various stakeholders including institutions of higher learning so that we do not surprise them with new standards. We develop documents and engage them through workshops so that they can make inputs so that by the time we are launching them, they would have had inputs from the universities.*

HEA, as guided by the director, was affiliated to various regional and international collaborative forums such as the Southern African Quality Assurance Network to ensure that qualifications are comparable with institutions from other nations. There were also provisions for universities to make inputs on the status quo of education in Zambia which is done annually. These were the major channels through which universities could engage the authority regarding policies and standards of e-learning. They were also opportunities of ensuring that HEA remained updated with current education trends from the perspectives of the key stakeholders.

4.8 Summary

In this chapter, obtained findings were presented in accordance with the respective sources of each data set. The findings were inclusive of both quantitative and qualitative data for students, as well as the qualitative data from university staff (lecturers and administrators. With this data having been outlined, the next chapter will focus on interpreting the findings and consolidating the various aspects of the collected data to establish patterns, guidelines, and standards.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Overview

In chapter four, a detailed presentation of the research findings has been done. The findings, which are outlined according to specific characteristics, data sources and established themes, provided a basis for discussions in this chapter. The discussions in this chapter are aligned with the theoretical framework of the study, the objectives and research questions that guided the study, as well as the literature that was reviewed when developing the study. Furthermore, the findings in this chapter are discussed in accordance with the results that were obtained using the three data collection instruments.

5.2 Emerging Themes in the Analysis of E-learning in Selected Zambian Universities

The need to analyse practices across Zambian universities in the implementation of e-learning as a mode of curriculum delivery was critical as it could serve as a starting point and basis for analysing e-learning from a comprehensive perspective. The analysis of how e-learning was being implemented, in this study, centred around the university administrators, as well as the practices from the perspectives of both lecturers and students, whom according to Chewe (2018) and Mwiinga (2018) were often not consulted in what were treated as responsibilities of educational administrators. By conducting this analysis which accounted for four key stakeholders, an opportunity for deriving comprehensive conclusions was created in this study.

The findings in this analysis led to the establishment of key issues with respect to student, lecturers, administrators, technological standards, as well as policies around e-learning in universities. Among the key issues that were established was the variety in how e-learning was being implemented across universities. This included concerns around the availability of technologies across universities, e-learning operation policies and standards in universities, as well as students' perceptions on the use of e-learning. Another key issue that emerged in the analysis was the applicability of e-learning across programmes of study from the perspectives of both students and lecturers. This was then followed by how appropriate e-learning was as a mode of delivery with respect to the adopted pedagogical approaches. These themes were all drawn after the consolidation of qualitative and quantitative data for comprehensive discussions.

5.3 Variations in Practices in the Implementation of E-learning in Zambian Universities

E-learning practices, as revealed by several studies, vary across different regions, countries, universities, and fields of study, and have evolved over time. The variations come in different forms which include, but are not limited to investments in ICT facilities, operational guidelines and practices, students' attributes, as well as lecturers' characteristics. In accordance with studies by Chewe (2018), Mulenga and Marbán (2020) and Zulu (2019), the implementation of e-learning in Zambian was not consistent with any one traceable framework among the universities in both private and government sectors. This suggested that the implementation of e-learning across the various universities in Zambia was not consistent. Furthermore, some studies also suggested that most universities migrated to the use of e-learning due to the COVID-19 pandemic.

The findings in this study confirmed that e-learning in Zambian universities was incorporated for the purposes of either facilitating distance learning or serving as an emergency solution to the social limitations caused by the COVID-19 pandemic that hit the country and the world at large starting in the year of 2020. UNESCO (2024) showed that this was also the case in other countries around the world. In this respect, institutions which had the option of distance learning were simply upgrading their systems to carter for a larger population of students from the fulltime streams, whilst those universities that did not have the option of distance learning had to start implementing e-learning systems from the scratch. To make this possible, university administrators either employed ICT technicians or engaged inhouse staff with some ICT skills and knowledge to manage the implementation of e-learning as an emergency alternative. This situation, as described, alluded to two key concerns in the implementation of e-learning. Firstly, the circumstances in which e-learning was introduced across universities with the perception that e-learning implementation was not consistent with any specific model across all universities. Instead, each institution had its own style of running online learning. Secondly, the evidence collected showed that there was little focus placed on curriculum change processes with the changes in the modes of delivery, just as observed in a study by Isaacs (2007). Such phenomena could have contributed to the observed changes in the quality of e-learning in respective institutions and possibly contributed to the perceptions of students and lecturers on the effectiveness of e-learning as a mode of curriculum implementation in their respective universities.

5.3.1 University Administrative Practices

With guidance being provided by the authority (HEA), university administration units had the mandate of ensuring compliance in all practices in the implementation of e-learning as a mode of curriculum implementation. The coming in of the COVID-19 pandemic, as earlier mentioned, led to changes in administrative practices which sought to arrive at effective solutions in good time that could allow for the continuation of educational processes. In universities with already established e-learning platforms and systems, the establishment of committees to oversee the implementation of e-learning was one administrative initiative which was embarked on to support ICT units. The implementation of e-learning systems and management of all ICT related responsibilities primarily required technocrats who understood the various technological aspects and were experts at operations. Technocrat led ICT units, however, were observed to have not been established in all 6 universities that were sampled for this study, thereby suggesting the possibilities of having other universities without an established ICT unit and with unqualified ICT technicians running the departments. While this may seem to be a minor aspect, its significance in the quality of education received by learners through the adopted e-learning may not be negligible.

As earlier indicated, e-learning implementation in Zambian universities ought to be guided by established policies as required by HEA. However, the evidence gathered was enough to conclude that the practice was not as outlined by HEA in all universities as there were some universities which did not have well established policies for e-learning or ICT. The evidence showed that universities that had programmes based in practical natural sciences (especially health programmes) did not invest as much as universities with a focus in social sciences in e-learning and ICT due to programme needs. As guided by the staff in charge of ICT in the Medical Universities, the investments in ICT were low because the university programmes were mostly practical and required learners to be physically present for lectures and practical sessions.

Across all universities, however, the operations of ICT units were not left unchecked. In top and larger universities, as showed in the findings, committees were put in place to guide the units in terms of the direction to take in the running of the university e-learning platforms. The establishment of committees which comprised of administrators and lecturers provided an opportunity of curbing the challenge of having e-learning platforms and systems that would not

resonate with the needs and interests of students and lecturers. This was vital because e-learning was not a mode of learning which everyone was prepared for, just as outlined in a study by Leontyeva (2018). The committees also took the role of establishing policies for the implementation of e-learning as outlined in the HEA compliance requirements. The committees, therefore, could have contributed to the success of e-learning as a mode of implementation in the universities where they took a leading role. This could be the reason why some universities (NSSS-1, SSB-1, NSSS-2 and SSB-2) had better records of students' perceptions on the effectiveness of adopted e-learning platforms. In this respect, it could be concluded that establishing ICT committees which include both technocrats and academicians could be a way of ensuring effective virtual education.

ICT units also played key roles in managing the e-learning platforms and processes in general. The units had responsibilities of training lecturers and students in the use of the adopted e-learning platforms, providing technical support on demand to both students and lecturers, as well as monitoring usages, among many other tasks. In the case of one university (NSSS-2), the unit had the task of monitoring the usage of the established platforms by both students and lecturers which provided opportunities of performance reviews which could guide administrators to understand obtained results in assessments from certain perspectives. Therefore, ICT units, as suggested by the obtained evidence, could be considered as vital in the establishment of e-learning systems, as well as during curriculum development or review for virtual learning. This aligns with the submissions made by students which spoke to the need for e-learning features necessary for the programmes of study and computer skills rates which varied among students across all universities in this study.

As shown in the findings, the need for ICT units led by experts cannot be overlooked due to the continuous need for technical support by both students and lecturers. Being experts who are dedicated to managing all hardware and software IT issues, ICT experts also played the key roles of training all lecturers in the use of e-learning platforms that they adopted and recommended, as well as orienting students in navigating the platforms to effectively participate in lectures. In the same regard, they are also better placed to guide academicians in the university on the technological feasibilities with respect to the requirement of lecturers of specific programmes. Therefore, this would suggest the importance of including ICT experts in the review or

development of e-learning based curricular. However, their contributions may have to be aligned with the needs of academicians who better understand the academic needs of programmes, as well as students themselves.

5.3.2 Availability of ICT Features and Facilities across Universities

In alignment with the accessions of Craig et al (2012) that e-learning technologies have increased and greatly vary in various aspects, the findings in this study also showed an existence of a wide variety in the employed e-learning technologies amongst the universities in the Zambian context. This also aligns with the findings in a study by UNESCO (2024) that showed that technological advancements have been continuous and rapid around the world. The variety in the e-learning technologies was notable through the existence of diverse software and hardware e-learning facilities and features which had different capabilities and varied from one university to another, as guided by ICT experts and champions in the sampled universities for this study. With universities having the full autonomy to dictate the level of investments to be made in ICT, each university made investments which resonated with its' respective abilities and priorities. While some universities such as NSSS-2, NSSS-1and SSB-1 were able to invest in robust outsourced e-learning platforms to carter for both distance and fulltime streams, some of the other universities could not afford to invest in e-learning platforms to comprehensively facilitate the teaching and learning process during the pandemic. Instead, such universities relied on the initiatives of their staff and lecturers to employ open-source platforms which included both corporate and educational e-learning platforms. However, it would be important to note that none of these universities had a locally constructed platform. In the case of universities that acquired outsourced e-learning platforms, storage servers were based in foreign nations.

With cyber security being a growing concern in the computer-based operations, the security of data is one aspect which needs the utmost attention, thereby requiring the establishment of measure which would foster security for data. In academia, security of data ought to be at its highest to prevent hackings, academic theft, or even unsupervised access to student data, or staff records. The findings, however, do not seem to alleviate the concerns of potential data breaches because the university data seats on servers that are not locally owned or installed, but rather on servers that that are in a different country and continent all together. This observation which was among

the universities which acquired outsourced e-learning platforms also showed that ICT technocrats were more concerned with security of data within the platforms. Such a situation poses risks and concerns of possible unauthorised access to data and the potential distribution of such data to the black-market. Nonetheless, the seriousness of such threats was not considered as massive even in terms of policy guidelines. Such observations could be what the authority needs to update its requirements and policies to guide institutions, as well as in advocating for developmental interventions that would alleviate such concerns. This should also serve as an opportunity to establish locally based servers for local platforms as it would enhance security.

