

The use of activity theory to explain the complexities surrounding the use of ICT in overcrowded university classrooms: the case of Nigeria

Moyosore Samuel Ekundayo

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Department of Business Information Systems
Primary Supervisor: Assoc Prof William Wang
Secondary Supervisor: Dr. Antonio Diaz Andrade

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ATTESTATION OF AUTHORSHIP

I hereby declare that this is my own work and that to the best of my knowledge and belief, it contains no material previously published or written by another person or material which to a substantial extent has been accepted for the qualification of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.

Signed: _____

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ABSTRACT

Higher education in the past decades has no doubt increased in value. Its appreciation as a source of economic growth and development has caused an enormous expansion in the number of applications for its products and services worldwide. As a result, student enrolment is soaring record high and for higher education systems to cope, classes are rapidly increasing in size and Staff-Student Ratios (SSR) - the ratio of full time equivalent staffs to full time equivalent students - are perpetually decreasing. For this reason, administrators, teachers and students are seeking evidence on which to base decisions about how to configure the 'right' class size to ensure quality, satisfaction, and meaningful learning outcomes. They want to be able to assess the effect of class size on teaching and learning. This is because of the common perception that large classes are economical to run and small ones are not. But what if the large classes are overcrowded?

Research evidence on the impact of class size on teaching and learning is often based on the class sizes that are purported by some developed countries like the United States of America, United Kingdom, Australia, Hong Kong and New Zealand. However, average class sizes vary greatly between countries and in some countries can be very much larger. In Africa, and most developing countries of the world, for instance, classes are more than 'large'. They are usually crowded. Classrooms of public schools – primary, secondary and even post-secondary schools - are facing the challenge of overcrowding.

Questions arise as to the quality of teaching and learning that takes place in the overcrowded classrooms of developing countries. Some suggestions appraise the contribution of Information and Communications Technology (ICT) to improving teaching and learning in large classes. They argue that new ICT technologies as well as the new use of old ones are useful in addressing the challenge of teaching and learning in overcrowded classrooms. Moreover, higher education systems all over the world are experiencing continuous growth in the applications of technology to approaches in teaching and learning. Recently, ICT is being deployed in developing countries in an attempt to meet the critical educational challenges of enrolment demands on infrastructure at all levels.

This study investigates the contributions of ICT to teaching and learning in overcrowded classrooms of developing countries with Nigerian universities as cases. The lens of activity theory is adopted for analysis. While extensive studies have been conducted on the effect of class size on student learning, little attention has been paid to the contributions of ICT to teaching and learning in the crowded classrooms of developing countries. Moreover, most studies on the topic have been anecdotal in nature, usually lacking both empirical evidence and theoretically backbone. This study draws upon the findings from three case studies - two public and one private university - located in a high profile commercial state in Nigeria. An interpretative approach is followed, with 35 participants interviewed including student and lecturers.

Findings from this study reveal that the most common forms of ICT in Nigerian universities are computers, mobile phones and the internet. With the exception of the private university, the ICT tools were mainly used outside the classroom but for teaching and learning activities of the classroom. While the appreciation of ICT seems high amongst Nigerian students and lecturers, access is limited and commercial centres like the cybercafés are still the highest point of access. The main goal of using ICT for teaching and learning is directed at is information search and retrieval. Several contextual factors challenge the adoption, use and integration of ICT in Nigerian universities. One mostly reported is the issue of poor power supply. Others include bandwidth, technophobia, computer literacy, cost, ICT culture and institutional support. Activity theory also helped to expose systemic tensions related to the use of ICT in the universities.

These findings suggest that the use of ICT in universities of developing countries is a complex and contextual issue. More importantly, it is a socially constructed phenomenon that is unique to the case under investigation. While ICT may be useful in the delivery of higher education in some other countries, its usefulness in Nigeria is highly dependent on strings of contextual factors that must be mitigated if the effect would be seen. Findings also reveal that the perception of ICT is fundamental to its deployment in the schools.

PREFACE

This research is about the contribution of ICT to teaching and learning activities in the overcrowded classrooms of Nigerian universities. While this study is not a solution-finder, it exposes the intimate mesh mechanism of issues, perspectives, opinions and scenarios surrounding the topic. This study combines prior knowledge of scholars in the field with first-hand investigation of overcrowding and the use of ICT for teaching and learning in Nigerian universities.

More than the passion for the topic, I have experienced overcrowding as a university student in Nigeria before migrating to Singapore in 2006. The experience of teaching and learning in Nigeria and Singapore was totally different. While in Nigeria, ICT tools never made their way to our classrooms, in Singapore, ICT tools were in abundance in the classroom. The classrooms I received lectures in when I got to Singapore had computers and projectors; also I did not have to share a desk with anyone unlike in Nigeria where about eight of us would have to share a bench meant for five students.

This experience fuelled in me a quest for a deeper understanding of the effect of class size on teaching and learning. I wondered if ICT would perhaps have a role to play where teaching and learning in crowded classrooms is concerned. I delved into literature related to this quest ranging from access to higher education to teaching and learning in developing countries; from effect of large class size on teaching, learning and student achievements, to the use of ICT for teaching and learning in large classes, to mention a few. Eventually, I decided to do my PhD study to examine, clarify and present my ideas and findings towards understanding the contribution of ICT to teaching and learning in large classes of developing countries; particularly the overcrowded classrooms of Nigerian universities.

CHAPTER 1

1.1 Introduction

Higher education is increasingly gaining attention all over the world. Its appreciation as a source of economic growth and development has caused an enormous expansion in the number of applications for its delivery worldwide. Student enrolment is soaring record high and for higher education systems to cope, classes are rapidly increasing in size and Staff-Student Ratios (SSR) - the ratio of full time equivalent staff to full time equivalent students - are perpetually decreasing. Questions arise as to the quality of teaching and learning that takes place in large classrooms (Biggs, 1999; Gibbs & Jenkins, 1992; Burruss, Billings & Skiba, 2009). Several investments have gone into tackling the challenge of large class sizes, and the use of ICT has emerged as the most prominent with initiatives such as Open and Distance Learning, E-Learning being at the forefront.

Some scholars have appraised the contribution of Information and Communications Technology (ICT) to teaching and learning in large classes (Daniel, Kanwar & Uvalic-Trumbic, 2009). Some technological advocates like Odera-Musakali & Mutula (2007) suggest that the future of universities appears to hinge on their ability to embrace and leverage on the potentials of emerging technologies at all levels of their activities. Adam (2003, p. 196) likewise argues that “it is becoming apparent that higher education reform cannot take place without paying attention to ICT...in support of teaching, research, and lifelong learning.” Particularly, on the subject of overcrowding (large classes) in higher education of developing countries, Bajinath et al., (2008) suggest that plain reliance on traditional forms and systems of higher education appears not to offer a sustainable solution. Daniel (1996) suggests that, new technologies, as well as the new use of old ones are useful in addressing the challenge of overcrowding in higher institutions of learning.

For this reason, administrators, policy makers, lecturers and other decision makers in higher education systems are seeking evidence on which to base decisions about how to configure the ‘right’ class size to ensure quality, satisfaction, and meaningful learning outcomes (Burruss et al., 2009). They want to be able to assess the effect of class size on teaching and learning; particularly student learning outcomes. This is also based on

the common perception that large classes are economical to run and small ones are not (Hall et al., 2011).

But what happens if classes are larger than ‘large’? By this I mean, what if the class sizes reported in literature (cf. Kokkelenberg, Dillon & Christy, 2008; Blatchford & Lai, 2010) only provide a myopic view of class size scenarios worldwide? According to Blatchford & Lai (2010), research evidence on the impact of class size is often based on the class sizes that are purported by some developed countries within North America, Europe, and Australasia, such as the United States of America, United Kingdom, Australia, Hong Kong and New Zealand. However, average class sizes can vary greatly between countries and in some countries can be very much larger (Blatchford & Lai, 2010). In Africa, and most developing countries of the world, for instance, classes are more than ‘large’. They are usually crowded. Classrooms of public schools – primary, secondary and even post-secondary schools - are facing the challenge of overcrowding.

While there are no rigid definitions as to how many students make a class large, what is of relative concern are what resources, accommodation and facilities are available to cater for the students. For instance, in a lecture theatre with 250 students with a capacity that could only accommodate 100 students or in a design studio with 150 students with available work space for 70 students, the impact of class size seems not too far from obvious (Gibbs & Jenkins, 1992). The experience of higher education would be totally different for both lecturers and students in an environment where there is an increase in the number of students being enrolled without a proportionate increase in the resources to cater for them. Little wonder Gibbs and Jenkins (1992) conclude that, “the effects of class size and students numbers are complex and contextual” (p. 16).

The condition where the number of students enrolled in a classroom or institution is more than the resources available to accommodate and cater for them is a long standing challenge in higher education institution of developing countries. In the context of this study, I refer to this condition as overcrowding. Overcrowding is a two-dimensional phenomenon comprising of the student population and resource situation within a given institution or educational system. Student population refers to the number of enrolled students in the institution while resource situation, refers to the “inputs that go into the running and operation” of the institution (Ajayi & Oyeboji, 2010). These inputs range

from physical to material facilities as well as human to social resources. As a result of the increasing pressure facing higher education institutions, many of them enrol students without giving consideration to their resource situation; the consequence of which is overcrowding.

Over the last four decades, there has been a growing body of research suggesting that ICT presents opportunities and promises in addressing the challenge of overcrowding in higher education if carefully and strategically used (Olakulehin, 2008; Olulube, Ubogu & Egbezor, 2007; Perraton, 2007; Rye, 2009). Higher education systems all over the world are continuously experiencing an expansion in the number of applications in which ICT is being used (D'Andrea & Gosling, 2005). According to Ekundayo and Ekundayo (2009), ICT is being deployed in developing countries in an attempt to meet the critical educational challenges of enrolment demands on infrastructure at all levels.

As a result, I carried out this research to investigate the contribution of ICT to teaching and learning in overcrowded classrooms of developing countries with Nigerian universities as case studies. While extensive studies have been conducted on the effect of class size on student learning, very rarely have investigations been on overcrowded classrooms and the contributions of ICT to teaching and learning in such context.

Having presented the core concept of this research in this section of the chapter, in the next, I introduce the theoretical perspective from which I take the study; the activity theory perspective. Thereafter I make explicit the problem I am focussing on and posed a pertinent question. I later provide answers based on my reflections on the findings that emerge from this research. Then, I present the objectives and research questions that I plan to fulfil and answer respectively. I then move on to explicate the rationale behind this research and back it up with my personal experience as a student with a taste of both worlds (teaching and learning in both developing countries and developed countries). I conclude the chapter by providing an overview of the subsequent chapters in this thesis.

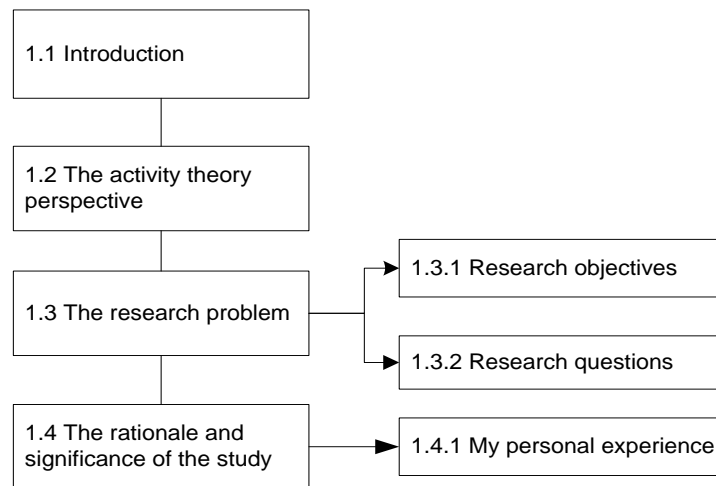


Figure 1.1: The flow of thought presented in the rest of the chapter

1.2 The Activity theory perspective

Activity theory is the underlying framework for this research. It serves as the theoretical lens through which most interpretations are made. Its core principle of tool mediation is the central tenet for this study and as such it is important to introduce in this chapter.

Activities are part and parcel of human lives and in activities, humans develop their skills, personalities and consciousness (Sannino, Daniels & Gutiérrez, 2009). Activity theory aims at understanding the interaction of human activities and the social entities they compose in their natural everyday setting. It is a truism that human beings are immersed in a world made of both social and technical artefacts (Callon, 1986; Latour, 1986). It is also true that the social world cannot subsist without technical artefacts as much as the latter only exists because of the former (Miettinen, 1999). In the words of Lim and Hang (2003, p.87), “if we remove human activity from the system of social relationships and social life, it would not exist and would have no structure”. These assertions emphasise the interplay of humans as subjects and the objectives of their activities in a social world.

The activities of humans are complex, collective and motivated by the need to transform a material or abstract object into desired outcomes (Blin & Munro, 2007). For this reason, humans make use of tools to help them meet their objectives. In other words, for human beings to survive in the world, they need technical artefacts to help meet their needs. These artefacts in activity theory are also interchangeably referred to as tools.

For instance, ICT is a tool that helps human beings connect to the world at large either by providing access to information or assisting with communication to either a large audience or people separated by time and space. The interplay between the use of the tools and their desired outcome is enmeshed in a network of socially-constructed relationships referred to as an activity system. An activity system is defined as an object-oriented, artefact-mediated and socially-constructed system, where cognition, behaviour and motivation are integrated and organised by a mechanism of self-regulation towards achieving a deliberate goal (Bedny & Karwowski, 2004). In activity theory, the main unit of analysis is the activity system (Engeström & Miettinen, 1999). Therefore the principle of cultural-historical development of activity systems is a major instrument of analysis in this thesis. The other principle of activity theory that is also expanded in this thesis is the tool mediation concept (Engeström, 1999). According to Engeström (1999), the tool mediation concept is not merely a psychological idea, “It is an idea that breaks down the Cartesian walls that isolate the individual mind from the culture and the society” (p. 29).

Activity theory involves the researcher throughout the course of development, stagnation or regression of the activities under scrutiny as well as in the activities of the research subjects (Sannino et al., 2009). In the context of this research, the activity systems (unit of analysis) under scrutiny are the classrooms of Nigerian universities. The research subjects are the students and lecturers. The tool that is being zeroed on is ICT, amidst several other tools fostering teaching and learning in the schools. The desired outcome is an improved teaching and learning activity in their large classes. Activity theory provides the lens of analysis in exploring these elements and their interaction in understanding the role and contributions of ICT to teaching and learning in overcrowded classrooms of Nigerian universities.

1.3 The research problem

Nigeria’s higher education system currently has 123 accredited universities - 36 Federal universities, 37 State universities and 50 Privately owned universities (NUC, 2009) - and over 160 other tertiary institutions - Colleges of Education, Polytechnics, Monotechnics (UNESCO, 2009). However, every year, nearly 1.5million students apply to sit the University entrance examinations in order to be enrolled into the universities

and an average of just about 20% of them are enrolled (JAMB, 2012). A report from a Nigerian newspaper revealed that “a total of 1,503,931 candidates registered for the 2012 Unified Tertiary Matriculation Examination, making it the highest number of candidates so far since the existence of JAMB”. There is only a marginal increase when compared to the number of candidates that sat the exam in year 2010 and 2011; a total number of 1,375,642 and 1,493,603 candidates respectively (Alechenu, 2012). Annually, the demand for university education in Nigeria is soaring higher than the capacity of the available universities can accommodate.

Moreover, while the universities’ enrolment rates have been on the rise, reports suggest it has not kept up with the increasing demand (Ojo & Olakulehin, 2006). In turn, this is putting pressure on the universities to accommodate more students than they should. Whilst more universities are being accredited, their capacity is not commensurate to the demand placed on university education annually. This is the main recipe for overcrowded classrooms in Nigerian universities. Despite the low percentage of eligible students enrolled, classrooms of Nigerian universities are usually crowded beyond their capacity (Erinosho 2008). Enrinosh (2008, p. 43) puts it like this, “they have begun to enrol more students than they can handle effectively...Campuses have become overcrowded amidst limited facilities”. Okebukola (2004) concludes that the capacity of Nigerian universities to accommodate students would soon get worse.

Student numbers are overflowing and it appears the institutions are not able to put a cap on the number of students they enrol. In fact, lecturers have begun spending more hours teaching and therefore hardly have time for research and consultation with private organisations (Erinosho, 2008). The lecturers are forced to mark hundreds or thousands of scripts; and in the words of Erinosho (2008, p. 51), “no wonder quite a number of them simply do not just bother to mark them but merely supply marks to the departmental examination officers”. There is a need for capacity building for Nigerian universities in order to reduce the overcrowding in classrooms and at the same time, ease the threat on teaching and learning.

