



**GEOGRAPHY UNDERGRADUATE STUDENTS' EXPERIENCES OF USING MODULAR
OBJECT-ORIENTED DYNAMIC LEARNING ENVIRONMENT IN HIGHER EDUCATION**

BY

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DECLARATION

I, Thembelihle Ndwane, declare that this research project is my own work. It is being submitted for the Masters Degree in Geography Education at the University of KwaZulu-Natal, Durban. It has not been submitted for any degree or examination at any other University. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons. This thesis does not contain other person's writing unless specifically acknowledged as being sourced from the other persons.

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DEDICATION

I wish to express my sincere gratitude and thanksgiving to God, the creator, for his endless love towards me. To You belong all the praise and glory. Thank You for the love and support throughout this journey. I have accomplished this only because of the wisdom and knowledge You have imparted unto me. I dedicate this dissertation to my sons, Ukuthokoza and Eliezer Ndwalane. I have stolen quality time that was meant for you in order to focus on this study.

LIST OF ACRONYMS

LMS: Learning Management System

ICT: Information Communication Technologies

MOODLE: Modular Object-Oriented Dynamic Learning Environment

ABSTRACT

Technology has been adopted by various higher education institutions globally and locally to support teaching and learning. Modular Object-Oriented Dynamic Learning Environment (Moodle) is one of the Learning Management Systems (LMSs) that is a popular choice among higher education institutions. Moodle provides an online teaching and learning environment that supports students in their courses. Many students have, however, been experienced challenges in adopting the LMSs due to insufficient training and lack of computer skills in developing countries. This study, therefore, sought to explore Geography students' experiences of using Moodle in Higher Education. The study drew from the Activity theory. The study adopted a qualitative research method and followed a case study methodology. The participants in this study were Geography Education students at the University KwaZulu Natal- Edgewood Campus. The study applied qualitative data generation methods in the use of semi-structured interviews and focus group discussions. The findings from the study indicated that Moodle was convenient, time-saving and enhanced communication between lecturers and students. However, the students revealed that usage of Moodle was affected by lack of training. From the findings, this study recommends regular training for students on the use of Moodle and electricity back-up arrangements during load shedding.

Keywords: Moodle; students' experiences; Geography Education; Higher Education

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CHAPTER ONE

BACKGROUND AND ORIENTATION TO THE STUDY

1.1 Introduction

Learning Management Systems (LMSs) play a very significant role in technology-based interaction in higher education globally. This is affirmed by Binyamin, Rutter and Smith (2020), who note that LMSs, such as Modular Object-Oriented Dynamic Learning Environment (Moodle), allow lecturers and students to share course material, receive and send assignments, make class announcements, and engage with each other in online discussions. This study investigated Geography Undergraduate students' experiences of using Moodle as their platform for teaching and learning. I was interested in exploring how students dealt with the daily routine of teaching and learning using Moodle. In this introductory chapter, I discuss the background to the study, statement of the problem, rationale and motivation for the study, research objectives, research questions, clarification of key concepts, and an outline of the dissertation chapters.

1.2 Background of the study

Learning Management Systems (LMSs) refer to learning platforms, instructional course management systems, content management systems, or instructional management systems (Padayachee, Kotzé, & van Der Merwe, 2011). LMSs are sets of organized e-learning systems used to facilitate the administration of teaching and learning activities interactively and efficiently (Phongphaew & Jiamsanguanwong, 2017). LMSs play an important role in supporting academic innovations of teaching and learning in higher education. LMSs contain aspects of administration but also deal directly with core aspects of teaching such as learning objects, class work, assignments and tests, integrated tools for real-time chats, and bulletin board communication.

LMSs have the potential to make a huge impact on all aspects of teaching, learning and student-teacher interactions (Chinara, Sahoo & Dwivedi, 2016). Currently, LMSs offer lecturers and students a variety of tools and features which provide greater opportunities for innovative educational application and increased use of the system, rather than traditional lecturer-based teaching methods (Sejzi & Arisa, 2013). Higher education institutions are adopting LMSs due to their significant benefits. As a consequence of the advancement of technology in education, the nature of learning and the methods in which knowledge is acquired are changing. Advances in teaching and learning tools have influenced the adoption of LMSs

(Tutkun, 2011). Learning can now be achievable using a variety of learning management systems such as Moodle, WebCT, Blackboard, Sakai, Joomla and others. This study aims to explore the Geography students' experiences of using a Learning Management System (Moodle) in higher education.

1.3 Rationale for the study

Personal

I did my first undergraduate degree (BSc Information Systems) at one of the universities in KwaZulu Natal province, which gave me a good background and understanding of Information Technology and computers. In addition, while I was studying, I worked as a student assistant in tutoring Computer Applications at the university. During my course of study, I did not own a computer due to financial restrictions. I made use of computers in the computer laboratories Local Area Networks (LANs) at the university campus. As a student, I encountered many challenges due to lack of a personal computer. Firstly, computer LANs were overcrowded and I had to wait for my turn or come back later at night. While at this university, I also realised that sometimes the network was down for extended periods and thus, study time was lost. After completing my first degree, I then moved to another university for my postgraduate studies. It was at this university that I was introduced to Moodle. However, I encountered some of the challenges I had experienced at my previous university, such as overcrowding of LANs. I also observed similarities such as unreliable servers going down often resulting in students not being able to access the internet for their research. These experiences made me wonder how this affected the students' learning and how they coped with their daily learning operations if they could not access LANs and had problems with servers.

Practical

In the year 2012, I registered for my Honours degree study, and information about courses was shared to me through the university's Learning Management System known as Moodle. Through this particular platform, I received readings, study materials, assignments and due dates, as well as other important information. At that time, it was very difficult for me to access Moodle because I was not well versed or experienced in using this teaching and learning platform, even though I was familiar with using computers. We were not introduced to Moodle during orientation. Resultantly, I missed the announcements, readings, assignment due dates, and other important information that was sent to me through Moodle. The fact was, I did not know how to go about using the system for receiving information and communicating with lecturers, and yet I was expected to know about the platform and be proficient in all its functions. I was completely lost and confused, because when I did my Post Graduate Certificate in Education, the procedure

for reading, sending and receiving information was traditional; involving verbal and written feedback, where one had to submit an assignment to the lecturer as a hard copy. After a while, I realised that students actually received feedback through Moodle.

Moodle was also used to communicate lecture timetables and venues. Despite the challenges I faced with Moodle, I was expected to use the system to submit my tasks and receive feedback. At that time, I felt that no-one knew or cared enough to understand what challenges I was experiencing while using Moodle. I was drawn to the view that I might not be the only student experiencing such challenges or feeling the same way. This was solidified by my experiences when I was an honours student and the lecturers did not initiate any discussion around how we, as students, were experiencing the new method of providing feedback and sharing information. This prompted me to explore other students' experiences of using Moodle in higher education. Furthermore, the literature I reviewed suggested that there was a need to research the experiences of students on using Moodle as their Learning Management System (Mudaly, 2012).

Literature and my personal experiences gave impetus for me to explore the experiences of using Moodle by Geography Education students. During my honours study Moodle was never used for posting notes and sharing learning material, which left the impression that there are still challenges in the adoption of Moodle. As a student, I did not have adequate access to understand the use of Moodle in my learning. It is for this reason, that I explored other Geography students' experiences of using Moodle and the reasons for having these experiences.

Social

In my review of literature, I observed that most research focuses on lecturers' perceptions of LMSs' use in Higher Education. There is a dearth of literature on students' experiences with LMSs. A study conducted by Goh, Hong and Gunawan (2014) on the perception of lecturers using LMS revealed that Moodle was treated as a content repository platform and the interactive features were seldom used. In addition, a study conducted by Borwarnginn and Tate (2014) on the perceptions of lecturers and students revealed issues related to usability, interaction and communication. Since little attention has been given to the students' perspectives, my interest in exploring their experiences strengthened. The study aimed to investigate the experiences of the students as they were involved in the implementation of Moodle in teaching and learning.

1.4 Problem statement

Universities around the world are embarking on online education. Aldiab, Chowdhury, Kootsookos, Alam and Allhibi (2019) opine that the experiences of lecturers are studied to a greater extent than those of the students themselves. Studying the students' experiences would, however, make universities better informed about the future of online learning, and successfully implement online teaching and learning. Studies conducted in different higher education institutions in African countries reveal that few are implementing Learning Management Systems or online teaching and learning without experiencing challenges (Kabarungi, Musiimenta, & Atuhe, 2016; Sife, Lwoga, & Sanga, 2015; Yakubu, 2019). Some of these challenges lie with the students' lack of foundational skills in computing prior to their admission (Al-Rahmi, Othman, & Musa, 2014). These challenges can affect the students' learning and lead to the increase in the number of dropouts in the university system. Therefore, this study sought to explore students' experiences of using Moodle.

1.5 Objectives

1. To explore Geography Undergraduate students' experiences using Modular Object-Oriented Dynamic Learning Environment in Higher Education.
2. To explore how students transit from the traditional Geography pedagogy to using Modular Object-Oriented Dynamic Learning Environment.
3. To explore Geography Undergraduate students' challenges and opportunities related to using Modular Object-Oriented Dynamic Learning Environment in Higher Education.

1.6 Research questions

1. What are the Geography Undergraduate students' experiences of using Modular Object-Oriented Dynamic Learning Environment in Higher Education?
2. How do students transit from the traditional Geography pedagogy to using Modular Object-Oriented Dynamic Learning Environment?
3. What are Geography Undergraduate students' challenges and opportunities in using Modular Object-Oriented Dynamic Learning Environment in Higher Education?

1.7 Clarification of concepts

In this section, I clarify the key concepts that I used in this study.

1.7.1 Online learning

Al-Busaidi and Al-Shihi (2010) define online learning as a flexible learning method that utilises various technologies in specific contexts. Moreover, as defined by Jabli and Qahmash (2013), online learning is a structured learning activity that uses the internet to interact with students and lecturers, educational content, learning activities, assessment, and communication.

1.7.2 Blended learning

Horn and Staker (2011) define blended learning as an educational approach that combines traditional face-to-face classroom instruction and opportunities for online instruction in ways that enable students to learn at their own pace.

1.7.3 Learning Management System

The concept Learning Management System is expansive and has multi-approaches and definitions according to different contexts and authors. The term has various understandings, for example Virtual Learning Management Systems (VLMs), Course Management Systems (CMSs) and Virtual Learning Environments (VLEs). These terms are ordinarily used to depict courses that combine face-to-face contact in a traditional classroom with web-based learning (Tayebinik & Puteh, 2012). This reduces classroom contact significantly to allow students flexible combination of face to face and online learning (Shalev-Shwartz, 2012). Some studies, Aboagye, Yawson, and Appiah (2020); Fearnley and Amora(2020) view the LMS approach as an effective and learning mode than can be modified to the specific educational requirement of every institution.

Lim et al. (2011) observe that online techniques can be used in conjunction with ICT; using an institutional e-learning context. Venter, van Rensburg and Davis (2012) say LMSs utilise technology with web-based tools for instruction, communication and assessment of the course, at the same time acknowledging the advantages of preserving face-to-face interaction with students. Ouadoud, Chkouri, and Nejari (2018) as

well as Dube and Scott (2014) opine that LMSs employ a variety of e-learning tools that help improve students' learning experiences. Therefore, there is a strong argument in favour of LMS being a flexible pedagogical method that supports traditional face-to-face learning and online learning. LMSs, in their e-learning component, suggest a student-centred teaching approach, as opposed to traditional education where learning is teacher-centred and teachers are largely the source of information for the students (Røkenes, 2016).

LMSs have the potential to reduce restrictions in learning brought about by time and distance. LMSs such as Moodle, provide an environment inclusive of various technologies that support diverse students' needs. The purpose of adopting LMSs is to enhance face-to-face instruction while, at the same time, delivering online courses (Ferdig, 2010). LMSs offer administrative affordances such as course notes, posting, task entries, assessments, and communication features. The best motivation for using LMSs is to make it easier for students to get course materials from one location. Several studies have analysed LMSs and their use from lecturers and institutional perspectives (Conway, Munguatocha, Muyinda, & Lubega, 2011). They, however, provide inadequate information about how easy or difficult blended learning is for a student. Very few case studies have been conducted to explore the experiences of students in the learning of Geography Education using the LMS (Moodle).

1.8 Structure of the dissertation

Chapter One

This chapter provided a brief overview of the research study. It also provided the background to the study, the research problem and the rationale. Furthermore, it presented the research objectives and the key research questions which informed this research study. In addition, the key concepts were clarified in this chapter and the outline of chapters is presented.

Chapter Two

The first part of this chapter examines the literature related to Geography undergraduate students' experiences of using LMSs (Moodle) in higher education. Thereafter, the literature provides a history of LMSs as well as the use of LMSs internationally, in the African continent, as well as South Africa. Massification of higher education, large classes and student learning in large classes is also discussed. Thereafter, the benefits and challenges of LMSs in higher education are presented. The second part of this

chapter discusses the theoretical framework used to frame this study, namely; the Activity Theory. The literature dealing with Activity Theory and its application in past research works is also discussed in this chapter. Lastly, an explanation of the Activity theory is presented. The Activity theory's different components such as subject, object, rules, division of labour, rules, community and learning outcomes, are discussed.

Chapter Three

This chapter outlines the research design employed to explore students' experiences of using LMS (Moodle) in Geography education and includes the rationale for the choice of a qualitative approach and the interpretive paradigm. It also focuses on the selection of participants and data generation tools such as semi-structured interviews and focus group discussions. It then goes on to discuss thematic analysis and trustworthiness of the study. Finally, the chapter considers the ethical issues that were taken into account during the study.

Chapter Four

Chapter four comprises the presentation, interpretation and analysis of data from focus group discussions and semi-structured interviews. Emerging themes from the generated data are utilised to discuss the findings. Some studies are used to discuss the findings on students' experiences of using Modular Object Orientated in Geography Higher Education.

Chapter Five

This chapter comprises a synopsis of the findings of the study as well as the recommendations arising from the study. It presents a discussion of the conclusions of the study as they relate to the research questions and discusses the limitations of the study. Recommendations that might assist in the successful integration of Moodle in teaching and learning are made. Thereafter, it makes suggestions for further research.

1.9 Chapter summary

This chapter provided the introduction and background to the study. Furthermore, it presented the statement of the problem, rationale, research questions and clarification of key concepts. The layout of all the chapters was also presented to show the development of the dissertation. The next chapter presents a review of the literature, and the Activity Theory that was used to frame this study.

CHAPTER TWO

LITERATURE REVIEW AND THE THEORETICAL FRAMEWORK

2.1 Introduction

An introduction and overview of the complete study was presented in the previous chapter. This chapter is divided into those respective sections. The first section provides a brief discussion of what Geography is. The second section discusses the massification of higher education. The third section provides an understanding of the Learning Management Systems (LMSs). The fourth section highlights the motives behind the adoption of LMSs in higher education. The fifth section discusses the usage of LMSs in higher education. The sixth section discusses students' experiences of using Moodle in higher education. In addition to these, the chapter also highlights the benefits and challenges of using Moodle in higher education. Before the chapter ends, a comprehensive outline of the Activity theory that informs this study is presented.

2.2 Defining Geography

This section discusses Geography generally and Geography as a discipline.

2.2.1 Geography

The shift of paradigms in how people make sense of the world over the years resulted in different perspectives and definitions of Geography. For instance, historical definitions of geography were concerned with 'what is where' and finding exact locations. Modern definitions of geography are concerned with understanding the vast system on the earth's surface comprising man and the natural environment (Gerber, 2003). After the Age of Discovery, it was important for geographers to study various areas around the world, which increased geographic understanding about different lands and people; giving us the basis for much of the knowledge we have today.

According to Balasubramanian (2014), "Geography is about the study of Earth's environments and peoples, and the interactions between them". Aspinall (2010) posits that Geography strives "to provide an accurate, orderly, and rational description and interpretation of the variable character of the earth's surface" (p. 21). Likewise, Holt-Jensen (2018) sees Geography as a discipline that seeks to describe and interpret the earth

as the universe of man. Geographer Kenzer (2013) states that geography seeks to understand the earth as the place of residence for humans. Likewise, Tuan (2012) defines Geography as the study of earth as the home of humans. Dikshit (2018) further notes that Geography is derived from the Greek word *geographe*, “geo” meaning earth and “graphie” meaning the writing or description. This study adopts Kenzer’s (2013) definition of geography as a discipline that studies the earth as a place where people live, and their complex interactions with the environment in which they live. This study explored students’ experiences of using Moodle, therefore the definition is fitting in the sense that Moodle is an environment where geography students learn.

2.2.2 Geography as a discipline

Geography is different from other disciplines in that, it is an integrative discipline because of its connection with other academic disciplines such as chemistry, economics and philosophy. In fact, every academic subject is closely linked to Geography. Since the study of geography is broad, the discipline is typically divided into specialities (Balasubramanian, 2014). Geography, as a discipline, can be categorised into two main areas of focus. There is Physical Geography and Human Geography or Cultural Geography. Physical Geography strives to understand the world’s physical geographic features that make up the environment. These include rivers, mountains, landforms, weather, climate, soils, plants, and other physical aspects of the earth’s surface. Physical geography focuses on geography as a form of earth science. It emphasizes the main parts of the earth. It aims to understand the physical features of the earth such as the lithosphere (surface layer), the atmosphere (air), the hydrosphere (water), the biosphere (a region occupied by living organisms), as well as the relationship between and among these features.

Geography can be further divided into several sub-disciplines or related fields that treat a particular kind of physical phenomenon like Biogeography (the study of the spatial distribution of plants and animals), Climatology (the study of climate), Hydrology (the study of water), and Geomorphology - the study of Earth’s topographic features (Banski, 2013). Human geography focuses on the study of dynamics, people’s cultural aspects, and how they interact with the physical world around them. It is a branch of Geography that studies the patterns and processes responsible for shaping human societies, and focuses on economic, social, cultural and political factors. Human geography aims to understand how human beings interact with their environment over time and across space. Like physical geography, human geography can be divided into various fields, including historical, cultural, urban, political, economic, development, population, settlement and health geography (Stachowiak & Bajerski, 2016).

2.3 Massification of higher education: large classes and student learning

Massification of higher education alludes to the expansion of access for university-age students to higher education (Altbach, 2013). It is viewed as one of the preeminent developments in higher education worldwide and has immensely affected the higher education system (Peeraer & Van Petegem, 2015). It has changed higher education from being an elitist privilege to a system characterised by mass participation from different social, economic and geographical groups. Massification responds to the historical background of South Africa as a racially segregated country in which certain racial groups were privileged over others.

Before 1994, South Africa was under a politically-sanctioned racial segregation (Pandor, 2018). White South Africans were the only beneficiaries of every policy within the apartheid regime. This created differential and elitist education. As a result, the education system was deeply rooted in inequality and imbalance. The first democratic elections in South Africa in 1994 ended politically-sanctioned racial segregation. The new democratic government invested in redressing all imbalances of the past, and sought to guarantee an efficient, equitable and equality education for every single South African (Machingambi, 2011). In order to redress the imbalances of the past, the government introduced policies that underpinned social justice, equality, equity, democracy, human rights, non-racism, non-sexism and responsibility (Mohamedbhai, 2014). As a result, universities were affected by the rebirth of the new South African Education System.

Universities are forced to provide access to mass students and individuals who had been previously disadvantaged, to further their studies and pursue professional development (Hawkins, Mok, & Neubauer, 2018). Massification brings up both positive and negative consequences on all higher education institutions in Africa, be it on educational quality, physical infrastructure, funding and increased lecturers/student ratio (Mohamedbhai, 2014). For some institutions, lecture rooms, laboratories, academic staff as well as theatres are inadequate to meet the needs of the increased enrolment. Libraries have a shortage of books. Some of the laboratory equipment is non-functional and needs to be replaced. The teaching load of full-time lecturers has inevitably increased and this comes with increased administrative duties. This has meant reduction of time to devote to research (Varghese, 2018). Students with learning challenges related to understanding the course content are easily frustrated in a large class learning environment as there is little or no individual attention from their lectures. Such students need to learn how to adopt cognitive functions such as critical thinking skills and problem-solving skills (Hornsby & Osman, 2014). Sadly, this need is not met in a large

class environment (Nilson & Goodson, 2017). As a result, the relationship between some lecturers and students is strained, and there is no meaningful interaction given the large class sizes. This creates an uncondusive learning environment as students do not get the full support and attention of the lecturers

Large classes result in a poor learning atmosphere as some students do not get enough attention and support from their lecturers (Moutlana & Moloji, 2014). Thus, large class size environments appear to be a phenomenon that will last for a long time. Therefore, integrating LMSs into teaching and learning promises to offer a solution to educate masses who cannot be given individual attention during contact sessions with their lecturers. To meet the demands of increased enrolment, universities have established e-learning approaches to complement face-to-face teaching. Due to the large number of students, the LMSs, such as WebCT, Sakai, Blackboard and Moodle, have been effectively used for providing lectures and avoiding clashes, conducting assessments of students, and processing examination results. These web platforms can carry out other different tasks involved in the learning process. Smit (2012) observes a significant point about LMSs, that they promote quality education and assist faculties with adapting to everyday instruction and learning pressures.

According to Teichler (2013), LMSs often emphasise critical thinking, problem-solving, reading, writing and computer literacy skills. Therefore, universities focus on thinking about more creative ways to improve teaching and learning (Hunter, 2015). LMSs greatly enhance communication between students and lecturers, and between students themselves; affecting both learning and instruction and increasing active engagement. As a result of improved student–lecturer interactions, students' needs are met, everyone is involved in class discussion and not just the outspoken few (Hamann, Pollock, & Wilson, 2012). It was important to explore how Geography students made use of these technologies in online teaching and learning environment. Thus, this study intended to understand students' varied experiences of using Moodle.