In accordance with the findings, it was established that variety in ICT investments could also be observed through the levels of investments made by university administrators. With regards to lecturers, it was observed that lecturers were provided with computers and internet devices to facilitate the teaching process. This was also accompanied by ICT unit led trainings on the platforms and devices. On the students' end, the figures 4.4 and 4.5 showed that students interacted with e-learning platforms using different personal devices such as computers, smartphones, and tablets to access the platforms. These platforms were either university acquired LMS (such as Big Blue Button, Moodle, or Google Classroom) or alternative open-source platforms such as Google Meet or Zoom Meet applications. In some cases, as indicated in findings on students' experiences with e-learning, it was observed that social media platforms such as WhatsApp and personal emailing services were being used to facilitate the teaching and learning process, just as was observed in the findings of a study by Sintema (2020). Evidently, the effectiveness of e-learning as a mode of educational delivery using non-education-based software systems could have been compromised.

While the variety of e-learning options would be ideal for altering learning strategies to foster either surface and deep learning in accordance with the requirements as suggested by Hattie and Donoghue (2016), this variety also holds potential to affect the quality of education delivered through e-learning because several platforms were not ideally built for supporting the teaching and learning process and were not all integrated into one LMS. A review of most platforms showed that they were built for the corporate industry, despite having features and options/functions which could be considered necessary for e-learning. These observations aligned with submissions made by students on the need to have e-learning features being integrated into one LMS. The findings

in line with this aspect are in synch with the studies by DeLone and McLean, (2003) who emphasised the need for students to use almost all LMS features to yield excellent academic achievements and exhibit skills acquisition. Lee and Lee (2008), on the other hand, opined that learners' levels of satisfaction in the virtual learning environment are better attainable with easier usage of LMS that should be integrated. Easier usage of LMS can be attained through orientations and provision of technical assistance which as shown in figures 4.2 and 4.3 were perceived as an important aspect. In consideration of findings, the researcher was convinced that this was evidence of LMS being necessary to the e-learning mode even from the Zambian perspective. As shown in figure 4.7, the perceptions of the majority students (accounting for 62%) on LMS were that an integrated LMS could improve their learning experience and subsequently their academic achievement. These findings suggest that there is need to ensure that e-learning is limited to only integrated LMS systems being used for delivery, rather than being open to non-education platforms which affect quality (Mtebe, 2015). Further, the LMS systems may need to be accessible using all the various devices which are at the disposal of students such as smartphones, tablets, and computers. Based on the findings shown in figure 4.4, it would be prudent to suggest that LMS should be accessible using smartphones owing to the accumulative total of 90.42% of students who used them for e-learning in this study.

Access to internet, as shown in the findings, was one of the major challenges faced by both lecturers and students. While lecturers were provided with internet accessibility options by universities, students had limited options for accessing excellent quality internet connectivity due to factors such as high costs for internet access from ISPs, lower internet bandwidth, limited access for selected regions, as well as challenges of electricity access, especially for students in rural areas. These challenges which were provided by students, majority of whom were subjected to e-learning as a backup option amidst the pandemic, proves that e-learning should not be imposed on learners who have not prepared for it adequately. The risks of imposing e-learning as a mode of delivery on learners who might not have planned for it may vary across different contexts and circumstances. Even then, the chances of some students being left lagging would be much higher, thereby possibly leading into a situation where the system overlooks the needs and concerns of some students, Such a case could lead to the situation that was observed at NSSS-1 as submitted by some staff where the university Senate resolved on making considerations for students due to the observed poor academic performance during the pandemic and while using e-learning. With

education being viewed as an equalizer in society, it would be imperative to ensure that no marginalized students are excluded due to abrupt decisions.

5.3.3 Unique E-learning Operational Policies and Standards

Another interesting aspect of the implementation of e-learning that was explored in this study was that of e-learning regulatory policies and standards. While studies by Bari and Djoub (2014) and Martin et al. (2017) showed how regulations of e-learning differed across countries and universities, the findings in this study also provided evidence that e-learning policies and observed implementation frameworks in Zambia are quite unique and ought to be well understood by the different stakeholders. The evidence for this conclusion could be drawn particularly from the observed inconsistencies across the universities in the existence and implementation of e-learning policies, as well as the feedback from students, lecturers, and ICT staff on their perceptions of e-learning as a mode of curriculum implementation. Furthermore, several other factors were observed to have contributed to the differences in observed policies at universities.

One key factor to guiding university e-learning policies was the classifications of the offered programmes of study at each institution. Drawing from the submissions of the interviewed ICT staff across all six universities, it was clear that decisions around e-learning were largely driven by the nature of the programmes being offered and their respective learning requirements. This understanding aligns well with the notions that applicability of e-learning to programmes of study was crucial in determining the extent to which institutions would invest in the mode as an alternative. In this respect, it was also observed that while social sciences and natural sciences based in theory seemed to favour investments in e-learning at well-established universities, natural sciences based both theory and practice seemed to render e-learning as not very effective for learning due to the practical nature of study programmes in this classification. Investments by universities were directed by established policies which were in turn guided by experts from specific fields of study to ensure that decisions were made from an informed point of view. In this respect, operational policies could be said to be reliant on guidance from subject matter experts and students on the nature of study programmes. This could be the reason why institutions that primarily offered health programmes (Natural Sciences based in both Practical and Theory) seemed to have less focus on having robust e-learning platforms during the pandemic but rather

establish ways of having physical lectures. In other terms, policies need to account for guidance from both administrators and end users (here being lecturers and students).

The implementation of e-learning, as guided by Bari and Djoub (2014), mostly took the direction of technological needs of the teaching and learning process, rather than being directed by a wholistic approach. Similarly, most ICT personnel demonstrated having their focus on ensuring that the adopted platforms for e-learning conformed to the technological standards such as SCORM. Nonetheless, the findings showed that a combination of ICT experts with lecturers led towards implementation strategies which somewhat accounted for both technological needs and academic needs in the forms of pedagogical approaches, delivery modes (whether synchronously or asynchronously) as well as scheduling. In this regard, it could be concluded that since the observed adopted practices in universities incorporated more than just technological standards to guide e-learning operations in universities, the policies ought to be drawn from the perspectives of both technology and pedagogy. This conclusion, however, ought to be inclusive of student needs and perceptions which seemed to have been given the least attention among the universities involved in this study.

A review of the operational standards in universities regarding LMS to be used in universities showed that variations existed across the institutions in how the case was handled. For instance, while some universities had well established policies and committees to manage e-learning implementation in the institution, other universities did not have any policies whatsoever speaking to the implementation of e-learning. This situation, however, was largely due to the ‘emergency nature’ of the implementation of e-learning during the pandemic. Interestingly, in the universities with well-established policies, the findings showed that the policies did not provide special considerations based on programme classifications despite having significant differences in the requirements across programmes as submitted by lecturers. But what was most intriguing was that the implementation of e-learning in these universities did not follow any one model to guide operations. Instead, these Zambian universities relied on the inputs of lectures, administrators, and staff managing ICT to guide the implementation of e-learning, and at the same time drew from the experiences of other universities in implementing e-learning through distance education. This demonstrated abilities to establishing a localized framework that accounts for key factors.

5.3.3.1 HEA Recommended Policies and Standard

Regulation of e-learning implementation, as opined by Górska (2016) is an aspect that is practical and possible at national level through policies and legislature. While this is the practice in some countries with well-established e-learning systems and technologies, the case was observed to be different in Zambia. Universities in Zambia were only provided with guidelines on what e-learning policies should reflect as part of the registration requirements, thereby providing institutions with some kind of autonomy in e-learning policy formulations and implementations, provided they remained compliant with the authority (HEA). This situation which is consistent with the findings of Picciano (2017) that showed no defined extent for the implementation of e-learning, therefore, provided opportunities for universities establishing very effective e-learning systems on one hand, and on the other hand, risks of having inadequate e-learning systems in other universities. The implications, in this matter, are that the undefined extent to which e-learning should be applied leaves room for a range of possibilities which could either be positive or negative, depending on the way it has been implemented.

A key observation in the findings of this study was that HEA tried to avoid micro-managing of universities operations, as guided by the quality assurance director. While this strategy is important in promoting autonomy in the universities, one could argue that micro-managing of certain components might be necessary to ensure standardised quality in the delivery of educational programmes through e-learning. For instance, while the authority provided institutions with guidelines on the establishment of policies, it did not go to the extent of verifying the effectiveness of e-learning systems from the perspectives of students and lecturers. While universities could have the autonomy to make decisions on such 'minor details', the extent to which quality would be compromised could be unknown. In this case, the effectiveness of employed e-learning platforms as modes of educational delivery across most universities, evident in table 4.8, depended largely on the participations of students in lectures, yet only 76.67% of students in this study acknowledged participating in lectures, even though not consistently. Such a phenomenon could raise questions of how the situation would be different if HEA provided more specific directions to aspects which speak to quality assurance. While avoiding micro-managing would be ideal for overseeing universities, the lack of specific standards/policies would a risk of quality educational delivery.

5.3.4 E-learning Experiences and Practices from a Student's Lens

Students, being the primary end-users and beneficiaries of the educational processes, equally had their fair share of adopted practices in the use of e-learning as a mode of curriculum implementation. Their practices, however, were greatly influenced by some factors which the researcher also sought to understand such as their levels of computer skills, devices available for accessing virtual learning platforms, as well as their exposure to educational LMS and non-educational platforms. In the review of their computer skills, the findings as elaborated in table 4.4 showed that an accumulative total of 86.67% of students had computer skills scored as moderate or better while 13.33% of students scored the computer skills as below 40%. While these scores seemed to be favourable in the sense that the average students had basic computer skills, they would still need to be viewed with concern as they demonstrated low computer literacy rates among university students, a factor which could be linked to the similar observations made by Musamba and Mulenga (2019) in a study on Computer Studies in secondary schools. This could also suggest the existence of a need to address the low computer literacy among students in universities, even though this challenge would be best addressed general educational levels. While such an assumption could also be supported by the observed age distribution which suggests that most students came straight from secondary education, further reviews of the need for technical support by students as show in figure 4.3 could also support the need to address the issue of still existing low computer literacy levels.

Students across all universities, as observed in the findings, were left with the responsibility of choosing their own devices for accessing the university adopted e-learning platforms. This situation implies that students' choices of devices was based on their financial abilities to acquire any devices, rather than choosing devices based on convenience. In addition, students also had to bear the costs for internet to access the adopted e-learning platforms while universities maintained the same tuition fees and costs for students, and in some cases even placed extra charges on students for the acquired e-learning platforms. These findings were contrary to the findings in a study by Ghareb and Mohammed (2016) who opined that e-learning platforms were a cost-efficient measure for learners. In this respect, there would be need for regulations which would guide the costings by university administrations to make education affordable and focused on quality, rather than profit making.