The problem of overcrowding is very rampant in the public universities. As a result, some scholars (e.g. Ajadi, 2010; Banya, 2001; Mabizela, 2007; Erinosho, 2008) suggest that the burgeoning demand from students for access and the inability of the public

universities to satisfy the growing social demand for university education has necessitated the entry and establishment of private universities across the African continent, Nigeria inclusive. Some of them even argue that the establishment of private institutions is due to the failure of public ones (Mabizela, 2007). The establishment of private universities comes with the objective to expand access to university education, as well as relieve the pressure on public universities as the only centres producing the needed skilled labour force in the present knowledge economy (Ajadi, 2010). Ajadi, (2010) further puts it straight that, “with the establishment of private universities in Nigeria, some of those not admitted are taken care of and are graduated at record time because strikes and other vices found at the public universities are alien to private universities” (p. 21). It is also important to note that private universities are not for everybody. Their tuition fees are usually expensive because of their profit oriented philosophy. Mabizela (2007, p. 19) notes that “private institutions become elitist because the majority of the population cannot afford high fees charged”.

Apart from the role of private schools, the role of ICT in expanding student access has also been discussed in literature. For instance, Banya (2001) contends that “it is becoming increasingly clear that the higher education crisis on the African continent cannot be realistically solved with a single solution” (p. 161). This brings about a pertinent question I would like to be able to provide answers to at the end of this study, which is; *does access to or use of ICT automatically guarantee that students and lecturers will achieve their teaching and learning objectives in the classroom?*

The problem this research investigates is the challenge faced by universities of developing countries (Nigeria as a case), where students are being enrolled in their large numbers with little or no corresponding increase in both the infrastructure or technology (ICT) resources available to cater for them. The investigation moreover, aims to contribute to the growing discussion that large classes (crowded classrooms) often threaten the delivery of higher education – the notion that “more means worse” (see Alani & Ilusanya, 2008; Daniel et al., 2009; Green, 1994) and the use of ICT in large classes (see Barnett, 2006; Draper, 2004).

1.3.1 Research Objectives

This study delves into the complexities around use of ICT in overcrowded classrooms of universities of developing countries using the framework of activity theory. From the onset, the ultimate objective of the study was to make use of activity theory to develop an understanding of the intrinsic factors related to the contributions of ICT to teaching and learning in crowded classrooms. I expect that the findings of this study will not only be academically useful but also practically viable to policy makers and stakeholders of higher education systems concerned with the deployment of ICT for higher education in developing countries.

Specifically, the objectives this study set out to achieve includes:

- To explore the context of teaching and learning in the overcrowded classrooms of Nigerian universities using qualitative methods;
- To investigate the complexities around access to and the contribution of ICT to teaching and learning in the overcrowded classrooms of Nigerian universities;
- To provide an activity theory informed study on the contribution of ICT to teaching and learning in universities of developing countries. That is, the role of ICT (the tool) in the delivery (activity) of higher education in large classes (activity system) of developing countries.

1.3.2 Research Questions

Towards achieving the research objectives above, this study addresses the following research questions:

How does ICT contribute to teaching and learning in overcrowded university classrooms of developing countries?

To really understand the contribution of ICT to teaching and learning in overcrowded classrooms of developing countries, it is essential to first of all gain insights into the context of this study which is teaching and learning in overcrowded classrooms of Nigerian universities. From an activity theory perspective, to understand the role of a tool in a human activity, it is essential to fully comprehend the entire activity system or context where the activity is taking place (Engeström, 1999). As such, the initial

research questions are geared towards exploring the context; that is, the network of elements and relationships involved in teaching and learning in overcrowded classrooms. The questions are such that target the participants' perceptions, experiences and opinions on overcrowding and its effects on their teaching and learning activities. With Nigerian universities as case studies, the questions are:

- *How is overcrowding perceived by the students and lecturers of Nigerian universities and how does it affect their teaching and learning activities?*
- *How are the students and lecturers coping with overcrowding and its effects on their teaching and learning?*

Fully armed with answers to the research questions above, exploring the role of the tool (ICT) in question within the activity system becomes easier. In other words, with insights into the challenge of overcrowding and the context of teaching and learning in the universities, garnering answers as to the contributions of ICT becomes the next task; hence, the following sub-questions:

- *How are ICT tools used for teaching and learning activities in the overcrowded classrooms of Nigerian universities?*
- *How does ICT contribute to teaching and learning in the overcrowded classrooms of Nigerian universities?*
- *What are the inherent factors affecting the use and integration of ICT for teaching and learning in Nigerian universities?*

Following the principles of activity theory for this study, it is worthwhile to also understand the contradictions or systemic tensions relating to the challenge of overcrowding and the contributions of ICT in Nigerian universities.

- *What systemic tensions or contradictions emerged in the views of students and lecturers on the challenge of overcrowding and the contributions of ICT thereof?*

Answers to these questions emerge from empirical data collected during my field work in Nigeria. I also present and discuss the findings from the empirical data through the lens of activity theory, being the framework for this study.

1.4 Rationale and Significance of the Study

Issues pertaining to the effect of class size on teaching and learning in higher education have been the subject of several forums for decades now (see Crittendon et al., 1975; Glass & Smith, 1979; Smith & Glass, 1980; Gibbs & Jenkins 1992; Ward & Jenkins 1992; Biggs, 1999; McGiverin, Gilman, & Tillitski, 1989; Hanushek 1986, 1997, 1999). Tensions have started to emerge between the providers and prospective consumers of the higher education product (Morley, Leach, & Lugg, 2009). Around the globe, several strictures have been levied against the current practise of higher education. A major of such strictures is that whilst universities are struggling to accommodate the threatening demand for their products, they are also struggling to maintain the quality of their delivery (Perraton, 2007). Some scholars contend that ‘more means worse’ (Green 1994). In other words, large classes do not favour quality teaching and learning (Cuseo, 2007).

A review of literature reflects that little attention has been paid to the contributions of ICT to overcrowded classes in developing countries. In fact, such studies are almost non-existent in African countries. Issues relating to the use of ICT for teaching and learning in large classes are imperative for the current higher education context considering the growing discussion on how efforts to increase access to education often impacts the quality of delivery and learning (Daniel et al., 2009; Green, 1994). This study takes critical cognisance of this gap in literature and intends to contribute to the growing discussion.

Moreover, beyond academic research, the chosen case (business education) is deemed pertinent to the commercial and economic development of a nation. Given the volatility of current global business environment, there is a need for a new breed of workers (knowledge workers), flexible, knowledgeable and capable of working effectively with new ICT for knowledge creation, collaboration and communication (Alavi, Wheeler, & Valacich, 1995). It was rare of studies found in literature, to be discipline specific, z especially with business education as a unit of analysis.

It is also intended that the study will contribute to the knowledge and awareness of the challenges of teaching and learning in large/overcrowded classes and the use and contributions of ICT to teaching and learning in universities of developing countries. Nigeria is pertinent to a study like this for the following reasons:

- Since the mid-1990s, the global demand for business education has surged (Hawawini, 2005). Likewise in Nigeria, several initiatives have been underway for the development of business education (Saint, Hartnett, & Strassner, 2003).
- The Nigerian government as well as private organisations are beginning to pledge their commitment to the integration of ICT into curricula of higher education (Teferra & Altback, 2004; Teferra 2006).
- The rate of growth of the university system in terms of student enrolment could be described as phenomenal, doubling every four to five years and probably faster than anywhere else in the world (Adesola, 1991).

Finally, the study intends to present a model capable of guiding policy makers, administrators and decision makers of business education in developing countries to develop policies to appropriate the possible use of ICT in higher education institutions, with reference to the increasing demand.

1.4.1 My personal experience

Prior to my move to Singapore in 2006, I attended Nigerian schools both at primary, secondary and university levels. It was not strange to have classrooms crowded with students struggling for spaces to sit. Some sit on the floor, not because they chose to but because the chairs were not enough to accommodate the number of students in the classrooms. On benches that were meant to sit five students each, it is not strange to see about 8-9 students squeezing to fit into them. The secondary schools were still better considering there were many of them around. However, the universities were a different experience as the number of universities is not enough to accommodate the students applying to enrol into them. It was also not strange to learn without computers. We had no computers in our classrooms; the traditional teaching and learning method did not involve the use of ICT. I was never opportune to use a computer throughout my primary and secondary schooling in Nigeria.

In the year 2003 when I started my pre-university classes at Ladoke Akintola University of Technology (LAUTECH), overcrowding was a natural phenomenon. Apart from the enormous challenge a student has to go through to gain admission into the program, a student still needs survival strategies if he or she is to make it through with flying colours. I remember one of my strategies then was to arrive at least 2 hours before my classes. Classes often started at 7 in the morning. I remember having to wake up daily around 2a.m., walk down about one kilometre from my hostel to the lecture theatre to secure space for my 7a.m. lecture. For the six months in which I took the program, that was my daily ordeal. Any day that I did not wake up, I would have to stand outside the class listening to the lectures through the public address system. I would not be able to take notes as access to the lecture board was almost impossible. I usually pleaded with those who got to class early to help me with their notes so I could either make a photocopy or copy them into my note book. Again, ICT was not a part of the teaching and learning activities in LAUTECH. It was the traditional chalkboard and lecture style of teaching. We were not encouraged to learn to use ICT save for those who were in the computer science and engineering courses. Reports from such students suggest they struggled for access too.

I got used to seeing my classes crowded. To me then, that was the ideal university learning environment as I had not seen anything different apart from what I do see in foreign brochures. The pictures in foreign handbooks with just about 30 students in a class seemed like paradise; like a totally different planet. I also used to notice how the classes were well lit and bright. Computers and projectors never failed to catch my attention. There were no computers or projectors in our classrooms then. Our only access to computers was the cybercafés and business centres around school where we got our notes photocopied or projects typed. In fact, we did not get to type our documents ourselves. The business administrator does the typing for us. Ours main aim was to get our assignments when they had already been bound to submit to the lecturers.

As I pointed out earlier, the use of ICT in the classroom was limited to the microphones used by the lecturers to reach the multitude of students both in and outside of the classroom space. My knowledge of ICT was limited to the once-a-month practice of checking my emails at cybercafés. We had a computer centre at the school library that

provided access to the internet for students and staff of the university at an affordable rate but the speed of the internet was very slow; thus discouraging regular visit to the centre. The centre soon folded as a result of a combination of challenges including frequent complaints of server loss, bandwidth problems, theft, and an erratic power supply.

When I moved to Singapore in 2006 to finalize my university degree program, it was a different university experience entirely. Teaching and learning took a new turn. I started to experience the “paradise” I had seen in the foreign university brochures during my stay in Nigeria. The most crowded class I witnessed was my IT Project Management class with 40 students, each seated comfortably on an executive chair with lots of spaces on the table to accommodate at least a note book, a laptop and perhaps an mp3 audio recorder which most of my classmates used in recording lectures. Almost every student had a laptop. In fact, as soon as my parents were done paying my tuition fees, they were advised to get me a personal laptop, which they did. Nearly every class involved the use of computers, projectors and online Learning Management System (LMS) technology. We had wireless access to the internet within the school with almost no bandwidth issues. I also had internet access at home which helped with my academic work too. Moreover, my computer literacy improved as I had to type my assignments myself, check my email several times a day and used search engines for most of my academic work. My learning experience was different from what I was used to in the Nigerian university setting.

One of the reasons I have decided to focus on this topic is because it resonates with my personal experience of the research problem. In addition, when I noticed the gaps in literature as regards to the contribution of ICT to teaching and learning in overcrowded classrooms, I could not have been keener to find out if anything had changed since I left Nigeria. Also, with the worldwide appreciation of ICT in the delivery of higher education, I wanted to know if it has a role to play in teaching and learning in overcrowded classrooms; hence, this PhD study.

1.5 Overview of subsequent chapters

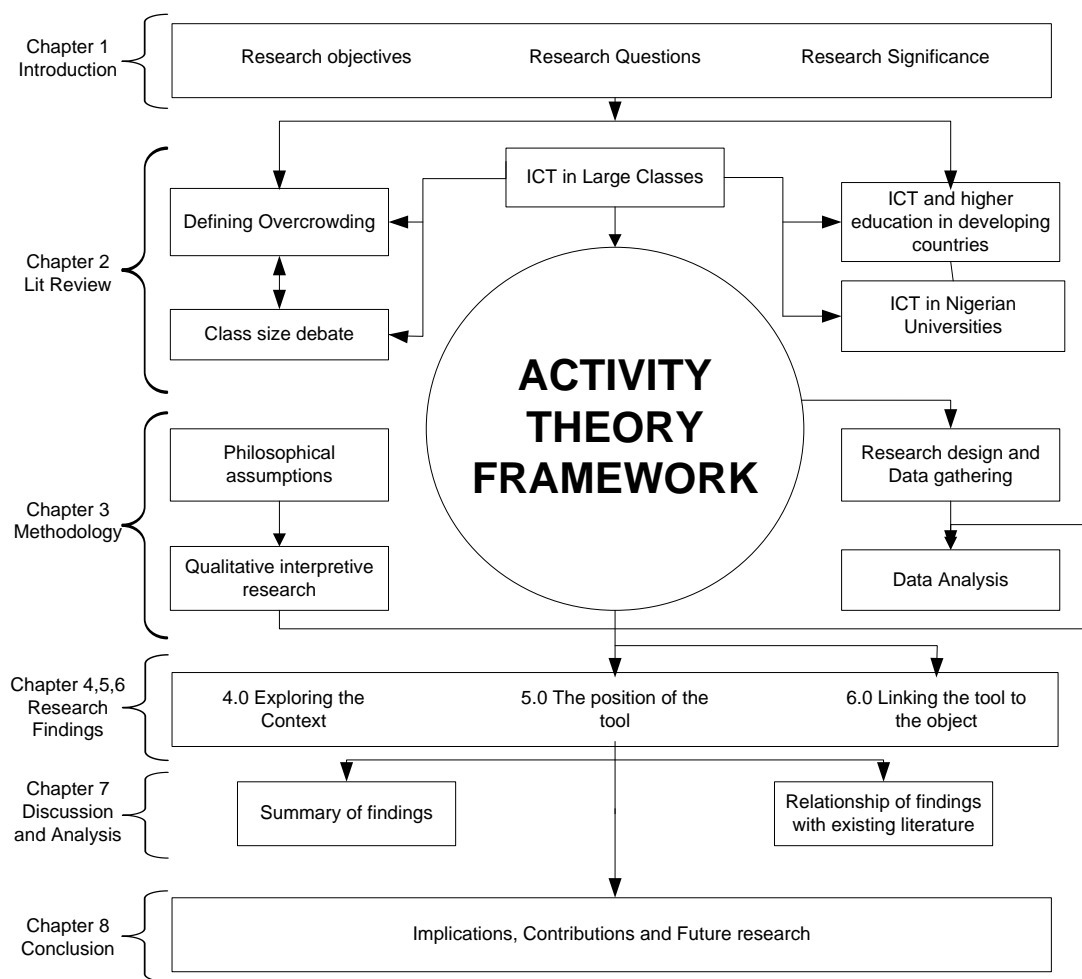


Figure 1.2: Thesis flow chart

Having introduced the overarching problem, research objectives, questions and significance for this study, I now present the structure of the thesis. In chapter two, I review the literature on key concepts underlying the study and try to establish gaps in knowledge necessitating undertaking of this research. In the same chapter, I present the activity theory framework for the study.

In chapter three, I provide a detailed explanation of the research procedures for the study. I justify my interpretative world view by eliciting my ontological and epistemological assumptions. I also explain the case study research design and provide details of the processes involved in data collection. I conclude the chapter by providing details of my data analysis technique.

In chapter four, I present the context of this study, relating my interpretation of the participants' perspectives on overcrowding, its effect on their teaching and learning activities and the coping strategies they employ in tackling it. In Chapter five and six, I present my findings using the framework of activity theory as a lens. These chapters cover two main principles of activity theory explored in this thesis – the concept of tool mediation and contradictions. In chapter five, I set the stage for the tool mediation concept of activity theory by uncovering the position of the tool within the activity system; that is, how ICT is accessed and used for teaching and learning in the universities. In chapter six, I elaborate more on the tool mediation concept by providing findings on the contributions of the tool to activity system; that is, the contribution of ICT to teaching and learning in the universities. In addition, I identify and discuss the contradictions in the activity system relating to the use of ICT.

In chapter seven, I pull together the findings and discuss them in relation to existing literature and the theoretical lens of activity theory. Finally, in chapter eight, I present the conclusions and state the practical and theoretical contributions of the study. I also explain the limitations of the study and areas of concentration for future studies.

Chapter 2

Literature review and theoretical framework

2.1 Chapter Overview

In this chapter I introduce and engage with literature relevant to this study. Having made clear the research problem in the previous chapter, this chapter follows on to reveal what is contained in the body of knowledge in relation to the research problem in order to elicit the gaps I particularly address in this PhD study.

On that note, the chapter is organised as follows: first, I present an introduction of overcrowding and make explicit the debate on the effect of large class size on teaching and learning. I also present a review of issues surrounding the use of ICT in large classes, higher education of developing countries and particularly Nigerian universities. From this I move on to highlight the gaps in literature that this study addresses. Thereafter, I present the theoretical framework for this study which is based on activity theory. I emphasise the principle of tool mediation as significant for the analysis of the findings of this study. I also highlight activity theory's principle of contradiction because in every activity systems, there are embedded systemic tensions which contribute to knowledge about the system. In the final section of the chapter, I discuss the theoretical notions of ICT following Feenberg's (2006) framework. The framework is instrumental to my analysis later on in the thesis as it informs my understanding of the philosophies of technology (particularly ICT) held by the participants of this study.