2.4 Learning Management Systems (LMSs)

LMSs are a form of specialised software designed to support the management of educational courses for students, particularly by assisting lecturers and students with course administration (Khoza & Mpungose, 2018). The LMSs, which are currently in operation, can often track students' progress. While the primary objective of the systems is believed to be a primary tool for distance education, they are, more recently, also being used to support face-to-face teaching and learning at traditional higher learning institutions. Since

the introduction of these programmes and their subsequent advancement, they have been called by many names, such as; Course Management Systems (CMS), Virtual Learning Environments (VLEs), and Virtual Learning System (VLS). Most popular LMSs, such as Moodle, Blackboard, Sakai and WebCT (among others), are chosen and supported because of their affordability as well as because they offer inimitable teaching experiences beyond traditional 'one-on-one' and 'face-to-face' teaching.

2.4.1 History of Learning Management Systems (LMSs)

This section provides a historical background of popular LMSs. The history of the LMSs in education dates back to 1924, and their adoption has been accelerated by the development of multimedia and the expansion of the internet (Watson & Watson, 2007). The main aim of these learning management systems is to facilitate course arrangements, assessment and grading, web-based or blended delivery of course content, and to manage course processes in asynchronous and synchronous learning environments (Samaka & Impagliazzo, 2013). LMSs have been used in higher education institutions for several reasons, including to accommodate the increased student enrolment levels, and to afford unrestricted distance education and flexible learning times (Hamuy & Galaz, 2010). LMSs provide flexibility to both lecturers and students, allowing them to access course content anywhere and anytime (Berking & Gallagher, 2011).

Programmed Logic for Automatic Teaching Operations (PLATO) - 1960

PLATO was the first computer-assisted instructional system developed at the University of Illinois by Donald L. Bitzer at Urbana-Champaign in the 1960s and 1970s (Jones, 2018). PLATO was designed by the University of Illinois to offer coursework to local universities and schools. The system enabled users to design courses using a range of subjects, such as Latin, Chemistry, Music, and Primary Mathematics. PLATO included features useful for pedagogy, like graphic text, contextual assessment, and feedback designed to respond to alternative answers. This system had a strong following in the computer world, but the producer (owner) found that marketing the system was not as easy as he had hoped. The last production was coincidentally in 2006 just after the death of co-founder William C. Norris. However, the system did not shut down completely (Tsavdaris, Le Deuff, & Batier, 2016).

Andrew Project - 1982

The Andrew project was an Integrated System developed by Carnegie Mellon University (CUM) and IBM in 1982. The objective of this project was to create a platform for the university to easily interact in a computing environment. The Andrew System included a set of computer tools that enabled users to receive and send emails, edit documents, read bulletin boards, and access program files from any machine at a site (Vincent & Segarra, 2010).

EKKO - 1987

The EKKO computer-based conferencing system was developed at NKI Internet College. The first version of EKKO was designed and implemented in 1986. It was an alternative to an on-campus part-time programme through distance education delivery. In 1992, the system was well established. An evaluation of the EKKO project showed that students were satisfied that the system gave them the education they would not have experienced in a physical learning environment (Dalsgaard & Paulsen, 2009; Rekkedal & Qvist-Eriksen, 2004). The system was said to be flexible in the sense that it allowed students to have the freedom to study anytime and follow their progression according to their personal needs combining studies with work, family and social life (Paulsen & Rekkedal, 2001).

Project Athena - 1983

In 1983, Project Athena was started at the Massachusetts Institute of Technology (MIT). The objectives of the project were to develop computer-based learning tools to support multiple educational environments, to encourage the sharing of ideas, coding and data among the MIT community (Chaubey & Bhattacharya, 2015). OpenCourseWare (2007) states that the Project was presented as an initiative to explore innovative computer usage in teaching by MIT.

HyperCourseware - 1990

HyperCourseware was developed by Kent Norman, an American psychologist and an expert on computers, at the University of Maryland in 1990. The goal of developing this system was to host education activities electronically, through electronic learning materials such as e-books, lecture notes, maps, charts, lesson plans, calculators, lectures, discussions, and question and answer documents (Norman, 2017).

WebCTTM - 1996

WebCT is an online proprietary virtual learning environment system that was developed at the University of British Columbia by Murray Goldberg in 1996. Later in 2006, WebCT was owned by Blackboard. It became the first world's popular course management system, and it was used by more than 10 million higher education students in 80 countries. The system is meant to be used by colleges, and other institutions for e-learning. For their WebCT courses, lecturers could use features of this LMS such as live chat, mail systems, discussion board, and content that included downloadable downloadable archives and website pages (Rugg, 2011).

Blackboard -1997

Blackboard is a virtual learning environment and learning management system established in 1997 by two educational advisors; Matthew Pittinsky and Michael Chasen, and provides a web-based server that features course management and allows online learning applications and related services (Jain, 2015). In 2015, the Blackboard company announced a major development to the user interface. In October 2017, Blackboard merged with another company called OER. Today, Blackboard is one of the few popular commercial LMSs used in Washington, D.C, North America, Europe, Africa, Australia and Asia. Presently, Blackboard provides users with a platform for communication (Announcements, Chat, Discussions, mail) and managing course content. Also, students can upload assessments and create e-profiles (Bradford, Porciello, Balkon & Backus, 2007).

Moodle - 1999

Moodle is an open-source software system developed by Martin Dougiamas in 1999 as a PhD research project at Curtin University of Technology (Perth, Western Australia). Open-source software refers to a system that allows users to run the software, modify it, study it, and redistribute resources or material with or without changes free of charge. The first version of Moodle was released in 2002, and within months, it was in full swing and used all over the world. In 2003, the Moodle.com company was launched and since then, has sponsored Moodle development. In 2007, more than 20,000 users registered their active Moodle sites, and by 2011, this number increased to more than 1 million registered users. In 2015, Moodle achieved its greatest milestone and became the world's most used LMS with over 18 million registered users. Moodle has become an education community worldwide mostly in higher education, empowering lecturers and students to access quality learning experiences (Lima, Brito, & Caldeira, 2019).

Desire2Learn - 1999

Desire2Learn, also known as D2L, was founded in 1999. It serves as a Learning Management System (LMS) and content management system (CMS) providing e-learning solutions for colleges, schools, higher education, corporate and associates, healthcare, and government organisations. Desire2Learn provides a platform to manage course work, access resources, deliver media presentations, do assignments and assessments online, and track student progress. According to the Desire2Learn website, there are over 1,100 clients and 13 million students in higher education, schools, government, and corporate sector that use the system (Gunawardena, Frechette, & Layne, 2018).

SakaiTM - 2004

The first development of Sakai was built using a grant offered by the Mellon Foundation in 2004, when Stanford University, Georgia Institute of Technology, Michigan University, Indiana University, Massachusetts Institute of Technology University, and University of Berkeley build a common Courseware Management System. Later in 2012, the Sakai's founders collaborated with Jasig for the development of the system. Since then, there have been major releases almost yearly, and two products have been developed. These are Sakai CLETM and Sakai OAETM. They support educational users to enhance collaborative teaching, learning and research. The main aim of its development is to improve the existing toolset and modernise the design, making it more suitable for mobile users (Severance, 2011).

The discussion above traced the history of LMSs in higher education. Additionally, the discussion revealed that LMSs have been widely used for decades. Moodle, Blackboard and WebCT are currently the most widely used platforms by higher education institutions.

2.5 Moodle as a Learning Management System

Moodle is an open-source platform used to build perfect education solutions for all needs and users (Kasim & Khalid, 2016). Moodle is a learning management system (LMS) that lecturers can use to configure courses with a variety of social and correspondence media (Roy, Giraldo-Garcia, Mathew, Matias, & Bommisetty, 2016). Moodle is free, user friendly, accessible to students anywhere, anytime, and is a flexible virtual learning environment designed to support face-to-face teaching with a wide array of valuable online instruments. Some institutions of higher learning make use of this learning platform to conduct courses

completely online, some use it for a combination of traditional lecturer courses. Moodle was introduced to implement technological inventions in support of online learning (Zakaria & Daud, 2013).

Several authors have extolled the merits of Moodle that make it the LMS of choice (Ng, Yeung, Rivera, & Lee, 2019). The merits include ease of use, easy getting to resources by means of the web; affording collaboration between the students and their lecturers, and fostering cooperation between students. This platform allows students to experience new ideas and different perspective where students access learning independently, it allows lecturers to monitor students' progress, and gives prompt feedback on tasks. In addition, it boasts several features such as automatic backup of courses and detailed grade books (Salhab, 2019). Lecturers can program Moodle modules for selective release and upload a variety of media including photos, documents and links to websites (Flavin & Quintero, 2018). However, Shah and Barkas (2018) emphasise that simply using the platform for learning development is not enough. Therefore, universities need to choose the kind of technology that supports their objectives and purpose.

Learning is a social activity that ought to include support, participation, communication and interaction. Moodle fulfils many of the principles and standards of effective teaching including active learning, interaction and timely feedback (Yengin, Karahoca, Karahoca, & Yücel, 2010). Students can receive assessment and feedback during collaboration, in forums, and on quizzes. Lecturers can use material and access other resources from different places. Moodle supports communication, collaboration and interaction (Luk, Ng, & Lam, 2018). Lecturers can use Moodle to get a sense of community among Geography students.

Lecturers can create a favourable and effective learning environment using Moodle's interaction, communication and collaboration tools. This new learning environment cultivates a feeling of trust and communication and builds up relationships between the lecturers, the content and the students. This advances learning. Moodle allows lecturers to facilitate learning as students learn independently. In other words, lecturers act as facilitators, supporters and aides during the teaching and learning process. This allows students to develop relationships with lecturers and other students face to face and online (Abedi-Lartey, 2016). By using Moodle in a blended classroom, lecturers provide a different kind of learning unique in its values, norms and roles. Students derive a sense of safety since they are familiar with lecturers prior to engaging with them online. A study conducted by Badea, Popescu, Sterbini, and Temperini (2019)

observes that the strengths and benefits of using Moodle are that students feel involved, and their input appreciated. They feel motivated when they get feedback from the lecturer after they have asked questions. Using Moodle for teaching and learning is very productive as it permits students to be accountable for their learning.

In a blended classroom both extroverted and introverted students can feel a sense of belonging. Extroverts will do well in the face-to-face sessions while introverts can experience a newfound sense of community online, where they can partake effectively yet almost anonymously with Moodle's collaboration and communication tools. Extroversion and introversion are the two different personalities that shape how they learn and communicate in a learning environment (Mandel & Dailey, 2017). Introverts are individuals who generally keep their perspectives, sentiments and emotions to themselves, and prefer online interactions (Rose, 2012). Extroverts prefer communicating with others and make their perspectives public as they associate with others (Cain, 2012).

A study conducted at the University of Houston-Victoria (Texas) reported that introverts preferred the online learning approach, and dominated in these courses, while most extroverts participated in a face-face course (Harrington & Loffredo, 2010). This shows that Moodle offers introverts, who are regularly hesitant to talk in face-to-face settings, a convenient space to contribute to the lesson (Blau & Barak, 2012). The use of Moodle, therefore, inspires students to engage in on-going discussions with their peers. This is on the grounds that online discussions enable students to process others' sentiments prior to replying (Al-Dujaily, Kim, & Ryu, 2013). Modern LMSs, such as Moodle, attempt to cater for different personalities as they provide an online-supported learning experience that combines face-to-face learning in the classroom with online learning (Kim, Hong, Bonk, & Lim, 2011).

Similarly, a study conducted at the Resurrection University, Chicago, discovered that learning platforms that combine face-to-face learning with an online component allow students who are reserved an opportunity to communicate their perspectives online (Muglia & Murphey 2017) by means of text-based conversations. For students who were normally too timid to even consider engaging in face-to-face discussion, online support helps by offering an alternative method for articulation using textual conversation. The study also reported that students who were afraid to express their opinions in a face-to-

face setting, especially if they were unsure about their views and suggestions, preferred online social interactions at their convenience.

Moodle can be used by lecturers to create a conducive learning environment characterised by communication, collaboration, and interaction (Tretinjak, 2018). Students can communicate with lecturers and with each other using synchronous and asynchronous communication tools like chats, forums and email (Murat, Zingaro, Brett, & Hewitt, 2013). Students can cooperate with others to create content using wikis and blogs, gathering information and sharing it in an aggregate way (Bronack et al., 2008; Richardson, 2010). Moreover, students can interrelate with course content using Moodle's visual, auditory and kinaesthetic content capabilities. Overall, students can learn in a lively environment that encourages them to communicate with others and learn independently. Special attention should be paid to developing a sense of community within the participants, for the learning process to be successful (Phirangee, 2016).

Research studies have reported that people in communities have a sense of belonging, which helps them to succeed (Brook & Oliver, 2003; Goldsworthy & Rankine, 2010). Moodle was designed around the concept of community, and its design is directed by a particular philosophy of learning known as social constructivist pedagogy, which asserts that learning is social (Shackelford & Maxwell, 2012b). Effective learning should be community-centred, learner-centred, knowledge-centred, and assessment centred (Arends, 2014). Lecturers need to establish a supportive environment so that students feel comfortable and secure to express their ideas in a collaborative context, and to present themselves as real and functional human beings (Anderson & Corbett, 2012). Overall, researchers suggest that lecturers can use Moodle's tools to achieve the principle of learning and create a sense of community (Elias, 2010).

Lecturers can use Moodle to create reading and writing activities, as well as discussions on a variety of topics. Instructions can be text-based, audio, or visual. Students can use synchronous and asynchronous communication tools like chat, forum, and email, to communicate (Hsiao, 2012). Lecturers can use forum discussions to help customise and improve the course. The course designer can include links to course-related sites and use different activities. Conde, Aguilar, de Dios, and Peñalvo (2010) suggest that lecturers who use a variety of learning material contribute to an increase in students' confidence and motivation to study, their intensity of learning, and their depth of knowledge and understanding. Interaction, assessment and feedback are important aspects of learning (Cleveland-Innes & Campbell, 2012).

Research further supports the use of LMSs platform for collaborative learning (Chewe & Chitumbo, 2012). The use of advanced LMSs platforms, like Moodle, encourages more students to interact with others in asynchronous and synchronous communication contexts, and interact with course content through activities and quizzes that also provide direct feedback. Synchronous e-learning defeats the barrier of time, space and distance, that constrain collaborative activities between lecturers and students within the physical classroom environment. Asynchronous e-learning students study at their convenience and do not require simultaneous participation of instructors and learners (Moallem, 2015).

Synchronous e-learning students and lecturers participate in lessons simultaneously and their interactions happen in real-time (Overbaugh & Nickel, 2011). Synchronous e-learning is facilitated by media such as video conferencing, teleconferencing and online chat programs (Oztok, Zingaro, Brett, & Hewtt, 2013). Asynchronous e-learning is facilitated by media like email, online discussion groups or forums, and bulletin boards. Where Moodle is used, students can log onto the platform at their convenience, download course materials, and read and send messages to their lecturers and fellow learners (Mtebe, 2015). Lecturers can develop assessments and assignments with immediate feedback, and set up social activities. Students can interact with course content and activities with the instructor through forums and email; and with other students through forums, wikis and chats. Overall, lecturers can use Moodle to teach, reach different types of students, and create a community of learning.

The debate about the integration of Moodle in higher education seems to continue. Essel and Wilson (2017) assert that, although students and lecturers use Moodle as an alternative to teaching and learning in a traditional classroom, more research is needed on its effectiveness in enhancing and supporting student learning. Similarly, Daniel (2019) emphasises that, despite the benefits that Moodle provides, students and lecturers may still be facing challenges using it. The discussion has been on Moodle as a Learning Management System.

2.6 Learning Management Systems (LMSs) and Higher education

Studies conducted by Chung and Ackerman (2015), Gomez (2015), Outlaw (2014) and others, argue that the higher education sector is experiencing rapid changes, as are other sectors of the world. These changes in education coincide with an increase in learning with technology in higher education, supported by the rising use of online-based learning platforms (Shemahonge & Mtebe, 2018). Consequently, universities

have been quick to adopt learning management systems as part of the teaching and learning process (Mpungose, 2018). In addition to the above, Yam and Peter (2012), as well as Ostashewski, Martin, and Brennan (2015) share the belief that these LMS web-based education platforms have contributed to raising standards in the higher education system in the past few years, as they are encouraged by the fact that students and lecturers are not limited by their geographic location. LMSs offer lecturers an exceptional teaching experience beyond traditional pedagogy, to help both lecturers and students to decide if they have to be physically present at the same location during the teaching and learning process (Ngubane-Mokiwa, 2017).

Bhartu and Yusuf (2016) state that the benefits of LMSs include flexibility, accessibility, cost-effectiveness, ease of tracking, collaboration and interactivity. Mbatha (2014) emphasises that LMSs benefits for students are flexibility, easy access to resources and the convenience of electronic communication with lecturers. Additionally, LMSs result in the decrease in the cost of storing and transmitting information electronically, enhancement of computer and internet skills, and participation and social presence for students (Gitau, 2016). The following authors Letseka, and Pitsoe (2018), as well as Milman, Posey, Pintz, Wright, and Zhou (2015), observe that higher institutions are facing an overcrowding problem. The use of these LMSs can help resolve this issue by providing students with the course materials and other resources for individual learning (Dell & Hakeem, 2012). Consequently, universities employ these LMSs to mediate teaching and learning, and there is need for their adoption by higher education institutions worldwide (Baloyi, 2014).

2.7 Use of LMSs in education-International perspective

This section provides a succinct overview of the use LMSs in higher education in a few countries.

2.7.1 Germany

A study conducted by Bond, Marín, Dolch, Bedenlier, and Zawacki-Richter (2018) indicated that approximately 99% of students have internet access at home, and are well equipped with digital devices, in Germany. The study highlighted that; firstly, German HE Students owned five different digital devices on average, whilst one third owned more than six devices. Within a period of 3 years (2012 to 2015), the possession of smartphones increased from 56% to 91%, which highlights the trend towards using mobile digital devices. Secondly, students reported easy communication and active participation with lecturers when using LMSs. Thirdly, students found online learning with digital learning tools very useful in terms of getting online material in the form of PowerPoint, online exercises and e-books.

2.7.2 Norway

In Norway, online technologies have dominated higher education for many years (Hustad & Arntzen, 2013). However, in a study by Shahmoradi et al. (2018), it was revealed that, although frequent use of the technology was high in Norway, challenges existed during the implementation of these systems. About half of the students (40%) interviewed had a problem accessing the technology, and 38% of them stated that they had skills challenges in areas that included the use of e-learning tools, and the ability to use audio and video tools for online chat. In this regard, the participants believed that previous technological experiences contributed to the success of e-learning.

2.7.3 Russia

Yanuschik, Pakhomova, and Batbold's (2015) study in Russia focused on the use of E-learning as a way to improve the quality of education for international students. The findings showed that e-learning cannot replace face-to-face teaching between a lecturer and a student. For example, face-to-face lectures were especially important for students who studied mathematics in a non-native language. Personal attendance at lectures did not mean better understanding of subject material by such students, but they also needed extra language practice. The students involved in web-assisted instruction showed better results when compared to the average (by almost 12%). The latter results show that web-assisted instruction was effective in improving the quality of education for international students.

2.7.4 UK

At a UK university, Kirkwood and Price (2014) studied the implementation of technology and the effect it had on teaching and learning in higher education. The research findings were that there was no conclusive evidence to prove that technology improved or hindered learning, and consequently student results. Nonetheless, over the years there has been an increase in the adoption of LMSs in higher education Institutions of the UK.

2.7.5 Australia

A study by Zanjani's (2015) findings concur with those of a study by Hutchison and Colwell (2012) who studied the success factors related to engaging higher education students and staff with e-learning tools

within LMSs in an Australian university. The research found that Blackboard LMS was mostly used as an online repository for teaching resources. However, findings revealed that Blackboard was used mainly for a content delivery mechanism and not its full potential.

2.7.6 Spain

María, Pérez-López, and Rodríguez-Ariza (2013) researched an instance at the University of Granada where blended learning was introduced and then student responses to the interview questions were recorded. Here again, the outcomes reiterated that a blended approach was not conclusively more beneficial. Although some students saw the benefits and were motivated and satisfied; more than half still preferred the face-to-face sessions.

2.8 Use of LMSs in the African higher education

There has been increasing adoption of various LMSs in higher education in Africa. However, the adoption of these systems may be of waste if they cannot help students to improve learning, maybe because they are not used, either at all or to their full potential (Joo, Lim, & Lim, 2014). The empirical studies conducted in Africa have also recognised these LMS adoption patterns. Ssekakubo, Suleman, and Marsden (2011) found that 5 of the surveyed higher institutions in Africa had mostly installed Moodle and Sakai as their LMSs. Likewise, Mtebe and Raisamo's (2014) findings were that 50% of surveyed institutions had installed the LMSs while Conway et al.'s (2011) findings indicated that 80% of surveyed institutions in Tanzania were using Moodle (LMS). Sarah and Butcher (2012) found that seven institutions that participated in the Partnership for Higher Education in Africa (PHEA) project had installed various types of LMSs.

Other studies have also shown that several institutions have installed various LMS in countries such as Sudan (Elmahadi & Osman, 2013), Ghana (Edumadze & Owusu, 2013), Uganda (Mayoka & Kyeyune 2012), Tanzania (Bervell & Umar, 2017), and Egypt (El-Batanouny, Elkhayat, and Elsheikh, 2018). Despite the growing implementation of these LMSs, authors such Mwalumbwe and Mtebe (2017) as well as Hastie, Hung, Chen, and Kinshuk (2010) have reported that the usage is low across many institutions in sub-Saharan Africa. Various installed systems consist of inactive users and/ or users who use relatively few features. For instance, in Uganda, Makerere University only 60 active users in the LMS installed Mayoka and Kyeyune (2012). Whereas, there was less than 10 LMSs users at the University of Nairobi (Ssekakubo

et al., 2011). Mtebe and Raisamo (2014) indicated that there were 103 users at University of Dodoma in Tanzania, 15 000 active users at the University of Dar es Salaam, and more than 400 courses and 49 users at the Institute of Financial Management. The findings of these studies depict a situation similar to that of several institutions in Zambia, Zimbabwe, Mozambique, and Sudan. For instance, only 20% of trained users were using LMS at National University of Science and Technology of Zimbabwe (Dube & Scott, 2014).