As universities embarked on the employment of various e-learning platforms to facilitate virtual learning, both LMS and non-educational platforms were sought for as immediate solutions amid the COVID-19 pandemic influence social restriction. While a similar situation was also observed in another study by Craig et al. (2012) at Deakin University in Australia, the findings in this study showed through the submissions made by students that in Zambia, the non-education platforms that were being used as e-learning platforms were mostly those meant for the corporate industry and not social media platforms. The only exceptions, however, were for communication purposes between students and lecturers to arrange for lecture times or agree on assessment submissions. Chatting applications such as WhatsApp and Telegram were the most utilise platforms for such communication because even the educational LMS platforms did not have such provision which were regarded as vital. The findings, therefore, provide reason for emphasising on the inclusion of such options in one educational LMS which should also be accessible through an application that students could easily download and install on their smartphones, tablets and computers, their most convenient devices for e-learning.

In a study by Palmer and Holt (2009), it was postulated that the use of open-source LMS and non-educational platforms to facilitate e-learning led to poor academic achievements by learners, especially due to the lack of integration of features. While this revelation, combined with the findings of other studies showed that integrated LMS platforms would be more ideal for students, the findings in this study also showed that the case was similar in the Zambian context, with other factors being identified as key to the success of LMS platforms. The factors revealed through the findings of this study included aspects such as orientation to the e-learning platforms, provision of on-demand technical support, real-time interaction, as well as consideration of applicability to fields of study. In consideration of these factors that were observed from the perceptions of students, it could be concluded that having educational LMS alone would not be enough to ensure quality educational delivery in the e-learning mode. In this respect, LMS should be guided by the programme classifications while having real-time audio-visual communication features to create an environment which promotes focus of learners through the visual interactions, especially. Further, the students need to be provided with both orientation and on-demand technical support services.

Alienation of students, though a social factor, was also one of the key issues which students seemed to have been subjected to using e-learning platforms. As Teo and Williams (2005) promulgated, alienation of learners had a toll of the academic achievements of learners. Similarly, the findings in this study showed that students in the Zambian context also experiences the negative effects of alienation as others needed to consult from their peers on aspects which the struggled to understand individually. Furthermore, the findings also showed that social interactions were vital to students' social lives which could not be detached from their academic lives. In this respect, these findings could be linked to the assertions of El-Seoud et al. (2014) who suggested that provisions should be established for students to interact and collaborate within well-defined virtual spaces. Such spaces could be integrated in LMS systems.

From an overall perspective, students' perception on the effectiveness of e-learning as a mode of curriculum implementation were influenced by various factors which need to be considered by both academicians and technocrats when designing e-learning platforms. In the same line, LMS platforms should reflect the desires and preferences of students if they are to be regarded as effective learning platforms, as shown in the findings of this study. LMS should also be designed to accommodate all learner needs which include academic and social needs. Therefore, the findings in this study provide evidence for the need of ensuring that students' inputs are considered in the development of e-learning curricular, and educational curricular at large.

5.4 Applicability of E-learning Across Programmes of Study

Virtual learning platforms as modes of curriculum implementation come with their own advantages and disadvantages. This characteristic may lead to either positive or negative contributions towards educational programmes, thereby needing to be understood from an in-depth point of view. As earlier outlined, the effectiveness of e-learning mode of delivery would vary across different fields of study due to several factors. The major factor that was being investigated in this study was the classification of a programme as either theoretical or practical, and natural science-based or social science-based. In a bid to make comprehensive conclusions, the applicability of e-learning according to classification of programmes required a review of findings specific to students and lecturers.

5.4.1 Delivery Across Both Social Sciences and Natural Sciences

With the difference between participants from social science-based and natural science-based programmes being very minimal, the possibility of establishing guiding themes specific to programme classifications could not be ruled out. One of the most interesting findings with regards to the applicability of e-learning to both social sciences and natural science was how the effectiveness of the university adopted e-learning platforms could be distributed according to the general classifications of programmes. While the grading was mostly moderate according to most students, some students from social science-based programmes even considered the effectiveness as being effective, and very effective in some cases, as compared to students from natural science-based programme. Similarly, submissions by lecturers also showed differences in their expert opinions on the effectiveness of e-learning with respect to the areas of expertise. With these findings, it was evident that the delivery of e-learning varied across programme classifications thereby needing an in-depth review of the factors at play in the existence of the difference. In this respect, there researcher in this study saw if befitting to explore the factors that contributed to these observed differences from the perspectives of both students and lecturers.

It would also be important to note that while some of the observed differences seemed to have been unique to specific institutional practices, their considerations could be vital in ensuring wholistic approaches to e-learning implementation. Therefore, this study could be considered to have accounted for various possibilities in establishing the effectiveness of e-learning.

5.4.1.1 Students' Perceptions

In accordance with some of the students' submissions, positive contributing factors towards the effectiveness of e-learning platforms in delivering social science-based programmes included the use of features such as audio-video conferencing tools which made it possible to hold certain practical sessions such as Moot court for law students. The use of audio-visual features was considered a key aspect to the effectiveness of e-learning by most student because of how it helped create a virtual environment in which learning could occur in real-time. While this feature was observed to have been either not present, ineffective, or inefficient in most LMS where present, most universities expedited the adoption process of alternative ICT options to stay on track with sessional dates and other factors. This situation provided evidence of positive changes in the speed

of adopting new ICT in Zambia's tertiary institutions, contrary to the findings in a study by Mwila et al. (2011) in which the pace of adopting ICT was regarded as slow. The adoption of audio-visual features clearly provided greater opportunities for social science-based programme. Natural science-based programmes, in accordance with the findings, also benefited students' and lecturers' progress as well, but required much more. Therefore, audio-visual features could be said to have allowed for the continuation of the teaching and learning process in a manner that could be easily likened to the brick-and-mortar system, from the perspectives of students, with social sciences seeming to have easily adapted to e-learning mode.

Further submissions by students, however, showed that audio-visual features could only be effective if both students and lecturers had the features enabled synchronously. The need for such operations could be tied to the need for students to be kept attentive and focused, especially with cases of poor learning environments for some students. Subsequently, students should be mandated to have their visual features turned on during online lectures as this would somehow control their environment and avoid distractions on the premise that they would be identified as not being attentive or fully present in the lecture. While this suggestion would seem restrictive, it could be deemed necessary in ensuring a conducive learning environment within the virtual space. The basis for such assumptions could be drawn from the interests of the Community of Inquiry theory by Garrison, Anderson, and Archer (2000) which is a key pillar to the foundation of this study. While the theory emphasizes on the design of a blended online learning system which promotes collaboration between and among students and lecturers, the findings prove that students need the interaction most, thereby needing to ensure that the environment is conducive for learning.

For students under natural science-based programmes, e-learning was not as applicable due to the need for hands-on experiences. In courses such as Soil Science, Human Anatomy, and many other practical courses, the use of live or pre-recorded audio-visual features was not enough for students because of the need for real-time experiences which allow for physical contact, an aspect that is vital in most practical programmes and courses. Furthermore, students should also be able to attend practical sessions within the same time of learning the theory to maintain the sequence of content and complement lessons efficiently and allow for integrated assimilation of content within the same time space. That way, students would be able to harness the benefits of both deep and surface learning which Hattie and Donoghue (2016) opined as mostly being possible through synchronous

teaching and learning processes. However, with universities in Zambia being provided with the autonomy to define how e-learning operates and to what extent it could be applied (Ministry of Higher Education, 2019), there existed an opportunity for universities to provide virtual education with compromised standards as suggested by Ramakrisnan et al. (2011).

The case of e-learning in the delivery of natural science-based programmes, as shown through the findings of this study, is one which should lead to limitations to the extent to which online learning could be used in natural science-based programmes. Such limitations, however, should not be imposed on all natural sciences as others could be effectively provided through e-learning without compromising standards. This could be achieved by introducing virtual laboratories in courses where simulations could still provide the hands-on experience needed by students. In reference to table 4.10, one major limitation should be on the holding of practical sessions in physical lectures only and without following the sequence of content. The necessity of this suggestion could be drawn from the need to ensure quality educational delivery from the perceptions of students.

Despite observing several differences between social science-based and natural science-based programmes in the students' perception of how e-learning was implemented with respect to their programme classifications, there were some aspects in the findings which were observed as being regarded in the same manner. One such an aspect was that of students' participation during online lectures. The findings showed in table 4.8 that most students from both classifications participated in online lectures that the attended. Further, in the case of their assumptions on whether participation in lectures did impact their performance, more than 90% of students agreed to the correlation. Students, therefore, need to be able to actively participate in the teaching and learning process as this also impacts their academic performance. This aspect should be considered as affecting all learners in the same way and not from the perspective of specific classifications of programmes of study. With Zambia being a Sub-Saharan nation, it is possible that such needs and practices among students might have been influenced by cultural values. However, further studies would be needed to establish what these values are and to what extent they influence students.

5.4.1.2 Perceptions of Subject-Matter Experts

As key informants in this study, lecturers made significant inputs which complemented most of the submissions made by students, the majority participants in the study. As experts in their

respective fields of study lecturers best understood how applicable e-learning was as a mode of curriculum implementation. It was on this basis that the researcher opted to conduct interviews with lecturers from different fields.

Analogous to findings specific to students, the findings revealed that e-learning could not be regarded as an ideal mode of delivery for most natural science-based programmes from the perceptions of subject matter experts. The mode was not advised for future use to its limitations when it comes to meeting needs of having practical lessons which should provide hands-on experiences for students. Medical and Agricultural professors indicated that their programmes are best delivered in person to have professionals who would be practical, rather than theoretic in the comprehension of how the job should be done. Therefore, the only exceptions which could be tolerated in the use of e-learning mode for delivering natural science-based programmes should be courses which have very little to no practical experimental sessions such as Statistical Mathematics, Quantum Physics, Ecology, and Public Health. However, this would still pose a challenge on the programmes entirety as some courses are interlinked with each other, as guided by the practitioners. These perceptions from lecturers align with the assumptions of Jandric (2012) that pedagogy should guide the use of e-learning as a mode. In the case of Health programmes, the use of e-learning would be best being left out as an option for curriculum implementation. This resolution could further be supported by the observed poor academic performance of students.