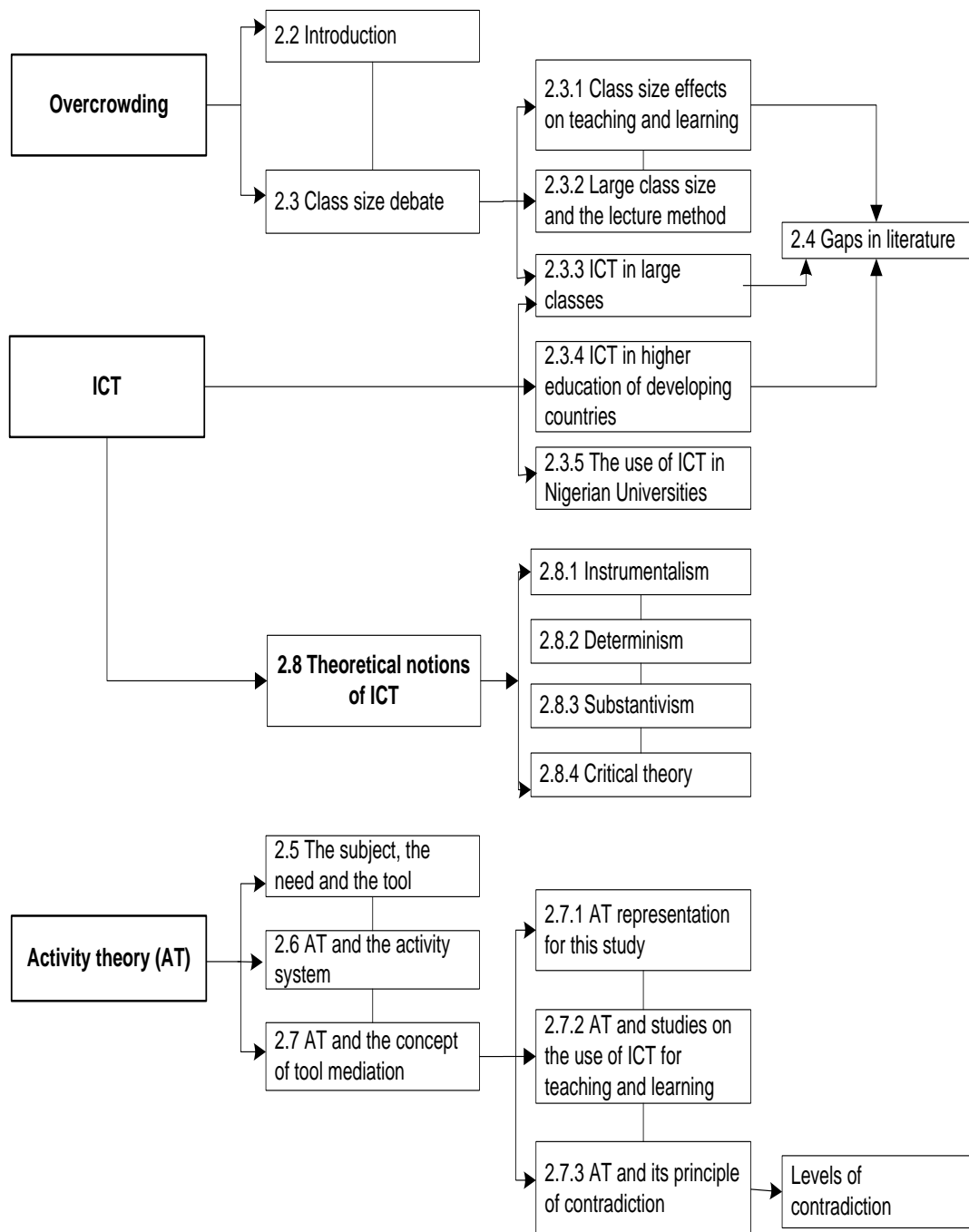


Figure 2.1: Flow chart for the rest of the chapter

2.2 Overcrowding: An introduction

The term overcrowding does not appear often in higher education or information systems literature. However, it is common in some other disciplines. For instance, in medicine, some medical scholars have studied the effect of overcrowding on medical practice (see Schull, Slaughter & Redelmeier, 2002; Trzeciak & Rivers, 2003; Derlet & Richards, 2000). In the medical field, particularly on the issue of emergency, overcrowding is seen as a problem that is difficult to define scientifically because of its complex web of interrelated causes and consequences. According to Derlet and Richards (2000), “Overcrowding may be obvious to the average person when places such as supermarkets, international airports, and national parks are overcrowded, but arriving at the precise scientific definitions and thresholds are the subject of debate” (p. 63). For education, particularly higher education, overcrowding is a phenomenon that is likewise difficult to define.

What is particularly inherent in the disciplines discussing the overcrowding phenomenon is that it is a situation where a given population exceeds the capacity to effectively cater for it. For instance, Levitt’s (1996) study on the effect of prison population on societal crime rates; Myers and Lee’s (1996) study on the population of immigrants and its effect on inadequate housing; Trzeciak and Rivers’ (2003) study on the threat of hospital emergency departments population on patients’ safety and public health. In specific terms, overcrowding in the health sector is manifested by inadequate capacity to cater for a growing population of patients (Trzeciak & Rivers 2003). The key words in that quote are “*inadequate capacity*” and “*patient population*” because they reflect elements of space and size respectively. What implications have these key words for describing or defining overcrowding in higher education?

‘*Inadequate capacity*’ would refer to insufficient capacity for student enrolment in an institution or educational system while ‘*patient population*’ would correlate to student enrolment/population. These keywords reflect the scenario in which the number of students accommodated by a higher education system or institution is more than the capacity (resources and infrastructure) available to cater for them. In other words, the term overcrowding, in an academic context, is a quantitative indicator reflecting the extent to which an educational system or institution is able to admit students, relative to

not only the demand for education but also the resources available to successfully accommodate for them. As such, overcrowding is a significant topic that links student population, student enrolment, or class size to the effective delivery of the higher education.

The subject of overcrowding can be seen in the light of discussions on 'class size', as seen mostly in the 'economics of education' literature and student access/enrolment discussions in general higher education discourse; for instance, see Cueso (2007), Cooper & Robinson (2000), Kokkelenberg, Dillon & Christy (2008), and a host of others. Urquiola (2006) argues that "it is impossible to separate class size from enrolment, because they are in fact equal" (p. 171). In other words, it is impossible to examine the effect of student enrolment on the quality of teaching and learning without involving the class size perspective.

Several scholars have attempted investigating the effect of class size on teaching and learning. The debate, though a long standing one, is still as hot as when it started several decades ago. The effect of class size on student retention and achievement, quality of teaching and learning as well as student to student and student to teacher interaction in the classroom have all being investigated (Biggs, 1999; Cuseo, 2007); however, conclusions seem to vary on this debate. The debate remains inconclusive till date. The discussion also cuts across primary education, secondary education as well as post-secondary education but postsecondary education has witnessed little interest compared to others.

2.3 The Class size debate

The impact of class size on teaching and learning is not a settled research debate in the education literature. It has been the subject of much contention for over 70 years and yet far from conclusive (Hall, Binney, & Kennedy, 2011; Paola & Scoppa, 2011). Findings are mixed and opinions vary from those academics and policy makers who argue that class-size reduction is not cost-effective to those who argue that it should be a cornerstone of educational policy (Blatchford & Lai, 2010). While some show empirical evidences that suggest large class sizes negatively affects teaching and learning (e.g. Hall et al., 2011), others strongly argue (with empirical evidences as well) that there is

little or perhaps no evidence to support the claim that smaller classes benefit teaching and learning; in other words, the effects are negligible and not statistically significant (for instance, Hanushek 1999). The reason for the differing conclusions, according to Krueger (2002), is that most published studies seem to have flaws in their empirics.

Some opinions registered that much previous research has not had designs strong enough to draw reliable conclusions about the effects of class size differences (Blatchford & Lai, 2010). For instance, Hattie (2005) criticized a highly rated research project on this topic (Project STAR – Student-Teacher Achievement Ratio), suggesting that the results could have gone wrong as a result of more resources devoted to the smaller classes which the results tend to favour. Hanushek (1997) likewise argues that perhaps the direct motivation and incentives of teachers and principals could be a factor in the results of the experimental classes. Glewwe (2002) similarly suggests that many of the studies did not properly manage the ‘unobserved characteristics’ that influenced class size and student achievement.

In traditional studies, estimates of class size effects are often plagued by thorny endogeneity problems which produce biased estimates (Paola & Scoppa, 2011; Urquiola, 2006). When attempting to assess class size effect on students’ achievements (for instance, when class sizes are reduced), researchers are typically not able to observe all the other factors entering into the student learning process, such as student effort and family support, teaching quality, etc. These endogenous characteristics are likely to produce a cross-sectional variation which may eventually yield biased estimates of class size effects (Urquiola 2006). These may be related both to the class reduction intervention as well as to student achievements. All these are pointers to the fact that a researcher needs to be cautious about generalizing class-size effects in isolation from other factors in education systems (Blatchford and Lai, 2010).

Most research evidence is often based on the class sizes that are purported by some developed countries within North America, Europe, and Australasia. However, average class sizes can vary greatly between countries and in some countries can be relatively much larger (Blatchford & Lai, 2010). Mulryan-Kyne (2010) argues that “it is difficult to determine exactly what constitutes a ‘large’ class in a tertiary level education context or a class that is too large for effective teaching to occur” (p 176). While there are no

rigid definitions as to how many students make a class large, what is of relative concern are what resources, accommodation and facilities are available to cater for the students (Gibbs & Jenkins 1992). “For instance: In a design studio with 40 students with available work space for 18 students, the impact of class size seems not too far from obvious. Students who once had their own permanent work space will now have to share it with others. Even though class size is only 40, the experience of higher education is totally transformed for both teachers and students. *So the effects of class size and student numbers are complex and contextual*” (p 16). The range of student ability, background, age and experience as well as the skills, competencies and ability of the lecturer are factors to consider when designating a class as large or ‘too large’ (Mulryan-Kyne, 2010). Oliver (2006) puts it like this, “Large classes hold many students, some of whom may be under-prepared for the course they are taking and some who will already have a high degree of familiarity with much of the planned content and learning outcomes” (p 1). The contexts of classes differ as a result of diversity amongst students but the difficulty tends for effective teaching and learning to take place if the class is large.

It is often assumed that class size need to fall below a certain number (the figure of 20 is often stressed) before they can have an impact on educational outcomes. For instance, Kokkelenberg et al (2008) study of 760,000 undergraduate students over a four year period show that class size negatively affects students’ grades, in particular when class size becomes larger than 20. Specific reference was made to the number 20. Also, Keil and Partell’s (1997) study of all Binghamton University students found that increasing class size had a negative influence on student achievement at a decreasing rate; meaning that, adding 10 students to a class of 10 or 20 had much more significant negative effect on grades than adding 10 students to a class of 200.

According to Cuseo (2007), despite the several conclusions made on the class size phenomena, “*what remains to be answered is the question: “How small is “small”?”*” (p. 11) and perhaps how large is large? He argues that most of the studies conducted on class size have managed to compare classes of different sizes within a high range (e.g. 50 and higher) with class sizes within a lower range (e.g. 25 and lower) to demonstrate that the average outcomes of smaller classes are more positive than those associated with larger classes. Crittenden, Norr and LeBailly (1975), an even earlier study argue

that there is no agreement among studies on class size effects as to the operational definition of size categories. For example, a large class varies in size from 10 or more to 200 or more. Cuseo (2007) added that, finding an operational definition for the size categories is significant in that there may be that there is a threshold number, below which the positive benefits of class size increase appreciably or “jump” dramatically. There may also be a threshold number, above which the liabilities of further increases in class size “level” off or become negligible. Several scholars including Cuseo (2007) suggests that an area for further exploration in the class size debate is the examination of what, or whether, specific positive changes occur in student and instructor behaviour when classes reach a certain size.

2.3.1 Class size effects on teaching and learning

While the issue of class size effect is yet to be settled in literature, what seems particularly apparent is that the experience of teachers and students changes with every change in class size (Gibbs & Jenkins, 1992). The change in experience, whether positive or negative, has also been a perpetual subject of discussion. However, according to Ahmed and Arends-Kuenning (2006), an increase in student numbers without related increases in numbers of staff and classroom resources will result in a decline in the quality of teaching and learning. This is the premise on which several studies stand. For over four decades now, enrolments of students into various realms of education have increased. The World Bank’s evangelisation of the Universal Basic Education promoted the value of primary and secondary education. Also, the appreciation of higher education as a source of economic growth and social development has surged the demand for its products.

In order to cope with increased student numbers, class sizes have to increase very rapidly. Students had to adjust to changes in class size, and staff had to solve the new problems of teaching large classes (Ward & Jenkins 1992). Staff-student Ratios (SSR) – the ratio of full time equivalent staff to full time equivalent students - have decreased as class sizes continue to surge (Gibbs & Jenkins 1992). For this reason, administrators, teachers and students are seeking evidence on which to base decisions about how to configure the ‘right’ class size to ensure quality, satisfaction, and meaningful learning outcomes (Burrus et al., 2009). They want to be able to assess the effect of class size on

teaching and learning; particularly student achievement. This is because of the common perception that large classes are economical to run and small ones are not (Hall et al., 2011). However, according to Biggs (1999), large class teaching is difficult, and requires rather more self-assurance and experience on the part of the teacher. This is because; large lecture halls tend to impose physical and logistical constraints on effective teaching and learning. Biggs (1999) therefore concludes that “the larger the class, the slower things get done” (p. 103).

Several studies have been conducted and some of them strongly advocate that small classes correlate with higher student achievement or better learning. However, Hanushek (1998) was quick to suggest this only occurs under specific conditions, for specific group of students, in specific subjects. There are some reasons why some scholars believe small classes are the way to go for better student learning and achievement: firstly, teachers in small classes tend to pay greater attention to each pupil – more individualization and less anonymity; secondly, students in small classes experience continuing pressure to participate in learning activities and become more involved students; thirdly, attention to learning goes up, and disruptive and off-task behaviour seem lowered because classrooms seem easier to control and lastly, teachers prefer small classes because it is associated with less stress for them as they tend to have more time for planning, marking and assessments (Hall et al., 2011; Blatchford & Lai, 2010).

Teachers in small classes tend to experience better relationships with, and have more knowledge of individual pupils. In smaller classes, it can be easier for teachers to spot problems and give feedback, identify specific needs, and gear teaching to meet them as well as set individual targets for pupils (Blatchford & Lai, 2010). This is the reason why many scholars argue that smaller classes are more effective when the development of higher-level cognitive skills is required because they allow for more interaction between students and staff and students with specific learning needs can be more easily addressed (Mulryan-Kyne, 2010).

In a survey conducted at the University of Maryland, researchers asked students in large classes to respond to the statement, “The size of the class does not affect my ability to learn” (Carbone & Greenberg 1998). It was reported that 41% of the students disagreed

with the statement while only 25% agreed. Further responses from the students indicated that large classes were bothersome due to a host of associated challenges including, lack of interaction with lecturers, absence of a structure in their lectures and a reduction in the frequency of assessments. An earlier study by Lindsay & Paton-Saltzberg (1987) on the impact of class size on Oxford Polytechnic students, reported that as class size increases, the average marks of students in a module assessment decreased. That is, the probability of a student making an 'A' grade is less than half in a module containing 50-60 of what it is on a module with less than 20 students. However, some other studies argue that teacher expertise is a more influential determinant of student learning and achievement than class size (see Wright, Horn & Sanders, 1997; McKeachie, 1990). McKeachie (1990) argues that in higher education, practical and theoretical reasons exist as to why class size should affect student learning and achievement but the skills and competencies of lecturers seem more significant factors.

Some studies also reported students in large classes expressed feelings of anonymity, being overwhelmed and vulnerable even in university environment (Hall et al., 2011). They were quick to add that, when students experience anonymity, they can feel less personally responsible and disinterested in their studies. As a result, their motivation to learn decreases and dissatisfaction and student attrition increases. Wulff, Nyquist and

Abbott (1987) collected the perceptions of 800 students of the University of Washington. The students were all enrolled in large classes. Three main findings were gathered. Students reported that in their classes, (1) they lost attention easily (2) they easily got distracted by classroom noise and student conversations, and (3) they were less motivated to learn because of the 'impersonal' nature of the class and lack of individual accountability. The 'impersonal' nature is similarly expressed in other studies as 'anonymity'. The effects of feelings of anonymity and isolation are particularly problematic for students in their first year at university as they lack the necessary skills and independence to cope (Light, 2001; Hall et al., 2011). In fact, many studies recommend small class sizes for subjects or courses with emphasis on problem solving, critical thinking, long term retention, and attitude towards the discipline (Cuseo, 2007; Light, 2001; Kwantlen, 2004; Kokkelenberg et al., 2008). McKeachie (1986) puts it like this, if one takes the basic outcomes of retention, problem solving and attitude differentiation as criteria for learning, the weight of evidence clearly favours small

classes. Gibbs and Jenkins (1992) add that methods of dealing with large classes have their costs, particularly in terms of drop-outs and failures.