Further studies confirm the same situation of low LMS usage at Maseno University in Kenya, Mondlane University in Mozambique (Unwin et al., 2010), University of Zambia (Ssekakubo et al., 2011), and in four leading universities in Zimbabwe (Machika & Dolley, 2018; Munyoro & Mutula, 2018). Despite the variety of features and tools embedded in LMSs, findings indicated that users only used LMSs primarily as content repository, and many of them used a relatively small number of the features (Lwoga, 2012). According to Kissaka, Kondoro, Mtebe, and Kibga (2015), communication tools in LMS, such as discussion boards, chat rooms, and e-mail are utilised at their lowest potential in the majority of institutions in Africa. For instance, only 8% of users used the communication tools of LMS at Open University of Tanzania in Dar es Salaam campus (Chatama, 2014).

It was also found that only 96% of students used LMS at the University of South Africa, and only 13% effectively contributed to discussions (Venter et al., 2012). Moreover, an LMS has tools with the capability of presenting the learning materials in various multimedia forms, such as audio, video and animations. Many studies have shown that these tools are underutilised by lecturers and students (Mwakisole, Kissaka, & Mtebe, 2018). This finding may be because the majority of lecturers at the National University of Science and Technology of Zimbabwe have been using LMS tools for delivering course content only (Dube & Scott, 2014). Lecturers upload electronic learning material for students to download.

Despite technological developments and benefits, many higher education institutions in Africa were not taking full advantage of LMSs, and that has been a major setback against their success (Filippidi, Tselios, & Komis, 2010; Jo, Kim, & Yoon, 2014). Generally, the failure of LMSs usage starts when the new system is implemented but immediately the users decline or abandon the system. In many institutions in sub-Saharan Africa, users normally do not use the LMS after they have been trained. This is significant, given the fact that after 10,000 users were trained to use the LMS at the National University of Science and Technology of Zimbabwe, only 20% continued to use it. Clearly, this situation resonates with many other

institutions in the region. The low use of LMSs in higher education institutions in sub-Saharan Africa is an important indication that the anticipated benefits of the LMSs may not be realised.

Studies have pointed out some issues such as poor internet connectivity, inadequate technical support, lack of technological infrastructure, inadequate ICT skills, negative attitude towards the use of LMSs, and high costs of technology, as limiting factors to the use of these systems in sub-Saharan Africa (Mgeni, Ismail, Yunus, & Haji, 2018; Mlitwa & Van Belle, 2011). A study conducted by Unwin et al. (2010), based on a survey of 358 respondents from 25 African countries, found that many respondents (74%) indicated that lack of training and technical support hindered them from making full utilisation of LMS features. Similarly, a study from Zimbabwe National University of Science and Technology showed that the majority of respondents indicated (77,3%) indicated that the lack of training hindered them from using Sakai LMS.

A study at the Open University of Tanzania found that 50% of the respondents indicated lack of training, and in Zimbabwe, 76% of respondents in a survey conducted in four universities cited lack of training as the main issue behind the low usage of Moodle LMS. These studies corroborate with a study from University of Botswana, conducted by Uziak, Oladiran, Lorencowicz, and Becker (2018), which indicated that students were hindered from using Blackboard LMS effectively because of the lack of support, network failures, internet breakdowns, as well as power failures and interruptions. The need to ensure that students and lecturers make use of these LMSs in teaching and learning is extremely important so that anticipated benefits are attained.

2.9 Use of LMSs in education- South African perspective

Despite the growing demand for LMSs in South Africa, it is underutilised in higher education. There are many reasons why students respond or do not respond to the use of technology in higher education learning. Many studies have been carried out in relation to the challenges of students and lecturers' use or non-use of LMSs in different universities. The challenges regarding LMS adoption in South African institutions of Higher Education vary based on the lecturers' and students' willingness and ability to engage with LMSs in the teaching and learning process.

Bagarukayo and Kalema's (2015) evaluation of e-learning usage at a tertiary institution in South Africa made the following conclusions; that many students came from dysfunctional schools where they lacked exposure to technology, that they had no personal computers, that they typed slowly, and were second-language speakers who struggled to write academically in English. Bharuthram and Kies (2013) found similar challenges in implementing technology at tertiary institutions. They highlight the importance of students' support and lecturers' need for training and continuous professional development in using technology successfully in their teaching. They also emphasise the need for in-depth research to overcome the problems of using technology in South African higher education. These problems are firstly at the implementation level requiring Wi-Fi and electricity. Secondly, the lecturers and students need training and technological support before the pedagogical evolution where student centred strategies are implemented in a blended approach.

Czerniewicz and Brown (2010) published a study involving 3522 students who related their use of ICT in six tertiary environments across five South African provinces. The results confirmed that the implementation of technology in teaching and learning was poor, despite the increasing developments in new technologies. ICT integration in higher education courses was not embraced, and students displayed low levels of interaction with technologies. Surprisingly, the study also revealed that students were less likely to engage with social software, but frequently used instant messaging and web searching.

The University of South Africa (UNISA) has over 200 000 active students on *myUnisa* platform, which uses the Open Source Software (OSS) Sakai platform, designed to be used for administration of the course and tuition related interaction. The findings of the study indicate that 96% of students accessed the system, 13% were active users participating in discussions, 63% were frequent users, 23% were occasional users, and 10% were infrequent users. The findings indicate the LMSs platform were not fully utilised to its potential. There is need to increase student engagement to improve learning (Venter et al., 2012).

Mlitwa and Van Belle (2011) carried out a study at the University of Cape Town (UCT). The institution implemented WebCT and Moodle as their LMSs, customised by Sakai in 2006, and used by 25 000 students and lecturers. This LMS supported teaching by distributing teaching material and announcements. According to the findings of the study, Science lecturers lagged behind because they were unwilling to use the system in their teaching. System usage was not promoted or supported, the computers were in poor

condition, there were no relevant software programs, and no helpful lab assistants. Another study was conducted by Mlitwa (2017) at the University of Zululand, using Moodle LMSs as an e-learning solution. The author wanted to find out whether the technology was accepted as an educational tool at the institution. The study findings revealed that the institution was committed to offer mobile connectivity in order to use technology for teaching and learning. However, basic ICT access remained a challenge for students. As a result, the institution was hardly anywhere in terms of the full implementation of technology into the curricula.

The University of Kwa Zul-Natal (UKZN) faces challenges of increased enrolments together with a limited number of staff. In order to improve the quality of education for courses offered at UKZN, the university opted to use an open source LMS Moodle because of its functionalities. Lecturers use the platform to upload notes and assignments; for file sharing, collaboration and communication, for discussion forums and other interactive activities (Sibanda & Donnelly, 2014). The latter authors revealed that there was a low usage of Moodle by UKZN students because there was no support given to them. Therefore, students were reluctant to make use of Moodle because they were not trained on using it.

In line with the above studies, Czerniewicz and Brown (2014) conducted a study at Walter Sisulu University (WSU) and reported low LMS usage. In their finding, the study noted that first-year students had no exposure to ICT because they came from disadvantaged backgrounds, and entered the university with limited computer knowledge. The study also noted that first-timers and experienced lecturers tended to use traditional teaching methodologies, and this could be because of their historical background with ICT. In order to transform their pedagogy, lecturers need to be provided with training to enhance their computer skills, and technical knowledge on how to use ICT. In as much as there is evidence that LMS can bring transformation to education, there has been a low usage of it as mentioned in the above studies.

2.10 Benefits of using Moodle as an LMS in Higher Education

In this section, I focus on and discuss the benefits of the learning management system Moodle on student learning in higher education. Due to the developments and complexities of educational technologies in higher education, learning can be facilitated via a variety of learning management systems such as Moodle. A number of studies (Cerezo, Sánchez-Santillán, Paule-Ruiz, & Núñez, 2016; Rhode, Richter, Gowen,

Miller, & Wills, 2017) have shared their experiences on the use of LMSs in Web-Based teaching and learning.

Ssekakubo, Suleman, and Marsden (2012) argue that LMSs have impacted education by allowing lecturers to use new methods and tools for teaching and learning, and managing courses effectively. Students are given the opportunity to be involved in active, independent and collaborative models of learning. In the same way, Siang and Santoso (2015) state that the use of Moodle offers great flexibility when issues of time and place are taken into consideration. Every student has the luxury of choosing the place and time that suits him/her for studying. Crawford-Ferre and Wiest (2012) argue that, for students to reap the benefits of the flexibility of time and distance, they must have adequate access to the internet, from other places other than campus. Mbatha and Manana (2012) note that such access varies with socioeconomic status. They add that internet access may be an issue for low- income students and those from rural areas where low -speed internet prevents them to adequately access learning sites.

Albidewi and Tulb (2014) conducted a critical review of existing literature on virtual learning environments and found that virtual learning environments offered a variety of benefits over traditional teaching environments. Such as the convenience of accessing course material at any time, lower costs, access to current learning materials, increased retention of knowledge, and elimination of geographical boundaries. In another study, Padayachee (2013) conducted a study on the factors that influenced Virtual Learning Systems (VLSs) at UKZN. The study discussed factors affecting the adoption of Virtual Management Systems (VLMs) and included a comprehensive section on online learning and virtual learning environments. Padayachee (2013) identified several advantages associated with virtual learning systems. Padayachee (2013) found that universities which have integrated VLMSs expand the time, place, and pace of education; and enable learning to be more individualised and emphasise interaction and collaboration between students and lecturers. This confirms Albidewi and Tulb's (2014) claim about key advantages of virtual university environments emanating from Learning Management Systems.

Gooley and Lockwood (2012) studied existing literature within the online distance education in an attempt to explore the developments of distance learning technologies. They suggest that the role of the student will change from an inactive student to a dynamic participant in the learning process. They also imply that the role of the lecturers will change from the distributor of knowledge to the sharer of understandings and

intellectual breakthroughs. This means that students may gain more independent learning skills by becoming more active participants in their own learning processes. This is a key advantage that online learning has over traditional learning environments.

Other advantages that Albidewi and Tulb (2014) identified are that LMSs suit the needs of all students and accommodate both full-time and part-time students, as well as students who have prior knowledge. They permit students to learn at their own pace, meaning that fast students are no longer constrained by the needs of the slower and inexperienced students who often control the pace of learning at a traditional university. This suggests that LMSs potentially provide for the needs of all types of students, without affecting their learning abilities.

Integrating LMSs in classroom teaching and learning does, not only improve the quality of interaction and communication between lecturers and students, but also allows them to exchange ideas, and access teaching and learning materials of modules in a secure environment (Nandi, Hamilton, Chang, & Balbo, 2012). With the integration of these platforms, teaching and learning can take a new shape. In addition, LMSs allow students the ability to assess their learning. Students enhance their educational experiences, interact through collaborative learning, embrace cultural diversity and globalization, leading to the eradication of boundaries of place and time (Carvalho, Areal, & Silva, 2011). LMSs enhance the efficacy of accessing knowledge. This is also supported by Arkorful and Abaidoo (2015) who stated that LMSs improve educational instruction and offer access to massive information irrespective of gender, ethnic origins, race, age and location of the user.

Aucamp and Swart (2015) say the advantage of LMSs is the provision of opportunities for relations between students through discussion forums. The LMSs help eliminate barriers that have the potential of hampering participation through fear of talking to other learners. They further state that learning management systems motivate students to interact with others, as well as exchange and respect different points of view. LMSs also provide prospects for interactivity between students and teachers during content delivery.

According to Dutta, Roy and Seetharaman (2013) LMSs promote student cognitive growth in knowledge of computers and skills. Learning online has a great potential for the construction of knowledge A point is

raised by Keengwe and Georgina (2013), that the integration of technology in education can meet the needs of the millennials, which is the generation currently attending universities. They describe this generation as one that constructs their own learning content, and are willing to work with others, and gain knowledge and skills of information technologies. At the same time, they are vigilant about their understanding and use of technology.

Lopes (2014) describes the LMSs environment as one that inspires students to depend on themselves, as lecturers are no longer the sole source of knowledge. They, instead, become advisors and guides. This suggests that students become responsible for their own learning. Kušen and Hoic-Bozic (2012) claim that LMSs prepare society to globally communicate and dialogue with each other. According to Shylesh (2016), the likely benefits of these learning management systems are greater compared to the benefits of traditional learning, if learning management systems are used and applied in proper ways. Authors such as Horvat, Dobrota, Krsmanovic, and Cudanov (2015) observe the positive effects of LMSs from the perspectives of students. They say LMSs permit exploration and flexibility, and reduce the need to travel to classes. Therefore, incorporating LMSs in teaching and learning of Geography can make learning more accessible and more achievable to the students.

Damnjanovic, Jednak, and Mijatovic (2015) maintain that teaching and learning becomes flexible when using technological tools such as internet and other e-learning tools. These offer lecturers numerous ways of interacting with students and giving them immediate feedback. According to Caputi and Garrido (2015), it is essential for those who embrace the advanced technology during the process of teaching and learning, to have a variety of skills in Information and Communication Technology (ICT). A study conducted by Ogunnowo (2016) suggests other advantages and benefits of e-learning. For instance, E-learning systems allow better communication between students and lecturers because higher education institutions are facing growing enrolments and greater demands for online courses. According to Graham, Woodfield, and Harrison (2013), when institutions plan to put traditional courses online, it is necessary to put LMSs in place in order to organise content, courses, sections, faculty, student and grades. They further state that LMSs also supply tools for providing multimedia content and assignments, as well as supporting interaction like discussion groups, chat sessions and online quizzes and examinations. Based on the work of Picciano, Dziuban and Graham (2013), blended learning is more effective as it increases the level of active learning strategies, peer -to -peer learning strategies and learner centred strategies.

According to Cheawjindakarn, Suwannatthachote and Theeraroungchaisri (2013), as cited in Spring, Graham and Hadlock (2016), lecturers in higher education incorporate LMSs to help students obtain technical information, and then use face-to-face class time to focus on application case studies and develop decision-making skills. The findings from Zhang and Kenny's (2010) study in Canada on LMSs integration in the classroom reveal that learning online provides great benefits to students. Students can work together in a course; increase their involvement due to plenty of time for reading, writing and posting discussions; and promote critical thinking and cooperative learning (Zhang & Kenny, 2010).

Another study was conducted at a USA- based university to explore the types of student-student interactions in online graduate courses. It was found that online courses provided educational experiences to students that were not previously known (Shackelford & Maxwell, 2012a). The online learning environment facilitated collaborative group projects, sharing of personal experiences, whole-class discussions, and exchange of learning resources. The lectures also benefited greatly in the sharing of the resources. The findings recommended interaction between students and their lecturers, not only among students themselves. Meishar-Tal, Kurtz and Pieterse (2012) posit that integrating LMSs into teaching and learning is a great way of bringing education to people at home, workplace or communities; for those who cannot attend due to some economic and cultural barriers. This suggests that integrating LMSs in the teaching and learning of Geography eliminates access restrictions to education imposed by geographical location and timetable conflicts. What is substantial in these arguments is the emphasis on the benefits of LMSs in higher education. The next section focuses on the challenges of LMSs in higher education.

2.11 Challenges of learning management systems in higher education

Despite the above-mentioned benefits of LMSs in higher education, many universities have not adopted them fully in their teaching (Aljaloud, 2012). Kitsantas and Dabbagh (2011); Mohamed and Peerbhay (2012); Swart (2015) revealed that computer efficiency and internet usage were at the lower level and that there was a little confidence in using LMSs by both students and lecturers. The integration of LMSs in teaching and learning requires lecturers and students to undertake training on new technology (Ryan, Scott, Freeman, & Patel, 2013). These authors note that trained lecturers can apply strategic skills that can effectively assist students to engage in an online environment. Students who had their lecturers gone through professional development perform well and have fewer chances of dropping out of the course (AbuZayyad-Nuseibeh, 2017).

A critical appraisal of the use of, and attitude towards, LMSs in Saudi Arabian universities was done by Alghamdi & Bayaga (2016) in which the authors revealed major disadvantages associated with the use of LMSs in the learning environment. The review highlighted the shortcomings associated with LMSs for learning and teaching. These shortcomings include computer hardware malfunctions and difficulties in setting up software to provide access to LMSs. Other shortcomings included slow network, which frustrated both the lecturers and students (Wardoyo & Mahmud, 2013). Cavus and Alhih (2014) advises that the latter shortcoming should be taken into consideration when setting up an LMS.

Cost is another contributing barrier likely to affect the effectiveness of online learning. Cavus and Alhih (2014) argue that the effective use of LMSs comes at a cost. These costs are linked to training and technical support. Although Cavus and Alhih (2014) identify the cost of training as a potential problem, the authors do not consider the implications to students and lecturers. When the university funds are limited, the virtual learning environment is also limited. This suggests that the cost factor could cause serious problems to both lecturers and students in their teaching and learning. Moreover, Alghamdi and Bayaga (2016) list several challenges of integrating LMSs in teaching and learning, amongst other is lack of sufficient resources such as sufficient LANs, students' lack of computer skills, limited resources to train lecturers and students in higher education.

Many students come from disadvantaged backgrounds. The schools they graduated from are poorly equipped with learning resources such as computers and libraries. Also, computers and the internet are not accessible in their home setting because of socio-economic statuses (Letseka et al., 2018). The latter students should be supported to embrace new technology (Drange, Sutherland, & Irons, 2015). Scaffolding needs to be provided for the student in the beginning stages of adopting LMSs (Tiantong & Teemuangsai, 2013). Zhang and Kenny (2010) explored students' experiences in an online masters programme in a university in Canada. Findings revealed that students' previous education, especially language proficiency, had a strong impact on their online learning. Non-English speakers needed more time to understand readings and to make postings themselves. This resulted in students being frustrated and not wanting to participate in their learning. Siddiquah and Salim (2017) suggest that this can be solved by making ICT courses compulsory at junior schools so that students get to learn the ICT tools at an early stage. By the time they reach tertiary level, they will be technologically sound. This can be done by the Government making a concerted effort to incorporate ICT into the curriculum.

Moreillon (2015) adds that a lack of personal desire to exploit the full potential of e-learning is also a challenge in the use of LMS. Resistance to change due to the fear of, or unwillingness to take, calculated risks is a challenge to adopting new technology. The fear and unwillingness can be attributed to ignorance of the advantages provided by LMS (Chaubey & Bhattacharya, 2015). According to Asunka (2012), the introduction of LMSs in any institution needs to be a concerted effort from all other stakeholders involved. This includes management, the board of directors, policymakers, administrative personnel, and lecturers and students. He further states that, in order for policies to be successful and effective, management must provide a conducive environment for lecturers as well as others involved. Asiri, Mahmud, Bakar and Ayub, (2012) reveal that faculty members' behaviour and acceptance of technology, play a key role in the optimal operation of Learning Management Systems (LMSs) in higher education. Their level of acceptance of such a system would lead to an increase in usage and encourage students to use LMSs in their modules.

A study by Gumbo (2016) indicates that LMSs face technical and practical challenges during teaching and learning online. The study further indicates that LMSs depend on the availability of electricity and internet availability. Another study was conducted by Islam and Ferdowsi (2014) at Bangladesh University, exploring students' experiences of online distance learning to see if students' needs were met. The findings of this study revealed students' dissatisfaction with access and availability to quality resource materials, and lack of support from their tutors. Zhang and Kenny (2010) posit that the challenges of digital spaces and e-learning systems may have a negative impact on students' learning as they may feel frustrated due to many postings than they can handle, and when they do not receive rapid responses to their posting or are confronted with information overload. The challenge of digital spaces may result in students being demotivated with regard to learning online, especially when adequate training is not provided. This shows that the integration of LMSs in Geography teaching and learning is a good idea, only if it is done with proper planning and training of students.

A study conducted by Fichten et al. (2012) explored how well the information and communication technologies related needs of students with different disabilities were met on campus at institutions of higher education. The findings revealed that students experienced problems downloading and opening files, with webpages that would not load, and professors who used LMSs in ineffective ways like failing to put material onto the course website on time, having no guidelines to documents posted, as well as posting incomplete course notes and in-class PowerPoint presentations.

Students can develop computer visual syndrome from using a computer for long hours. A study by Oliveira (2012) at Andrews University reported that students gave a reason for not buying the electronic version of the textbook because it caused eyestrain was unreliable, and it expired. A finding from the study by Wang and Bai (2016) was that students showed a strong preference for printed books. They did not like to read textbooks on the screen because of eye strain. The preceding section revealed that LMSs have both benefits and challenges in the teaching and learning of Geography in higher education.

2.12 Students' experiences of using Learning Management Systems

Blackmon and Major (2012) and Kigundu (2014) note the importance of understanding students' experiences with online learning environment. They posit that several studies have examined and discussed the use of Moodle in online learning. However, these studies have focused on the course content and lecturers' experiences, while neglecting the experiences of the students. The emphasis by the authors is that, increasing research on students' experiences with online learning could benefit the field of higher education in a number of ways. Data about students' experiences could provide information to help institutions to deliver better courses, which could help to improve learning in these courses. Secondly, data could also assist institutions to determine what challenges students face with online learning. Thus, more studies are being conducted with an attempt to learn from students' perspectives what their experiences with online learning are. This study aims to contribute to research that seeks to understand what students think about online learning, what would make them successful in online learning, and what challenges they face.

The students' experiences reported in this section are based on studies that have explored students' experiences of learning environments where face-to-face teaching is complemented by online teaching within higher education. In one case study, researchers worked with a course team at Oxford Brookes University's School of Health and Social Care to redesign a first-year module on inter-professional learning, that incorporated an online component alongside seminar group work. Course materials were made available, and moderated discussion areas provided for each group working on a collaborative group project. One of the recommendations made by this study was that students needed to manage their time better. This because they were of the view that learning online is time consuming because they struggled to regulate how much time they should spend on the course given that the material is available even on weekends and holidays.