From the experiences of social science-based lecturers, on the other hand, e-learning mode was able to provide the necessary environment that supported the teaching and learning process. With the use of the various features available to the lecturers, it was possible for lecturers to conduct their lectures and employ various methodologies to achieve the intended outcomes. Nonetheless, the process could not be as smooth for all social science-based programmes. One interesting submission from a Lecturer in Law showed that the provision of practical experiences to Law students proved a challenge because it was difficult to assess the students thoroughly as aspects such as professional appearance. Further, in some courses were lecturers needed to read the mood or emotions of students; e-learning somehow made it impossible to achieve that. This, therefore, shows that e-learning has several limitations with social science-based courses and programmes which have components of practical experiences. These limitations, however, could be easily

addressed through collaborative efforts of lecturers, students, and ICT experts within respective institutions with the blessings of management.

In terms of assessments, the use of e-learning proved a challenge across both social and natural sciences, though with different degrees. For most universities, summative assessments were conducted in-person, especially using the traditional ink and paper. While formative assessments could have been administered and graded using online learning platforms, final examinations could not be administered virtually as this posed a risk at higher levels. To begin with, the researcher observed that assessments required that institutions had paid-for LMS with assessment tools. The tools needed to carter for proctoring services which include locking access to other windows and applications on a computer, monitoring and recording the students' audio-visual features, as well as time-watch on display. While these tools were available in some of the university platforms, they were not employable due to several factors which spoke to students, lecturers, ICT facilities and classifications of programmes.

Characteristics of programme classifications were the major determinants of how feasible it could be to conduct summative assessments using e-learning platforms. For most natural science-based programmes, it would be easier to conduct assessments using online platforms because of requiring less of long explanations which would pose a challenge for students who might not have acclimatized to typing answers at reasonable speeds to allow them to complete an assessment within the stipulated time. Further, some natural science-based programmes require a student to exhibit their understanding of concepts by showing every step in the attempt to obtain the correct answers. Such processes would require the use of a writing pad linked to an online worksheet. These requirements, however, were farfetched milestone to overcome. In consideration of these conditions, therefore, it could have been unfair to subject students to a mode of assessment for which they would have been unprepared. In this respect, the research suggests that lecturers and university administrators ought to be guided on what mode to assess students' learning achievements with respect to the mode of delivery and the classification of the field of study.

5.5 A Review of the Appropriateness of Pedagogical Approaches

Instructional strategies in the teaching and learning process are one of the fundamental aspects of education. While pedagogical approaches can take various forms, as outlined by Oslon et al.

(2011), the findings in this study provided evidence of various pedagogical approaches being employed across all 6 universities through the mode of e-learning and leading to various experiences on the ends of both lecturers and students. In a review of pedagogical approaches, observations were made regarding the perceptions on the effectiveness of these approaches from the perspectives of both lecturers and students, the key stakeholders in the teaching and learning process at university tertiary level of education. In addition, trends were established with respect to lecturers, students, programme classifications, and ICT investments.

Notable in the findings of this study was how across all 6 universities, the most effective modes of delivery through e-learning were Blended Learning and Synchronous Learning modes with 67.5% and 30% of students having made these selections, respectively. This was clear evidence that there has been a complete shift from Asynchronous Learning as an only mode for curriculum implementation in e-learning. Instead, there is a preference for having interactive teaching and learning processes on the ends of both lecturers and students. Thus, there is a preference learning through interactions in real-time which should be maintained in all online curricular, regardless of the field of study. Asynchronous modes should only be outside lectures.

5.5.1 Students' Perceptions on Appropriateness of Adopted Pedagogical Approaches

Selection of appropriate pedagogical approaches is key in the teaching and learning process, this is because of the direct impact that these choices would have on the quality and effectiveness of a modes of learning from the students' perspectives. Across all programmes and with consideration of the great diversity, it would be imperative that lecturers apply the most suitable approaches to programmes, courses and during lectures which should respond to the needs of the learners. In this respect, the researcher believes that the findings in this study are clear evidence for the need to guide educators to select instructional strategies which provide for participation of students in lectures. As shown in table 4.8, and as earlier discussed, students need to actively participate during lectures because this directly impacts their academic achievements. In consideration of this observation, the outcomes of statistical tests as shown in table 4.11 provides further evidence that lecturing modes that do not favour interactions during lecturers would be perceived the least effective modes. In this respect, decisions on which lecturing modes to recommend or apply in

universities should be guided by such factors as the students' ability to actively participate in online lectures in real-time.

The engagement of students could take many forms during educational processes. It could be in the forms of consultations to establish issues affecting students, all stakeholders dialogue to collectively address challenges, or even student led consultations which are often done during lectures to understand concepts better. Nonetheless, the submissions made by students showed that all these forms of engagements need to be included in the implementation of e-learning as a mode of learning. Students cited the engagements during lecturer as being the most cardinal because of how it directly impacts their academic performance. Without it, students would have challenges of getting clarity. However, further evidence indicates that this form of engagement has also got its own impediments which ought to be addressed. Among these obstacles would be the large numbers of students amid limited time for some lectures, challenges of accessing consistent internet connectivity, as well as poor learning environments owing to unpreparedness for the mode. Subsequently, future adoptions of e-learning should be instituted with the factoring in of the outlined challenges which were observed across all universities. Lecturers should also ensure to employ lecturing methodologies which allow for effective participation of students during lectures, while employing captivating strategies. With engagements of ICT staff, provisions should also be made for students to have asynchronous features embedded within platforms to facilitate consultations within an academic space between and among students and their lecturers, as well as access learning material in their own time.

From the perspectives of students with respect to programme classifications, it should be noted that social science-based programmes require more opportunities for consultative engagements between students and lecturers during lectures. Such interactions should be considered vital due to the dynamicity of social concepts. Therefore, lecturers should be able to employ a variety of lecturing methodologies which should be learner centred within the virtual environment and allow lecturers to observe any changes in students' levels of concentration, like the suggestions by Ghared and Mohammed (2016). These should be well combined with effective teaching aids and tools for lecturers to use for practical elaborations, as well as providing students with notes or transcriptions. Not doing so would risk boring students during lecturers because concentrating in a virtual environment can be challenging for students.

Concerns on pedagogical approaches from students in natural science-based programmes, on the other hand, led to conclusions that e-learning should not be a considered as an effective mode of curriculum implementation. While it is possible to use e-learning effectively in some natural science based-programmes, the effectiveness would not be as much if lacking key aspects such as virtual laboratories, writing pads and whiteboard tools. Further, the need to maintain the sequence of content was a major concern for students as it impacts on their assimilation of concepts. This need for practicality could imply that students should not be subjected to using e-learning where it is not effective. These findings confirm the observations of Chewe (2018) that e-learning was introduce in universities without the involvement of students as key stakeholders. Therefore, as already suggested from other explored perspectives, the extent to which e-learning should be use for delivery of natural sciences should be defined.

5.5.2 Lecturers' Insights on Pedagogies in E-learning

As implementers of curricular, lecturers should be the experts in pedagogical issues with respect to their fields of study. It is in this respect that experts from the health fraternity emphasised on the need to limit the use of e-learning as a mode of curriculum implementation to certain levels and fields of education. For fields such as Human Medicine, and Agricultural Sciences, the most effective strategies, as proposed by lecturers in the fields, are practical scenarios which provide students with hands-on experiences. It is believed that students should be able to use their senses of touch, smell, and sight to learn more effectively in such fields, an experience which would be impossible for e-learning to facilitate effectively. In this respect, the effectiveness of e-learning in natural sciences could be said to rely on the concept of blended learning. With this mode of delivery, practical session could be left for physical contact while theory only is covered online. In this case, e-learning should be conducted in real-time with options of interaction between lecturers and students. However, the interaction is mostly focused on tracking the progress of learners instantly.

For other natural sciences and social science-based programmes, lecturers require students to be provided with audio-visual features which allow for the use learner centred approaches such as group discussions, presentations, or peer teaching. These methodologies become possible to employ because the nature of the programmes may not require students to use their senses of touch

and smell which translate into physical presence. In this case, lecturers can effectively embark on the use of groups discussions, debates, question and answer sessions, even open discussions. The possibility of using such methods would even be more enhance using e-learning thanks to features such as breakout room, screen sharing tools, and content upload tools. However, it should be noted that the number of students in a lecture group determines what methodologies should be applied in each programme or course.

5.6 Emerging Trends in E-learning Implementation Practices

In consideration of the existing literature and obtained findings in this study, there are certain trends which were observed in the implementation of e-learning as a mode of curriculum implementation. These trends, as established by the researcher, were observed among universities, administrators, lecturers, student, and programmes classification. The importance of these trends should not be overlooked as they may contribute to understanding practices in a manner that effectively informs the establishment of standards in e-learning.

Challenges of accessing efficient internet connectivity were observed across all universities and among all participants in the study. While lecturers were provided with internet devices and faster computers in some cases, the internet was not always consistent, thereby affecting the teaching and learning process. On the students' end, erratic internet connectivity contributed largely to most issues experienced with e-learning. Participation during lectures and let alone attending lecturers was a struggle for most students because of the inconsistencies. High costs of internet data bundles were another contributor to challenges in e-learning faced by students which affected them.

The use of e-learning as a way of expanding timetables was one of the positive trends from the perspectives of both lecturers and students. The ability to hold lecturers at any time was considered a bonus for some lecturers who did not mind working past 5 o'clock up to the early evening hours. With the ease of communicating with students through social networking platforms such as WhatsApp or Telegram, it became easier to expand timetables and spend more time on topics where necessary. It was also helpful in ensuring that course content was covered in time enough before students could sit for the examinations. Therefore, e-learning could be said to have broadened the spectrum of working times for both students and lecturers.

One other interesting observation was that university adopted LMS seemed to have been complemented by non-educational platforms (corporate platforms) in features which were not effectively applicable. While some university LMS systems could overload and fail to function as intended, the corporate platforms (like Microsoft Teams, Zoom Meet and Google Meet) could still operate without problems, hence, being relied on the most to conduct lectures. This observation could be explained as the outcome of low investments in ICT by universities. Ideally, universities ought to migrate towards developing their own LMS with local servers, either independently or collaboratively as Zambian universities.

In accordance with the opinations of Zulu (2019) that e-learning practices have improved in most universities, the findings in this study provided the researcher with enough evidence to conclude that universities have made some significant investments in the implementation of e-learning to carter for both fulltime, parttime and distance education modes. In some universities, the advancement of e-learning technologies could probably compete with international standards within the region and in Africa. However, to get to top level international standards, more investments would need to be made.