Ehrenberg, Brewer, Gamoran and Willms (2001) share concerns why they think the number of students in a class has the potential to affect how much is learned in that class. First, they affirm that an essential part of learning is the level of social interaction within a classroom; that is, student being able to interact with each other and their lecturers. The lesser the number of students in a class, the more likely a teacher's ability to promote learning is encouraged. Second, the question of how much time a teacher is able to devote to an individual student and his/her specific needs is very dependent the class size. The smaller the class, the more likely teachers would have time at their disposal to cater for the individual needs of the students. The class size is also capable of affecting a teacher's allocation of time and, hence, effectiveness in the classroom. That is, how much material the teacher is able to cover and engage the class. The smaller the class size, the more likely it is feasible that a teacher would assign and assess written work, provide more feedback on student's work, use open-ended assessments and encourage more discussions within a class session.

Cuseo (2007) claims there are eight "deleterious outcomes associated with large-sized classes". He backed up the arguments by reviewing various empirical studies associated with each of them. The arguments are: (1) increased faculty reliance on the lecture method of instruction, (2) less active student involvement in the learning process, (3) reduced frequency of instructor interaction with and feedback to students, (4) reduced depth of student thinking inside the classroom, (5) reduced breadth and depth of course objectives, course assignments, and course-related learning strategies used by students outside the classroom, (6) lower levels of academic achievement (learning) and academic performance (grades), (7) reduced overall course satisfaction with the learning experience, and (8) lower student ratings (evaluations) of course instruction. He concludes that it would be a difficult task "to find any empirical evidence or conceptually compelling reason to support large class sizes, other than its obvious fiscal advantage, plus some speculation that instructors might be more motivated to teach classes with large audiences" (p. 10).

2.3.2 Large class size and the lecture method

“Large classes are more likely to use lecture methods and less likely to use discussion than small classes. Since discussion tends to be more effective than lecture for achieving changes in thinking and problem solving, we might expect large classes to be less effective than small classes” – McKeachie (1999, p. 201)

One of the core aspects of this thesis is teaching and learning and this emphasises the importance of teaching methods. Class size and teaching methods are almost inextricably linked. This is the main reason why studies on class size and teaching methods (depending on the class size) usually overlap (McKeachie, 1986; Cuseo, 2007). A number of scholars argue that large classes are most likely to use lecture methods (Cuseo, 2007; Biggs, 1999; Oliver, 2007). Large classes are not a new phenomenon in higher education. In the United States of America and some parts of Europe operating the mass higher education systems, first year classes are commonly between 300 and 1,000 students (Biggs, 1999). Universities and higher education systems are developing ways of coping with large classes (Gibbs & Jenkins, 1992). Several scholars, including Gibbs and Jenkins (1992) contested that the explosive increases in enrolment rates experienced all over the world calls for a rapid change in the mode of teaching and assessments. Many fear that the consequences of not changing the methods of teaching and assessment could be a dramatic decline in quality of education. Cohn and Cooper (2004) puts it this way, “If expansion of output, especially instructional output, is achieved by expanding average class size, educational quality may suffer” (p. 599).

Administrators, teachers and even students are all concerned about how education quality can be maintained when class size increases (Burrus et al., 2009). This concern is genuine because increases in class size have come to stay in educational institutions. These increases have taken place and are taking place in a context in which increasing demands are being made on staff and institutions; hence it is a situation that is very unlikely to change in future (Mulryan-Kyne, 2010). In the words of Christopher (2003), “current trends point to more and more large classes. Small classes may be a thing of the past for most of us in the modern university” (p 82). As enrolment increases, budget constraints are likely to perpetually tend institutions and educational systems towards large classes (Christopher, 2003).

Moreover, the most cost effective teaching method common in institutions for coping with large class sizes is the lecture method (Efsthathiou & Bailey, 2012). It is not

surprising that teaching sessions with large classes are frequently referred to as ‘large lecture’ or ‘large lecture sessions’ as most common method employed by teaching staff is lecture method (Mulryan-Kyne, 2010). According to her, the few studies that have been carried out on teaching and learning at university level show that “lecturing is the most common teaching approach used. “As class size increased (in the studies), the amount of lecturing also increased” (p 179). Given the pressure to publish research articles and undertake consultancy in addition to their teaching role, lecturers can very easily become overwhelmed and as a result, resort to traditional teaching and assessment methods; that is, lecture and written exam. Some lecturers lament that it is unfair to be expected to teach large classes and still be able to maintain the standards established for small course sessions (Christopher, 2003). This is because, according to Oliver (2007), in large classes, it is often difficult to provide courses that recognize and cater for the diverse needs of students. While large classes provide institutions with economies of scale, it also comes with some potential risks as the delivery mode tends to be impersonal and alien to many students (Oliver, 2007).

The lecture is the standard method for teaching large classes. Its strength lies in communicating information and teacher’s personal interpretations to students, but it makes demands on concentration that drastically undermine its value if not properly handled (Cohn & Cooper, 2004). The effectiveness of the lecture method is dependent on the effort and care that goes into the preparation and quality of delivery (Mulryan-Kyne, 2010). According to Christopher (2003), lectures are effective when goals involve factual information; presenting and comprehending that information. However, when instructional goals involve higher level cognitive skills including application, analysis, and synthesis, lecture method faces criticisms. Words like “ineffective”, “cold”, “distant”, and even “boring” are descriptions often linked in some way to the lecture method (Davis, 2007). Barnett (2006) argues that even if the best lecturing skills are used, the basis of the lecture method is, at heart, transmissive because of its ‘one to many’ nature. This is because lectures are generally described from the instructor’s point of view, and the students’ needs for interaction with the lecturer are hardly addressed. The method tend to steer lecturers towards a school of thought that knowledge is something passed on from ‘top’ to ‘bottom’; that is, from lecturer to the student (Barnett, 2006). The approach has been assessed as less effective for long term retention of knowledge, the application of knowledge to new contexts, the development

of higher-order thinking, attitude change and motivation (Bligh 2000; Mulryan-Kyne, 2010).

Its advantage, particularly for higher education institutions, is there are enough students not only to use classroom space but also graduate students and instructors' talents more efficiently (Cohn & Cooper 2004).

2.3.3 Information and Communications Technology in large classes

The use of ICT in large classes is usually motivated by the need to improve active learning, foster feedback and interaction with the lecturer and between students. Marbach-Ad and Sokolove (2002) argue that active learning through interaction can help instructors become better teachers. In fact, in the realm of higher education, studies since the 1980s have demonstrated that the quality and frequency of interaction between faculty and students have a strong effect on student persistence towards learning (Bongey, Cizaldo & Kalnbach, 2005). This is because class interaction has been assessed as more effective than the one-way lecture method in achieving higher order thinking and problem solving abilities in students (McKeachie, 1999). Marbach-Ad and Sokolove (2002) stress that the major benefit resulting from more frequent student-instructor interaction is that instructors can learn more about what their students are thinking: what they understand, what they misunderstand, what misconceptions they hold that get in the way of their learning, what prior beliefs and concepts they bring to the classroom, and what captures and engages their interest.

ICT, some argue can help foster interaction in large classes. For instance, Barnet (2006), studied the use of personal response unit or clickers in large classes and argues that, "the devices alter the very basis of classroom dynamics by giving students in large lecture based classes, the power of individual feedback and motivation" (p 2). Anderson, Anderson, VanDeGrift, Wolfman and Yasuhara (2003) also identified four main challenges technologies could solve in large class lectures including: the issue of *feedback lag* since there is hardly time for students to process presented material let alone interrupt with a question; the issue of *student apprehension*, which is caused by students feeling intimidated by the number of students in large classes; the issue of comment verbalization in that some students have trouble communicating their

confusion in words; and the issue of *single-speaker paradigm* which limits the potential for student participation because the rule seem only one student can take the attention of an instructor per time. Literature suggests ICT can help address these challenges by providing real time feedback to lecturers (as seen with the personal response technology), providing an anonymous platform for students to voice their opinions and the collective advantage of multiple participation per time respectively.

The debate on the value or effect of technology in large classes remains inconclusive in literature. Samson (2010) puts it like this, “the value of in-class internet technologies to student attentiveness, engagement and learning remains both controversial and filled with promising potential” (p 1). The reason is because for some of these technologies, the challenges associated with their use in large classes outweigh the benefits, and the goal of interaction is hardly met. However, the positive deduced from the use of such technologies is that students and lecturers seem happy about the exposure to a new technology in the classroom. For instance, Freeman’s (1998) study on the use of videoconferencing technology in large classes found that students and lecturers were happy with the exposure to a new technology, even though there were more challenges than positive outcomes from the experiment.

There are other positives beyond exposure to new technologies. For instance, Draper (2004) presented findings from an institution-wide project involving the use of electronic voting equipment for lectures and concludes that the most promising pedagogical attribute of the technology is interactive engagement. It fostered peer discussion amongst students and lecturers were able to use diagnostic questions to garner and as a result focus on the learning needs of their students, real time. In all the classes, except one, majority of students reported that the advantages of the electronic voting tool outweighed the disadvantages. The class where students had a different opinion came as a result of the enthusiasm of the lecturer in that “the equipment was being used for its own sake... rather than being of direct benefit to the class” (Draper 2004, p. 87). They conclude that the lesson learned from the finding is that, the benefits of technology is only seen when pedagogical concerns are put first. Barnett (2006) also studied the effect of the use of personal response units in three large classes of introductory science courses at the University of Western Ontario. From a survey response of 560 students, he reported students were happy with the personal response

technology: 36.2% of students found the feedback they were receiving in the class on how well they understood their learning material very useful; 22.9% said they enjoyed the interactivity of their courses while 20.7% were happy they were able to know what they are doing in comparison with their classmates; 15.4% felt more involved; 14.9% were happy to get examination hints and 11.6% said they learned better.

Eyitayo (2005) studied the use e-learning applications for large classes teaching at the University of Botswana. Face-to-face sessions were supplemented with course outlines, lecture notes, laboratory manuals, quizzes and bulletin board on the Learning Management System (LMS) called WebCT and laboratory sessions were done using only WebCT. From a quantitative survey involving 750 students, he found that majority of the students surveyed felt the elearning platform was very useful (93.1% of students); it met their learning needs (78.4% of students) and it made the course better (92% of students). Freeman (1998) also investigated the use of videoconferencing technology in large multi-campus classes. From a combination of focus group and survey questionnaires administered to 239 students, he found that student satisfaction was lower (a record of 7.2 compared to 7.5 when no video was used) and 16% expressed a sense of excitement with the use of the innovative technology. There was no significant difference however. Perceived benefits of students include greater equity in assessment and learning; motivational involvement in approach to mass lecture; exposure to new technology; cross campus student interaction and better access to information.

Amoroso (2005) studied the use of online assessment tools to enhance student performance in large classes. Using two large classes at a university in Southwest United States, both with almost 500 students in size, he found that students who performed better on online assessments also performed better in traditional examinations. He argues that online assessments better prepared students for traditional in-class examinations. Riffell and Sibley (2004) conducted a similar study on whether the use of web-based instruction will improve large undergraduate biology courses. Findings suggest quality of interaction with the instructor was high; frequency with which students contacted lecturers and fellow students with questions increased; students read learning materials more often and studied in groups more frequently. The conclusion they made was that active-learning exercises were more effective when

coupled with online activities. Table 2.1 summarizes a list of studies that have investigated the use of technology to aid large class size lectures.

While the technologies, in some cases, helped improve interaction and perhaps student engagement in the classroom, they are not without challenges related to the use of technologies themselves. The most common is the time it takes to set up and shut down the technology systems; student disruptive behaviours as a result of distractions caused by the technology; the possibility of lecturers and students drifting away from pivotal learning points due to a focus on the technology rather than the pedagogical implications. For instance, Draper's (2004) study on the use of electronic voting system revealed challenges in the time taken to set up and use the tool, shift of focus from the course content to the technology if care is not taken, students could vote randomly and mislead the lecturer and the tool could be a distraction from the learning point for both lecturers and students. Eyitayo (2005) in his study reported challenges relating to the setup time of the elearning application in the classroom. Other challenges reported include, limited number of computers available for further practice; some students are distracted in class because they know they would get notes on WebCT; and the WebCT outside the university is usually very slow to open. Freeman (1998) also reported problems in his study on videoconference technology in large classes. The perceived problems include reduction time in learning as a result of the time it took to set up and shut down the technology for every class; increased potential for disruptive behaviours by students and reduced interaction with lecturers and amongst students. Table 2.1 shows a summary of the findings of these studies and the challenges encountered.

The studies tend to surmise that while the use of technology cannot entirely solve the perceived challenges of large class sizes, it certainly has a role to play. However, the focus of the use of the technology must be to assist pedagogy and not the other way round.

Table 2.1: Summary of studies on the use of technology in large classes

Technology	References	Positive outcomes	Challenges
Personal Response System	Draper (2004)	Peer Interaction; Student-Lecturer interaction.	Time taken to set up and shut down the system; distraction from pedagogy to technology
	Barnett (2006)	Real time in-class feedback; improved interaction; ability to compare peer choices; examination hints; active	Time taken to set up and shut down the system

		learning	
	Poirier & Feldman (2007)	Students in technology used classes performed significantly better than in the traditional course judging from exam scores; students reported positive attitudes towards technology use – they thought the class was fun and enjoyable; students felt they learned more with the use of technology; technology improved student-student interaction	Students did not really appreciate the technology.
	Patry (2009)	Students felt the technology helped them to understand learning material; favourable responses on the instant feedback potential of the technology; student felt they engaged and paid attention more; technology was a motivational tool	Financial cost; technical difficulties; and forgetting the device at home.
LMS/CMS	Eyitayo (2005)	Technology made the course ‘better’; technology met students’ learning needs; students felt technology was useful	Time taken to set up and shut down the system; not enough computers; students were distracted; slow speed of the technology outside university environment
	Bongey, Cizaldo & Kalnbach (2005)	Strong support for the effect of the technology in improving student achievement; saves time in providing administrative information to students.	Initial learning and set up on the part of instructor.
Videoconferencing	Freeman (1998)	Motivational involvement in approach to mass lecture; exposure to new technology; and better access to information	Lower satisfaction with the course; Time taken to set up and shut down the system; increase potential for disruptive behaviour by students; reduced with lecturers and amongst students
Online assessment tool	Amoroso (2005)	Students who performed better online performed better in traditional assessment	Not mentioned.
	Riffell & Sibley (2004)	Quality of interaction with lecturer increased; frequency of contact with lecturers and peers with questions increased; students studied learning materials more; students got into groups more frequently.	Not mentioned.
Laptops	Samson (2010)	Increase in student inquiry on learning materials; students felt they were more attentive using technology; increase in student engagement; students felt technology had a positive influence on their learning	Students were easily distracted by their laptops – spent enhanced time on tasks unrelated to class.
	Wentling, Park	Technology positively affects	Students perceive the usability

	& Peiper (2007)	student learning scores; students felt the use of the computer increased their understanding of learning material; students found it easy to communicate and interact with instructor, TA and with each other; students felt close to the instructor	of the software more than its efficiency; server connection/technical problems; insufficient functionality; system interface issues;
Email & in-class lab notebook	Marbach-Ad & Sokolove (2002)	Quality of students' questions and comments increased; increased student-instructor communication.	Not mentioned.

2.3.4 ICT in Higher Education of developing countries

Most countries in Latin America, Middle East, Africa, Southeast Asia, and some parts of southern Europe have been assigned the 'developing countries' tag because of their lower rank in the United Nations Development Program (UNDP) Human Development Index (Gulati, 2008). Education research in these countries often points to a lack of or limited educational infrastructures, teachers, economic structures and technologies to support the demand for education at all levels. Limited textbooks, crowded desks or writing spaces, libraries without journals, laboratories without equipments and barriers of ICT access, use and integration for teaching and learning (Perraton, 2000).

This is not to assume that all developing countries have homogenous characteristics, social problems and issues. They differ in their political circumstances, the history of their educational development, culture, language, religion, gender issues, population size and resources (Gulati, 2008). Even though institutions around the world are undergoing epochal transformations in response to a wave of education reforms and the potentials of ICT (Adam, 2003; Daniel, 1996; Perraton, 2007), literature suggests that most developing countries are struggling to harness the potentials of ICT based technology for their higher education systems. In the words of Barajas and Gannaway (2007), implementing ICT in higher education of most developing countries often encounter highly volatile socio-economic, cultural, environmental and political challenges. Issues of poor connectivity, lack of human capacity, scarcity of appropriate content and ever diminishing budgets are some of the challenges ICT initiatives have to face (Arias & Clark, 2004; Ekundayo & Ekundayo, 2009).