Findings from a study done by Van Tonder (2015) on student experiences on using LMS confirm the benefit of using LMS and its flexibility. Students indicated that they did not need to spend hours in a classroom and to be on the campus all the time. Learners experienced the effect of learning with technology while working. Part-time students who are employed and studying expressed the benefits of improved computer skills and more resourcefulness in their work, and ability to work independently. Another study was conducted by Shackelford and Maxwell (2012b) at a university in the USA, to explore the types of student-student interactions in online graduate courses. The findings showed that students valued online interaction as it involved group collaboration, sharing of personal experiences, class discussion, and exchange of learning materials and resources. The findings indicate that students had positive experiences with regard to interaction among students and also between students and their lecturers. This tallies very well with the Activity Theory and constructivism, which promote student-lecturer and student-student interaction, where students have the ability to share views and knowledge with classmates and their lecturers.

A study by Paechter, Maier and Macher (2010) on students' experiences revealed that students valued interaction or discussion through LMSs (Moodle) than face-face interactions. Time available to devote to the course is regarded as one of the factors around students' experiences with regards to online learning. In a study by Valentine, Devi, Prema, and Kishor (2019), which examined the experiences of students using LMSs in Malaysia, 57 students were examined from three different professional development courses using questionnaires, discussion group postings and interviews. In the analysis of the discussion postings, most students reported time as the greatest concern to students at the beginning of the courses. Through the interviews, the latter authors examined how students dealt with time management at an early stage in their programme and went on to develop a range of different time management strategies. Poon (2013) also explored what time might be needed for using data from a discussion forum, and 45 students were asked to reflect on their experiences of using online professional development courses at the Nottingham Trent University. All participants mentioned time as a major concern, and that included physical writing time, time lag, the time needed to reflect on posts, within their busy schedules.

Students need to develop strategies for using their time more effectively in blended courses. In order to engage effectively in online work, particularly group discussions; students need to login regularly and this demands a change to their usual study patterns. In the blended context, Paechter and Maier (2010) report that “students became aware that the online seminars required them to get organized and to think extensively about the discussion on-and-off over a week, rather than making a one-off contribution over a short period

of time in a face-to-face session” (p.320). The other side of the blend is using on-campus time differently. Surjono, Muhtadi, and Wahyuningsih (2017) found that students on blended courses gave examples of how they were using their on-campus time more effectively, particularly emphasising using the time to meet in small groups with other students and using the 20 minutes before lectures to check for course announcements and emails. The second finding was that students lacked confidence and expertise in the e-learning platform.

Cleveland-Innes and Campbell (2012) studied the students' experiences towards using their most prevalent emotions associated with online studying. The responses from the study indicated that students had negative and positive experiences towards using Moodle as an LMS. They experienced frustration with learning online trying to fit study into life, trying to navigate online resources, from rambling online discussions, or materials being outdated. It seems that what caused the frustration for each individual was less important than the fact that it was experienced by every student at some stage. For some, it caused them to question whether or not to continue with the course. The results also indicated that students with a better understanding of computer and internet skills viewed the learning environment as one supportive of their learning.

Czerkowski and Gonzales (2014) posit that lecturers often have to check that students have sufficient technical skills to engage with the online course. The authors present the same findings on a study on student experiences in an Information Systems module in a blended course at the University of Sheffield. Findings revealed that students were reporting concerns about posting comments online which the course team had not well-thought-out. As Masters' students in Information Systems, they were supposed to be able to cope with ICT. Nevertheless, general technical ability is not the same as the ability to learn online. A study conducted Zhang and Kenny (2010) at the University of Canada to explore experiences of masters students on an online programme findings reported that students had challenges in making postings themselves because of the language barrier. The study also reports that students experienced problems of student support, quality tutors, and access to resources, to the extent that they avoided socialising in a course. This is an indication that Canada students had negative experiences about LMSs.

Mafuna and Wadesango (2012) opine that social and emotional barriers are greatest to some students interacting in an online paradigm. Participants had not realised the extent to which they would be asked to publicly expose their views, which left them uncomfortable. E-learning promotes interaction within a social

constructivism environment. Constructivism allows students to collaborate and interact with their peers, as well as their lecturers, in the learning process (Chan, 2010). Interestingly, Hodgson, McConnell, and Dirckinck-Holmfeld (2012) share the same viewpoint, that e-learning environments activities are designed around principles of social constructivism, which require students to create their own meaning from a variety of different views and ideas.

Students should be engaged in activities that focus on real-world, authentic tasks and require collaboration with peers (Qureshi, Shah, & Zaka, 2014). In case studies on courses based on notions of collaboration and peer learning, some report difficulty in moving students beyond interactions for socialisation and information sharing (Khatri, Chouskey & Singh, 2013) or with engaging students in productive peer feedback (Terras & Ramsay, 2012). Other studies reported that students were managing successfully and were starting to offer guidance for lecturers around their role as facilitators (Otero, Petch & Catapan, 2015) and the assessment of collaborative tasks (Simpson, 2016). Emphasis is on students' different personalities and how lecturers should utilise instructional strategies in order to ensure successful online participation.

Some students are sceptical to participate in online discussions because of fear of public communication and unfamiliarity with the person they communicate with. A study carried out by Keller and Karau (2013) involving 12 students who participated in a blended course involving face-to-face and board discussion, highlighted contradictions familiar to anyone experienced in running online discussions. The study indicated that some students felt free to contribute without fear of criticism. However, for other students, having a written permanent record made them feel more vulnerable. Furthermore, some students appreciated the emphasis on the move from tutor-led face-to-face tutorials to more collaborative discussions with peers online, whereas other students expected to have feedback from the tutor and were frustrated when it did not arrive. The study further indicated that some students appreciated that working online allowed them to offer more considered responses; others expressed concern at the time needed to contribute effectively to online discussions. Some students viewed the discussion board as hard work, requiring reflection and time. Whereas others viewed it as offering deep learning and freedom of speech.

Studies have reported students being uncomfortable with peer to peer interaction. For instance, Akamavi, Butterfield, Roushan, and Mohamed (2015) found that students wanted more academic interaction directly with the lecturers rather than with their peers. Meyer (2014) reported that students with different personality types were likely to react differently to the online setting. She opined that the student who engaged more

in higher energy activities or processed their thought by talking felt disadvantaged in the online setting, whereas the student who required more time to reflect and carefully assess and evaluate their response would be advantaged. Therefore, it is recommended that a mix of teaching approaches be utilised to increase the likelihood of most students finding an avenue for contributing that satisfies their learning needs, so that there is a balanced classroom where real learning takes places for all students (Meyer, 2014).

A study by Salmon (2014) indicated that there could be a difference with students in connection to their understanding of their learning, and the role of the e-learning environment. Working with undergraduate students, Moore and Ocak (2011) reported that positive experiences with e-learning were strongly connected to students understanding why it is used, and negative experiences resulted when students could not see the purpose of the online activities. Entwistle and Ramsden (2015) attempted to quantitatively study the experience of engineering students undertaking a traditional course blended with some asynchronous discussions. Students were given three questionnaires to complete; the course experience questionnaire, and two others, developed by the authors, assessing approaches to learning through discussions and conceptions of learning through discussions. The findings of the study indicated that the differences in experience described by individual students were related to their perceptions about their learning as a whole, and in particular, their understanding of the role played by the different modes of discussion. The study further indicated that students who were not conscious of the nature of teaching and learning were not able to understand the lecturers' intentions for the online and face-to-face modes, and so were not able to engage in them appropriately. They concluded that, 'It is not enough simply to provide opportunities for meaningful discussions ... if the students are not aware of the purpose of the discussions, or they have negative perceptions of the learning context, then they are not likely to benefit from the discussions or perform well in the subject' (p.13). This suggests that lecturers should play a pivotal role in motivating student participation in online learning. This would help reduce students' challenges and ensure progress in their studies.

Ellis, Barrett, Higa, and Bliuc (2011) evaluated petroleum engineering students' use of computer-based modules developed for work-based experience. The modules included real-world case studies, activities, and self-assessment questions. The modules were designed to allow students to follow the material linearly. They also enabled them to use the activities and self-tests to consolidate learning at the end. The students also had the option of starting with the activities and referring to the content as and when they needed it. Modules were available in online and paper-based formats. Despite the students' awareness of these options, they still preferred to work from paper-based materials. The study speculated that this surprising

finding could be due to prior experience and expectations. The students continued to work in the method that was familiar to them. It is also possible that students' conceptions of learning and teaching were not sufficiently elaborated. This prevented them from making informed choices about which method and mode of study would be most beneficial.

A study conducted by Dahlstrom, Walker and Dziuban (2013) at the University of Cape Town reported that students had the desire to use LMSs. The study reported students' high abilities and self-confidence to use the different technology platforms available for accessing the LMSs. The study indicated that students owned smartphones and would have been expected to use them to access the LMS. Instead, they preferred to use laptops and desktop computers for accessing the LMS. They expressed various opinions upon which their preferences were based. These mainly included; screen size, processing power, portability, usability, power save, wireless connectivity and convenience of use. The study also indicated that students preferred to use laptops and desktop computers to access the LMS services, even though they did not have access to these devices most of the time, as they did with their mobile devices (cell phones). The use of such devices, especially the desktop computers, mostly depended on the institutional Information Communication Technology infrastructure such as LAN and Internet bandwidth, which are major constraints in most universities in developing countries.

The concern by students about usability and compatibility was further confirmed by Singh and Hardaker (2014) where students highlighted usability and compatibility issues of mobile phones while trying to use them to access websites meant for desktop or laptop computers. This was the major reason why students did not use them to access the LMSs. Thus, if mobile phones are to be used to effectively to access LMSs, there should be a LMSs optimisation for mobile access. Charitonos, Blake, Scanlon and Jones (2012) mention that there are two options that can be a benefit if LMSs are to be effectively optimized for mobile access, either: (i) providing fewer LMS services on the mobile phone, but with all the necessary details for each service or (ii) providing all the LMS services with little detail for each service. Charitonos et al. (2012) firstly argue that the design challenge is to optimise the LMS in such a way that the mobile users' needs for the LMS are satisfied. Secondly, they argue that the optimisation of LMSs can help to reduce the extra cost of accessing the full LMS and reduces the over-dependence on the institutional ICT infrastructure for accessing the LMS services all the time by the students. Thirdly, this study also identified the services that were most desired and needed by the students in the surveyed universities. These included posting assignments, announcements, resources, course outlines and creating chat rooms. The provision of the latter services needed attention if an LMS has to be optimised for mobile access.

Consistent training and orientation appear to be major influences on the success of students' learning experience. In USA, a study was undertaken by Fetzner (2013) at Monroe Community College, in which online students were asked to share perspectives on their being unsuccessful in their online course, their expectations for the online class, and their advice to students who may be willingly taking the course online. The reasons mentioned by students was that they lagged behind and it was difficult for them to catch up on the course. This indicates that students can be intimidated by their online activities to a point of forgetting the intention to participate. As indicated by Coetzee and Oosthuizen (2013), proper training and orientation of students in online classes could help to balance their time better, to prevent them lagging in academic activities.

Students learning online experience the same challenges such as student support, lack of training and access to resources. A study by Hanson, Asante and Practice (2014) explored students' experiences in using the hybrid Moodle approach at the University of Education, Winneba, Ghana; and showed that students had challenges during the transition from the face-to-face to online hybrid tuition. The findings of the study revealed that students had limited access to computers and so could not do assignments when they were required. They experienced several interruptions while connecting to the internet during periods scheduled for online activities. Students could not submit activities on time due to these interruptions. Others failed to read preceding or prelude information for student activities due to internet failure or sheer negligence. It was noted that some students were used to being told what to do by their lecturers all the time. As a result, they found it difficult to read instructions provided to guide them in the online course. It was obvious that such students had poor reading skills and culture.

To conclude, the above literature review revealed that students' experiences of using LMSs in different institutions of higher learning are dissimilar. Studies showed that some students had negative experiences of using LMSs. On the other hand, other students had positive experiences of using LMSs. In the following section I present the theoretical framework that was used to frame this study. I made use of the Activity Theory to explore the Geography student teachers' experiences of using Moodle in higher education.

2.13 Theoretical Framework

Determining the guiding framework for the research study is one of the most important aspects of the research process that guides the researcher to make meaning of the phenomena under investigation. As

expressed by Grant and Osanloo (2016), without a theoretical framework, the structure and vision for the study is indistinct. A theoretical framework allows the study to have direction and structure, with an organised flow starting with one chapter to the next. According to Imenda (2014), it gives life to a research. Green (2014) defines a theoretical framework as a plan or guide of a research, which depends on the existing theory in a field of inquiry that is related to, and/ or reflects the hypothesis of a study. According to Simon and Goes (2011), theoretical framework serves as the foundation upon which a research is constructed.

The role of a theoretical framework in a research study is to guide the researcher not to stray from the confines of the accepted theories, and to make his/her final contribution scholarly and academic (Ravitch & Carl, 2016). A theoretical framework helps the researcher to find a suitable research approach, analytical tools and procedures for his/ her research inquiry. Osanloo and Grant (2016) agrees that a theoretical framework provides the structure showing of how a researcher defines her/ his study philosophically, epistemologically, methodology and analytically. Researchers such as Budden (2013), Gedera (2014a), and Jugoo (2014) have used the Activity Theory to study the design and implementation of learning supported by technology in various communities of practice. The authors found that the Activity Theory is useful in providing insights into all aspects of learning facilitated by Moodle (LMSs) and allowed them to document and examine successful and unsuccessful incorporation of technologies and activities facilitated by Moodle (LMSs) in an online learning environment. The Activity Theory was suitable to explore students' experiences of using Moodle, given that the students were exposed to online learning.

2.13.1 Origins of the Activity Theory

The Activity Theory is based on Vygotsky's research on cultural-historical philosophy, and the work of his student Leontiev (Vygotsky, 1978). The Activity theory is a theoretical framework that analyses and understands human interaction through tools and artifacts (Hashim & Jones, 2007). The Activity Theory uses the actual activity as a unit of analysis, and categorises the elements that come together to achieve goals of a particular activity into *subject*, *tool* and *object* (Engeström, 2001). *Subject* refers to the participant of the activity while *tools* can be the artifact or instruments (participants' prior knowledge) that influence the experience of mediated actions/ activity, and *object* refers to the goal of the activity being achieved. Over the years, as different scholars adopted this theory, Engeström (1987) modified Vygotsky's original contribution by adding on two elements. The first is *rules*. These are set of conditions that help to decide how and why people may act and are a result of conditioning. The second is the *division of labour*. This

provides for the distribution of activities and tasks among a community of workers. The components of the Activity Theory were used to analyse the findings of this study.

2.13.2 The Activity Theory, constructivism and online learning

The Activity Theory may be used as a framework for designing constructivist learning, especially in an online learning environment (Engeström, 2000). Emerging new technology in online learning increases the potential for constructivist learning processes. Constructivists assert that students are no longer dependant on the lecturers as the main source of information (Medina & Alvarez, 2014). As a result, the constructivist approach is significantly student-centred because students have the freedom to learn on the online environment by themselves and communicate with more knowledgeable others. Constructive learning in an online environment promotes collaborative knowledge construction, that allows students to be partners with one another and with their lecturers (Weegar & Pacis, 2012). According to Jung, Shin, and Zumbach (2019) students construct knowledge online through collaborative written assignments, group discussions, debates, and critique of arguments. Consequently, I selected the Activity Theory for this study. Kaptelinin and Nardi (2012) note that the Activity Theory has been instrumental as a theoretical framework in the technology-based learning. Kim (2010) summarises the rationale for applying the Activity Theory to the learning environment by stating that Activity theory assists in understanding online collaborative learning, and contradictions between learning independently and being isolated and adapting to changing roles. Students produce cognitive skills through social interactions resulting from the cultural environment produced by an activity system. Further, the Activity Theory can offer understanding into learning processes facilitated by Moodle (LMSs). Thus, this study used the activity theory to explore various relationships which take place between the students and LMS (Moodle) as they work together to achieve an objective (Bagarukayo, Ssentamu, Mayisela, & Brown, 2016).

2.13.3 The structure of the Activity Theory

Leontiev and Vygotsky were students and colleagues who worked together in the military hospital on a developmental project, and the new generation came into science (Yasnitsky & Van der Veer, 2015). After the passing of Vygotsky, Leontien proceeded with the work of consciousness using an activity approach to develop the Activity Theory and taking it to another level. Leontien extended Vygotsky's triangle by incorporating community and division of labor into Vygotsky's model, thus; making it more of a systems approach, illustrated in Figure 1. He moved from individual mediation action and introduced the collective

idea of an activity as the unit of analysis. Leontiev’s view of human activity can be described using the upper part of Vygotsky’s triangle and lower triangle which introduces the subject-object-community which has rules and division of labour as the form of mediation.

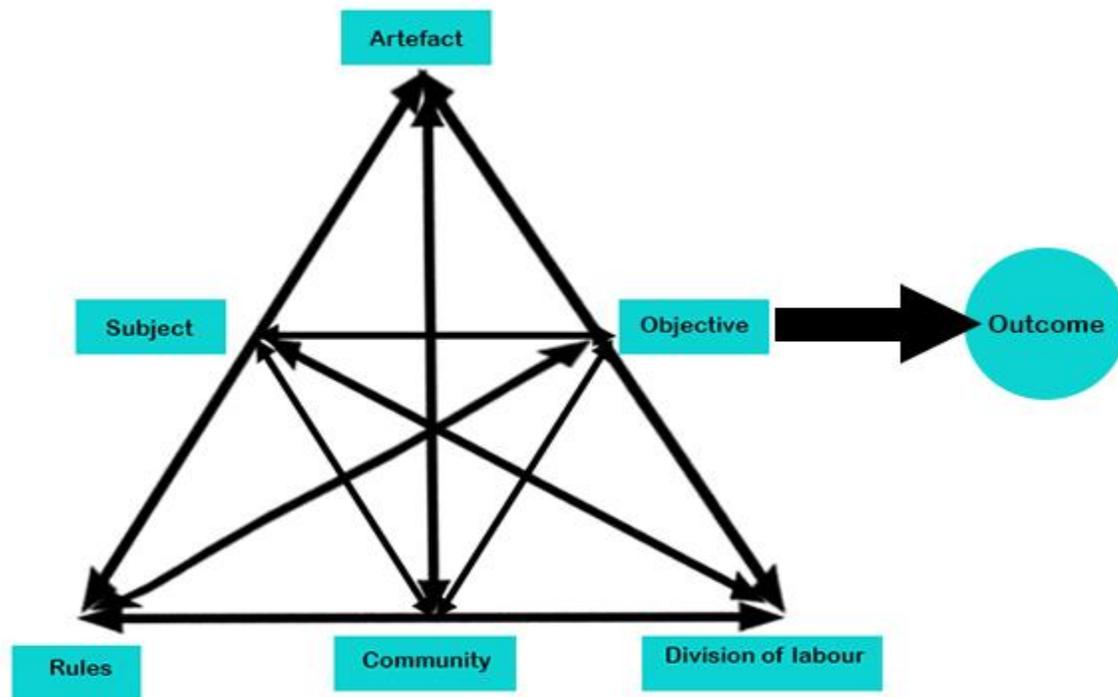


Figure 1: Activity Theory framework (adapted from Engestrom, 2001)

Figure 1 shows how the relationship between components of the Activity system relate; where the upper part of the triangle remains the same as Vygotsky’s representation as tools mediate the subject towards the object. This model proposes the formation of two new relationships in the lower part of the triangle. The first is that a relationship exists between the *subject-community* which is mediated by the *rules*. This suggests that a defined set of rules needs to be in place so that the subject can have successful interaction as members of a community. The second relationship is between the *community-object* and is mediated by the *division of labour*, which highlights that the power of the individuals within the activity system will determine how objects go through multiple transformations. The double arrows between the components indicate that they are not static components existing in isolation from each other, but there is a mutual relationship that exists in the system. Each of the aspects of this activity system is described below.

2.13.3.1 Object

In the Activity theory, the term object alludes to all intentions, objectives, and goals leading to Moodle integration (Engeström, 2000). The integration of LMSs in the teaching and learning activity is not without any intention or motivation. The principal objective for integrating Moodle is to enhance educational goals through the use of technology. Mlitwa (2010) makes comparable remarks by contending that new application, new practices, new policies and change in teaching and learning practice through which LMSs are used, are motives for integrating Moodle in teaching at higher education institutions, hence they are called objects in activity theory. Engeström (2015) notes that in the Activity theory, objects are referred to as aims and objectives of the institution for integrating Moodle in teaching and learning activities of the institution. Engeström (2015) further maintains that objects should be considered and viewed as students' learning experiences. In both Swearingen (2011) and Hung, Huang, and Hwang (2014) studies, the object was teaching and learning of mathematics. For Naidoo (2017), object was the development of mathematics content and conceptual knowledge. Thus, almost all studies identify the object within the Activity theory lens. Now that various studies have outlined the position of object in the activity systems, it is now important to shed light on the object of this study. The object of this study is the content and syllabus of the module, and the use of online resources to achieve the objectives or outcomes of the course.