5.6.1 Implications of the Adopted Theoretical and Conceptual Frameworks

The blueprint of this study, as mentioned in chapter 1.7, merged three different frameworks on online learning: The ‘E-learning Systems’ Theoretical Framework’ by Aparicio, Bacao and Oliveira (2016); the Community of Inquiry (Col) model by Garrison, Anderson, and Archer (2000); and the ‘Online Collaborative Learning’ (OCL) theory by Harasim (2012). Each of these theories focuses on unique combinations of elements/factors to guide the implementation of online learning. However, these factors, even though all important, were omitted in one or two of the 3 frameworks. The need for the inclusion of each of these elements in achieving wholistic approaches to education process contributed to the comprehensive analysis of e-learning from the perspectives of all key stakeholders, as well as key processes in the delivery of university education. One of the most important establishments due to the guidance of the theoretical framework was that the implementation of e-learning should be in accordance with the needs of students and lecturers. This is vital as it speaks to the technological investments that should be made by institutions.

The conceptual framework of this study, on the other hand, guides towards the conclusion that policies to guide the implementation of e-learning should be co-created by both universities and the regulatory authorities. In this case, HEA should collaborate with universities to the extent of engaging both students and lecturers.

5.7 Summary

Discussions of findings, in this chapter, were guided by the obtained findings of the study with respect to the guiding objectives. These discussions explored the implications of the findings while considering the literature that was reviewed. Key in this chapter was the intention to merge the qualitative and quantitative findings while establishing trends, interpreting implications, as well as drawing resolutions. The next chapter comprises of conclusions to the entire study, as well as relevant recommendations to stakeholders of the study.

CHAPTER SIX: RECOMMENDATIONS AND CONCLUSIONS

6.1 Overview

As the final chapter of this report, the focus here is on the provision of overall conclusions that the researcher drew according to the findings. With the study having sought to analyse e-learning as a mode of curriculum implementation in Zambian universities to inform and guide practices, standards, and the application of e-learning, the conclusions given will provide a summary of the achievements made in the attempt to meet this initial purpose.

6.2 Conclusions

In accordance with the intended purpose and guiding objectives of this study as outlined in sections 1.4 and 1.5 respectively, this study was intended to address e-learning in Zambian universities by analysing the practices, standards, applicability and ability to establish comprehensive principles for implementing e-learning effectively. This analysis, as shown in the findings, provided information that could guide e-learning practices and standards towards effectiveness and efficiency, with each objective being addressed.

6.2.1 E-learning Practices in Zambian Universities

The findings of this study have provided evidence of existing patterns among the universities in the implementation of e-learning. While these patterns could be examined from the singular perspectives of students, lecturers, ICTs, or programme classifications, they were also drawn from the combination of two or more characteristics. The identified patterns showed that e-learning as a mode of curriculum implementation has its own characteristics which the PI established as needing to be always considered when implementing e-learning. Most importantly, the practices in e-learning were identifiable as being aligned with either natural sciences or social sciences as the major determinants. This implied that e-learning practices were mostly dictated by the primary programme classifications and available technologies.

6.2.2 Understanding the Applicability of E-learning

Having established the practices across universities and policy guidelines by HEA in e-learning implementation, focus was also stretched towards exploring how applicable e-learning was across

the variety of programmes of study in all universities. The findings showed that there was a variation in the applicability of e-learning across different programmes of study thereby yielding varying outcomes from the perceptions and experiences of both lecturers and students. According to the obtained findings, e-learning was considered an effective mode of delivery for social science-based and natural science-based programmes that do not comprise of experimental or physical practical sessions as these could be implemented in accordance with the designed course content sequences which would not disturb the flow of a programme. The success of e-learning in this case, however, could be dependent on the technological factors which create real-time experience for both students and lecturers.

On the other hand, e-learning was not recommended for the delivery of experimental and physically practical programmes across both natural and social sciences. While the findings showed that this was achieved using Blended learning during the pandemic, its effectiveness could be regarded as being low owing to the challenges in maintaining the sequence of content in the delivery. Evidently, students taking experimental and physically practical programmes perform poorly academically when e-learning is used for curriculum implementation. From the perspectives of lecturers in practical programmes, the proposed best practices would be to exclude e-learning from the options of delivery because students need to have real-time experiences in which they should be able to use their senses during the learning process.

6.2.3 Pedagogical Considerations in E-learning

In terms of pedagogical issues, the findings in this study showed that both students and lecturers have preferences for real-time interactive engagements in their educational programmes. In this respect, Blended Learning and Synchronous learning were the most recommended and employed strategies in the implementation of e-learning across all universities. Real-time interactions also contributed to most achievements made in the implementation of e-learning. The use of live audio-visual features in e-learning was one of the most impactful aspects which these strategies came with.

Nonetheless, the implementation of e-learning, as shown in the findings, varied in terms of effectiveness across field of study. From an overall perspective, non-experimental and non-physically practical programmes have better success with e-learning because student centred

methodologies were feasible and effective even within online platforms. Therefore, this study showed that student centred approaches are vital in e-learning as they determine its effectiveness as a mode of curriculum implementation.

6.2.4 A Framework for E-learning in Zambia

A review of all findings in this study, with consideration of the 3 theories for the frameworks, led to the conclusion that e-learning, in Zambia, should be guided by the needs of three key elements of education: Students, Lecturers and Subject Matter Classifications. These elements should be the determinants of what the Virtual Learning Environment (VLE) should constitute, as elaborated in figure 6.1. When defined by the 3 elements, the VLE should guide in the aspects of technologies to be included in one integrated LMS, the classifications of programmes and courses to be offered through and excluded from e-learning mode, as well as the requirements of students as key stakeholders in the educational process.

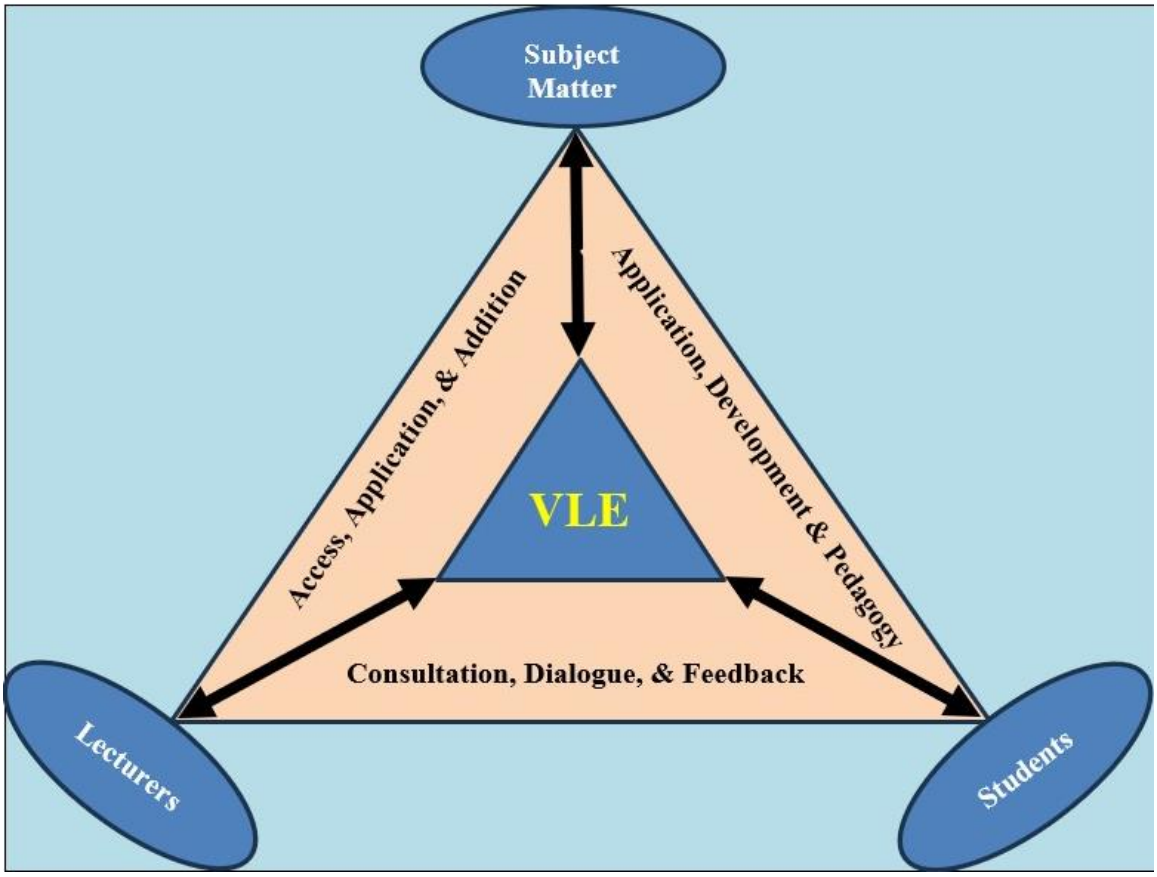

Figure 6.1: *The Triangular Virtual Learning System*

In accordance with the findings obtained in this study, a summary of the ideal strategy for implementing e-learning across Zambian universities has been provided through the diagrammatic Triangular Virtual Learning System representation in figure 6.1. The understanding behind the presentation of elements is that the interactions between students, lecturers, and the content in accordance with its classification should be aligned in a manner that acknowledges the needs and influences of each element to create a VLE which is practical, effective, efficient, and secure. VLN should be developed with respect to the nature of interactions because they in turn dictate the quality of education offered through e-learning. Students ought to interact with lecturers in a manner that is meaningful and productive to both parties during lectures and outside lectures, through the established LMS. Provisions should be made to accommodate consultations, dialogue, and feedback. At the same time, they should be able to access, apply and add to the content through the established VLE. In that way, the use of e-learning should provide both students and lecturers with the opportunity of contributing to the body of knowledge, and to the improvement of standards.

While lecturers should be able to interact with students meaningfully, they also ought to take the role of being subject matter experts by assessing the applicability of e-learning modes to specific classifications of content. In doing so, the classification of content becomes pivotal in deciding whether e-learning should be applied or not. Further, lecturers ought to continuously interact with content to ensure it is up to date, relevant, improved and applicable. This would ensure that e-learning is not imposed on programmes that require the use of the traditional brick-and-mortar system. Furthermore, laymen in subject matter (especially ICT experts) would have guidance on the applicability of e-learning stemming from the interactions with the content by both students and lecturers, as well as the classifications.