Moreover, significantly, there is the barrier of “Digital Divide” that limits the ability of some countries to take advantage of technological developments (Kozma & Anderson 2002). Walsham and Sahay (2006) argue that ‘digital divide’ exists between people with access to ICT and their ability to use them effectively; and those without it. They stress that this continues to remain a challenge for higher education in developing countries. Gulati (2008) also contends that the present ICT provision in developing countries is often limited to the elites within the communities. She opines that ICT access is contributing to the widening gap between ‘haves’ and ‘haves not’ in developing economies. In other words, existing efforts to improve access to ICT in developing countries have provided opportunities for some and not for others.

Even though ICT plays a role in representing equalization strategy for developing countries, the reality of the digital divide makes a huge difference in the use of ICT. According to Chinn and Fairlie (2010), most developing countries have substantially lower rates of computer and internet penetration than the rates for developed countries. In developing countries, 25% of homes have a computer and 20% have Internet access compared to 74% and 71% in developed countries respectively (ITU, 2011). Particularly in African countries, rates of technology use are especially low. For instance in Nigeria, there are 45,039,711 internet users as of December 2011, 29% of the total Nigerian population; in South Africa, there are 2,400,000 internet users, 13.9% of the population and in Egypt, there are 21,691,776 internet user, making 26.4% of the population. These compared to New Zealand's 84.5% of the population; Australia's 89.8%, Singapore's 77.2% and the United State's 87.3% (ITU, 2011).

Issues of access and cost appear to be significant to the adoption and use of ICT for teaching and learning in developing countries. Gulati (2008) stresses that it is hard to imagine that ICT can have a positive impact on the education of citizens who lack basic living resources and live with an underdeveloped educational infrastructure in an environment of increasing political instability. For instance, Ojo and Awuah's (1998) argue that the critical challenge in Botswana is the need to balance investments in computer education against more pressing needs of basic living resources in rural and deprived areas. Pena-Bandalaria (2007) likewise reveal that typical infrastructural and digital divide challenges exist between rural populations when it comes to using computers and associated technologies for teaching and learning in the Philippines.

Andersson and Gronlund (2009) argue that for those implementing or looking to implement ICT mediated learning in developing countries, it is important to understand all challenges. They argue that the challenges ICT mediated teaching and learning face in developing countries could be unique and different from those of developed countries depending on the context. Nawaz, Awan and Ahmad (2011) suggest that approaches to integrating ICT in higher education of developing countries should not ignore or underplay the social dimensions of the process. In other words, for ICT to thrive in higher education systems of developing countries, it is imperative that its initiatives must not be based on technological possibilities but on contextual and unique educational needs (Sarkar 2012). The contexts of these developing countries are significant to the success or failure of ICT initiatives in their higher education institutions. According to Avgerou (2001), the differences in context are often the reason why ICT initiatives fail to meet their objectives.

2.3.5 The use of ICT in Nigerian Universities

This research uses Nigerian universities as case studies; hence it is important to consider relevant literature on the use of ICT in Nigerian universities. According to the World Bank and the United Nations, Nigeria is the most populous African nation with strong influence on the continent and usually one of the countries at the forefront of prominent ICT initiatives (Akinsola, Herselman & Jacobs 2005).

There are more computers in universities nowadays than there was three decades ago and Nigerian universities are not excluded. However, despite the seeming proliferations of computers in Nigerian universities, reports suggest access to ICT is limited (Ani, Edem & Ottong, 2010; Ani, 2009; Agbonlahor, 2006). In a survey of 1,284 undergraduate students from seven universities in Nigeria, Adetimirin (2011) found that ICT was available on campuses in different locations including university libraries, computer laboratories and cybercafés except for classrooms. However, classes were not equipped with ICT facilities. In her words, “the number of the available ICT was found to be inadequate when compared with the number of undergraduates in these universities” (p. 6). This reinforces the overcrowding phenomenon in the universities; that is, the number of students is more than the resources available to cater for them. Also, in a survey administered to 600 students from three Nigerian universities, Ani

(2009) reported that, “inequitable access to the internet has been a major problem impeding internet use among undergraduate students in Nigerian universities to support their learning and research” (p. 561). Agbonlahor (2006) in her study found that the level of access to computers significantly influenced both the frequency of computer use and the number of computer applications used by Nigerian lecturers. According to her report, some universities with computer laboratories have a problem of providing access for lecturers; as the computers were “generally insufficient for the needs of the faculty members, especially when they had to share such labs with their students” (p. 273). This perhaps explains why the use of ICT facilities is limited in classrooms of Nigerian universities.

The most common forms of ICT in Nigerian universities are computers, mobile phones and the internet (Adetimerin, 2011; Ani, 2009). Adetimerin (2011) found that mobile phones had the highest frequency of use of the three while the internet had the least frequency. Ajayi (2008) found in the study on the use of ICT in five Colleges of Education in South West Nigeria that the ICTs present were computers, television sets, bulletin boards, radio, record player and disc player. He noted that ICT facilities such as internet facilities, electronic boards and projectors were not available for teaching.

Due to limited access to ICT facilities within the schools, students and lecturer have to depend on commercial ICT centres within and outside their schools, popularly known as cybercafés. Archibong, Ogbiji and Anijaobi-Idem’s (2010) study revealed that majority (62.3% of 300) of academic staff surveyed in their study, accessed the internet at public cybercafés, 31% had private access on their laptops while only 6.7% had access within the school. Ani et al., (2010) found that commercial internet cybercafés off campus are the highest point of access for academic staff. Other points of access include, University ICT centre, mobile phones, wireless access through personal laptops, personal office and the access from the university library was the least. Adomi, Okiy and Ruteyan (2003) in the study of cybercafés in Delta state Nigeria found that most of the users were university students. Anyira (2011) also revealed in his survey of staff and students of a private university in Nigeria that majority of them access the internet via cybercafés and personal laptops for which they have to pay for access. He added that only a handful of them use the internet through the university facility; not because they do not want to but because access is limited within the school. She concludes that there is a

positive relationship between the point of access and the frequency of internet use. Anunobi's (2006) study on access to internet at Federal University of Technology Owerri (FUTO) Nigeria reveals that the "majority of students spend so much time and money and even risk their lives travelling about 30km" to public cybercafés outside the school to use the internet for their school assignments and projects as internet facilities were not available within the school (p. 193). She argues that such long distance travel to access ICT may be a source of frustration or perhaps distraction from the use of the internet.

Several studies have investigated the purpose for which ICT resources are used in Nigerian universities. For instance, Ani et al. (2010) in their analysis of internet access by academic staff found that academic staff majorly used the internet to communicate with their peers and colleagues through email to enhance their teaching and research activities; also as a tool to obtain information to make-up lecture notes; and as information resource for research. Ani (2009) in his study on the use of the internet by undergraduate students from three public universities in Nigerian, found that the internet is mostly (87.1% of 600) used for research related activities; to write term papers, seminar presentations and projects. They also used the internet as an information resource for class work/assignments (80.1%) and to make up lecture notes (52.4%). Anunobi (2006) also found from a survey of internet usage by undergraduate students from a university in Nigeria that "majority of the students spend their time, energy and money accessing the internet for one academic reason or another" (p. 194). Areas of academic activities students focussed on include knowledge improvement (52.77% of 812 students), collection of material for assignment (39.68%) and collection of materials for research and projects (7.53%). This indicates, students use the internet as an information resource mostly to improve their knowledge in their academic work. Nwagu et al., (2009) in a survey of 560 students on the use of the internet amongst Nigerian universities also found that students "used the internet for education purposes more than they did for leisure, entertainment, social, health and business" (p. 725).

As with several developing countries of the world, a complex web of interrelated issues affect the use of ICT in Nigeria. According to Ajayi (2008), the major challenges of using ICT for teaching are poor power supply, inadequate ICT facilities within the universities and the incompetence of lecturers in using the ICT resources. Their findings

revealed erratic power supply as the most prominent of the problems of using ICT. Archibong et al., (2010) found limited funding, access and proximity to ICT facilities and “very erratic” electricity supply which makes the ownership of power generating sets mandatory, and academic staff workload and personal disposition to ICT as the main challenges of ICT for teaching and learning in Nigerian universities (p. 112). Adetimerin (2011) found that inaccessibility to ICT, inadequate ICT facilities, lack of skills to use ICT, irregular power supply, limited duration for the use of ICT, and frequent technical/computer breakdown as challenges of ICT use. The most common from the 1,284 survey questionnaires analyzed was irregular power supply. In their words, “among the constraints identified, irregular power supply was identified as a problem in all the universities studied since this is a national problem faced by all in the country” (p. 10). Omotayo (2010) also found power failure as the most challenging issue affecting access to e-journals by Nigerian academic staff. Other challenges include system breakdown and bandwidth problems.

2.4 The gaps in literature

This study addresses the contribution of ICT to teaching and learning in overcrowded classrooms of Nigerian universities. While the past four decades have witnessed a burgeoning literature on the effect of class size differences on teaching and learning as well as the use of technology in large classes, most developing countries’ (particularly African countries) perspective to the topic has not been well captured and reported. In the words of Blatchford and Lai (2010), “research evidence is usually based on class size normally experienced in countries within North America, Europe, Australia and New Zealand. However, average class size can vary greatly between countries and in some countries can be very much larger” (p. 202). The experience of large classes in developing countries, for instance Nigeria is different from those of developed countries. It is usually a case of crowded classrooms with the number of students exceeding the resources available to cater for them.

Apart from Eyitayo’s (2005) study that focussed on the use of ICT in large classrooms of universities in Botswana, not many studies were found on the use of ICT specifically to address large class sizes in African countries as well as developing countries as a whole. Most part of literature on the use of ICT in higher education of developing

countries focuses more on open and distance education and e-learning debates that tend not to emphasise the contribution of ICT tools to teaching and learning dynamics in a crowded classroom. This study addresses that gap however, with a specific focus on how ICT is used and its contribution to teaching and learning in the crowded classrooms.

The majority of research on class size tends to have only considered the number of students in the class and its relation to achievement, while neglecting the pedagogical process or mediating conditions of the teaching and learning process. Not many studies have provided information on classroom conditions that may be associated with class size (Paola & Scoppa 2011).

Moreover, while several investigations have been conducted on class size, most of them seem to be talking about the overwhelming nature of the students per instructor in the class without considering the resource situation to cater for them. This is what I refer to in chapter 1 as, “when the class is larger than large”. For instance, overcrowding is teaching a class of 500 students in a lecture theatre that can only accommodate 300 people. The experience of teaching and learning in that classroom will certainly be different from that obtained in a 50 siter capacity lecture theatre with only 30 students. Very rarely has this context of overcrowded classrooms been considered in literature. In other words, studies that look into classes where the number of students are more than the resources to cater for them. Also, it appears that only a handful of studies have been undertaken to investigate the contribution of ICT to teaching and learning in overcrowded classrooms especially at higher education levels.

In addition, literature on the effect of class size on teaching and learning typically analyse early childhood, primary and secondary education contexts (e.g. Blatchford & Lai, 2010), while little attention has been paid to college or university students (Paola & Scoppa, 2011; Burrus et al., 2009). However class size is also relevant issue for post-secondary education. The large growth in student enrolment recorded over the last few decades and limited financial resources have induced many universities to offer courses which are organized into very large teaching classes with unknown effects on students’ learning processes.

Therefore, the contribution of this study is to examine the contribution of ICT to teaching and learning in overcrowded classrooms in Nigerian universities as case studies of developing countries.

2.5 Introducing activity theory: The subject, the need and the tool

Our world is characterised by the coexistence of humans and nonhumans. Individually or collectively, we cannot subsist without technical artefacts just as much as the artefacts only exist because of human beings (Miettinen, 1999). These assertions typically refers to the interplay between the subject and object of an activity as purported by activity theory. Activity theory aims at understanding the interaction of human beings and the social entities that compose their everyday natural setting. Achieving this understanding requires going through an analysis of the genesis, structure and process of human activities (Kaptelinin & Nardi, 2006).

The genesis of human activity starts with a subject and an objective (a need). Where the subject is the human being, consciousness is significant in what he does and how he reacts to the needs in his lives. “In activity theory, any activity is an activity of a subject. Not any entity is a subject. Subjects live in the world; they have needs that can be met only by being and acting in the world” (Kaptelinin & Nardi, 2006, p. 33). Some theories for instance, actor-network theory, assume symmetry between the social and the technical (that is, humans and non-humans) elements of an activity, suggesting both are ‘collective’ in that they are equal in their influence on each other (Latour 1999). Activity theory does not subscribe to this philosophy. Rather it grants agency to human subjects only, emphasising their superiority over non-human elements as social beings with significant traits of consciousness and intentionality (Diaz Andrade, 2010; Miettinen, 1999).

Diaz Andrade and Ekundayo (2011) argue that “the ultimate cause for human activity is needs”. The survival of humans in the world is based on their ability to meet their needs using the tools available to them. The needs of human beings are what lead to the creation, continuous modification and appropriation of tools to meet the needs. This again emphasises that the interaction between human subjects and their objectives is not a symmetrical relationship; rather it is initiated and carried out by human subject to

fulfil its needs. This is where the role of consciousness and intentionality come to play in the activities of human being. For every human activity, there is always a motive, a goal, and the consciousness trait of humans provides the platform by which the goal is to be met (Miettinen, 1999).

Mwanza and Engeström (2005, pp. 453-454) opine that “the current surge to implement information and communications technologies (ICT) within teaching and learning processes has created an inevitable need to store, access and distribute educational resources via technology-based systems, particularly databases and web-based systems”. The use of ICT as a tool in teaching and learning processes has great implications for both lecturers and students as creators and users of educational content. There is also an inevitable need for current higher education administrators to involve technical, information and educational specialist when handling issues regarding the management and distribution of educational content especially in e-learning environment. In the current era of higher education delivery, ICT as tool has been influential in distributing learning materials to a large number of people especially when they are separated by distance and time. Without doubt, higher education delivery, shape and is in turn shaped, by ICT technologies as mediators of teaching and learning activities.

This study investigates the mediation of the ICT tool in the large class sizes of Nigerian universities. The need to be met is teaching and learning in overcrowded classrooms and the tool being examined amongst many others is the ICT tool. The subjects are the teachers and students participating in teaching and learning activities. The activity system or unit of analysis is the classroom.

2.5.1 Justification for activity theory

Teaching and learning are critical concepts of this study which investigates access to and quality of higher education. For this reason, some commonly used theories in teaching and learning settings were examined. Most of them tend to both explain human behaviour in terms of continuous reciprocal interaction between cognitive, behavioural and environmental influences (Kim, Jain, Westhoff & Rezabeck, 2008). For instance, Bandura (1997) stresses that Social Learning Theory (SLT) and Social Cognitive

Theory (SCT) emphasise the importance of observing and modelling, the attitudes, and emotional reactions of others in learning. Moreover, some of these other theories are good at explaining some important elements in teaching and learning such as subject-subject interaction, environmental influence and mediation by signs (the use of instructional modelling) (Kim et al., 2008), they tend to have limited or no focus at all on subject-object interaction (the relationship between the subject and the goal of learning), the consciousness of the learner and the role of tool mediation (Engeström, 1999).

In contrast, activity theory advocates for these three concepts (Engeström, 1999). According to Nardi (1996), activity theory possesses a strong notion of consciousness and mediation, that all human experience is shaped by the tools and sign systems we use. Also, compared to the other theories that focus mainly on the cognitive nature of human beings in their learning process, activity theory offers the advantage of studying the interaction of human beings with mediation tools on their learning process (Mwanza, 2001). Mwanza and Engeström (2005) identified three aspects of learning activities that activity theory helps to explain: the nature of activities involved in the learning process; the methods and tools used to interact with learning object; and the purpose for which subjects interact with the learning objects.

Activity theory advocates for the tool mediation concept; that is, the methods and tools subjects use to interact with their learning objects (Mwanza & Engeström, 2005). Jonassen & Rohrer-Murphy (1999) argue that, to fully grasp the learning process within an activity system, it is beneficial to understand the nature of tools within the system by looking at the way they are used, the needs they serve and the history of their development. The theory provides theoretical underpinnings as to the nature, use or tools and the needs they serve in the lives of humans, particular in a learning activity. A significant objective of this study is to investigate the contribution of ICT as a tool for effective teaching and learning in overcrowded institutions. Above the other theories examined, activity appears to emerge more suitable considering the concern of the use of ICT in this study.

2.6 Activity Theory and the activity system

The theoretical framework of activity theory is rooted in the classical German philosophy of Kant and Hegel, which emphasises both the historical development of ideas as well as the active and constructive role of humans (Jonassen & Rohrer-Murphy 1999; Lektorsky, 2009). That is, activity theory perceives day-to-day actions of human life as a result of the existence of the human mind as a special component of interaction with the environment.

Further development of activity theory came from the works of Soviet scholars – mainly, Sergei Rubinshtein (1935), Alexei Leont’ev (1978) and Lev Vygotsky (1978) – who contributed immensely to set its foundations. As a whole, activity theory’s combined origin encompasses Marxist philosophy, Vygotsky’s (1978) cultural-historical psychology as well as Leont’ev’s (1978) hierarchical structure of human activity (Blin & Munro, 2007). Because of its non-English language origin, activity theory has encountered a major challenge through the several attempts to translate and formulate its concepts and principles into English language (Bedny & Karwowski, 2004). Nowadays, activity theory has transcended its own origins and become a truly international theoretical approach applicable in multiple disciplines (Engström, 1999).