2.13.3.2 Community

According to Karimi and Mofidi (2019), the Activity theory is associated with how people work together, how they use tools to accomplish their outcomes, and how they involve a sense a community. Engeström (1996) posits that all human action is contextualised within an independent system. Thurasingam and Sivanandan (2012) assert that within the community role of the activity system, the subjects (people) solicit ideas to achieve the object (goal). The community's interests give purpose to the activity by dividing the workload into specific duties within the reach of objectives (Daniels, Edwards, Engeström, Gallagher, & Ludvigsen, 2013). A study by Karimi and Mofidi (2019) affirms that even though people who are part of the activity system may be physically distant, it is always possible to work over a common goal, and they can form a community and hence support the activity system. This is in line with literature (Song, 2011; Weightman, Farnell, Morris, Strange, & Hallam, 2017) which conveys that, because of the nature of the online environment, it is accessible almost everywhere at any time, provided internet connectivity is available. This suggests that even if students are physically absent from a lecture room, they can still be a part of the online learning environment from wherever they are, and thus, contribute to the learning community and supporting the activity system. In this study, I consider students, lecturers, peer students

and members of the university in the field of Social Sciences as the members of the community. Community as described by most of the reviewed studies comprise students and teachers. For instance, in Beatty and Feldman's (2012) study, community were facilitators and teachers. Their community also included support staff, counsellors, administrators, as well as student teachers. In both Hardman's (2015) and Ekundayo's (2013) studies, the community only included students and teachers. Naidoo's (2017) study community consisted of learners in the mathematics classroom, the teachers, staff and parents within the community. By reviewing how the role of community has evolved in other studies, it is possible to suggest the members of the community in this study. Therefore, in this study, I have considered the lecturers, students, technical support offered by the university, external examiners, and other scholars, as the community in the field of geography. Lecturers who contribute to the effectiveness of learning by providing resources, and students who learn cooperatively online, were included.

2.13.3.3 Tools

Individuals interact with each other to strive towards achieving a specific outcome, mediated by tools (Camilleri, 2019). The belief is that these tools assist individuals to be more actively engaged in collaborative activities and problem-solving. In solving problems more effectively, the tools employed can change the activity as desired. Tools that mediate the activity system can vary, and can be physical tools such as PCs, texts, as well as psychological tools such as language (both written and oral) and skills (Kain & Wardle, 2014). According to Price, De Leone, and Lasry (2010), the function of the tool is one of mediation between the subject and object. Camilleri and Camilleri (2019) confirm this view of Bennett (2010) by elaborating that e-learning tools (e.g., electronic mail, video conferencing and discussion boards) enable active participation, leading to collaborative learning that can be represented in an activity system. Other studies also convey an expression of the artifacts (tools) in their activity system. The tools in Trust's (2017) study included the search engine for community members to search Edmodo site, and visual space that allowed members to post questions and share resources. Naidoo (2017) characterised his mediating artifacts tools like pictures, charts, technology, chalkboard, diagrams, gestures and colour that were used to teach mathematics, as visual.

Now that the discussion has explored the function and use of tools in an activity system in other studies, it is possible to examine the tools that will be implemented in the activity system of this study. The tools include a discussion forum, presentation software, file sharing and digital images that the lecturers and students might use. These tools allow students to have opportunities for communication, interaction with

their lecturers and peers, and more collaboration without time and space constraints (Brown & Gachago, 2013).

2.13.3.4 Outcomes

Lecturers engage with students in learning and need to guarantee that they provide a relevant meaningful learning experience and correct tools to enable students to do so. The integration of LMS (Moodle) is based on the assumption that it will enhance students' learning (He, Huang, Yu, & Li, 2020). There is some empirical evidence that confirms that the use of technology is important as it allows students to focus on reaching their goals and outcomes and allow lecturers to build tools and materials for learning (Agosto, Copeland, & Zach, 2013). However, researchers caution that while access to these technologies is important, the positive outcome of a student using them depends on their lecturers, (Dias & Diniz 2014), and there is a need for training and competence in using these technologies. Cavus and Alhih (2014) advise that the lecturers should be mindful of the diverse ways of learning and should continually remind students of the outcome of the Activity to keep them involved and focused. Furthermore, there are predictions about the integration of LMSs (Moodle) in teaching and learning that it brings about outcomes such as increasing dependence, collaboration, critical thinking and problem-solving skills (Hodges & Grant, 2015).

Lee, Feldman and Beatty (2012) identify the outcome in the activity system of their study as the successful implementation of TEFA to help students learn the desired objective (outcome), as well as equipping students with the knowledge, skills and problem-solving techniques to be used in comprehension, tests and subsequent schooling. For Naidoo's (2017) study, the outcome was teaching and learning mathematics. For Trust (2017) outcome was the intention to improve student engagement in the professional development network. While then again, Budden (2013) identified the outcome of the activity system as equipping students with the knowledge and skills for reflecting critically on disciplinary knowledges by using online resources to facilitate learning. Guided by the influence of other studies, I have identified the outcome of the activity system in this study are to manage the learning effectively and efficiently, to equip students with the knowledge and other skills by using Moodle to facilitate teaching and learning of Geography education.

2.13.3.5 Rules

Rules in the Activity theory are described as ethics, norms, conversations, social traditions and interactions within a community (Clemmensen, Kaptelinin, & Nardi, 2016). Importantly, Peña-Ayala, Sossa, and Méndez (2014) add the definition of rules as procedures and policies, which represent the connection/relationship (mediate) between the institution and the community. In that sense, this could be the South African Government policy in integrating the use of Information and Communication Technology (ICT) within the education system in higher education institutions. The policy postulates the need to make progress integrating ICT in all South African schools at least by the year 2020. This is because the Department of Higher Education (2004) sees ICT as a tool to improve learning, develop pedagogy, and enrich courses. Tay (2011) contends that rules may include the transformative teaching methods of the lecturer, installation of PCs, the assessment methods used to evaluate students' performance in the module, compulsory submission of assignments in a digital format, attendance of students and the specific learning material related to the use of ICT integration in teaching and learning online. To correlate with the idea from Tay (2011) regarding the rules in the activity system, other studies have also been reviewed to gain more perspective.

The rules in the activity system of Budden (2016) include the specific teaching methods of the facilitator, submission of assignments by students in the course, the assessment methods used to evaluate students' performance in the module, compulsory attendance of students, and the learning material related to the Curriculum Context and Change module. Further, in Edmunds, Thorpe, and Conole's (2012) study, there were rules to follow related to submission of typed students' assignment, teaching pedagogies of subjects affiliated to the use of ICT in teaching and learning, as well as research in their domain of expertise, installation of PC Tablets in classrooms and continuous training of the students in using the computer. This review broadened my understanding of the role of rules in the activity system, and therefore, positioned the study in such a way that it is able to identify how the rules applied in the use of Moodle in the learning process. The discussion, thus far, has framed the concept and functionality of rules in the activity system. This has broadened the understanding of the role of rules in the activity system. The rules relating to the teaching methods of the lecturers of different subjects; how students should write and submit their assignments, attendance of students, evaluation of students' performance and sharing of resources for the course.

12.13.3.6 Division of labour

According to the Activity theory, Division of labour is seen as the separation of tasks and roles between members of the community (Peña-Ayala et al., 2014). The responsibilities and tasks of the work process are separated. Nortvig, Petersen, and Balle (2018) describe the role of the educator as that of teaching, and the task of students as one of learning in the system. The integration of ICT into teaching and learning in a higher institution is viewed as one of the elements of division of labour. It means different parties are required to perform specific tasks in activity system towards the success of ICT integration in teaching and learning of Geography in higher institution. Students assume the task for completing assignments, lecturers are responsible for grading assignments, and administrators have to ensure grades are transparent on students' transcripts (Kigundu, 2014). Thus, Bradey (2014) affirms that it is important that the tasks assigned to each member are clearly spelt out, to ensure an effective demonstration in reality.

Other studies also articulated the use of division of labour in their activity system. The study by Feldman (2016) and Matanhire (2017) specified the roles and responsibilities of facilitators and teachers. The tasks in the classroom are distributed, for instance, the teachers' authority to manage learning goals for students, select and design learning material, establish performance criteria and measures. For Budden (2013), the division of labour includes the role of students, the lecturers and the higher education institution. As part of the lecturers' responsibilities, they have to use online learning resources to inform their pedagogical style. This involves passing information to students using online tools, conducting online discussions and debates with students, setting activities that students can respond to, and prescribing readings that are relevant to the Curriculum Context and Change module. Students have the task of responding to the teaching method by learning and participating in the online activities outlined by facilitators and completing and submitting assignments that will determine their progress of the course. In light of this, it is possible for me to identify the lecturers and students as people who comprise the division of labour in this study. The lecturer decides on pedagogical approaches that align to the implementation of Moodle, designed for learning and teaching. The lecturer also sets assignments and develops learning materials. The students assume the position of learners guided by the lecturer and required to complete and submit assignments as expected.

2.13.4 Application of Activity Theory in Education Research

As a consequence of the great demand for LMSs' adoption in higher education to support online teaching and learning, activity theory has been used by various researchers to ascertain the implementation of this

strategy (Park & Jo, 2017). Activity Theory has inspired many scholars in the field of education as a conceptual framework to describe elements of online learning environments and computer-mediated communication (Karakus, 2014). As a result, different aspects of activity theory have been employed to obtain a different perspective on learning contexts. A study by Gedera, Williams, and Wright (2013) provides evidence that the Activity Theory is suitable for education research. The research examines the current use of learning technologies in higher education, based on the experiences of students and lecturers in their use of technology-based teaching tools. Using the Activity Theory, the study employed the learning technology as the *tool* in the community of a higher education institution, the subject was the student and the *object* was the purpose of the task, and the desired outcome was more learning for the student. The Activity System was drawn by taking the perspective of the teacher, tutor, or any other member of the community, such as a departmental administrator. These concepts allowed researchers to explore the consequences and examine different outcomes influenced by the interaction between the features of the learning situation. Their research confirmed that the Activity Theory, as a framework, was useful for analysing data, providing a means for observing the emergence of patterns in human activity in terms of achieving goals and purposes.

Another research project based on Activity Theory is by Chidiebere (2014) who used the Activity Theory approach to explore students' experiences of Information and Communication Technology facilitated feedback. In the study's activity system, subjects were Business management students with varying experiences about e-mail facilitated feedback. The object was using email to achieve knowledge and skills as the outcome. Students participated in an activity that transformed their knowledge application skills. The community comprised students and lecturers who directed the learning process. Division of labour included the distribution of tasks between the lecturer who facilitated learning, students who carried out activities, and administrators who ensured that the email tool worked. Rules included university policies, lecturer regulations, deadlines and curriculum. The study by Chidiebere (2014) drew from the framework applied in this study and concluded that the Activity theory was suitable for the study because the institution achieved its primary purpose (goal) of integrating email in teaching and learning of Business Management Education, to promote fast, effective and constant communication of feedback.

Extending on the above studies, Budden (2013) undertook a study to evaluate the use of online resources in the teaching and learning of the Curriculum Context and Change module. For this study, the Activity Theory was used to develop an understanding of the facilitators and students' experiences on the benefits

and challenges encountered from implementing online resources in their current practice. In coding of data, relevant meaningful units from transcribed interviews, were identified and coded according to elements of Activity theory as a conceptual framework. The findings of Budden (2013) showed an increase in participation and interest in learning. In addition, Budden (2013) found that online learning improved the participants' communication and social skills. As a result, the latter author encouraged students use to post in discussion forums, engage in online video presentations and asked students to send emails to engage in collaborative activities while receiving the support of wireless computer technology. These tools were considered as the Activity Theory tools that motivated engagement in the community. The study proved that the Activity theory framework was an appropriate approach to add richness and insight into the study under investigation.

It is noteworthy that various studies demonstrate the value of the Activity Theory in education research, as well as investigate teaching and learning in online contexts. The theory affords the opportunity to study, analyse experiences, and understand the success and failure of using online platforms in higher education. Studies contribute to new insights regarding the Activity theory and equip the researcher by providing a deeper analysis of the findings that emerge from this present study.

2.13.5 Application of Activity Theory in Information Systems Research and in this study

Ismagilova, Hughes, Dwivedi, and Raman (2019) assert that Information Systems studies focus on the advancement of systems and technologies, implementation, support and management within specific contexts and perspectives. Every study in the IS field has basic fundamental attributes that identify it, which include technology, models, data, processes and people (Marakas & O'Brien, 2012). Each Information system consists of components such as hardware, software and telecommunication networks working together to help people build, collect, create and distribute useful data in an organisational setting (Jung, Schneider, & Valacich, 2010). Primarily, organisations make use of IS in order to improve organisational efficiency and effectiveness. It is, not only used by organisations, but also by communities to conveniently fulfil their social and economic needs such as e-commerce, financial management, social interaction, and online banking.

The Activity Theory has been employed in studies of human technology interaction as well as in Information Systems studies for almost three decades (Hasan, Smith, & Finnegan, 2017; Simeonova, 2018)

and it still offers researchers useful insights and guidance. The studies employ the theory as a conceptual tool, which is used only if it is considered useful. It can be combined with other theories if it is justified by theoretical arguments and needs of the particular study. The practice of combining the Activity theory with other theories appears to be common in studies of technology that use Activity Theory (Clemmensen et al., 2016). Selecting a suitable theory to underpin IS studies is primarily influenced by the objectives of the study. Every research has its objectives that are steps taken to answer the research questions. Farrugia, Petrisor, Farrokhyar, and Bhandari (2010) posit that those objectives are useful in measuring the outcome of the research study. Objectives describe what we expect to achieve by a research study. Collins (2017) suggests that research objectives must be formulated and defined. Objectives help to develop a specific list of achievements required by the phenomenon being studied. Therefore, based on the objectives, it is vital to consider the most appropriate theory to underpin a study. Er, Kay, and Lawrence (2010), as cited by Sekgweleo, Makovhololo, and Iyamu (2017), suggests that a theoretical framework can be thought of as a map or travel plan of the research. As a result, there has been a substantial body of work in IS which makes use of the Activity Theory as a theoretical framework. For example, a qualitative study by Forsgren and Byström (2018) examined the use of multiple social media in the workplace from a software development company. The authors revealed that social media was used to help the company to maintain coherence in some work activities by improving ambient awareness as well as for socialising purposes. However, their study showed that social media served different purposes in the organisation and it led to contradictions and tensions because the platform was seen as more beneficial to some work activities and as limited to others.

An Activity Theory study of data, information and knowledge construction conducted by Kelly (2018), a UK philanthropic donor and small non-government organization NGO in India, to uncover issues around power inequalities in the evaluation of development initiatives, argues that power and social practice are neglected in the evaluation and IS research, even though power dynamics influence what data and knowledge are discarded or foregrounded. An in-depth case study analysed the impact of evaluation activities conducted using interviews and examination of organisational documents and evaluation tools. It explained how power inequalities were generated during evaluation, and the underlying power dynamics around the dual nature of evaluation in terms of presenting evaluation results for marketing to the development sector and assessment of the impact on beneficiaries. The paper also argues that the Activity Theory successfully helped to uncover power issues and dynamics as inherent features that impacted data/knowledge supply and demand.

A study by Riechert, Durst, and Wickramasinghe (2016) applied the Activity Theory to describe a chemotherapy ordering process in a non-profit hospital in Australia. Since chemotherapy ordering is a major aspect of cancer treatment deemed high risk, the Activity Theory was elected as a robust and rich lens to analyse success factors of the implementation process of a computerised physician order entry system. Eleven tensions with the ordering procedure were uncovered. In conclusion, it was revealed that Activity Theory was appropriate to describe complex healthcare system because it precisely illustrated the interaction and partnership between the medical stakeholders of a process (doctors, nurses etc). It helped to overcome barriers in healthcare and to provide the best possible results for healthcare.

In later a research by Gleasure and Morgan (2018), the researchers used two theories to explore the social resources that enabled self-hosted crowdfunding activities. In this study, the authors combined the Activity theory with the Social Capital Theory to both describe and analyse the crowdfunding of technology. The study highlighted various implications for practice framed around crowdfunding as an activity to ensure the crowd grows, its potential is realised, and contributors are actively engaged during a crowdfunding initiative. They found that the use of Activity Theory proved useful to understand various aspects of complex and dynamic activities. They also found the framework added value to their analysis of user-generated content that can be used within an activity theory study.

The above studies have demonstrated the value of activity theory in IS research. Activity theory is a framework that can be used to study various layers of human practices that are linked at individual and social levels (Kuutti, 1996). It provides scholars in several fields with a powerful lens through which to understand and analyse various forms of human activity. Yamagata-Lynch (2010) adds that the theoretical framework and the language of the Activity theory and activity systems analysis provides researchers with a perspective for organising and communicating data about human interactions that other methodologies do not necessarily address. Indeed, this framework has been used by the above studies in the IS research field context and I concur with the comments made by Yamagata and Kutti. Since the use of the Activity theory by these studies enabled specific contradictions and tensions to become visible, it helped to understand and analyse the behaviour of the activity system towards achieving the objective.

From the extensive discussions above about the Activity Theory, it is evident that various studies support its use as lens for data analysis, predominantly in Information Systems. It is an appropriate framework for

understanding e-learning systems Karanasios (Allen & Finnegan, 2015) to analyse mobile computer supported collaborative system (Alghamdi, 2021); for guidance in the use of web tools for collaborative learning amongst students (Al- Huneni, Walker and Badger, 2020); and for describing the functions happening within collaborative learning activities through technology (Hamid, 2011). This is the premise which informed the choice of this theory to underpin this study. This study explored students' experiences of Moodle in higher education, to analyse Geography students' experiences of using Moodle. Using Moodle is an activity that students had to engage in.

2.14 Chapter summary

This chapter has presented the Activity Theory framework that guided this study and relevant literature to the experiences of using Moodle in higher education was reviewed. The literature was reviewed to shed some light on the use of Moodle in higher education focusing on international, African and South African perspectives. Most literature revealed that Moodle had several advantages in teaching and learning in higher education institutions. Challenges in the use of Moodle were also highlighted. The chapter discussed Moodle focusing on the students' experiences with the use of this platform. In this chapter, I also explored the origins of the Activity theory. I demonstrated Vygotsky's model and its relationships to the Activity system. The application of the Activity theory by other studies was also discussed. The next chapter discusses the research methodology utilised in this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The preceding chapter reviewed literature and the theoretical framework that guided this study. In this present chapter, the research methodology is discussed. The following aspects are discussed: research paradigm, research design, sampling and sampling procedure, instrumentation and data generation procedures. The chapter also discusses the approach that was adopted for the research study, guided by the critical research questions. It further discusses methods of data analysis, research ethical considerations, research limitations, and a conclusion. This study explored Geography student teachers' experiences of using Moodle at a higher education institution.

3.2 Research paradigm

The emphasis on the concept of a paradigm in research originates from Thomas Kuhn's book called: *The structure of scientific revolutions*, first distributed in 1962 (Mouton, 1996). Authors, such as Mouton and Marais (1990), De Vos, Delpont, Fouché, and Strydom (2011), as well as Wahyuni (2012), have utilised the term in social sciences. Thus, paradigms play a vital role in the social sciences research. Consequently, the term paradigm has been defined by different authors and researchers. Wahyuni (2012) describes a paradigm as a whole system of thinking. Similarly, Davies and Fisher (2018) provide a useful definition of paradigms as the research traditions in a particular discipline, or a philosophical framework. More explicitly, a paradigm would incorporate the accepted theories, customs and traditions, methodological methodologies, frames of references, models, body of research; and may very well may be viewed as a model or system for perception and comprehension (Rubin & Babbie, 2009).

A paradigm is thus, a basic set of beliefs and values that researchers have in common, regarding the nature of the research. Additionally, there are three categories of paradigms as depicted by Davies and Fisher (2018); the positivist, interpretive and constructivist. I adopted an interpretive paradigm to explore students' experiences of using Moodle. This is on the grounds that the interpretive paradigm is to comprehend and decipher ordinary reality, experiences and social structures, as well as the values people assign to these phenomena (Creswell & Creswell, 2017). The interpretive paradigm permitted me to understand the Geography Education students' experiences of using Moodle, as their lived experience. Moreover,

interpretivists accept that reality is abstract since it is moulded by various view of the participants, as well as the values and aims of the researcher.

Additionally, the interpretive approach resonated with this study, that explored students' experiences in light of the fact that their experiences were unique and personal. It permitted students to reflect on their learning. This study was concerned with students' experiences of using Moodle . I interviewed participants in their natural settings to accord them an opportunity to freely express themselves, and to associate what is said with what is seen, in the process restructuring their experiences (Rahi, 2017). Another motivation behind utilising interpretivism in this study was that it permitted me to decipher whatever was said by the students. This is on the grounds that Geography students would not be understood better without examining them in their social context and deciphering their own Moodle learning experiences. The interpretive paradigm was relevant for the study at hand because it explored the experiences of students that were divergent, all of which were added to the study.

3.3 Research Design

A research design, as defined by Creswell and Plano Clark (2011), consists of the guidelines, plans and procedures to be followed in addressing a research problem. There are various research designs that can be used in social sciences, such as quantitative, qualitative and mixed methods (Östlund, Kidd, Wengström, & Rowa-Dewar, 2011). Quantitative research designs are widely used in the natural and social sciences to study natural phenomena. The purpose of quantitative research is to test and understand relationships between variables, make predictions, and generalise results in a larger population (Schoonenboom & Johnson, 2017). Qualitative research designs were developed in the social sciences to enable researchers to study social and cultural phenomena. They are designed to help us understand people, their behaviour and the social and cultural contexts within which they live (Creswell, 2014). The mixed methods research design involves a combination of the quantitative and the qualitative research designs (Venkatesh, Brown, & Bala, 2013). This study adopted the qualitative research design because it aimed at exploring experiences of students, and generated data from participants using semi-structured interviews and focus groups discussions.

3.3.1 Qualitative research design

Glaser and Strauss (2017) provide a simplified definition of the qualitative research design. The scholars opine that the qualitative research design deals with understanding how and why people undertake particular behaviours. This study adopted the qualitative research design. Qualitative research is a type of research that produces findings not arrived at by means of quantification. It may refer to research about a person's life, about stories or behaviour, and it is also research that is used with regard to organisational functioning, social movements or international relationships (Schneider, Coates, & Yarris, 2017). Sutton and Austin (2015) add that qualitative research explores real-life issues that exist in the real world. Queirós, Faria, and Almeida (2017) affirm that qualitative research is concerned about human experience, hence, the current study explored undergraduate Geography student teachers' experiences of using Moodle.