The review of e-learning implementation from the perspectives of students, lecturers, and university administrators of ICT, as well as pedagogical issues, provided an opportunity for establishing a framework to guide and enhance the effectiveness of e-learning in the Zambian context. As shown in figure 6.1, the interaction of these stakeholders and existing aspects of pedagogy and technology follows a unique pattern specific to the Zambian context. In this respect, across all Zambian universities, e-learning ought to be implemented in a manner that adheres to the needs and context settings of the Zambian society. Evidently, there should be meaningful

involvements of lecturers, students, as well as administrators whenever there's an attempt to implement e-learning as a mode of curriculum delivery, while considering the influence of programme classification. These considerations, ideally, would lead towards the outline of what the VLE should have to have an e-learning system that responds to all needs adequately.

Lastly, it should be noted that e-learning curricular, like ordinary educational curricular, needs to be reviewed wholistically and periodically to ensure validity. If e-learning is implemented on the premise of having expert guidance from one group of stakeholders only (mostly lecturers and ICT staff), there is a risk of having ineffective delivery modes. Subsequently, it should be emphasized that the application of e-learning should always be guided by patterns in the practices and internal interactions that represent all key stakeholders.

6.3 Recommendations

Based on the discoveries made in this study, with consideration of the drawn interpretations, discussions and conclusions, some recommendations were drawn for various stakeholders. The following are the drawn recommendations.

i) With HEA being at the helm of compliance by universities and other tertiary institutions, the institution should collaborate with the universities to establish a set of admissible standards that should comprehensively address e-learning implementation from the various operational levels which affect the teaching and learning process. Ideally, these standards should include aspects of hardware and software technologies, e-learning curricular, applicability according to programme classifications, as well as students' affordability and accessibility.

ii) University administrators and lecturers should place a limit on the applicability of e-learning as a mode of curriculum implementation to respective fields of study for the purpose of upholding quality. The limitations should be responsive to pedagogical approaches required for respective fields of study.

iii) HEA should consider providing universities with guidance in the acquisition or development of their own comprehensive and integrated LMS which should respond to students' needs such as gadgets, content access, library access, as well as socialising needs. These software requirements could be collectively reviewed by HEA, university administrators, and lecturers.

iv) Universities should explore ways of establishing locally hosted and managed LMS to enhance cyber security and be more responsive to local learner needs. With the cost for owning servers locally being high for some universities, collaborations between and among universities could be a great way of achieving this, especially universities within Zambia or Sub-Saharan countries that are very close to Zambia.

v) While HEA seeks to avoid micro-managing university operations, there would be need for the authority to create a strategy for engaging all university stakeholders, including students. The introduction of such a strategy would be important in ensuring that policies and standards are developed wholistically in that all stakeholders would be able to make inputs. This is how educational curricular, and policies ought to be developed, even at tertiary levels of education.

6.4 Proposition for Future Research

With this study being among the few to explore e-learning from a unique angle, it has provided vast opportunities for further research which would be key in enhancing the delivery of education through e-learning in universities. In this respect, it would be prudent to consider the following opportunities of further research.

i. Having explored the applicability of e-learning from the perspectives of social sciences and natural sciences in this study, another study could focus on establishing the limitations withing these classifications of programmes to understand how applicable e-learning would be to specific programmes of study. Such a study could take an experimental approach to make comparisons between learners using the brick-and-mortar system and e-learning.

ii. While the study showed that cultural aspects affected both lecturers and learners, it could be interesting to understand the aspects of culture that affect these stakeholders, as well as the extent to which they affect them.

iii. Another opportunity this study provided for further studies could be drawn from the finding on how some students experienced alienation. A study to understand the extent to which alienation affect students could be important in understanding the extent to which e-learning could include features for social interactions among students.

iv. Lastly, a study on how e-learning could be used for delivering education for learners with hearing and/or speech impairment could be important in understanding inclusive educational needs.

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APPENDICIES

Appendix 1: Questionnaire for University Students

I am a student at the University of Zambia (UNZA) pursuing a Master of Education (M.Ed.) degree in Curriculum Studies. As part of master's programme, I am conducting an academic study titled '*An Analysis Of E-Learning as a Mode of Curriculum Implementation in Zambian Universities: Practices, Standards and Applicability'.* Your participation in this study is very important. Therefore, it is my humble appeal that you provide truthful responses to all the questions. Kindly note that the information you shall provide shall be treated with the utmost confidentiality and will only be utilised for the purpose of this study.

Instruction

a. Do not mention any person's name in your responses to any question in this questionnaire.

b. Before providing a response to any question, kindly ensure that you read the questions carefully.

c. Provide your answers to all items by clicking on the most appropriate option or by providing a brief explanation in the spaces provided.

Section A: Background Information

1. Name of your institution: …….

2. Gender: [Male] [Female]

3. Age Range: [16 – 20] [21 – 25] [26 – 30] [31 and above]

4. Classification of your programme of study:

   A. Natural Sciences Based in Physics & Chemistry… e.g., Engineering, Radiography.

   B. Natural Sciences Based in Biology & Chemistry… e.g., Human Biology, Pharmacy.

   C. Social Science Based in Theory only... e.g., Pure Mathematics, Sociology, and Psychology.

D. Social Sciences Based in Theory & Practice… e.g., Teaching, and Demography.

5. On a scale 1 – 5, how conversant are you in using computers?

   (Click on the number that best reflects your level of computer skills)

1	2	3	4	5
Know nothing	Basic usage	Moderate usage	Advanced usage	Expert usage

Section B: Student's E-learning Practical Experiences

6. What mode of e-learning has your institution adopted to facilitate the teaching and learning process in your respective programme of study?

   [Virtual Learning Only]

   [Blended Learning… i.e., combined with physical lessons]

7. At the time of being introduced to e-learning, were you provided with an orientation in the use of the institution's adopted e-learning platform(s)?

   [Yes] [No]

8. If your answer is to question 7 is 'no', why do you think you were not oriented? .....

9. Would you say that you needed to undergo orientation at the time of commencing learning through e-learning at your institution? Provide a reason for your answer.

   [Yes] [No]

   Reason: …….....

   …….

10. Which device(s) do you use to facilitate your access to the institution's adopted e-learning platform(s)? (Select all devices that you were utilising)

    [Computer] [Tablet] [Smartphone]

11. What online platform(s) have you and your lecturers been using as e-learning platforms to facilitate learning in your respective programme of study? Indicate all platforms (e.g., Zoom).

    …….

12. Did you face any challenges with the e-learning platform(s) you have mentioned in question 10 in your use of the platforms for learning purposes in your respective programme of study?

    [Yes] [No]

    If yes, state the major challenges that you faced:

    ……..…….

13. Were you provided with the option of seeking instant technical support from the university ICT management team in an event of facing technical challenges?

    [Yes] [No]

14. In your own opinion, to what extent would you agree/disagree that technical support is necessary to the online teaching and learning process?

1	2	3	4	5
Strongly Disagree	Disagree	Not certain	Agree	Strongly Agree

15. Briefly explain your choice of options in question 14.

    ……..

Section C: Applicability of E-learning

16. What e-learning platform(s) (if any) has your university management installed or recommended to facilitate learning through e-learning across all programmes?

    [Astria LMS] [Braincert LMS] [Google Classroom] [Moodle] [None]

    Others: ……

17. Which electronic device would you say is the most accessible and convenient for your accessing of the university's adopted or recommended e-learning platforms?

    [Computer] [Tablet] [Smartphone]

18. On a scale of 1 – 5, how effective would you say the adopted e-learning platform was for facilitating learning in the courses under your respective programme of study?

1	2	3	4	5
Very Ineffective	Fairly Ineffective	Moderately Effective	Effective	Very Effective

19. What features of the e-learning platform adopted by the institution were your lecturers utilising the most to facilitate lectures?

Audio/Visual Conferencing tools (e.g., Zoom)	Virtual Simulators (e.g., virtual laboratories)	Asynchronous discussion tools (e.g., chat panel)	Content sharing tools (e.g., pre-uploaded videos)
Screen-sharing features	White board features	Polling tools (e.g., instant class opinion poll features)	Assessment tools

Other features ……

20. To what extent would you agree/disagree that having all e-learning features integrated into a robust e-learning platform or Learning Management System (LSM) would improve your experience as an e-learner?

1	2	3	4	5
Strongly Disagree	Disagree	Not certain	Agree	Strongly Agree

Section D: Appropriateness of Pedagogical Approaches

21. Through which mode(s) do your lecturers conduct lectures in your courses?

    [Synchronously, i.e., using live video or audio conferencing]

    [Asynchronously, i.e., posting pre-recorded content such as videos or notes]

    [Both Asynchronously and Synchronously]

22. Briefly describe how your lecturers conducted lectures online

    ……..
    .

23. On a scale of 1 – 5, how effective was your lecturers' adopted mode(s) of lecturing?

1	2	3	4	5
Not Effective	Fairly Effective	Moderate	Effective	Very Effective

24. a) Do you or other students actively participate in online lessons during lecturers?

    [Yes] [No]

b.) If your answer to question 29.a is 'No', briefly explain why you do not actively participate in online lectures.

……..

25. a) Do you think learners' participation in lectures would be important to your performance?

[Yes] [No]

b) Briefly explain your answer. ……

…….

26. What factors do you think deter learners' participation when learning through e-learning?

……
……

27. Do you think engaging with your lecturers during online lectures would be vital to your learning in your programme of study?

[Yes] [No]

28. Briefly explain your choice of answer to question 32.

……..

29. Based on your recent experience as an e-learning student in your respective programme of study, which style(s) of lecturing do you think would be most effective if adopted by your lecturers and why?

[Synchronously, i.e., using live video conferencing]

[Asynchronously, i.e., posting pre-recorded content]

[Both]

Reason.……

30. What other interventions do you think would help your lecturers to improve their lecturing styles to become more effective?

    …….

31. From your overall experience, what could be done differently to improve your experience as an e-learner in relation to your respective programme of study?

    ……

    ……

The End!

Thank you very much for the taking time to respond to all question!

Appendix 2: Interview Guide for Higher Education Authority Director of Quality Assurance

This interview is meant to find out the position of HEA on the use of e-learning as a mode of curriculum implementation in Zambian universities. You are therefore being requested to provide information based on the stance of the institution.

INTERVIEW GUIDE FOR HEA DIRECTOR OF QUALITY ASSURANCE OFFICER

1. What is the policy of HEA on the use of e-learning as a mode of curriculum implementation in Zambian universities?

2. How are policies on e-learning educational practices in Zambian universities established by HEA?

3. What guidelines does HEA provide to Zambian universities on how e-learning should be implemented and the extent to which it should be utilised?