Activity theory was introduced to overcome the Cartesian opposition between the subject and the object, between the inner world of consciousness and the outer world of stimuli (Lektorsky, 2009). The theory postulates that activities can only be properly understood by analysing their historical-cultural development within a specific context. In this sense, activity theory conceptualises the interaction between human beings and their social environment as a system of social relations – that is, an activity system. Activities do not exist without social relations. This is because human activity is enmeshed in a network of social relations working together. Since human activity is the result of historical development, activities are constantly undergoing change and reformation (Quek & Shah, 2004).

An activity system is an object-oriented, artefact-mediated and socially-constructed system, where cognition, behaviour and motivation are integrated and organised by a mechanism of self-regulation towards achieving a deliberate goal (Bedny & Karwowski, 2004). As a result, activities are complex, collective and motivated by the

need to transform a material or abstract object into desired outcomes (Blin & Munro, 2007) – e.g., turning grapes into wine, solving a mathematical problem, etc. Thus, different forms of activity within an activity system can be conceptualised as a development process (Bedny & Karwowski 2004). Barab, Barnett, Yamagata-Lynch, Squire and Keating (2002) put it this way; “a focus of activity theory is on how participants transform objects, and how the various system components mediate this transformation” (p 79).

Leont’ev (1978) puts forward that an activity system can be represented as a hierarchical structure organised into three levels: activity, actions and operations.

Activity, which is driven by a complex, social motive, is at the top level in this hierarchical structure. The motive is the object, which stimulates or motivates the subject to carry out a set of activities. In the long run, the set of activities carried out by the subject is ultimately aimed at attaining the object (Kaptelinin & Nardi, 2006).

Actions represent the second level in the hierarchy of activities. An activity may be composed of a sequence of steps, each of which is not immediately related to the motive even though the sequence as a whole may eventually result in attaining the object (Kaptelinin & Nardi, 2006). This sequence of steps is termed actions. The objects at which they are directed at are referred to as goals. Goals are conscious mental representations of human activity in conjunction with a motive (Blin & Munro, 2007).

The second-level actions can be decomposed into lower-level units; these units of activity are referred to as *operations*, which represent the third level. Operations are routine processes oriented towards the conditions under which the subject of an activity is trying to attain a goal. Over the course of constantly carrying out an activity, a conscious action may transform into a routine operation. Gradually, these actions may become more and more automatic (Kaptelinin & Nardi, 2006). For instance, after a series of sessions of driving a car with a manual gear system, a driver becomes acquainted to the car and drives without having to consciously think about where, when or how to change the gear. The operation gradually becomes a routine and thus normalised over the course of time.

Table 2.2: Descriptions of the levels of activity

Levels of activity	Description
Activity	Activity is driven by a motive towards an object.
Actions	A composition of activities towards a set goal. A sequence of tasks directed at an eventual goal.
Operations	A well mastered routine of activities directed at a goal. The activities have become normalised over time into the system of the subject such that they could be done almost unconsciously.

In summary, the uppermost level of collective activity is driven by an object-related motive. The middle level of individual – or group – action is driven by a specific goal. Finally, the bottom level of collective activity is driven by the conditions and tools of action at hand (Engeström & Miettinen, 1999).

By assuming that the human mind emerges and exists as a special component of interactions with the environment, activity theory highlights the importance of context and consciousness (Jonassen & Rohrer-Murphy, 1999). Consciousness unifies attention, intention, memory, reasoning and speech of humans. Humans are granted with intentionality since people orientate and plan their activities. In other words, purposeful actions are realised through conscious intentions. These human intentions are directed at objects of activity. The objects of activity affect the nature of the activity, which in turn affects the object. In this way, a mutual and dynamic relationship is generated. This mutual and dynamic relation is at the core of activity theory, concluding that activities are socially and contextually bound and can only be described in the context of the community in which it operates. Context is not simply a container or a situationally created experiential space but is an entire activity system, integrating the subject(s), the object, mediating tools, the community, rules of the community and division of labour into a unified whole (Barab et al., 2002; Engeström, 1993). Issroff and Scanlon (2002) argue that activity theory demands a high degree of understanding of the culture, practices and situations of the teaching and learning context or environment when analysing the use of ICT in higher education. This study takes into account the socially and contextually bound nature of activities and as such the investigation of the phenomenon was carried out within context. I travelled to Nigeria, spent time at the universities (case studies); made observations as to teaching and learning practices in their classrooms; conducted interviews with the subjects of the activity system (students and lecturers) while in Nigeria.

2.7 Activity theory and the concept of Tool mediation

Building on Vygotsky's (1978) ideas of collectivity, Engeström (1999) offers a new paradigm of activity theory that models the social and contextual significance of activities. This new paradigm of activity theory criticises the classical representation of activity systems as limited in explicating the societal and collaborative nature of actions within the system. Engeström (1999) makes a vigorous call, "more than ever before, there is a need for an approach that can dialectically link the individual and the social structure" (p. 19).

The new model expands the original conceptualisation of an activity system. It now includes community, division of labour, rules, subjects, objects and tools as its constitutive elements – see Figure 2.2. It conceptualises an activity as a collective and multi-voiced endeavour, taking into consideration multiple points of view, traditions, interests and interactions between participants. The main components of the new model are the objective of the activity, defined as the goals, motives or intentions of the participants of the activity. The human interactions present in the carrying out of the activities are mediated with each other as well as objects of the environment through the use of tools, rules and division of labour. The components and the interaction existing between these elements are collectively referred to as the activity system. Mediation represents the nature of relationships existing within and between participants of an activity in a given community (Mwanza & Engström, 2005).

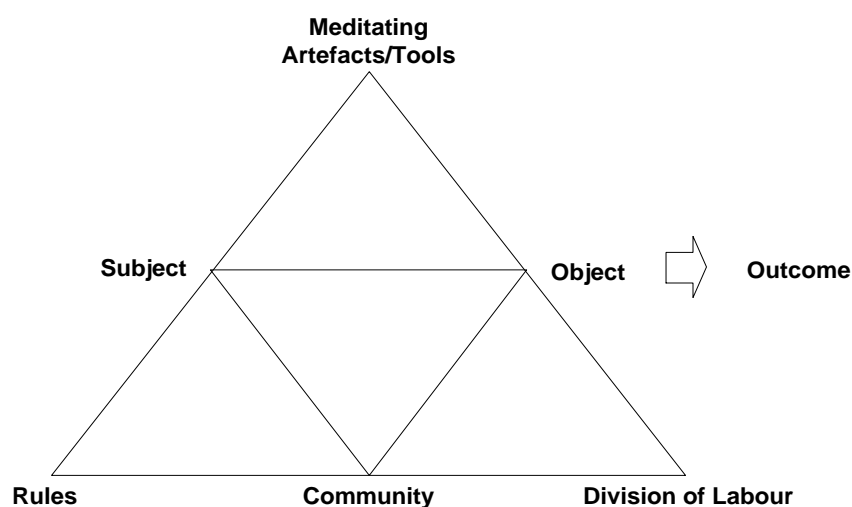


Figure 2.2: A complex model of an activity system (adapted from Engström, 1999)

In the uppermost triangle we recognise three elements: subjects, objects and tools. The subjects are the individuals or group of actors engaging in conscious actions or chains of operations related to or embedded in the goals of the system (Bedny & Karwowski 2004; Jonassen & Rohrer-Murphy 1999). The objects represent the target of the activity within the system. In other words, the objects are the physical or mental products that are sought after – the intention that motivates the activity (Jonassen & Rohrer-Murphy, 1999). Tools are the mediating artefacts that help to achieve the outcomes of the activity; tools alter the activity and are, in turn, altered by the activity. These tools include physical ones such as computers or photocopying papers and mental tools such as mathematical models or heuristics (Jonassen & Rohrer-Murphy, 1999). Physical tools are used to handle or manipulate objects, whilst mental tools are used to influence behaviour in one way or the other (Mwanza, 2001).

Rules are explicit and implicit regulations, norms and conventions that inherently guide or constrain actions and interactions within the activity system (Jonassen & Rohrer-Murphy, 1999; Mwanza, 2001). Community entails the individual or group of individuals who share the object with the subject (Bedny & Karwowski, 2004). In other words, community represents the social and cultural context of the environment embedding the activity system (Mwanza, 2001). Division of labour stands for the allocation of responsibilities and variations in job roles of the subjects as they carry out the activity in the community (Mwanza, 2001). It describes how tasks are divided horizontally between community members as well as referring to any vertical division of power and status (Bedny & Karwowski, 2004). Finally, the outcome is the desired result of the activity of a system (Bedny & Karwowski, 2004).

Engström's (1999) model makes apparent a set of mutual relationships between the constituents of the activity system. As seen in Figure 1, activities are not isolated units but nodes in crossing hierarchies and networks which are in turn influenced by other activities (Scanlon & Issroff, 2005). Benson, Lawler, and Whitworth (2008) stress that both the subjects of the activity system (internal) and the wider community (external) mediate their activities through tools, rules and roles. Thus, tools mediate the relationship between subjects and objects, while rules mediate the relationship between subjects and the wider community and division of labour mediates the relationship between objects and the wider community. These components of the activity system are

not static components existing in isolation from each other but are dynamic and continuously interact with the other components through which they define the activity system as a whole (Barab et al., 2002). As such, an activity theory perspective of any phenomenon (for instance, teaching and learning in the classroom) must consider the dynamics and interplay of all the components.

The new model – recognised for its seemingly encompassing concepts – has been widely accepted among activity theory researchers worldwide. Jonassen & Rohrer-Murphy's (1999) contention that an activity system cannot be understood or analysed independently of the context in which it occurs fully embodies Engström's (1999) ideas. That is, analysing human activity should not only involve the kinds of activities that people engage in but also who is engaging in the activity (subjects), what their goals and intentions are (objects), what products result from the activity (outcomes), the rules and norms that define the activity and the larger community in which the activity is taking place (Jonassen & Rohrer-Murphy, 1999).

Activity theory holds that human beings seldom interact with the world directly. Several artefacts, such as ICT, have been developed over time by humans to regulate and mediate their interactions with the world and among individuals; in simple terms, to meet their needs. The use of artefacts symbolises the hallmark of living the life of a human being (Kaptelinin & Nardi 2006). The significance of artefacts is that they carry with them successful adaptations of an earlier time, either in the life of the individuals who made them or in the lives of those from earlier generations (Cole, 1999). This view conceptualises artefacts as fundamental mediators of purposeful human actions that relate human beings to the present world as well as their culture and history (Kaptelinin & Nardi, 2006).

Artefacts that mediate activities of human beings are referred to as physical artefacts. They also could be simply referred to as tools or instruments. Physical artefacts are easy to recognise as their effect on the everyday life of humans cannot be overlooked (Kaptelinin & Nardi 2006) – for instance, the use of simple artefacts like books that we read, phones that we use, road signs on our motorway, cutlery for dining and so on. These artefacts are inextricably involved with the activities we are engaged in on a daily basis.

Wartofsky's (1979) proposes three levels of artefacts and describes the way each of them influences human activities. Some artefacts are directly involved in human work to mediate the relationship between the subject and object of activity; these are the first hand tools that we use (e.g., bowls, computers, telecommunication networks, etc.) and become the primary artefacts. The second level of artefacts is the combination of both the primary artefacts and models of actions used to preserve and transmit skills in the production and use of primary artefacts; they are referred to as secondary artefacts. The third level is called tertiary artefacts because they contain elements of the imaginative mind that provides conceivable change in the existing practices of human life. According to Cole (1999, p.91), "These imaginative artifacts can come to colour the way we see the actual world, acting as tools for changing current praxis".

The emphasis on the mediation of these tools in the interaction between the human mind and an objective is at the core of activity theory. This is because activity theory recognises the role the human mind plays in the cultural-historical development of human life. For development to occur – that is, the change from an existing practice to a new order – the activity is first of all conceived in the human mind. Imaginative artefacts are put to use to redefine and develop new concepts. This can be further explained using the concepts of internalisation and externalisation (Engeström, 1999). For every phase of development, the mind goes through a reflective analysis of an existing cultural practice, which represents a process of internalisation. However, this reflective, analytic, exercise alone is not enough. The produced mental structure has to be designed and implemented in the exterior for another level of development to take place; usually in the form of new practice. This is the externalisation process.

2.7.1 Activity theory representation for this study

One of the strengths of activity theory is that it allows researchers to place the activity system into a broader socio-cultural context. Arguing from Cole (1995) 'garden-as-culture' metaphor, Lim & Hang (2003, p. 54) suggest that researchers must attend simultaneously to two classes of concerns; what transpires inside an activity system ('garden') that is being investigated and what transpires around it. The two classes

cannot be observed independently of each other, as the garden is dependent on the larger ecological system within which it is embedded.

In the context of this study, the ‘inside of the garden’ represents the teaching and learning activity in the classroom, while the ‘outside of the garden’ includes the community the university belongs. To represent this using information from the activity theory model (as seen in figure 2.2), the following representations are given (also table 2.3): the subjects of the activity are the students and teachers of selected Nigerian universities. The object of the activity is to teach, learn and engage in class activities. The tools mediating between the subjects and the object are the infrastructure available for teaching and learning, which includes ICT and non-ICT tools. The student belongs to a community of fellow students (classmates), teachers, school administrators, ICT managers. Moreover, the community is mediated by rules and regulations guiding the delivery of university education in Nigeria. Rules include attending classes punctually and regularly, school disciplinary rules and other rules specific to classroom activities and etiquette. For division of labour; teachers mediate activities in the classroom to facilitate learning and give support to students when needed while students are expected to sit quietly and comfortably, learn and engage in class activities using the infrastructures available to them.

Table 2.3: Activity theory representation for this study

Categories	Information	Definitions
Subject	The humans from whose perspective the activity is being explored	<ul style="list-style-type: none"> • Lecturers • Students
Object	The object of the activity is to teach, learn and engage in class activities	<ul style="list-style-type: none"> • The objectives include: • Lecturers imparting learning on their students • Students’ learning and engaging actively in class
Tools	ICT and non-ICT tools that mediate the interaction between the subjects and the object of classroom activity	<ul style="list-style-type: none"> • ICT Tools (Learning and Teaching Tools, CD-ROMs, Internet bandwidth, computers, projectors, public address systems, other software etc) • Non-Computer tools (learning and teaching tools, classroom infrastructure, chalkboard/white board marker, desk, chairs etc)
Rules	Procedures and policies that mediate between the subjects and their community which includes, the entire university, the National Universities Commission (NUC)	<ul style="list-style-type: none"> • School disciplinary rules • Rules guiding teaching procedures • Learning models followed by the school • Expected student etiquette or behaviour • Implicit and explicit beliefs of learning and performances • Provision of ICT resources required to teach ICT related subjects • ICT policies guiding the use of ICT in the schools

		<ul style="list-style-type: none"> • Staff training policies • Costs and budgets • School curriculum
Community	The socio-cultural context and environment of the activity system	<ul style="list-style-type: none"> • The University administration with other faculties • The National Universities commission that oversees university activities in the country • IT Managers • Other schools • Parents • The Society at large
Division of Labour	Differing roles and responsibilities work together to achieve the object of the activity	<ul style="list-style-type: none"> • Teachers prepare learning materials, coordinate learning activities in the classroom and assess students' performances • Likewise, Students are expected to participate in the production of learning materials, behave ethically during lecture times (individually or collectively). • Administrators and staffs with designated roles functioning in their various capacities.

2.7.2 Activity theory and studies on the use of ICT for teaching and learning

Nardi (1996) argues that over the years, the development of activity theory has been influenced by the works of philosophers, psychologists, anthropologists, linguists, educators, and so on. It has been widely accepted and used in multidisciplinary research approaches increasingly oriented toward teaching and learning (the use of technology in higher education), the study of work and Human Computer Interaction (HCI) (Benson et al., 2008; Engeström, 1999, 2000; Scanlon & Issroff, 2005). For instance, activity theory has been applied to various contexts in higher education (see Benson, et al., 2008; Blin & Munro, 2007; Issroff & Scanlon, 2002; Mlitwa, 2007; Scanlon & Issroff, 2005; Mwanza & Engeström 2005).

Mwanza and Engeström (2005) model how activity theory can be used to abstract contextually and pedagogically centred metadata descriptions of educational content and interactions with learning objects. Their model made use of an e-learning research and development project called Lab@future. Using the activity theory triangle model, they present a visual representation of the case to describe various features of the data that form learning objects. Mlitwa (2007) explores the use of activity theory framework for the analysis of object-oriented applications of ICT in a teaching and learning environment. Using technology usability and Learning Management Systems (LMS) case studies, Mlitwa (2007) argues that activity theory adopts the neutral instrumentalist view of technology as a means of achieving teaching and learning 'ends'. That is, as a framework, it tends to mirror technology as a tool that merely stands to serve user

purposes and therefore limits the socio-technical debate to issues of resistance or adoption. Mlitwa argues that this neutral instrumentalist view sometimes limits issues relating to the use of technology to mere literacy challenge where all that matters is for humans to know how to use a technology in order to realise their goal.