Mertens (2014) gives two significant potential purposes behind the researcher using a qualitative research design in viewing the world. Mertens (2014) further gives two possible reasons for the researcher to utilise a qualitative research design in viewing the world. Firstly, qualitative research design affords the researcher an understanding of the constructed knowledge of people living in that context. Secondly, qualitative research design affords the researcher the ability to build trust in the members of the community where the study is conducted. The qualitative research design was best suited for this study on the grounds that the objective was to have a clear understanding of the students' experiences using Moodle. Teherani, Martimianakis, Stenfors-Hayes, Wadhwa, and Varpio (2015) reveal that qualitative research explores real-life issues which exist in reality. Therefore, qualitative research was utilised in this study to explore undergraduate Geography students' experiences of using Moodle.

The study was restricted to undergraduate Geography students purposively chosen because they had utilised Moodle in their learning. Generating qualitative data is better suited for addressing personal opinion and judgment (Barbour, 2013). Geography students were in a position to share their experiences of using Moodle. The quantitative research design was not chosen for the study since it was not appropriate for the aim of this study. Geography students needed to express their experiences of using Moodle from their perspective, and state why they had such experiences. Moreover, in this study, the qualitative research design was embraced in light of the fact that it was helpful to discover individuals' perspectives and their feelings according to their learning of Geography using Moodle (Taylor, Bogdan, & DeVault, 2015). Geography student teachers were interviewed as part of the qualitative aspect and their views on experiences of using Moodle were elicited. This interaction additionally empowered the researcher to

understand the emotions, thoughts, musings, standards and convictions of students about their experiences of Moodle. The qualitative research design was used to understand human phenomena (experiences) and the implications individuals provide for events they experienced (Terrell, 2012).

3.4 Research methodology

According to Chawla & Sodhi (2011) and Kumar (2018), research methodology refers to a range of approaches, which are sometimes called research methods, to designing studies and generating information. Flick (2015) refers to methodology as the rules and procedures of research work focusing on how knowledge is gained about the world. Part of research methodology is concerned about why and how the research has been conducted, and how the research problem has been defined (Kuada, 2012). Opoku, Ahmed, and Akotia (2016) define research methodology as the study of the research process in all its expansion and complexness. This process involves the various techniques, methods and procedures that are employed in the process of implementing research (Bryman, 2016). In order to understand Geography students' experiences of using Moodle in higher education for their learning, a case study research methodology was chosen.

3.4.1 Case study

To understand Geography students' experiences of using Moodle in higher education, a case study research methodology was chosen. Case study research gives a nitty gritty depiction of a specific issue in the research study. According to Terrell (2012), a case study is an in-depth study of a current phenomenon. It is a research methodology used to limit an expansive field of study into one effectively researchable topic. Another strength of case studies is that they provide both the researcher and reader of the research report a unique example of real people in a real situation. Furthermore, one of the qualities about case studies is that they give both the researcher and reader of the research an exceptional illustration of real people in a real circumstance. The focal point of case studies is to inspect, in detail, the different events and activities, and the conditions under which they happen, alongside any interweaved connections between events, activities and conditions. Case studies explore any current phenomena happening, in real life (Starman, 2013).

The case study technique was utilised despite the fact that there is no distinction between the object and the setting under which it is studied (Yin, 2017). The term case study is not restricted to social science research

but is utilised in many real-world situations. Case studies can be utilised in education research to examine the qualities of a group of people, and not of a population (Leavy, 2011). The case study was regarded appropriate for this research study on the grounds that it assisted me in gathering in-depth information from the participants about their experiences of using Moodle. In any case, researchers who have effectively utilised case studies in various situations have discovered that case studies are valuable methodological instruments. The researchers found that if the studies are well organised and planned with carefully systematic questions for participants, the ensuing findings are reliable as well as dependable and can reflect the nature of the whole (Leavy, 2014). I opted for the case study in this study on the grounds that it can yield a large amount of data required for the study.

3.5 Selection of participants

The selection of participants is defined by Bertram and Christiansen (2014) as a decision that a researcher makes on choosing which community, settings and behaviour to observe, in order to generate data that will be useful for addressing research questions. Farrokhi and Mahmoudi-Hamidabad (2012) state that the representative selection of people, places or things from which data are gathered is called a sample. This study made use of purposive sampling, which means that it made a specific choice about which community to include in this study. A sample of 12 participants was purposively selected. The study's intention was to explore Geography students' experiences of using Moodle, therefore the targeted community or participants for this study were first, second and third-year Geography education students because they had used Moodle before, and so could reflect on their experiences of using this LMS. In purposive sampling, the researcher targets a specific community with the understanding that such a community does not represent the whole population, but only the chosen community (Rule & John, 2011). As this was a qualitative study, a purposive sample was better suited as a method of selecting participants because the research does not intend to generalise findings.

3.6 Data generation methods

This section presents the data generation methods utilised in this study on the experiences of Geography Education students in using Moodle in higher education at a university in located in the Kwazulu-Natal province of South Africa.

3.6.1 Semi-structured Interviews

In general, the interview is a discussion between two individuals, where questions are posed by the interviewer to evoke a reaction from the interviewee. Interviews were carried out in order to obtain qualitative data, in this case, experiences of using Moodle in higher education. Kallio, Pietilä, Johnson and Kangasniemi (2016) note that the advantages of using interviews were that the interviewer can clarify any points that are unclear and probe further whenever the responses are particularly important. According to King, Horrocks, and Brooks (2018), the interview is an intentional interaction between at least two or more individuals, who are in conversation and negotiation for explicit purposes related to some topic. Interviews are also a resource and a time-intensive method. Interviewers should adhere to the agreed upon time, otherwise potential participants may quit (this is because many individuals are mindful of their time and have occupied timetables). King et al. (2018) state that there are various types of interviews like structured interviews, unstructured or semi-structured and focus group interviews. In the current study, semi-structured interviews were used as one of the data generation methods.

According to Robinson (2014), a semi-structured interview is a qualitative technique that combines a pre-determined set of open ended and closed questions, that prompt discussion between interviewer and interviewee into exploring particular themes or responses further. The explanation provided by Jamshed (2014) is that the semi-structured interview does not restrict respondents to a set of pre-determined answers (unlike a structured interview). Semi-structured interviews provided the researcher with flexibility to probe further, the experiences of Geography students with using Moodle.

I used face-to-face interviews to generate qualitative data for the study. The interviewed participants were twelve students from the Department of Geography Education. I interviewed all of them personally. Some participants were not able to participate because they were attending classes or other activities that were happening at the institution. Therefore, I had to remind participants twice to participate in the interview. Face-to-face and email reminders were used. Qu and Dumay (2011) reveal that the interviewer is free to adapt the interview to capitalise on the special knowledge, experience or insights of respondents. The scope of the interview was limited to certain sub-topics, and the questions were developed in advance (Singleton, Straits, Straits, & McAllister, 2010).

According to Jamshed (2014), semi-structured interviews tend to be more flexible when they are compared to structured interviews. I agree with this because in a structured interview, the researcher formulates several questions to be discussed in the interview and engages with only those questions during the Interview. Adams (2015) states the strengths of utilising semi-structured interviews in research as providing in-depth information about the research topic from the participants. Secondly, participants have freedom to respond to questions and have no limitation to ask. The participants are free to ask any questions related to the phenomenon being investigated, and no specific answers required. This goes beyond the limitation of questionnaires. It is for this reason, semi-structured interviews were the most appropriate technique for this study because they allowed for probing questions by the researcher when the interviewee raised important issues and concerns with regard to their experiences of using Moodle.

In the semi-structured interviews, I was not limited by a list of questions that were prepared in advance. I was able to follow up what was being said by the interviewee. Low (2013) also states that the semi-structured interview allows the interviewee to have a choice to express his/her ideas and feelings. This data generation method was more suitable for this study because it required the participants to voice out their experiences of using Moodle. Low (2013) further state that semi-structured interviews can provide reliability and dependability in qualitative data.

Semi-structured interviews have disadvantages as well. As indicated by Doody and Noonan (2013), semi-structured interviews can be expensive depending on how interviews are conducted and the quality of data. Semi-structured interviews can be expensive, especially if a researcher has to research their home-based environment, in the sense that the interviewer has to travel to the research field in order to collect data that is needed for the research study. In this study, I moved outside my home environment since I needed to meet with the participants in an environment that they were familiar with, and this had cost ramifications.

Cohen and Crabtree (2006) state that semi-structured interviews can be time-consuming and that the place where the interview is conducted can have an impact on the mood or attitude towards the interview. The interviews were done at the university, in an environment that the participants were familiar with. The participants were accessible at different times since they were going to classes, had different responsibilities as well as different lecture timetables. I needed to arrange times convenient for every participant. With the focus group discussions, I had to arrange one meeting with each group of participants. Data generation was

quicker because participants interacted with each other as a group. Nonetheless, I also enjoyed engaging with participants as individuals.

3.6.2 Focus group discussions

The second method that was utilised to generate data in this study was the focus group discussions. According to Kamberelis and Dimitriadis (2013), a focus group discussion is a discussion that is planned to obtain experiences in a defined area of interest, in an accommodating, friendly conducive environment for participants. Krueger (2014) suggests that focus group discussions can be used in conjunction with individual interviews, questionnaires and lesson observations. This was the case in this study because I conducted semi-structured interviews before the focus group discussions. The focus group discussions brought an interesting dimension to the study because I needed to decide on the size of the group.

Deciding on the size of the group needs careful planning as both small and large groups present different dynamics (Gibbs, 2012). For instance, very small, intra-group dynamics exert a disproportionate effect, and too large the group can get uncooperative and turn out to be difficult to oversee. Thus, Stewart and Shamdasani (2017) state that the focus group discussion should comprise of between four to twelve participants. Therefore, I carefully observed the group process. In this study, I selected three focus groups of four participants in each group, and on average the sessions lasted for an hour. I chose the group size of four because it was a manageable number and enabled me to maintain a balance between the participants to ensure that an effective discussion took place. I did not allow one or two participants to dominate the discussion by giving everyone involved a voice. This was a reasonable number that allowed the participants to interact and to share their experiences of using Moodle meaningfully.

According to Nyumba, Wilson, Derrick, and Mukherjee (2018), one advantage of focus group discussions is that they have a certain synergistic impact that causes participants to expand on one another's reactions. I employed this method of data generation because it encouraged debate and allowed in-depth discussions with various participants under one roof. One of the disadvantages of focus group discussions is that groups may be subjected to an opinionated individual who may dominate the group (Stewart & Shamdasani, 2017). Bearing this disadvantage in mind, I encouraged every participant to speak up during the sessions. The focus group discussions were useful in this study because they allowed me to bring together different participants to discuss their unique experiences of using Moodle. Krueger (2014) suggests that focus group

discussions are useful to triangulate with individual interviews, questionnaires and lesson observations. This is the reason I utilised focus group discussions to explore further what was said by the participants in the semi-structured interviews.

3.7 Data Analysis

According to Remler and Van Ryzin (2014), qualitative data analysis involves the organisation and interpretation of materials like field notes, interview transcriptions, video or audio recordings and documents. Ngulube (2015) adds that qualitative data analysis is a process of selecting, categorising, comparing, synthesising and interpreting data to give a proper explanation of a single phenomenon of interest. This study adopted thematic data analysis. Thematic analysis was used to analyse the participants' experiences of using Moodle. I used thematic data analysis by not merely counting explicit words or phrases but focusing on identifying and describing both implicit and explicit ideas within the data.

During the data analysis process, I was guided by the research objectives, semi-structured and focus group discussion schedules to come up with themes. Thematic analysis was the main technique in data analysis. Castleberry and Nolen (2018) note that thematic analysis is generally used in qualitative analysis. Braun and Clarke (2012) mention that thematic analysis involves identifying, analysing and reporting patterns (themes) within data. It slightly describes and organises your data set in (rich) detail. However, it goes further than this and interprets various aspects of the research topic. Thematic analysis is more suitable for this study since I desired to identify and describe patterns using themes from the participants' experiences and to understand and explain these themes.

In this study, after I generated data, I transcribed the recorded interviews and focus group discussions. Thereafter, I coded the transcribed data. I then analysed the codes by carefully reading them. Subsequently, I started developing themes by combining and categorising the connected codes. For instance, I identified the responses that fitted under specific themes that emerged from the participants' exploration of their experiences of Moodle. I then put them together with the corresponding patterns to form a sub-theme. I put together those that were similar to comprehend their combination. I had to establish how different ideas and notions fit together in a meaningful way when they were associated with each other.

3.8 Trustworthiness

Assessing accuracy is important in a qualitative research study. Trustworthiness refers to the measure of the quality of research. Connelly (2016) suggests that the trustworthiness of qualitative research can be established using four strategies: credibility, transferability, dependability and conformability. This suggests that the research should pay attention to standards and procedures that can be used to assess the trustworthiness of the study at hand (Nowell, Norris, White, & Moules, 2017). Therefore, to ensure trustworthiness in my research I employed a triangulation approach of data generation methods and the four strategies discussed below.

3.8.1 Credibility

Credibility in qualitative research refers to one of the major ways indicating whether or not the original data from participants is trustworthy (Cope, 2014). According to Guest, MacQueen, and Namey (2012), credibility shows that the research was done in a way that the phenomenon was correctly identified and described. To ensure credibility in this study, I used semi-structured and focus group discussions to generate data. I used a voice recorder to capture the experiences of using Moodle in learning Geography. The interviews were then transcribed into text, thereafter students had an opportunity to read the transcriptions to ascertain whether they are a true reflection of their responses. This practice was in line with Cope's (2014) assertion that, to confirm credibility in the qualitative study, one should verify information from the participants in regard to the accuracy of the generated data. To make certain of the credibility of the findings, I used more than one method of generating data; semi-structured interviews and focus group discussions.

3.8.2 Dependability

Bradshaw and Stratford (2010) describe dependability as the degree to which a research project can generate the same results or findings if the research project is conducted repeatedly in similar contexts, using the same participants and the same research methods. Furthermore, Guest et al. (2012) state that dependability centres around giving precise and direct information about the study. To ensure dependability in this study, I first started by including clear research questions as well as clear explanations of the research design and analysis. I also presented discussions of the findings in a way that represents the participants' description of the phenomenon explored in this study, rather than the characteristics and preferences of the researcher. I also considered the issue of ethical concerns that are important in qualitative research, thereby obtaining ethical clearance from the university and obtaining consent from the participants. I strove as much as could

be expected to maintain anonymity and confidentiality in the reporting of the findings of this research study (Guest et al., 2012).

3.8.3 Confirmability

Confirmability is a measure of how well the research findings are supported by the generated data (Cope, 2014). Houghton, Casey, Shaw, and Murphy (2013) define the concept of conformability as the degree to which the researcher is aware of individual subjectivity or bias. According to Gunawan (2015), for research to be trustworthy, the findings must be confirmed by participants as true reflections of their responses, after using different data generation methods (triangulation), to reduce the effect of researchers' bias. As this is a qualitative study, confirmability was not observed. When analysing data, I ensured that the presentation and discussion of the findings represented and reflected exactly the participants' experiences of using Moodle. Additionally, I followed different ways in doing so, including spending time reading the transcriptions made from the audio-tape recordings, as well as matching patterns by considering conclusions in terms of predictions from the theory and the relevant literature studied. I also allowed students to confirm their findings to ensure transparency.

3.8.4 Transferability

Transferability refers to the extent to which the findings of this present research study can apply or transfer beyond the setting of the project being studied (Houghton et al., 2013). Transferability in a sense reveals the idea that findings can be generalised from the context of the research study itself, to other settings or contexts (Ritchie, Lewis, Elam, Rosalind, & Rahim, 2003). To address transferability, I described the process of coding and giving insight into how the data was analysed. Wahyuni (2012) notes that transferability is achieved by providing a detailed description of the settings studied, to provide the reader with rich information to be able to compare the applicability of the findings to other settings that they know. To guarantee transferability in this study, I provided adequate detail of the context of the research. This was done to help the reader of the research report to decide whether the present environment is similar to another situation with which he or she is familiar, and whether the findings can reasonably be applied to the other setting (Gunawan, 2015). I discussed the literature in relation to students' experiences of using Moodle, particularly in Geography Education. Thick descriptions of the findings were provided, with verbatim quotes from the participants. However, I did not intend to generalise the findings of the study, as the experiences of participants are as unique as they are as individuals.

3.9 Ethical considerations

Researchers should adhere to acceptable ethics when generating data from research participants. Connelly (2014) reminds researchers about ethical issues that the researcher should always conform to, and the accepted professional practices of research. According to Goodwin, Mays, & Pope (2020), ethics is considered as dealing with beliefs about what is right or wrong, proper or improper, good or bad. Rani and Sharma (2012), cited in Burdick (2018), state that the researcher must act morally and responsibly, that she or he should conduct the research with care, be truthful in reporting of findings, and open to criticism and new ideas. To do that, I conducted the interviews in such a way that they elicited cooperation, trust, openness and acceptance with participants as recommended by (Goodwin et al., 2020).

The ethical issues in the study were as follows: obtaining permission from gatekeepers and ethical clearance from the university ethics committee to conduct the study; and obtaining informed consent from the participants for participation in the study. The informed consent encompassed assurance of confidentiality of information gathered from the participants. That is, all the participants' responses were treated with strict confidentiality, and the data were not used for any other purposes. Participants were made aware that their participation in the study was voluntary and they were free to withdraw from the research at any time without any negative or undesirable consequences. I also emphasised that their anonymity was protected at all times, and that none of their names would be used anywhere in the research. Maxfield and Babbie (2014) assert that anonymity means that it should be impossible for any of the participants to be identified by anyone reading the study. This study ensured the anonymity of participants, and identities were protected by the use of pseudonyms.

A voice recorder was used to record the interviews to get verbatim responses as well. The participants were not, under any circumstance, coerced to disclose what they did not want to disclose. I told the participants that the data transcripts would be stored in a securely locked cabinet of the selected institution for five years, after which such information would be destroyed. The ethical clearance to this study was granted by the same institution. Ground rules were laid out and equal respect was given to all participants. All these methods ensured that participants could speak without feeling judged or blamed.

3.10 Chapter summary

In conclusion, this chapter provided a detailed explanation of the research methodology that was used to generate data in this study. The chapter further recognised the appropriateness and positive aspects of utilising a qualitative approach. The research design and methodology were discussed. From the discussion above, it was clearly shown why the study used a qualitative approach and how it fitted within the interpretive paradigm. Two methods of data generation were used; focus group discussions and semi-structured interviews. The focus group discussions were used to expand or develop deeper, what was said in the semi-structured interviews. In addition to generating new data, I also explained that purposive sampling was used to select participants and the reasons for doing so. In explaining the research procedure, I discussed the data generation procedure and analysis, as well as the ways of ensuring trustworthiness that was followed in this study. I also discussed the ethical considerations that were considered in this study. In the next chapter, I present and discuss the research findings from this study on the experiences of Geography students in using Moodle in teaching and learning.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the research findings. The data were generated through semi-structured and focus group discussions. I present the data according to specific themes that emerged from the data. The themes that emerged from this study are as follows; students' experiences of using Moodle, benefits and challenges of using Moodle and the usage of Moodle in Higher Education. I have used abbreviations such as SSI to indicate quotations from semi-structured interviews transcripts and FGD to indicate extracts from the focus group discussions. Finally, I provided an overall conclusion based on all the findings.

4.2 Students' experiences of using Moodle

The students were asked to describe their experiences concerning the use of Moodle. Students had varied experiences. They had mixed feelings because they saw the benefits of the introduction of Moodle but also complained about accessing it due to lack of computer skills and unreliable internet connection.

The students' responses also indicated that Moodle improved communication between students and lecturers. For instance, Student A and Student K believed that Moodle increased communication with their lecturers. Student A explained that Moodle was good because it improved communication. However, she was unable to access Moodle at times because of it requires internet connection and load shedding. She explained:

For me as an individual I am not o with the introduction of Moodle. It is good in a way it has both pros and cons. It is good in a way that it provides faster communication between lecturers and us. But bad in a way that it needs internet connection which is pricey. Also, if there is no electricity maybe for a day it means that so I can't study for a day. That is how bad it is to study on Moodle. I won't lie studying online causes a lot of distraction because they are many things that I would rather do online rather than to focus on my studies. (SSI)

Student K shared the same positive experience as Student A. She also believed that Moodle improved communication with their lecturers. She explained:

Moodle is useful in our learning I should say. I cannot imagine how will be like without it. And I love technology. I always want to learn new things. There are a number of benefits such as ease of communication. I find it useful for me to access my learning materials and send assignments. I can access the course even if I am sick at home, I can be able to catch up with what was happening in class. (SSI)

Another student described her experiences as being good. She revealed that Moodle is convenient as it can be accessed anywhere anytime. The student further revealed that Moodle was indispensable to the learning activities at the university. She further explained in the Focus Group Discussion (SGD):

It has been good because I can access Moodle even when I am in another province. I mean anywhere besides being on campus, even if I was not in the lecture, I can still see what they did (Student D).

In addition, another participant, Student F stated that:

It has been quite easy to access information from any place without going to school straight to get such documents you need as a student for your degree studies. When I forget to read some article that is required for that particular lesson, I just go straight to Moodle using student Wi-Fi being provided to us as students. (FGD)

From the participants' responses, it shows that students had access to their course anytime due to Moodle. The findings indicate that students can work without any limitations of time and space. The findings further reveal that students who miss class for any reason can get documents electronically using Moodle. Albidewi and Tulb (2014) assert that learning management systems suit the needs of all students. They accommodate both full-time and part-time students, as well as students who have prior knowledge. They also assert that this type of learning environment permits students to learn at their own pace. According to Albidewi and Tulb (2014), virtual learning environments offer a variety of benefits over traditional teaching environments, including convenience and increased flexibility of delivery of education content. Students do not need to spend hours in a classroom and to be on the campus all the time.