4. Have there been any established standards for e-learning technologies that should be followed by Zambian universities?

5. How is the quality of education provided by universities through e-learning monitored across both public and private universities?

6. Are there any established systems of engaging with universities to ensure quality education especially in e-learning?

7. Is the authority involved in monitoring the quality of online education provided by universities to the level of classroom practices?

8. How does HEA ensure that it is up to date with current educational trends from the perspectives of all key stakeholders, especially the beneficiaries (students)?

Appendix 3: Interview Guide for University ICT Managers

This interview is meant to establish how e-learning in the university is managed from the perspective of the administrators. You are hereby being requested to provide information based on the institutional standards and practices.

INTERVIEW GUIDE FOR UNIVERSITY ICT MANAGERS

1. Is there any policy that guides the implementation of e-learning in the university?
2. What informs the university administration's decisions on the implementation of e-learning?
3. To what extent has the university invested in establishing e-learning technological infrastructures and systems to support e-learning?
4. From the perspective of university management, how is e-learning implemented across the various schools and programmes and to what extent?
5. How does management account for effectiveness of the adopted e-learning platforms?
6. To what extent does the ICT unit factor in the special needs of each programme of study when establishing or recommending e-learning facilities for use by lecturers and students?
7. How does the university management account for the concerns of lecturers and students in the decisions on how e-learning should be implemented?
8. What technical support and training in the use of the adopted e-learning systems are lecturers provided with?
9. To what extent are the needs of lecturers in their choices of lecturing methods considered when establishing or recommending e-learning facilities and features to facilitate learning?
10. How are students provided with on demand technical support to facilitate smooth learning through the established e-learning platforms?
11. To what extent does the university consult and/or engage with other institutions, authorities, or stakeholders on issues around e-learning?

Appendix 4: Interview Guide for University Lecturers

INTERVIEW GUIDE FOR UNIVERSITY LECTURERS

1. What is your understanding of e-learning?
2. How comfortable are you with the university's adopted e-learning system(s) with regards to lecturing online in your respective field of specialisation?
3. To what extent are your inputs considered by the university management in decisions regarding the adoption of e-learning platforms for the university?
4. In your opinion, what technological features would you consider as most important to lecturing online in your respective field of specialisation?
5. Based on your practices in implementing e-learning, what modes of e-learning implementation have worked well for you?
6. What lecturing methodologies do you consider as most effective in lecturing courses in your field of specialisation?
7. What lecturing methods have you been using to teaching online?
8. How has been your experience in lecturing your students online in relation to their numbers?
9. What kind of technical support are you provided with as a lecturer?
10. Has the academic performance of students been any different from when, they learnt through physical lectures?
11. To what extent do you engage with your students in respect to your field of specialisation to facilitate teaching and learning?
12. From your perspective, how effective is e-learning as a mode of curriculum implementation in your respective field of specialisation?

Appendix 5: Students' Contact Information Collection Form

STUDENTS CONTACT DETAILS REQUEST FORM

I am a postgraduate student at the University of Zambia (UNZA) pursuing a Master of Education (M.Ed.) degree in Curriculum Studies. As part of master's programme, I am conducting an academic study titled '*An Analysis Of E-Learning as a Mode of Curriculum Implementation in Zambian Universities: Practices, Standards and Applicability'.* Your participation in this study is very important. Therefore, it is my humble appeal that you provide truthful responses to all the questions. Kindly note that the information you shall provide will be treated with the utmost confidentiality and will only be utilised for the purpose of this study.

A *link* to the *questionnaire* will be sent to you using the email address you shall provide in the space provided below. I will be grateful for your participation.

Institutional Name: _____

	Student's Email Address/WhatsApp Number	**Programme**	**Year**	**Signature**
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
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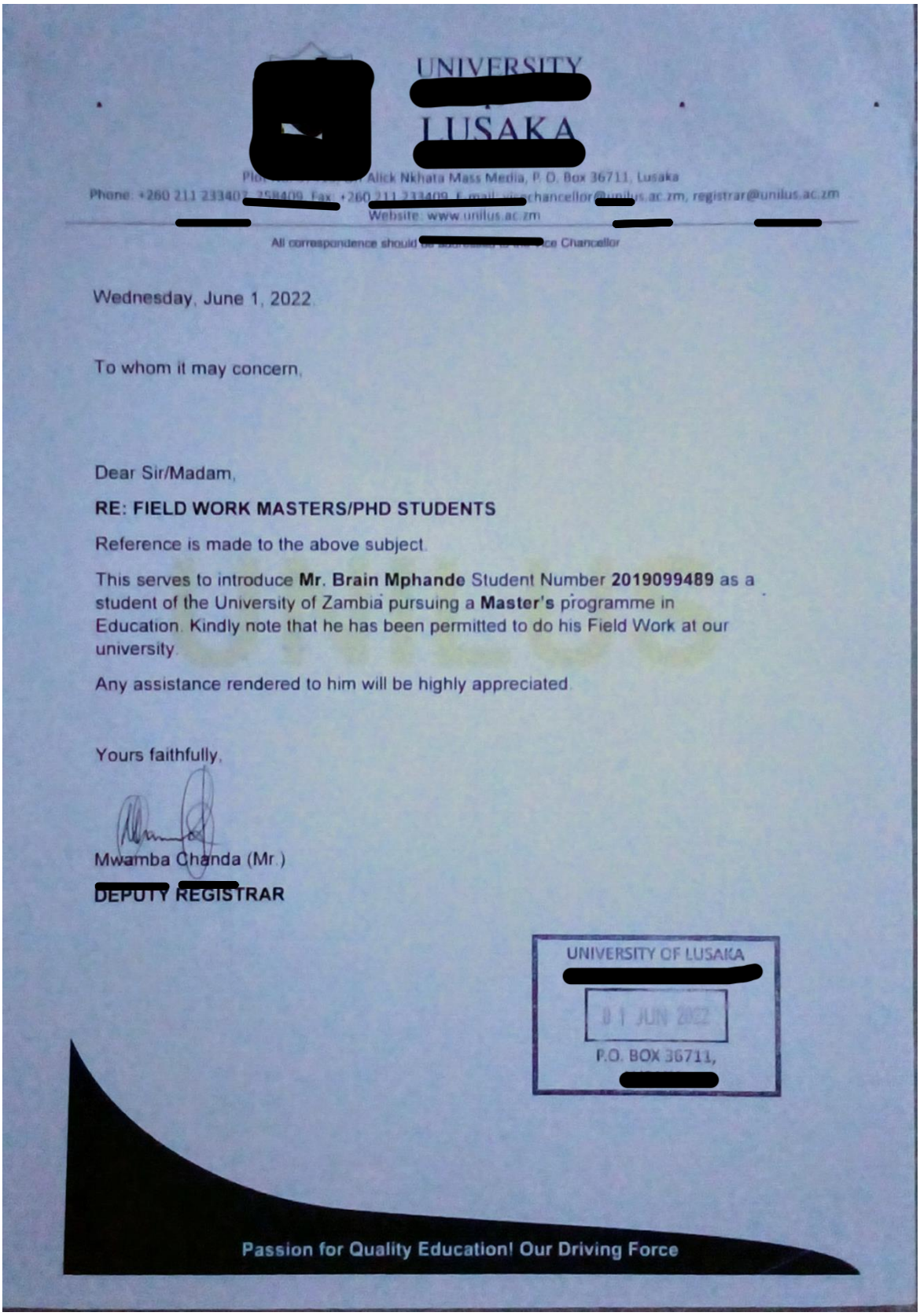
17.				
18.				
19.				
20.				
21.				

Appendix 6: Scanned Copy of Permission Letter from UNILUS



UNIVERSITY [redacted]
LUSAKA
[redacted]

[redacted] Alick Nkhata Mass Media, P. O. Box 36711, Lusaka
Phone: +260 211 233407, 258409, Fax: +260 211 233409, E-mail: [redacted]chancellor@unilus.ac.zm, registrar@unilus.ac.zm
Website: www.unilus.ac.zm

All correspondence should be addressed to the Vice Chancellor

Wednesday, June 1, 2022.

To whom it may concern,

Dear Sir/Madam,

RE: FIELD WORK MASTERS/PHD STUDENTS

Reference is made to the above subject.

This serves to introduce **Mr. Brain Mphande** Student Number **2019099489** as a student of the University of Zambia pursuing a **Master's** programme in Education. Kindly note that he has been permitted to do his Field Work at our university.

Any assistance rendered to him will be highly appreciated.

Yours faithfully,

Mwamba Chanda (Mr.)
[redacted]
DEPUTY REGISTRAR

UNIVERSITY OF LUSAKA
[redacted]
01 JUN 2022
P.O. BOX 36711,
[redacted]

Passion for Quality Education! Our Driving Force

Appendix 7: Scanned Copy of Permission Letter from NIPA

[redacted]/01/1/59

24th May, 2022

Mr. Brian Mphande
C/o The Dean of Students
University of Zambia
P O Box 32379
LUSAKA.

Contact Number: 0975376808

Dear Mr. Mphande,

PERMISSION TO ACCESS INFORMATION FOR RESEARCH FOR MASTERS OF EDUCATION

Reference is made to the above captioned subject. Further reference is made to your letter received on 23rd May, 2022 regarding the above subject matter.

I wish to inform you that your request to conduct research from our institution **has been granted**.

On behalf of management, we wish you the best in your undertaking.