Issroff and Scanlon (2002) use activity theory to conceptualise two case studies involving the use of ICT in higher education delivery. Their study relates two case studies of different disciplines to model how activity theory helps to inform the comprehension of teaching and learning activities in a higher education context. They conclude that the use of activity theory provides concepts that help describe key features in teaching and learning activities. These concepts include contradictions, multilevel analysis, multiple perspectives, and rules of the community and roles of the participants. They argue that a key feature of activity theory is how it helps to highlight problematic features of teaching and learning activities; for instance, difficulties students face in dealing with their learning materials and technologies. Scanlon and Issroff (2005) examine practices in the evaluation of learning technologies in higher education. That is, how activity theory could be of help in developing a more complete understanding of issues in evaluation and to improve the evaluation process of learning technologies. Through factors provided by Breen, Lindsay, Jenkins and Smith (2001), they discuss how activity theory provides a lens to the influence of the interaction between features of learning situations on different learning outcomes.

Blin and Munro (2007) apply activity theory to the transformation of teaching practices as a result of the institution-wide deployment of Virtual Learning Environments (VLE). In their analysis, they reveal that despite the widespread use of VLE in their university, only little disruption to teaching and learning activities occurred. They show that the VLE was mainly used for administrative purposes, to disseminate resources or information and to complement or replicate existing practices. Activity theory contributes to the analysis of their case study by revealing disruptions, contradiction and systemic tensions pertinent to the adoption and use of VLE in teaching and learning activities. Lim (2007) uses activity theory to analyse where and how ICT is used in Singapore schools to engage students in higher-order thinking activities. He argues that the use of activity theory helps to document the actual processes and socio-cultural elements involved in engaging students in higher-order thinking. Lim (2007) also

highlights what worked and what did not with respect to the use of ICT in Singapore schools; and the activity theoretical perspective from which they are construed.

Lim and Hang (2003) also use activity theory as a framework to explore ICT integration processes in Singapore schools from both a socio-cultural and pedagogical perspective. They argue that the use of activity theory as a framework helps to understand and present how teaching and learning activities shape and are shaped by their different levels of context; that is, how other factors such as the broader socio-cultural context of the classroom the use of ICT for teaching and learning in the classroom. They reveal and conclude that the effective integration of ICT in a learning environment depends on the way ICT is situated within the larger social cultural milieu. Hu & Webb (2009) apply activity theory to investigate the relationship between the implementation of ICT pedagogy and the factors that influence teachers of English for Business Purposes (EBP) in Chinese higher education concerning their adoption of ICT into their teaching. The activity theory framework provides information on how to identify contradictions in the teaching practices of the teachers leading to the implementation of a student-centred ICT pedagogy. Findings from the contradictions exposed through the use of activity theory suggest that though teachers were aware of the benefits of ICT, the implementation of ICT pedagogy was still 'alien' in the system. ICT was seen as an intruding force into EBP teaching.

The studies applied activity theory to examine learning experiences on ICT-mediated teaching and learning in various disciplines from various perspectives including students, teachers, Course Management Systems (CMS) and Learning Management Systems (LMS). Their findings include: positive and beneficial impact of the introduction of technology to the means by which student communicated and collaborated with each other; and realization of intended benefits of e-learning when coherent engagement is enabled between humans, structures and technology. The studies also indicate the use of activity theory in higher education in different historical-cultural as well as broader socio-cultural context: for instance, United States (see Benson, et al., 2008; Issroff & Scanlon, 2002), Europe (see Benson, et al., 2008; Blin & Munro, 2007; Issroff & Scanlon, 2002; Scanlon & Issroff, 2005), Asia (see Lim, 2007; Lim & Chai, 2004; Lim & Hang, 2003). Details of the specific findings of these studies are made explicit in the next section 2.7.3.

2.7.3 Activity theory and its principle of contradiction

Activity systems are characterized by their internal contradictions (Engeström, 1987), defined as historically accumulating structural tensions. They are best understood as tensions within and between activity systems that are capable of causing a change (breakdown or development) in people's activities or themselves (Blin & Munro, 2007). They are significant in the analysis of activity systems because they help to understand what motivates particular actions and also to better understand the evolution of the system (Barab et al., 2002). By their nature, they often cause a sort of imbalance to the norms in human activity and have the potential for instigating a change process. I have decided to highlight this principle because in an activity system such as the one under investigation, there are underlying systemic tensions capable of providing a deeper knowledge of the system. As Igira and Aanestad (2009) argue, contradictions are inevitable in the functioning of any activity system because they serve as useful sources for expansive developmental transformations. In other words, they are very important in the study of human beings in their social settings because of the way they act as agents of change and development. Engeström and Meittinen (1999) described contradictions as "the motive force of change and development" (p. 9).

However, the ways they bring about change in a setting vary depending on the context. In some contexts, they appear as tensions (Barab, Schatz, & Scheckler, 2004); in others, as breakdowns, conflicts or clashes between people, their cultures, practice or beliefs (Basharina, 2007; Demiraslan & Usluel, 2008); dilemmas; discoordinations (Roth, 2004). For instance, studies that use activity theory's principle of contradictions within educational settings suggest that contradictions are often dressed in forms of limited tools and infrastructure, training of teachers, misalignment of academic calendars, culturally inappropriate pedagogical models, academic socialization, technological access, methods of learning accreditation and diversity in backgrounds, cultures, values and beliefs of students.

Basharina (2007) employed the principle of contradiction in the study of a 12 week long WebCT collaborative project involving 135 English learners from Japan, Mexico and Russia. Three types of contradictions emerged in Basharina's findings: Intra-cultural

contradictions, inter-cultural contradiction and technology related contradictions. The intra-cultural contradictions came as a result of the learners' anxiety and unawareness of what to expect from their participation in the forum; and the dilemma they faced in deciding the approach they should take in participating. Inter-cultural contradictions were recorded as to unequal contribution to the forum; issues of plagiarism and topic choice. Technology related contradictions manifested themselves in issues relating to information overload as some learners "felt threatened by the overwhelmingly large number of messages that appeared on the bulletin board daily" (p. 93); the pace of the bulletin board as some student find the technology rather too slow; and names and gender confusion as a result of lack of visual cues and discernment of names of learners from other countries.

Barab et al. (2002) used the principles of contradictions to analyze an undergraduate computer based three-dimensional (3D) modeling course for learning astronomy. Their findings reveal that contradictions could exist within and between components of the activity system. For instance, within components of the system; within subjects, amongst learners, contradictions manifested themselves in the identity of passive recipients versus engaged learners; also between components of the system, between division of labour and the object manifested themselves in the distribution of tasks in groups versus each individual carrying out all the tasks. They conclude by suggesting that the information provided by activity theory's principle of contradiction can help educators evaluate, analyze and perhaps redesign courses towards meaningful classroom participation.

Demiraslan and Usluel (2008), from the perspective of activity theory's principle of contradictions examine complex pedagogical, social, and technological issues in ICT integration process at the classroom level in Turkish schools. Through proceeds from case study interviews, video records and observations, they identify and analyse the contradictions within the activity systems. Amidst other findings, they report contradictions including those between subject and division of labour – teachers were willing to use ICT resources but support from school administration was insufficient; between subject and tools – teachers were willing to use ICT resources for their teaching activities but the resources are limited as the schools lacked computers in classrooms; rules and tools – classes were expected to be interactive and engaging but

resources to facilitate such activities in the classroom were lacking; and a few others. They conclude that while activity theory's principle of contradiction is useful in describing and analysing the changes brought about by the introduction of ICT, it is not a tool for prescribing changes or designing solutions for effective ICT integration in teaching and learning.

Some studies have revealed the principle of contradiction as a tool that is capable of guiding students, lecturers, educators and administrators in the adoption, use and integration of ICT. This principle could help discern how to guide students and consider their expectations concerning the use of ICT before adopting it or help lecturers assess how the introduction of ICT could influence their classroom culture and teaching practices; as a result, develop strategies to support learning with the technology (Basharina, 2007; Barab et al., 2002). It could also help to clarify the roles and responsibilities of both students and lecturers, alleviate anxieties and define realistic goals (Murphy and Rodriguez-Manzanares, 2008).

Levels of contradiction

There are four principal levels of contradictions according to Engeström (1987): primary, secondary, tertiary, and quaternary (see table 2.4). *Primary contradictions* describe what are referred to as 'inner contradictions'. These types of contradictions occur within each constituent element of the central activity system (Turner & Turner, 2001). They can be understood in terms of breakdowns between actions or a set of actions. For example, within the subject of an activity system; say a disruption in activity of students as a result of differences in their backgrounds, cultures or beliefs. Secondly, there are also *secondary contradictions*. These types of contradictions are seen between the constituent elements of the central activity system. For instance, Demiraslan & Usluen (2008) identified contradictions between subjects and division of labour within a school setting with regards to ICT integration; a teacher was willing to use ICT in her teaching and even make use of various technologies in her courses, but finds the support of school administration rather insufficient. It is noteworthy that both the primary and secondary levels of contradictions exist within a single activity system.

The third level is referred to as *tertiary contradictions*. Contradictions of this type, appear between the dominant form of a central activity and an introduced culturally

more advanced form of the central activity; in other words, tertiary contradictions juxtapose the object of the dominant form of activity with the object of a culturally more advanced activity (Roth, 2004). The final level is referred to as *quaternary contradictions*. They are seen between the central activity and their neighbour activities within its network relations; in other words, quaternary contradictions exist between each entity of the dominant activity and the entity-producing neighbouring activity. Both the tertiary and quaternary levels of contradictions usually occur between activity systems (Roth, 2004).

Table 2.4: Engeström's (1987) four levels of contradiction in activity systems (adapted from Yagamata-Lynch and Haudenschild (2006))

Levels of Contradiction	Definition
Primary contradiction	This is seen when participants encounter more than one value system attached to an element within an activity that brings about conflict.
Secondary Contradiction	When activity participants encounter a new element of an activity, and the process for assimilating the new element into the activity brings about conflict
Tertiary Contradiction	When activity participants face conflicting situations by adopting what is believed to be a newly advanced method for achieving the object.
Quaternary Contradiction	When activity participants encounter changes to an activity that result in creating conflicts with adjacent activities.

Using activity theory's principle of contradiction provides important insights into the culture and contexts of learning environments in a number of ways. First, it exposes and provides a contextual understanding of the systemic tensions embedded in the activity system. Second, it helps to see activity systems beyond the surface by providing contextual mapping into the intimate mesh mechanism of the activity system; that is, the functions of and relationships between every component of the system and the socio-cultural environment in which it is situated. Lastly, it provides perspectives into possibilities for development or change (if needed) in activity systems.

2.8 Theoretical notions of ICT

Potential references have long been made to the contributions of ICT to teaching and learning in universities by scholars in literature (Selwyn 2007). Technological enthusiasts argue that ICT accelerates university students' learning, enhances and democratises access to educational opportunities, and supports interactivity, interaction and collaboration. Critical theorists however, are wary of "technological praise-singing"

regardless of its many advantages (Mlitwa, 2005). There are also arguments that the perception of ICT held by a community, institution, or educational system is significant and has a potential influence on the way they adopt and use ICT (Rogers, 1995; Mlitwa, 2005). This is the premise on which the analysis of the perception of ICT in this study is based.

Feenberg (2006), following Kuhn's (1962) approach proposed a philosophical-anthropological orientation to the study of technology. He argues that, for different people or societies, there is an implied interpretation of technology underpinning their beliefs as either neutral and autonomous, neutral and human controlled, autonomous and value laden, or human controlled and value laden (Feenberg, 2006). These implied interpretations include determinism, instrumentalism, substantivism and critical theory.

Table 2.5: Feenberg's (2006) Theory of Technology

Technology is:	<u>Autonomous</u>	<u>Human Controlled</u>
<u>Neutral</u> (complete separation of means and ends)	Determinism (e.g. modernization theory)	Instrumentalism (liberal faith in progress)
<u>Value-laden</u> (means form a way of life that includes ends)	Substantivism (means and ends linked in systems)	Critical Theory (choice of alternatives means-ends system)

In table 2.5, technology is defined along four rows reflecting its relation to human controlled and value-laden potential of technology. The horizontal rows offer two alternatives: either technology is value neutral or value laden. The vertical rows reflect technology as either autonomous or humanly controllable. The key distinction of these terms according to Feenberg (2006) is the role of human beings in determining the direction of the evolution of technology. That is, *“to say that technology is autonomous is not of course to say that it makes itself. Human beings are still involved, but the question is, do they actually have the freedom to decide how technology will develop?”* (p. 6) To agree that technology is autonomous means technological inventions and developments have their own immanent laws which humans merely follow in acting in the technical domain.

Because, Feenberg's (2006) theoretical 'notions of technology' framework is crucial to my analysis of the perceptions of tool by the subjects later on in chapter 5; I expatiate further on the four philosophies.

2.8.1 Instrumentalism

Technology is essentially neutral, subservient and nothing more than a tool (Leaning 2005). Mlitwa (2007) argues that instrumentalism corroborates the idea that technology is an indifferent tool that merely stands to serve user purposes. This idea of neutrality of technology, according to Leaning (2005), presupposes an established position of objective truth, one that has been discerned through scientific investigation. The implication of this is the view of technology as purely means-oriented; purely instrumental and value-free and is seen as a means of serving the subjective goals of human beings. In other words, technology is seen merely as a tool or instrument that can be used by humans to further their goals or meet their needs. This also comes with its implications, one of which is that, there is no preference between the various possible means to which technology can be put to use. This is perhaps the spontaneous product of our civilization, assumed unreflectively by most people (Feenberg, 2006) and often captured in the view of modernity as an unending progress towards the fulfilment of human needs through technological advancement. The instrumentalist view of technology is reflected in the philosophy that technology cannot teach, but is a tool for use by teachers to instruct (transfer knowledge). Technology is not value-laden and has no such implications on the user since it is just how you use it that matters.

The instrumentalist view of technology is reflected in the *Instructivist's* philosophy that technology cannot teach, but is a tool for use by teachers to instruct (transfer knowledge) (Mlitwa, 2007). Instructivists focus on the tool, its adoption, use and resistance to use and tend to overlook the interaction of the tool (ICT) with cognitive processes or pedagogical values. They could be very technocentric without taking into account the socio-technical dimension of ICT. In their world view, technology is not value-laden and has no such implications on the user since it is just how you use it that matters.

Examples of references to the instrumentalist philosophy include:

Adetimirin's (2011) Study of 1,497 undergraduate students in seven Nigerian universities on their ICT literacy that found "the ICT available in the seven universities were inadequate and this constituted a limitation to their effective use and literacy skills". She seems to equate access to or availability of ICT to effective use and literacy, which in reality is not often the case. It is possible to use ICT and yet not achieve any value from it.

In Ajayi's (2008) study on the use of ICT for teaching and learning in Nigerian universities, he argues that, "with the aid of ICT, teachers can take students beyond traditional classroom limits, ensure their adequate participation in teaching and learning process and create virtual environments to experiment and explore" (p. 210). Ajayi appears to be suggesting that ICT is a tool to achieve the wildest dreams of teachers and perhaps students. More like, with ICT as a tool in the classroom, all things are possible but reality is that this is not usually the case.

2.8.2 Determinist

Technology is not humanly controlled; on the contrary, it controls humans. In fact, it is believed that it shapes the society to the requirements of efficiency, productivity and progress. In other words, technology is a determinant of progress and social change on a macro or societal level. Technological determinists believe that technology employs advancing knowledge of the natural world to serve universal features of human nature such as basic needs and faculties. That is, each worthwhile discovery addresses some aspect of our nature and fulfils a basic need or extends our faculties. For instance, Heilbroner (1996), as cited in Leaning (2005) argues that "*machines [technology] make history by changing material conditions of human existence... It is largely machines [technology] that define what it is to live in a certain epoch*". This philosophical stance explicitly suggests that it is not up to human beings to adapt technology to our whims but on the contrary, we must adapt to technology as the most significant expression of our humanity.

The Uncritical Constructivists fall under this category. According to Mlitwa (2007), Constructivists are those who accept technology at face value as agent of change. They evangelize notions such as, "Technology automatically enhances education";

“technology enables independent learning, “technology influences or drives the theory of learning”, “technology breaches many walls created by distance and zones”, “It unites people and create powerful and synergistic partnerships at local, regional and global scales”, “it motivates students and energises classroom” (p 5).

Examples of references to the deterministic philosophy include:

In Ani’s (2010, p. 564) study of 180 students from three Nigerian universities on their internet access and use found that “The internet is now a global tool to achieve a better educational outcome for different nations, particularly developing countries”. Ani made several references to the internet (including this one) as a means to achieve better educational outcomes. This is consistent with the deterministic philosophy of ICT as a neutral and autonomous tool serving as a means to an end.

Achimugu et al., (2010, p. 25) study on the impact of ICT diffusion in Nigerian higher education institutions found that “The internet has emerged as a major driving force of the dynamic development of ICT which has impacted positively in virtually every sector of the Nigerian economy” – In. This statement as well as many others made in the study tend to suggest that the diffusion ICT as the means to achieving positive economic outcomes. It seemingly reinforces the notion that ICT is autonomous and neutral of any intervention but access to it guarantees a positive outcome.