As reported by participants, Moodle provided access to information. The participants acknowledged the benefits and challenges of the integration of Moodle in higher Education. Student D explained:

I will say Moodle has given me both negative and positive impacts. In terms of negative impact, Moodle has a deadline time to submit assignments. On the positive side, Moodle made my life easier, for instance, I can access the slides at any time. (SSI)

Student E shared the same positive experiences as Student D above. Student E indicated that Moodle made her life easier when accessing course material and emails as she explains:

The opportunities as I have mentioned- it makes our lives easier. For instance, there are some instant messages on Moodle from the lecturers in case you didn't get time to access your emails. And also, we can easily access the slides for the course. If you did not understand in class, you can read those slides. Moodle increases communication between the student and the lecturer. For instance, my lecturer could know who has accessed Moodle. (SS1)

The student responses above show that students appreciated the adoption of Moodle. They stated that Moodle made learning easier as it gave them access to their course material. Students could access the course information beyond the limit of their classrooms. The data from this study revealed that Moodle increased students' access to course information. The findings also revealed that Moodle offered convenient communication between lecturers and students. These findings confirm conclusions by Nandi, Hamilton, Chang and Balbo (2012) who state that integrating LMSs in teaching and learning will, not only improve the quality of interaction and communication between lecturers and students, but also allow them to exchange ideas, access teaching and learning materials of modules in a secure environment. The findings agree with Damnjanovic et al. (2015) who argue that teaching and learning become flexible when using technological tools such as the internet and other e-learning tools. This offers lecturers numerous ways of interacting with students and giving them immediate feedback.

The majority of students who participated in this study revealed that they lacked basic computer skills because they were not exposed to computers during their secondary school education. These students also experienced difficulties adopting the new way of learning with Moodle. Student F expressed that:

My experiences were both good and bad. Let me start with the bad. Let me say, students who come from disadvantaged schools do not know how to use computers at all; they cannot even use a mouse. Our university is trying to adopt technology and to be modern with other countries. However, it's taking students from disadvantaged schools. They come to the university and experience this kind

of technology. They see all this as a new thing and they feel they are failures. You will see these students typing very slow. And if you are asked to use some applications for example excel and instructed to do the register to put cells and other things. Students will be just confused and not sure what exactly is being required. I like Moodle very much it makes us be advanced with technology. They made a mistake of not doing a survey because in the survey, they could have asked how many students are having challenges with eyesight, how many are using naked eyes, how many students are disabled. After all, the university admits everybody so you can't exclude people. So how are they going to access Moodle? They only think in one way by saying let us advance technology without looking at these other things. We only look at the side that everyone should be advanced. That it is wrong. I understand there is a module computer literacy in the first semester but the problem is that lecturers and tutors are robbing us, and those tutors are working for the sake of money because they are teaching first-year students and you find that if you ask them, they won't teach you any of the software like excel. (SSI)

Student C also shared a similar experience as Student E. She explained how hard it is for the transition from traditional Geography pedagogy to using Moodle in class. She explained:

To be honest, it is very difficult to access Moodle if you come from a disadvantaged school because you are not used to the computers. The transition is not easy. (SSI)

Student H and Student G explained how it was when they started, to the point that they missed the assignments that were posted on Moodle. However, they currently had a better learning experience because they were exposed to the new way of learning with technology. This is highlighted in the following responses (Semi-structured interview):

To be honest with you, it was quite very hard. It was difficult to understand the system. Because... since I was not familiar with computers, I did not know most of the things. My friends used to help me. I was very confused, but now it is better than last year (Student H)

At the moment, everything is fine, but when I started, I didn't know where to get an assignment that was posted, also could not see slides; but as times went by, I learned from other students (Student G)

Student E had a unique experience because she was familiar with the use of computers back in secondary school. She indicated that she found it easy to use Moodle because of her previous experience in secondary school. Student E said:

As I explained, no one taught me Moodle. I've been finding it easy to use Moodle since I knew how to use computers literacy, but other people say they experienced difficulties in using Moodle just because they didn't have a background in computers. (SSI)

The above discussions show that many students lacked computer skills. It is clear from the data that students were frustrated because they did not understand how to operate computers for learning purposes. They sometimes missed their assignment deadline and information about their modules. Findings revealed that many students did not have the necessary computer skills to help them cope with daily learning demands. The students' lack of computer skills made them miss important information sent to them by lecturers. Some students missed announcements and assignments from their lecturers because they were technologically challenged. These findings concur with Adjin-Tettey's (2014) argument that other factors such as lack of technological skills among students hinder the learning opportunities and act as a barrier to effective learning for students. It was mentioned that students who have never been exposed to computers may even be scared to press keys in fear of damaging the computer. Students should have a basic understanding of how both hardware and software function. Technical problems can frustrate students and can hamper their progress. They advise that new students be provided with suitable support and help in their endeavor to embrace new technology.

The data in this study also revealed that poor connectivity limited students from accessing Moodle effectively. Student A reported that if there is no electricity or Wi-Fi connection, there is no learning taking place. Student A stated:

The challenges that come with Moodle are that it can only function using the internet. This means that you need data to access Moodle. You need data to access your study material. If you are outside of campus, you have problems because data is expensive. This results in me having to travel to campus to download all of my work and slides. Moodle is digital so if my computer crashes or my phone gets stolen, I am in deep trouble because all of my work is gone. If I do not have electricity at that given time, I cannot work or study because Moodle can only be accessed using a screen only. I cannot afford to print out everything that is on Moodle. That means I have to save my work on my laptop or phone for later use. For someone who is like me who has trouble with eyesight, suffers a lot due to using a digital screen for longer periods of time due to studying and working.

My eyesight deteriorates every year I am due for new glasses. My optometrist thinks that it might be due to the long periods of hours I spend in front of the screen working. More so, in times of the exams, because I can spend more than 10 hours a day using my laptop. This then becomes a disadvantage to me later on. My fellow students who do not know how to use a computer have challenges because they miss out on a lot of activities as well as slides due to having limited knowledge of using a computer. However, the Moodle system has more cons than pros. (FGD)

Additionally, Student I shared the same sentiments as Student A that unstable connections frustrated them and disturbed the learning progress. She said the following:

If we students can have stable internet access that does not fluctuate sometimes. It is frustrating when you want to do your assignment and there is no internet and you cannot check messages from the lecturers. (SSI)

To further emphasise the above point, other participants revealed that Moodle was expensive in the sense that when you stay outside campus, it is highly impossible to do any of the learning activities because data is expensive. This was highlighted in the following response during the Semi- Structured Interview (SSI):

It is not easy. It is complicated because of the internet access and data that is expensive when you do not have Wi-Fi (Student G)

Student K shared a similar experience that it was not easy to access Moodle when outside campus to do academic activities:

To be honest with you it's not easy, data is so expensive, it's just not possible for some of us. (SSI)

The responses above clearly show that Moodle depends on some factors for it to function. This suggests that when these factors are not present, Moodle will not function and students will not receive information from their lecturers. The responses showed some challenges in the use of Moodle that can discourage students from participating in the use of Moodle. Findings revealed that unstable internet connection, electricity load shedding, and lacking computer skills hinder students' learning progress. The factors confirm the argument made by Gumbo (2016), that LMSs encounter technical and practical challenges as they depend on the availability of electricity and internet, without which, there will not be no learning taking place. The results show the tension emerging in the activity system of this study between students (subject) and tools(computer/internet), as students experienced challenges with operating computers and accessing the internet.

4.3 The usage of Moodle in higher education

When students were asked if Moodle was an appropriate platform to be used in higher education, their responses showed that they preferred their modules to be offered online with Moodle and with a face-to-face approach. It can be concluded that students would like to have choices when it comes to their modules' method of delivery.

Student K acknowledged the contribution of Moodle in enabling them to learn independently. She explained:

Moodle supports our learning to be effective, and we save a lot of time, we get a lot of learning materials and other staff with Moodle. Moodle gives us the opportunity to work with others and also independently, to learn new technology skills, and for us to learn at our own time. Our lecturers can share a lot of information through the platform. And we acquire a lot of computer skills. Now I am knowledgeable about computers than before. (SSI)

Student G shared the same sentiment that Moodle enabled them to communicate, save time and was convenient. She expressed:

Moodle opened a big opportunity to interact with our lecturers. I can just communicate via the platform without even going to see the lecturer face to face. It saves me time. It is very convenient. Also during the lectures, I may not be able to get all the information our lecturer is giving us, but later I can always access the notes. Moodle helps to improve our learning of Geography. Some of the challenges you will find when you want to access Moodle and find out there is no internet connection and in that way, you will not study. (SSI)

Others were of the view that Moodle was good, but lecturers should not take away the other methods of delivery. The conclusion from these responses were that students preferred learning online with Moodle and also traditional physical lectures. They wanted to be given course packs. This was confirmed by the following responses from students.

Student A stated:

Bring back Course packs please because course packs have more information than slides we get on Moodle. Not a correct platform since it is not benefiting everyone. It is not putting everyone into the equation. For those unfamiliar with technology, what exactly happens with those people? It assumes everyone here knows technology. And it is also damaging our eyes as we always in front

of the screen. The integration was ok, but they should have given us a choice, not force us. They must not take away these other methods. Let me learn willingly because now I feel like I am forced to learn using Moodle. If you cannot do it, you going to fail. Moodle is there is there. I have never heard how disabled people manage to learn. (SSI)

Student H shared the same feelings that they wanted course packs. This can be seen in the following comment made during Semi-structured Interview (SSI):

I suggest that the University give us course packs because slides do not have much information (Student H).

Another view expressed by student participants was that using computers to assess Moodle caused computer vision syndrome. Student A said:

I still need to go and printout and I use a lot of money, now when you see that who is disadvantaged here? For anyone who wears spectacles, it is difficult to use a computer for a long time. In my suggestion, there should be a course pack and a person decide which one works for him/her. But I can assure you, most people will prefer to use course packs because people talk badly about Moodle and say it was better when there were course packs. Every module I print a course outline and printing is so expensive. Like I said, if you have friends you are lucky. For example, one of my friends borrowed me his course pack. Every time I make sure that I buy books and at the same time you need notes from the lecturers on Moodle. And now, I have to waste my money to go and print. Every semester I do print, I have to make sure I print the course outline and printing is so expensive. If the university was giving course packs for education. I like Moodle very much it makes us advanced with technology. They made a mistake by not doing a survey initially because they would have discovered that many students have an eyesight problem. (FGD)

Based on the responses from all participants, it is clear they held substantially different views, but preferred both teaching approaches; traditional and online. The findings also revealed that course packs enabled students to learn more when they studied for their examinations and tests since slides were not providing enough information. They believed that learning with both approaches would allow them to have a choice in their learning. They also believed that Moodle enhanced computer skills for those unfamiliar with computers in high school. From the findings, the students preferred to be given choices to teaching and learning of Geography in Higher Education. Both traditional and online approaches should be given equal chances. Other participants indicated some misgiving regarding the use of Moodle based on the fact that

they were not provided with enough content. Since course content was not printed anymore, students now incurred the cost of having to print out whatever material was uploaded on Moodle. Some participants were in total disagreement with the introduction of Moodle, as they preferred the old system of being given course packs as material for learning. These responses highlight a divergence between students' preferences. Some of the participants preferred Moodle for learning while others preferred the traditional approach of learning through course packs. In light of this, there is need for lecturers to revisit the policy documents which guide how LMSs should be integrated into teaching, and to consider the students diverging students' preferences.

The findings in this study agreed with the findings of Findik-Coşkunçay, Alkiş, and Özkan-Yildirim (2018) which assert that LMSs increase the efficiency of teaching and learning. They offered educational institutions a means for delivering course content in both blended learning and completely online. They offered flexibility in course delivery, the administration and use of resources, communication and conferencing, administration of activities and assessments, collaborative work, and student support. Contrary to this are findings from a study by Ellis et al. (2011) that evaluated petroleum engineering students' use of computer-based modules developed for work-based learning. The modules included real-world case studies, activities, and self-assessment questions. The modules were designed to allow the students to follow the material linearly. It also enabled them to use the activities and self-tests to consolidate material at the end. The students also had an option of starting with the activities and referring to the content as and when they needed it. Modules were available in online and paper-based format. Despite the students' awareness of these options, they still preferred to work from paper-based material.

There is evidence to suggest that university students experience visual discomfort related to exposure to computer use, and when working at poorly designed workstations (Woody, Daniel, & Baker, 2010). Recent studies reveal that laptop use by university students is associated with health problems such as musculoskeletal pain, carpal tunnel pressure, computer vision syndrome, and headaches (Kandri, Bonotis, Floros, & Zafiropoulou, 2014; Mingels, Dankaerts, van Etten, Thijs, & Granitzer, 2016). Although these studies cannot be used to conclude that laptop use is a risk factor for poor health, they nevertheless raise the hypothesis that laptop use may lead to health problems among university students (Kandri et al., 2014; Mingels et al., 2016).

In a study conducted by Oliveira (2012), reasons for students not buying electronic textbooks, included that they were hard on the eyes, expired and were unreliable. Also found from the study by Oliveira (2012) was that 15% of students surveyed did not like to read on the screen. Letchumanan and Tarmizi (2010) reported that students indicated that eyestrain was one of the reasons they preferred print books over e-books. Likewise, the results of a study conducted by Croft and Davis (2010) showed that 27 out of 61 students said e-books were not a good alternative. They gave many reasons to justify their answers. Some students' responses indicated that they were hard to read, and they could not flip through the pages, they could not highlight, and that they had problems with laptops

4.4 Opportunities for using Moodle as a teaching and learning platform

The students who participated in this study acknowledged the integration of Moodle in teaching and learning in higher education. Students were asked to share the benefits that Moodle provided in their learning. In response to this question, students were of the view that this platform helped them to access course material, learn independently, enhance collaborative learning, enhance computer skills, and reduce costs.

Student D explained that Moodle made their lives easier as they interacted with their lecturers and accessed their notes and emails. This can be seen in the following excerpt:

The opportunities, as I have mentioned; it makes our lives easier. For instance, there are some instant messages on Moodle from the lecturers in case you didn't get time to access your emails. And also, we can easily access the slides for the course. If you did not understand in class, you can read those slides. Moodle increases communication between the learner and the lecturer. For instance, my lecturer can know who has accessed Moodle. (SSI)

Student A also shared similar sentiments as Student D about being able to access Moodle anywhere anytime, she explained:

The good thing about using Moodle is that it is in front of me, so at any given time I can access my notes, even in my bed- still be learning and studying. I think that is the positive thing I could say about Moodle. (SSI)

The other benefit that participants cited was that Moodle helped them to increase their technological skills. Student A commented:

It benefits us in a way that it teaches us to use technology and to be exposed to technology. As there are students who have not used a computer before, so to them it is a benefit. I had a friend in a Technology Education class, he was saying as much as it is embarrassing as it is, "I have only seen the laptop on the paper now it is my first time touching it" This makes me think, how do students like my friend cope on the first week at the university. What do these students do? Do they rely on us as we have some computer skills? I don't know what they do as I can't help all the time because I don't want to be around people sometimes. I will not lie to you, it is quite difficult. If I have problems myself, what about these students? Whereas I started using a computer in grade four. (SSI)

Student D shared the same view that Moodle improves computer skills to new students who were not familiar with the technology. She explained:

I will say Moodle provides a new tradition of learning to those who come from a disadvantaged background. When they are introduced to technology, they start to adapt to new technology. They are improving their lives because these students learn new knowledge and can easily access information in a different way than using a book. You find that in a book, the font is too small but on slides, it is big enough for a person to read. It makes it easier what you have read when you go to a book, you just recall. (SSI)

Students also indicated that their use of Moodle helped them to access course information and learning material conveniently. The following comments by students confirmed these views. Student H indicated that Moodle saved their time and money by not coming to campus, but they still shared information with the lecturers and peers. She explained:

Moodle saves time and money. For example, if you cannot be able to come to the campus but you can still communicate with lecturers and other peers without coming to campus. The challenge is that of limiting the time for submitting the assignment. And if there is no electricity and network, it won't be possible to access anything from the lecturers. It's like no learning will take place. (SSI)

Student K also indicates that he cannot talk in class because of shyness so Moodle reduces power imbalances in class. He explained:

You know I am a shy person and I cannot raise my hand if I have a question in class, so later I can ask the lecturer when other students are not there that is good with Moodle. (SSI)

Student J stated that Moodle allowed them to get information on the uploaded slides to study for their test. She explained:

I can say it is convenient. Although it is still a new method of learning to me, but everything has its pros and cons. Like for instance, information on the slides- it is not enough for you to study for a test. But one can just stay in his/her room and study at a convenient time. Even if you did not attend the class, you can get notes on the slides. (SSI)

When students access uploaded slides despite being absent from the lesson for any reason, or when there is a strike, they felt that they were not left behind with the course. This was confirmed by Student B who said:

It helps a lot. Let me say, maybe there is a strike or the lecturer could not come to class, but we can still access notes on Moodle. One of the opportunities is that you get to access slides in case you could not be able to be in class. Another opportunity is that, if you do not understand something in class, you can still go back to Moodle. And I don't always go to the library for books, I can always get the information I need on Moodle. (SSI)

What was evident from the findings of this study was that Moodle was beneficial, as students could receive course information in the comfort of their homes even during strikes when it is unsafe to be on campus.

Most participants (Subject) were able to perform their tasks on Moodle (Tool). There is certainty that the platform used by students is user-friendly. It was also noted from the participants' responses, that they saved money on bus fare when they opted not to travel to campus because Moodle gave them access to course information. The findings agree with Horvat, Alajbeg & Predanić's idea (2015) that LMSs reduce the need to travel to go to classes. Additionally, the findings corroborate with Arkorful and Abaidoo's (2015) idea that the use of Moodle, a huge amount of information can easily and conveniently be shared with students.

Another benefit that students stated in their views was that Moodle was useful in their learning through increasing communication. This came from the following response from student H:

Moodle enhances effective communication with our lecturers. Sometimes, you will want to see your lecturer in his/ her office. You will go many times and not find them. But Moodle assists in sending messages, and it is easier for both student and lecturer to interact. (SSI)

Student G added:

It opens a big opportunity to interact with our lecturers. I can just communicate via the platform without even going to see the lecturer face to face. It saves me time and it is very convenient. Also

during the lecture, I may not be able to get all the information our lecturer is giving us, but later I can always access the notes. Moodle helps to improve our learning of Geography. Some of the challenges you will find that you are accessing Moodle and find out there is no internet connection and in that way, you will not study. (SSI)

Another benefit that students cited was that Moodle enhanced their computer skills. For instance, Student K indicated that:

Moodle provided us with an opportunity to be more advanced with technology, learn new ways of learning, that we were not exposed to before. (SSI)

Student J emphasised that:

It exposed us to a new way of learning, receiving and sharing information. We were also be exposed to technology as this was mostly not used before in high school. (SSI)

Another participant, Student I stated that:

Moodle advances our student computer skills and allows for effective communication between us as students, and the lecturer can communicate with us via Moodle. But, those that have uncapped WIFI connection benefit more from using Moodle. (SSI)

Student E added:

It helps the South African generation to be advanced in technology so they can be able to use computers, the internet and be online. There is a lot of development with technology. However, the challenge with Moodle is that, not everyone likes technology in a way that you don't know how to use a computer, then you will be affected because you are not computer literate. For example, first-year students, when they started classes, I'm sure they were not trained the first day. They came into the classroom and it took two months before being taught how to use Moodle. So, you can imagine how they struggled in those two months before they were trained. And another thing is that of students with eyesight problems. Moodle damages your eyes because of spending too much time on your computer. (SSI)

This study indicated that Moodle provides students an opportunity to communicate and engage with others. There was positive social interaction between the student community, consistent with the activity theory. Jati (2012) also affirm that the use of learning management systems motivates students to interact with others as well as exchange and respect, different point of views. Findings by Shylesh (2016) assert that LMSs promote student cognitive growth pertaining to knowledge of computer skills and students' academic

performance. It was evident that Moodle helped students to improve technological skills as they engaged with their daily learning activities of Geography Higher Education.

The ability of students to communicate with one another and with their lecturers through Moodle augurs well with Activity Theory which framed this study. Activity Theory posits that community members contribute to recruiting both material resources and psychological support needed to fulfil the implementation of LMSs in the curriculum. In the case of this study, community members include both lecturers and students. Once more, Activity Theory requires a full and deep-seated commitment by community members to work together for the successful implementation of LMSs in the curriculum (Hasan, 2013). The involvement of two parties (lecturers and students) maximises the co-construction of knowledge and enhances the online learning experience and academic performance of students (Pardo, Han, & Ellis, 2016).

4.5 Challenges of using Moodle as a teaching and learning platform

Although Moodle provided great benefits to student learning, numerous challenges hindered them from achieving effective learning. These challenges include; lack of constant training to students, lack of computer skills, Wi-Fi connection not reliable, insufficient material posted, data is expensive and shortage of computer LANs.

4.5.1 Insufficient material posted

According to the responses by the participants, learning on Moodle sometimes leaves the students with uncertainties and confusion. The findings of this study indicate that students felt stranded after receiving notes and information on Moodle. This is because the information that was posted was not sufficient, and the content was not sufficiently explained. The following participants expressed misunderstandings and dissatisfaction. During the SSI Student B revealed that information was not posted on time on Moodle, and they struggled with some of the courses. She said:

The challenge is that not everyone posts notes on Moodle. If they do not post, then we struggle. Some of the lecturers take time to upload (Student B)

Student F added:

Moodle can also come with its negative effects. This is due to the limited information that the lecturers put up on Moodle in the form of slides. Of which now I have to go out and do my research when I want to learn more. Instead of just giving me a course pack for me to engage with and get myself ready for my exams. Some people are not even good at researching a topic. So they would just use what is in the slides which obviously leads to a failing grade in the end. Some lecturers go to the extent of actually coping out the course pack or textbook and putting it on Moodle, while others do not bother and give students key points and that's it. (FGD)

From the above extracts, it is evident that students are faced with daunting tasks as they experience insufficient material posted by the lecturers. It is evident that everyone involved in the learning process has a role to play (Division of labour). The lecturer, as facilitator, has to perform his/her role as effectively and efficiently as possible. Students appeared not to be satisfied with the material posted as lecturers did not post enough resources. This discouraged students in their use of Moodle (Tool). This is in line with Mahlangu's (2018) finding that insufficient material resulted in poor learning. Insufficient material makes the learning of students difficult (Katoch, Doan & Dadashi, 2018), because they will not be getting what is expected. The findings of this study are in agreement with the findings of the study by Gurbuz (2014) who revealed that students were dissatisfied with the level of support they were getting from their lecturers and the resources posted on the LMS. It is apparent that lecturers have a direct influence on the success of students learning online (Salmi, 2013; Verawardina et al., 2020). This correlates with Activity Theory as it states that there is need for the provision of adequate resources/tools for any meaningful change to take place in the implementation of LMSs. Tension developed between students (subject) and lecturers (community) as students had difficulties in studying because of insufficient learning resources. The scarcity of resources harms students' learning.