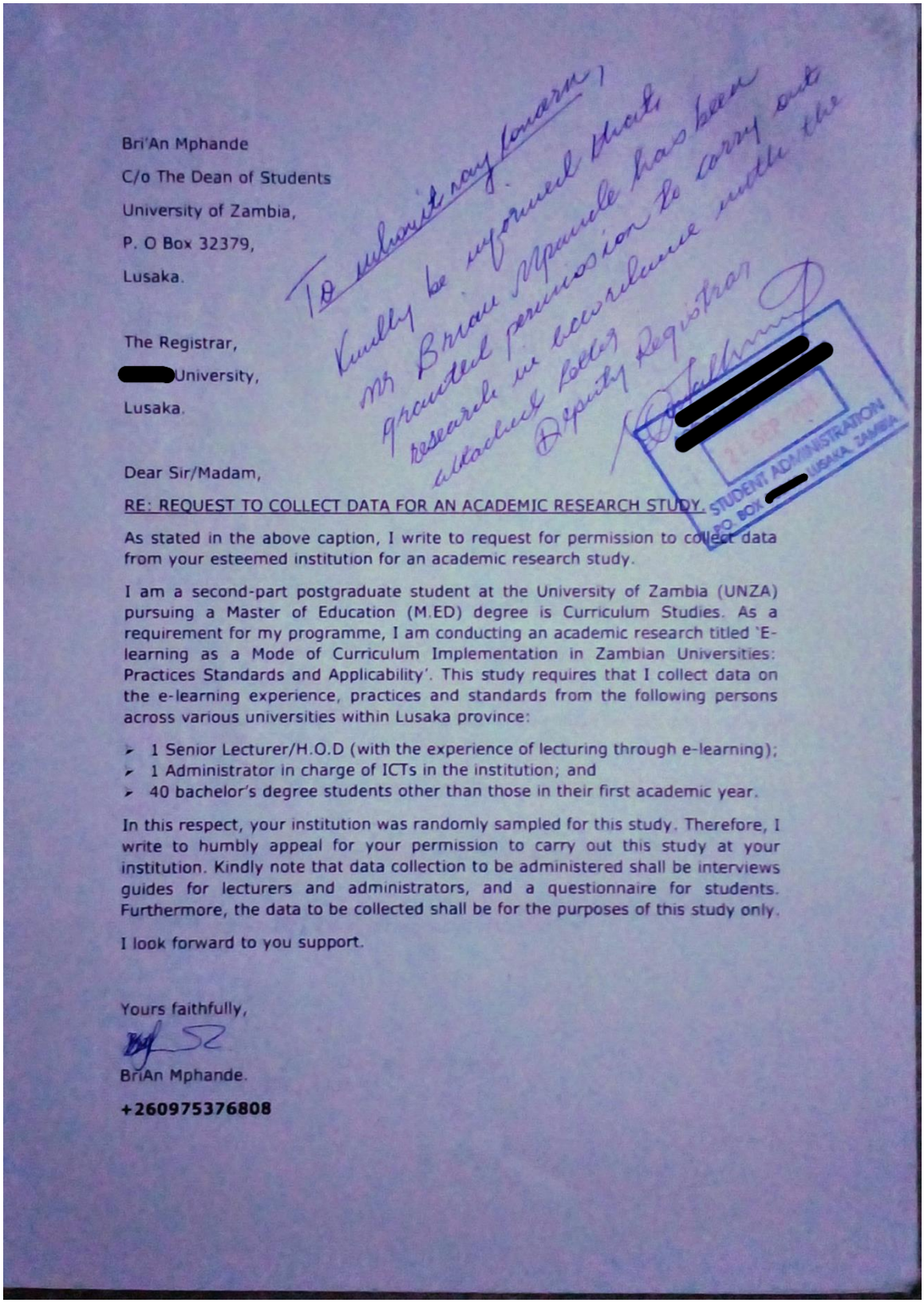
Yours sincerely,

[redacted]

[redacted]
DEPUTY REGISTRAR – ACADEMIC AFFAIRS
For/**EXECUTIVE DIRECTOR**
nmm

[redacted]
P.O Box [redacted]
Lusaka, Zambia
T +260 211 [redacted]
F +260 211 227213
E [redacted]

Appendix 8: Scanned Copy of Approval from ZCAS



Bri'An Mphande
C/o The Dean of Students
University of Zambia,
P. O Box 32379,
Lusaka.

The Registrar,
[redacted] University,
Lusaka.

To whom it may concern
Kindly be informed that
Mr Brian Mphande has been
granted permission to carry out
research in accordance with the
attached letter
Deputy Registrar

[redacted]
STUDENT ADMINISTRATION
P.O. BOX [redacted] LUSAKA, ZAMBIA

Dear Sir/Madam,

RE: REQUEST TO COLLECT DATA FOR AN ACADEMIC RESEARCH STUDY.

As stated in the above caption, I write to request for permission to collect data from your esteemed institution for an academic research study.

I am a second-part postgraduate student at the University of Zambia (UNZA) pursuing a Master of Education (M.ED) degree is Curriculum Studies. As a requirement for my programme, I am conducting an academic research titled 'E-learning as a Mode of Curriculum Implementation in Zambian Universities: Practices Standards and Applicability'. This study requires that I collect data on the e-learning experience, practices and standards from the following persons across various universities within Lusaka province:

- 1 Senior Lecturer/H.O.D (with the experience of lecturing through e-learning);
- 1 Administrator in charge of ICTs in the institution; and
- 40 bachelor's degree students other than those in their first academic year.

In this respect, your institution was randomly sampled for this study. Therefore, I write to humbly appeal for your permission to carry out this study at your institution. Kindly note that data collection to be administered shall be interviews guides for lecturers and administrators, and a questionnaire for students. Furthermore, the data to be collected shall be for the purposes of this study only.

I look forward to you support.

Yours faithfully,

BriAn Mphande.

+260975376808

Appendix 9: Consent Letter; University Registrars

BriAn Mphande
C/o The University of Zambia,
P. O Box 32379,
Lusaka.
…, 2022.

The Registrar,
……..
Lusaka.

Dear Sir/Madam,

RE: REQUEST TO COLLECT DATA FOR AN ACADEMIC RESEARCH STUDY.

As stated in the above caption, I write to request for permission to collect data from your esteemed institution for an academic research study.

I am a second-part postgraduate student at the University of Zambia (UNZA) pursuing a Master of Education (M.ED.) degree is Curriculum Studies. As a requirement for my programme, I am conducting academic research titled 'E-learning as a Mode of Curriculum Implementation in Zambian Universities: Practices Standards and Applicability'. This study requires that I collect data on the e-learning experience, practices and standards from the following persons across various universities within Lusaka province:

- 1 Senior Lecturer/HOD (with the experience of lecturing through e-learning),
- 1 Administrator in charge of ICTs in the institution; and
- 40 bachelor's degree students other than those in their first academic year.

In this respect, your institution was randomly sampled for this study. Therefore, I write to humbly appeal for your permission to carry out this study at your institution. Kindly note that data collection to be administered shall be interviews guides for lecturers and administrators, and a questionnaire for students. Furthermore, the data to be collected shall be for the purposes of this study only.

I look forward to your support.

Yours faithfully,

BriAn Mphande.
+260975376808

Appendix 10: C

THE UNIVERSITY OF ZAMBIA

DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE

Telephone: +260-211-290258/293937
Fax: +260-211-290258/293937
E-mail drgs@unza.zm

P O Box 32379
Lusaka Zambia

APPROVAL OF STUDY

6th September, 2021

REF NO.HSSREC-2021-AUG-006

Brian Mphande
The University of Zambia
School of Education
P.O. Box 32379
LUSAKA

Dear Mr. Mphande,

RE: "AN ANALYSIS OF E-LEARNING AS A MODE OF CURRICULUM IMPLEMENTATION IN ZAMBIAN UNIVERSITIES: PRACTICES, STANDARDS AND APPLICABILITY"

Reference is made to your submission of the protocol captioned above. The HSSREC resolved to approve this study and your participation as Principal Investigator for a period of one year.

REVIEW TYPE	ORDINARY REVIEW	APPROVAL NO. HSSREC-2021-AUG-006
Approval and Expiry Date	Approval Date: 7th September, 2021	Expiry Date: 6th September, 2022
Protocol Version and Date	Version - Nil.	6th September, 2022
Information Sheet, Consent Forms and Dates	• English.	To be provided
Consent form ID and Date	Version - Nil	To be provided
Recruitment Materials	Nil	Nil
Other Study Documents	Questionnaire.	
Number of Participants Approved for Study		

Specific conditions will apply to this approval. As Principal Investigator it is your responsibility to ensure that the contents of this letter are adhered to. If these are not adhered to, the approval may be suspended. Should the study be suspended, study sponsors and other regulatory authorities will be informed.

Conditions of Approval

- No participant may be involved in any study procedure prior to the study approval or after the expiration date.
- All unanticipated or Serious Adverse Events (SAEs) must be reported to HSSREC within 5 days.
- All protocol modifications must be approved by HSSREC prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address.
- All protocol deviations must be reported to HSSREC within 5 working days.
- All recruitment materials must be approved by HSSREC prior to being used.
- Principal investigators are responsible for initiating Continuing Review proceedings. HSSREC will only approve a study for a period of 12 months.
- It is the responsibility of the PI to renew his/her ethics approval through a renewal application to HSSREC.
- Where the PI desires to extend the study after expiry of the study period, documents for study extension must be received by HSSREC at least 30 days before the expiry date. This is for the purpose of facilitating the review process. Documents received within 30 days after expiry will be labelled "late submissions" and will incur a penalty fee of K500.00. No study shall be renewed whose documents are submitted for renewal 30 days after expiry of the certificate.
- Every 6 (six) months a progress report form supplied by The University of Zambia Humanities and Social Sciences Research Ethics Committee as an IRB must be filled in and submitted to us. There is a penalty of K500.00 for failure to submit the report.
- When closing a project, the PI is responsible for notifying, in writing or using the Research Ethics and Management Online (REMO), both HSSREC and the National Health Research Authority (NHRA) when ethics certification is no longer required for a project.
- In order to close an approved study, a Closing Report must be submitted in writing or through the REMO system. A Closing Report should be filed when data collection has ended and the study team will no longer be using human participants or animals or secondary data or have any direct or indirect contact with the research participants or animals for the study.
- Filing a closing report (rather than just letting your approval lapse) is important as it assists HSSRECin efficiently tracking and reporting on projects. Note that some funding agencies and sponsors require a notice of closure from the IRB which had approved the study and can only be generated after the Closing Report has been filed.
- A reprint of this letter shall be done at a fee.

- All protocol modifications must be approved by HSSREC by way of an application for an amendment prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address or methodology and methods. Many modifications entail minimal risk adjustments to a protocol and/or consent form and can be made on an Expedited basis (via the IRB Chair). Some examples are: format changes, correcting spelling errors, adding key personnel, minor changes to questionnaires, recruiting and changes, and so forth. Other, more substantive changes, especially those that may alter the risk-benefit ratio, may require Full Board review. In all cases, except where noted above regarding subject safety, any changes to any protocol document or procedure must first be approved by HSSREC before they can be implemented.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of HSSREC, we would like to wish you all the success as you carry out your study.

Yours faithfully,

Dr. J.I. Ziwa
DR. J. I. Ziwa

ACTING CHAIRPERSON
THE UNIVERSITY OF ZAMBIA HUMANITIES AND
SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE - IRB

cc: Director, Directorate of Research and Graduate Studies
Assistant Director (Research), Directorate of Research and Graduate Studies
Assistant Registrar (Research), Directorate of Research and Graduate Studies