4.5.2 Unreliable internet connection

The meaningful integration of Moodle was achieved when there was proper connection to the internet. Students experienced challenges with connecting to the internet.

Student C indicated that:

We face challenges when we are off-campus and have to use our data. It is a problem because data is expensive and the connection is very poor in the township and rural areas. (SSI)

Similar sentiments were raised by Student D, E and A during Semi-Structured Interview (SSI):

I will say it is not easy. It requires you to buy data. It is expensive. For example, smartphones like iPhone and Huawei, these phones take a lot of data. For me, the data I spend is a lot because I have to read to write an assignment. Mind you, I still have to go to the internet and inquire what the assignment is requiring me to do. So the data you can spend for a month just finish in a few days. Smartphones take all data. The network also contributes to the amount of data used. If the network is slow, the more data you are going to use. (Student D)

It is more difficult when you are at home because the data is expensive. What usually helps are internet cafés because they are cheaper. You find that an hour is R10. Therefore, for a student who lives off-campus, it is very difficult to access Moodle. Data is very expensive around R100 per 1GB or more you need if you were to use data to access Moodle. (Student E)

We use a lot of data. At times it is better to call a friend on campus to download an assignment or notes given and send you via WhatsApp. That is the only way we survive. That is why those lecturers will complain that we do not use Moodle because we use this method to share information and then there is no need to go and access Moodle because friends share on WhatsApp. So, I see no need in that way because Moodle is expensive to access because I need to download ten slides, then how much data can I use for that. (Student A)

Though some of the students in the university residence were connected to the internet, the network was not reliable. She said:

It depends where they stay. In the university residence there is no Wi-Fi there. It can be a lot, for example in a week there are always tasks to be done so you can spend a lot. (SSI)

Student I added:

If we can have reliable internet access that does not fluctuate sometimes, we would pass very well. It is frustrating when you want to do your assignment and there is no internet and you cannot check messages from the lecturers. (SSI)

From the above sentiments, it can be noted that accessing Moodle is affected by unreliable internet access and internet costs for students living off-campus. The results also indicated that not all students can afford data costs. Students living off-campus end up resorting to accessing learning materials with the help of friends staying on-campus. Learning materials accessed from Moodle were shared via WhatsApp. This is consistent with Neo's (2014) statement that e-learning is costly as it requires the availability of the internet to access information. Based on these findings, there was lack of access to high-speed internet services in many South African homes because it is costly.

4.5.3 Load shedding

Load shedding (power cuts) proved to be another challenge students faced as they tried to integrate Moodle in their learning. The issue of erratic power supply in most areas in South Africa makes the use of computers and the internet in higher education more difficult as these institutions go for hours or days without electricity (Zvavahera & Masimba, 2019). Students have to battle now and again with connectivity issues and power outages. Maboe, Nkosi, and Makoe (2013) state that “the situation of power cuts seems to be the worsening throughout the country. If the situation continues, it obviously has a drastic effect on the integration of LMSs” (p.39). Similarly, Tazvishaya (2014) pointed out that electricity is a challenge to the integration of LMSs.

Student D indicated that they were having difficulties with the unreliability of electricity, and this affected them negatively as they try to access Moodle for learning purposes. She said:

The challenge is that of limiting the time for submitting the assignment. And if there is no electricity and network, it won't be possible to access anything from the lecturers. It is like no learning will take place. (FGD)

Student J raised the same point:

The challenge with Moodle is that you have to be connected to the internet to use it. If I'm not on campus, I can't access it. Sometimes you find that there is load shedding as this is a South African problem, and by the time you have an assignment that is due, which means there is no learning when electricity is gone. (SSI)

The above extracts show that students faced challenges of unreliable electricity. The students who participated in this study identified the recurring problem of load shedding as a challenge. The findings were consistent with findings by Fu (2013) who stated that South Africa is suffering due to power cuts, and

electricity normally returns after hours. Fu (2013) points out that if the situation continues, it will lead to ineffective implementation of ICT integration in teaching and learning. Based on all the challenges raised by the participants, there is tension that has developed as students (subject) are expected to learn (object) and finish their degrees in record time notwithstanding the challenges they encounter.

4.5.4 Lack of training

The participants also identified lack of student training on using Moodle as a challenge. As a result, students found it difficult to adopt new approaches for their online learning activities. Student F explained:

There was no training at all. We were told there would be training but I did do any follow up. I learnt Moodle as times go. (SSI)

Student K echoed similar sentiments:

And another challenge is that of insufficient training, during my first year I was only told to use Moodle but I was not taught how to use it or a computer. I think the university should provide Moodle and computer training to students. (SSI)

Another challenge that students cited was the lack of computer knowledge and skills owing to their background. This problem was prevalent among the first-year students who had limited ICT background given the lack of exposure. This was highlighted in the participant's response below:

To be honest, it is very difficult to access Moodle if you come from a disadvantaged school because you are not used to the computers. The transition is not easy. As I have explained, those who come from rural and poor backgrounds find it difficult to adapt to learning online. I remember we were given laptops and we were not told how to use them and get on emails. To me, it appears as if Moodle is unfair for those who cannot use computers because they have insufficient knowledge on how to use a computer (Student J)

The findings revealed the need for continuous training of Geography students on the use of computers if Moodle was to succeed. The findings support a study conducted by Islam and Ferdowsi (2014) that found that the lack of computer training had a negative impact on students learning. Students feel frustrated to

experiment with Moodle due to lack of training. As a result, they lose motivation to learn online. Wozniak, Pizzica, and Mahony (2012) note that, to enable students to cope with online demands of the course and systems of online technologies, students' training should not be undermined. There should be organised ongoing training for them.

The issue of training students to use tools like computers to access module relates to one of the elements of the Activity Theory, which is the division of labour. Division of labour refers to the distribution of tasks and roles between members of a community (Liaw, Hatala, & Huang, 2010). In the case of this study, one of these roles includes adequate training of students for them to be able to use computers so that they can have access to Moodle. From the above extracts, it is evident that students were not provided with such training. This suggests that, within the university community, some members of the community are not carrying out their role of training students so that the opportunities presented by the introduction of LMSs can be unleashed.

McGill, Klobas, and Renzi (2014) say lecturers must check that students have sufficient technological skills to engage with the online course. The authors presented the same findings on a study about student experiences at the University of Sheffield in an information systems module in a blended course. Findings revealed that students were reporting concerns of lack of technical skills to learn online. A study conducted by Zhang and Zhou (2010) at the University of Canada reported that students had challenges to make postings themselves because they were not trained on how to use computers.

4.5.5 Shortage of computer LANs

The university computer laboratories were not enough for the students enrolled. The students- computer ratio was big for the integration of Moodle in teaching and learning in higher education. Relatively few computers in LANs prevent the effectiveness of using Moodle by students for daily activities. This was captured by Student D thus:

There are challenges, for example, notes are not posted on time, and not all of us have laptops, so we are forced to go to the LANs and only to find that LANs are full by that we cannot log in on time especially when we have to submit. (SSI)

Student F also echoed the view:

You will find that computer rooms are full most of the time. If you do not have your laptop, you have to wait. (FGD)

The above extracts highlight a source of Moodle integration tension among the Activity System elements of Subjects-Division of Labour. The Subject (Student) is motivated to use Moodle based on personal interest or institutional reasons, but the lack of computer laboratories or limited computers maintained by ICT personnel (Division of Labour) makes it more challenging for students to access Moodle. The number of computer rooms at the university were not enough for the meaningful integration of Moodle. What emerged from the students who participated in this study was that there was a need to have more computer laboratories so that Moodle integration could be successful. The inadequate computer laboratories was also noted by other scholars (Norman, 2017; Rana & Lal, 2014; Tarus, Gichoya, & Muumbo, 2015). The scholars indicated that the implementation of e-learning systems in higher education institutions in developing countries had not been successful. This was due to the challenges related to the shortage of computers in computer labs. Likewise, a study by Naresh and Reddy (2015) identified one of the challenges to e-learning in developing countries as lack of infrastructure.

The Activity Theory views computers as tools that enable people to engage in certain activities (Antoniadou, 2011). In this study, computers were viewed as tools that enabled students to access Moodle. The participants stated in the above excerpts that the number of computers available in the computer LANs was not enough. This had a negative impact on the students' ability to access Moodle. In the Activity Theory, tools or resources are important in doing an activity (Kaptelinin & Nardi, 2012). As people converse with one another to strive towards achieving goals, they develop and implement tools to facilitate their activities (Foot, 2014). Findings from this study suggest that tools are important for students to learn online. The assumption was that tools assisted people in solving problems more effectively and can change the activity as desired. A tool can relate to anything that is used in the transformation process of teaching and learning, including both material tools such as computers and tools for thinking (Karanasios et al., 2015). Learning appears not to be smooth in the institution where the study was conducted because many students indicated that they did not have constant access to computers. After all, computer LANs had a small number of computers in relation to the student population.

4.6 Chapter summary

In this chapter, I presented, analysed and discussed the findings concerning the experiences of students making use of Moodle to learn. The data were presented under themes and sub-themes addressing the key research questions. Thus, comments, views and opinions from students were used to reveal their experiences. These were further supported by existing literature, as well as the Activity Theory, that framed this study. The students' experiences included the benefits gained from using Moodle such as independent learning, collaborative learning, acquisition of computer skills, access to easy information and learning at their own time and space. The students' experiences also included negative aspects such as unreliable internet connection, insufficient material posted, load-shedding, lack of training and the shortage of computer LANs. The negative experiences that students had as a result of the integration of Moodle in the modules demotivated students from participating fully in their learning. This was contrary to the Activity theory as it argues that for an activity to flourish in an organisation community members need to work together and the necessary tools must be available so that the activity can flourish. For this study, activity meant the integration of Moodle in teaching and learning. Essentially, this revealed both macro and micro-organisational levels through everyday practice of Geography undergraduate students with Moodle. Park and Jo (2017) state that the Activity Theory allows for focus on both macro and micro-organisational levels. Based on these findings, the next chapter, provides the summary, conclusion and recommendations of this study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study explored Geography undergraduate students' experiences of using Moodle. This study was conducted in one of the higher institutions in KwaZulu Natal province, South Africa. The participants of the study were second, third and fourth-year students in Geography Education. These students were in a better position to share their experiences of Moodle because they were using the LMS in their studies. This chapter comprises the following aspects; aim and purpose of the study, research questions and the summary of the findings of the study. The chapter proceeds by providing suggestions for further research and ends with a conclusion.

5.2 Summary of the study

Chapter one introduced the entire study and gave a brief outline of the methodology.

Chapter two presented the review of international as well as national literature related to Geography undergraduate students' experiences of using Moodle. This chapter also presented the Activity Theory as the theoretical framework underpinning the study.

Chapter three presented the research design and methodology adopted in the study. The chapter paid attention to the interpretive paradigm, qualitative research and case study methodology. This chapter also presented methods used to generate data, namely; semi -structured interviews and focus group discussions. The method of analysing data (thematic analysis) and that of selecting participants were also discussed. Trustworthiness ethical consideration were also discussed in the chapter.

Chapter four presented and discussed data generated from semi-structured interviews and focus-group interview. These findings were then further analysed to identify emerging and common themes. The findings were presented using thematic analysis, and the themes were analysed relative to the research questions.

Chapter five is the final chapter which presents the conclusions from the findings of the study, and subsequently provides a summary of the study. Furthermore, recommendations to the Government, university and Geography lecturers are also presented in this chapter.

5.3 Conclusions drawn from the findings

The study aimed to explore the undergraduate Geography students' experiences of using Moodle. The data derived from both semi-structured and focus group discussions revealed that students had different experiences of using Moodle. The study revealed that students had positive experiences on the basis that Moodle was convenient, was time saving, enhanced communication, and provided access to information. However, students also had negative experiences of Moodle due to lack of training, lack of technological skills, network problems, and data issues. However, students appreciated the introduction of Moodle. The participants were motivated by their new way of learning using Moodle.

The students who participated in this study experienced fruitful collaboration between themselves and their peers, as well as with their lecturers in the transition from traditional Geography pedagogy to using Moodle. Students expressed their active involvement in the co-creation of knowledge, and that they owned their learning experience upon the introduction of Moodle. However, it was also important to note that the same students who appreciated the introduction of Moodle revealed that they were not given enough training to use Moodle. As a result, they missed announcements and important information posted about the course and were behind schedule in their tasks and assignments. This was prevalent among participants who had no background knowledge and skills of operating a computer.

There were many positive experiences like getting slides to read even if they could not attend the class. However, there was dissatisfaction about lecturers who did not post learning materials on time, and course content posted was not enough to study for their exams. This is when some students expressed preference for course packs rather than Moodle. According to them, the inadequacy of the course content posted on Moodle led to poor performance in their assessments. Moreover, students expressed that there were challenges with the internet connection. Students stated that if there is no electricity, there is no learning, and if they are outside campus, they cannot afford to buy expensive data. It therefore, appears that connection problems affected students' experiences negatively because they were unable to learn during this period.

This study focused on the experiences of Geography students of using Moodle, moving the conversation away from Moodle as an LMS to Moodle use. Fundamentally, the shift in the conversation to focus on Moodle use is consistent with the Activity Theory. Interrogating the experiences of Geography

undergraduate students made a shift “from focus on tools themselves to tool use” (Murphy & Rodriguez-Manzanares, 2008, p. 445). Instead of focusing on what Moodle is designed to do, this study focused on how Moodle is utilised and experienced by Geography undergraduate students.

5.4 Recommendations

Drawing from the findings of this study presented in the above section, it is recommended that students undergo frequent and prolonged training on how to use Moodle. It is imperative for all students to achieve the learning outcomes. For students to achieve learning outcomes, they must receive constant training that will ensure that they are competent and self-reliant in using technology. Those who are less knowledgeable about using computers should have a dedicated computer literacy module, which introduces the use of Moodle. This may be offered in the first semester of the first year. There should be official peer support systems to nurture first year students until they are confident to use Moodle. Students indicated that they mostly consult their peers to assist them when they encounter challenges of using Moodle rather than their lecturers or the designated university ICT personnel.

The study also recommends that the university should provide formal ongoing training for Geography lecturers to ensure the effective use of Moodle. The training may be in the form of workshops that focus on student engagement on Moodle. The workshops aimed at supporting lecturers with engaging students on Moodle would enable lecturers to deal with the complex endeavour of teaching students in an online environment. Lecturers need to be kept abreast with the rapidly evolving field of ICT. This will help them to stay up to date with new trends and learn new strategies, techniques and methods for teaching in an online environment.

The Department of Higher Education (DHET) is encouraged to give more financial support to universities for them to provide basic infrastructure for teaching and learning online. Furthermore, university management should liaise with the DHET to provide reliable internet access for students and arrange for alternate energy sources which will be used for teaching and learning when there is load shedding. Furthermore, current technological resources should also be upgraded to align with new developments.

5.5 Implications for further research

This was a single case study based in one institution, that aimed to explore Geography students' experiences of using Moodle. I made use of the case study methodology because I wanted an in-depth understanding of the students' experiences of using Moodle. Hence, this study only focused on undergraduate student experiences of using Moodle in one discipline (Geography) as the aim was not to generalise the findings. Therefore, this study's findings do not reflect the overall experiences of all higher education students that use Moodle. In this regard, there is a need for further studies to consider students' experiences of Moodle in other disciplines and across other institutions.

5.6 Chapter summary

This study explored Geography students' experiences of using Moodle in higher education. Three research questions guided this study. A case study was adopted as a research methodology in this study, and 12 participants were purposively selected to participate in the study. Findings from this study revealed that the use of Moodle in the Geography curriculum was beneficial as it allowed all students to participate in discussion, led to students' interaction and sharing of information, thus; encouraging a community of practice. However, there were challenges experienced by some students regarding the usage of Moodle, such as the lack of foundational computer skills to access Moodle, frequent power cuts which inhibited their learning, inability to access the internet due to expensive data costs. In conclusion, the study found that the students had both positive and negative experiences of using Moodle.

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Appendix A



7 March 2018

Ms ThembeHle Ndawane 210552415
School of Education
Edgewood Campus

Dear Ms Ndawane

Protocol reference number: HSS/D156/018M

Project Title: Geography Undergraduate Students' Experiences of Using Modular Object-Oriented Dynamic Learning Environment In Higher Education

Full Approval – Expedited Application

In response to your application received on 22 February 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Professor Shanuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Dr Dumisani Mncube & Thabile Zondi
cc Academic Leader Research: Dr SB Khoza
cc School Administrator: Ms Tyrone Khumalo

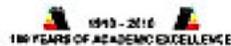
Humanities & Social Sciences Research Ethics Committee
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Website: www.ukzn.ac.za



Franchise Centres: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix B

University of Kwa Zulu-Natal

College of Humanities

School of Education

Geography

Dear Participant

INFORMED CONSENT LETTER

My name is Ms T Ndwane. I am a Masters candidate at the University of KwaZulu-Natal, Edgewood campus. I intend to conduct a research study aimed at exploring Geography student teachers' experiences of using Learning Management System (Moodle). With this letter, I wish to ask for your permission to participate in the study. Should you agree, you will be requested to take part in the semi-structured interview as well as a focus group discussion(s) in which you will be an interviewee. Each session will take less than an hour. Times and dates of the interviews and the focus group discussions will also be negotiated so as not to distract you from your other commitments.

Please note that:

- Your anonymity will be guaranteed, as pseudonyms will be used when analysing and presenting the generated data.
- Any information that you share during the course of the study will be used for the purpose of this study only and will not be used against you.
- Data will be stored in secure storage and destroyed after 5 years.
- Participation in this study will be at your own free will. You have a right to withdraw yourself and/or the information you shared in the study at any time without giving any explanation.
- Your involvement is purely for academic purposes only. This means that there are no financial benefits involved.

During the interview(s) and focus group discussions an audio equipment might be used to record the session(s). Therefore, if you are willing to take part in this study, please indicate (by ticking as applicable) if you would like the sessions to be recorded or not:

	Willing	Not willing
Audio equipment		

I can be contacted at:

Email: kakolight@gmail.com



My supervisor is Ms Zondi who is located at the School of Social Sciences, Edgewood campus of the University of KwaZulu-Natal.

Her contact details are as follows:

E-mail: zondit2@ukzn.ac.za

Phone number: 031 260 1379

Thank you for your contribution to this research.

DECLARATION

I..... (Full name and surname of participant)
hereby confirm that I understand the contents of this document and the nature of the research study, and I consent
to participating in the research study.

I understand that I can withdraw from the study at any time, should I wish to do so. A copy of this document has
been given to me to retain.

Signature of participant

Date

Appendix C

Semi-structured interview schedule

1. Briefly tell me about your educational background, why did you choose Geography to be one of your specialisations?
2. How are you taught Geography at this university? Take me through your first year up to now, have there been any changes to how you are taught Geography?
3. Have you been formally introduced to how Moodle works?
4. Please describe your experiences of using Moodle thus far?
5. What have been your favourite moments of using Moodle so far?
6. What are the resources that you use to access Moodle?
7. Have you experienced any challenges in using Moodle?
8. Is there anything you would like to add that I have not mentioned in our conversation?

Appendix D

Focus group Discussion schedule

1. Tell me what are your favourite topics in the Geography discipline?
2. What is your understanding of the Modular Object-Oriented Dynamic Learning Environment (Moodle)?
3. How long have you been exposed to Moodle?
4. How were you learning Geography before you were introduced to Moodle?
5. Did you receive any form of training on using Moodle?
6. What do you like about learning Geography on Moodle?
7. What is it that you do not like about learning Geography on Moodle?
8. Is there anything that you would like to add to our conversation?

Appendix E

Geography Student Teachers' Experiences of Using Modular Object-Oriented Dynamic Learning Management in Higher Education

ORIGINALITY REPORT

9%	%	9%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Stan Karanasios, David Allen. "Activity theory in Information Systems Research", <i>Information Systems Journal</i> , 2018 <small>Publication</small>	1%
2	Grace Ssekakubo, Hussein Suleman, Gary Marsden. "Designing mobile LMS interfaces: learners' expectations and experiences", <i>Interactive Technology and Smart Education</i> , 2013 <small>Publication</small>	1%
3	Marjorie Sarah Kabuye Batiibwe. "Using Cultural Historical Activity Theory to understand how emerging technologies can mediate teaching and learning in a mathematics classroom: a review of literature", <i>Research and Practice in Technology Enhanced Learning</i> , 2019 <small>Publication</small>	<1%
4	Abdullah Alenezi. "Barriers to Participation in Learning Management Systems in Saudi	<1%

Appendix F

Language editing certificate



Dr Jabulani Sibanda
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Alternate e-mail: jabusbnd@gmail.com
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31 August 2021

RE: CERTIFICATE OF LANGUAGE EDITING

To whom it may concern

I hereby confirm that I have proof read and edited the following PROJECT using Windows 'Tracking' System to reflect my comments and suggested corrections for the author(s) to action:

Geography Undergraduate Students' Experiences of Using Modular Object-Oriented Dynamic Learning Environment in Higher Education Reference

- Author(s): Thembelihle Ndwane
- Student No: 2010552416
- Affiliation: University of KwaZulu-Natal

Although the greatest care was taken in the editing of this document, the final responsibility for the product rests with the author(s).

Sincerely

[Redacted Signature]

31. 08. 2021

SIGNATURE