Leach (2008, p. 801) suggests that “Planning for the development of national systems of teacher education and school improvement should explicitly recognise the important role of ICT and its potentials for increasing access and improving quality”. Leach’s philosophy of ICT is such that it reflects the notion that ICT is neutral and autonomous; adopting it equals increased access and improved quality of higher education systems.

2.8.3 Substantivists

Technology can both be autonomous and value laden but not humanly controlled (Mlitwa 2007). Both means and ends are linked in a system. In other words, when you choose to use technology, you do not render your existing way of life more efficient, rather you choose a different way of life. As a result, technology is not simply instrumental to whatever values you hold. It carries with it values that hold exclusive

characters to its existence and development. That is why, when a society goes down the path of technological development, it will be inexorably transformed into a technological society, a specific type of society dedicated to values such as efficiency and power (Feenberg, 2006). Traditional values cannot survive the challenge of technology. As Mlitwa (2007) argues that within educational settings, this view purports the idea that ICT influences academic processes and change, but is also influenced by those processes.

2.8.4 Critical theory

Usually wary of technology praise-singing, critical theorists believe technology can be human controlled and value laden. According to Feenberg (2006), critical theory of technology holds that human beings need not await a God to change their technological society into a better place to live. They recognize the catastrophic consequences of technological development by substantivism, but still hope in the promise of greater freedom in technology. While they see technology as a tool to further human goals, they argue that the way it is designed, and sometimes imposed on people with no influence or say in the design could impose external values that are not their own, either positively or negatively. Their argument is embedded in the call for more openness and social involvement in decisions of technology development and design towards perhaps minimizing negative effects and maximising benefits derived from the use of technology (Mlitwa 2007).

An example of a critical theorist is Watson (2001), who argues that, “In reality, not many teachers are actually using computers with their classes. More importantly, computers are not contributing substantially to the learning of pupils” (p. 258); and “unreflexive and unabashed optimism about the necessarily transformative nature of new educational technologies is both naïve and historically unfounded” (p. 261). Watson is critical of technological praise-singing. He is not in support of the technocentric approach of several ICT enthusiasts lauding the manipulation of ICT to achieve unrealistic educational outcomes.

2.9 Summary of Chapter

In this chapter, I have presented a summary of my understanding of the established ideas that I consider pertinent and relevant to the research problem. My review of literature comprised of an understanding and justification of the framework of activity theory and its principle of contradictions, on-going debate as to the effect of class size on teaching and learning with a connection to how technology is used in large classes and the discuss on the use of ICT in Nigerian universities to reveal the gaps in literature that this study addresses. Lastly, I also touched on Feenberg's (2006) theoretical notions of ICT to explicate the philosophy of ICT held by people, which is relevant to this research.

While this review of literature informs my ideas and provide relevant cues on some aspects of my data collection, it did not limit me from introducing new ideas that emerged from the data from my field work.

CHAPTER 3

Methodology

3.1 Chapter Overview

Methodology relates the belief system held by the researcher and reveals the fundamental assumptions upon which the research is founded. This chapter is dedicated to this mission as it establishes the integrity of the entire research process. I embark on this objective by essentially revealing the link between the literature reviewed (as seen in the preceding chapter), the data gathered in the field and the analysis later presented in subsequent chapters. The use of an appropriate research methodology is vital to the success of a research study. For this reason, my approach to the methodology is such that ensures it is appropriate for the research problem and questions. The rest of this chapter outlines the methodological procedure followed towards garnering answers to the research questions for this study.

The chapter is structured as follows: In the next section, I introduce the underlying assumptions that guided the study. The choice of a research paradigm evidences a researcher's world view; that is, what constitutes knowledge, and the underlying characteristics of human behaviour. In the section following that, I discuss the research methodology that guided the research. Thereafter, I describe in detail each method of enquiry used in the data collection phase of the study. Lastly, I talk about the methods of sampling employed as well as characteristics of the participants that took part in the study.

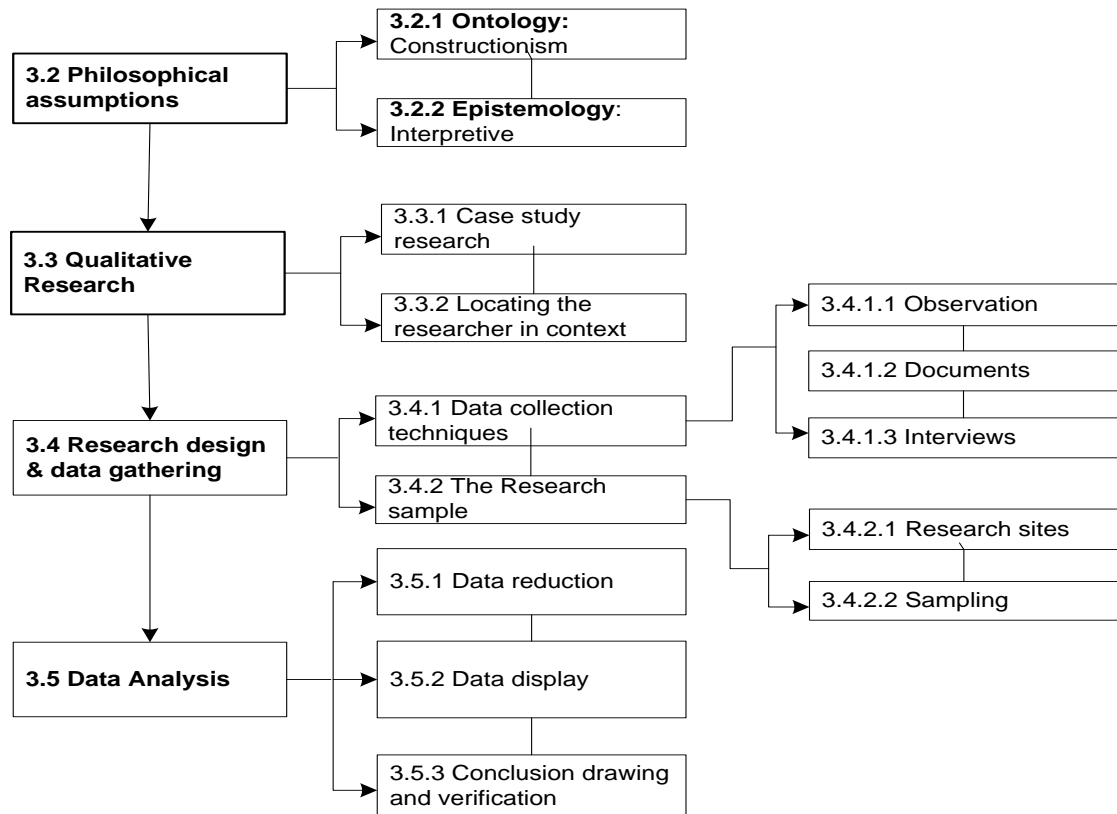


Figure 3.1: Flow chart for chapter 3

3.2 Philosophical Assumptions

All research is based on some underlying philosophical assumptions about what constitutes 'valid' research and which research methods are appropriate. These assumptions feed into ways in which the research questions are formulated and research is eventually carried out (Bryman & Bell, 2011). Researchers often make use of their own philosophical assumptions to not only bring out conclusions as well as report insights about observable facts of significance to them, but also to guide how knowledge is sought after and obtained (Myers, 2009). The reason for this is because the philosophical assumptions held by a researcher help guide the choice of methods that would be employed in the enquiry.

In order to determine the methodological stance taken in a research project, it is necessary to identify the founding assumptions held by the researcher. These assumptions relate to the researcher's view of the social world and how it may be studied (ontology); and his understanding of how knowledge can be obtained (epistemology).

3.2.1 Ontology

Every researcher carries within himself assumptions about the nature of the social world. The assumptions shape the researcher's quest for knowledge and how it can be obtained. A researcher's assumption of reality reflects two main questions, according to Bryman and Bell (2011). These questions are of whether social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors. If a research question is formulated in a way that suggests organisations and cultures are objective social entities that act on individuals, the researcher is likely to emphasise the formal properties of organisations or the beliefs and values of members of the culture. Alternatively, if the researcher formulates a research problem so that the tenuousness of organisation and culture as objective categories is stressed, it is likely that an emphasis will be placed on the active involvement of people in reality construction. In either case, it might be supposed that different approaches to the design of research and the collection of data will be required.

A researcher either sees the world as an objective reality (objectivism), which may be discovered by him, or as a subjective reality (constructionism), which is a social construct and will be influenced by the researcher himself (Bryman & Bell, 2011).

The prominent feature of objectivism is that social phenomena exist as external facts beyond our reach or influence. In other words, as researchers we play no part in influencing the subject of a research study or the outcomes of the research process (Bryman & Bell, 2011). The issue I have with this view of reality is the emphasis it places on the researcher not having any form of influence on either the subject or outcome of the research process. Reality to me is such that I have a role to play in the phenomena I am investigating, my understanding of it and the way I present my findings.

Alternatively, constructionism recognizes my influence as a researcher in the research process. It challenges the notion that "organisation and culture are pre-given" (Bryman & Bell, 2011, p. 21). This perspective aligns with my view of reality. Reality for me as

a researcher, was and is still, only that which is constructed or interpreted by individuals involved in the research situation according to their beliefs and value systems (Creswell, 1994). I see my research problem as that which is not external reality that acts on and constrains people, rather; it is an emergent reality that is in a continuous state of construction and reconstruction (Bryman & Bell, 2011). In other words, reality is not that which is essentially empirically constituted but socially constructed (Denzel & Lincoln, 2005). Reality is that which is always in the process of being formed and constantly shaping the perspective of human beings (Bryman & Bell, 2011). From the beginning, since the discovery of the research problem and the formulating of the research questions, I have approached this study from this ontological position as it resonates with the personal view of, and approach to, reality.

The next section discusses the influence of my ontological position on how I sought out the answers to my research questions; that is, epistemology.

3.2.2 Epistemology

Epistemology is the theory or study of the origin, nature, methods, and limits of knowledge. It refers to the assumptions about knowledge and how it can be obtained (Myers, 2009). Myers argues that it is important that a researcher understands the grounds of his knowledge, especially with reference to validity and scope of the knowledge being sought after or obtained. This automatically forms the frame of reference that a researcher brings to a study and helps to configure how knowledge is gained, analysed and eventually presented (Creswell, 2009).

Depending on a researcher's 'view of the world', research can be seen from any of the three epistemological dimensions: positivist, critical or interpretive (Orlikowski & Baroudi 1991). The underlying epistemology for this study is the interpretive world view, which argues that "access to reality is only through social constructions such as language, consciousness and shared meanings" (Myers, 1997, p. 242). In other words, to comprehend phenomena, it has to be done by accessing and assessing the meanings that people assign to them (Orlikowski & Baroudi, 1991). As an interpretive researcher, my mission is to provide a deeper meaning or comprehension of social phenomena (Silverman, 2001), and such deep meaning can be gotten from perspectives of people

towards reality (Creswell, 1994). As such, my aim has been and still remains, to provide rich interpretations that bring subjectivity to the fore and support it with quality arguments rather than statistical exactness (Garcia & Quek, 1997). This was the frame of reference I took to the study from the onset.

My quest for knowledge and how it can be obtained is entirely interpretive in that it relied heavily on the complexity of human sense-making as I studied the phenomenon (Myers, 1997). If there is anything about this study that tells of my epistemological stance, it is working with the participants to garner answers to the research questions. Myers (1997) argues that the motivation for doing qualitative research, as opposed to quantitative research, comes from the observation that, if there is one thing which distinguishes humans from the natural world, it is our ability to talk. This emphasises a relationship between the phenomenon under investigation, the researcher and the context-specific constraints that could possibly affect the investigation (Denzel & Lincoln, 2005).

Though initially criticized, the interpretive epistemology has emerged as a significant pillar in IS studies over the years (Walsham, 1995). It has offered a different perspective to IS researchers by offering the leverage of explaining the behaviour of people in their social contexts. For instance, Orlikowski and Baroudi's (1991) classified IS research as interpretive based on evidence that they helped to increase comprehension of the phenomenon through cultural and contextual lenses; the phenomenon of interest was observed in its natural setting as well as from the viewpoint of the participants; and researchers did not impose their outsiders' a priori understanding on the situation. Based on their personal opinions, beliefs, culture, value systems, and their unique experiences, heuristics and knowledge of the phenomenon, the participants of this study were able to express themselves.

Moreover, the interpretive stance is relevant to this study in which the analysis of the social interactions of people and their behaviours was the unit of analysis towards garnering answers to questions on the contributions of ICT to business education in a developing country. This stance, unlike positivism, places emphasis on subjectivity, where repeatability and generalisability to the population under investigation is not the primary objective (Lee & Baskerville, 2003). That is, the result of this study is mainly

relevant to a setting similar to where it was developed (Lee & Baskerville, 2003). As such, my main goal was to gain understanding of the perspectives of the various lecturers and students as to their standpoints on the contributions of ICT to teaching and learning in their crowded classrooms.

3.3 Qualitative Research

All research (whether quantitative or qualitative) is based on some underlying assumptions about what constitutes 'valid' research and which research methods are appropriate. The reason for this is because particular research methods imply different skills, assumptions and research practices (Myers, 1997). Therefore, the selection of a research methodology influences the technique in which the researcher gathers data (Bryman, 2008).

On that note, a research methodology is a *strategy of enquiry* which moves from the underlying philosophical assumptions to research design and data collection (Myers, 1997). The strategy of enquiry is a way of finding empirical data about the world (Myers 2009). Since I regarded the research problem of this study as one that could only be solved through a subjective process involving an epistemological world view that emphasises the significance of understanding the social world through the interpretation provided by the participants of a study; this study adopted a qualitative research process. In other words, I adopt a qualitative approach so as to explore the research problem based on the participants' social, cultural, behavioural and institutional context.

Creswell (1998) defines qualitative research as an “inquiry process of understanding based on distinct methodological traditions of investigation that explore a social or human problem, from which the researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting” (p.15). Simply put, qualitative research is a source of well-grounded, rich descriptions and explanations of processes occurring in local contexts (Miles & Huberman 1984).

While noting that qualitative research is a broad term and is by no means interchangeable or equivalent to the interpretative view underlying this study, it may or

may not be interpretive depending on the philosophical assumptions of the researcher (Diaz Andrade, 2009).

Qualitative research design favours the inductive perspective to research by emphasizing the significance of people, process, meanings and cultural interpretations that are not extricated through numerical measurements. As a result, qualitative researchers focus on the actual contexts in which people live and work in order to understand nature (Creswell, 2003). Amongst the several advantages qualitative research offers is the ability to preserve chronological flow, assess local causality, and derive fruitful explanations (Miles & Huberman, 1984).

As it is the goal of this study to gain insights into the intimate mesh mechanism involved in the use of ICT in the business schools of Nigerian universities, a qualitative research design fitted very well. As “qualitative data are mostly a record of what people have said” (Myers 2009, p.8), my mission was to garner answers to the research questions for the study through a record of the respondents’ experiences, opinions, perceptions, values, cultures and beliefs. In other words, I leveraged on social constructs through the multiple perspectives provided by the participants involved in the study.

Particularly, issues of main interests in the fieldwork include the state of teaching and learning (pedagogy); the size of an average class (staff-student ratio); the resources situation available to students and teachers in the classrooms; their use of the resources; students’ and lecturers’ perceptions of the use of ICT to achieve their teaching and learning objectives. These issues will allow me to understand people, their motivations and actions, and the broader contexts within which they work and live (Myers 2009).

However, it is noteworthy that the aim of qualitative research is not to generalise to a large population (Myers, 2009; Lee & Baskerville, 2003). As such, this study never had the aim or objective of generalising to a population right from the onset. My intention was to conduct an in depth investigation of the phenomena in order to eventually present a rich description that would provide a deeper level of understanding. That is, my aim was to look at the intimate mesh mechanism involved in the use of ICT for teaching and learning in Nigerian universities in terms of the social, cultural, political

and even technological contexts. So, my contribution to knowledge is to generalise the data results to theory, implications and rich insights (Lee & Baskerville, 2003).

3.3.1 Case study research

A case study is defined as “an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin 2003, p. 13). Yin’s (2003) definition describes the scope of a case; emphasizing that the phenomenon of interest is not studied divorced from its context (Myers, 2009). Also, case research can be regarded as the account of an activity, event or problem because it as a research it is concerned with complexity and particular nature of the case in question (Dooley, 2002; Stake 1995). What distinguishes a case study from other research is the focus on a bounded situation or system, an entity with a purpose and functioning parts (Bryman & Bell, 2011). As such, the emphasis of case study research tends to be placed on intensive examination of the setting or unit of analysis.

The unit of analysis for this study is the classroom of the business schools/faculties of Nigerian universities. I approached three business schools in one of Nigeria’s cities for this study. The cases were typical, representative and instrumental to the research problem under investigation as they cut across the three genres of universities present in Nigeria; these are Federal, State and Private Universities. The federal and state universities are owned by the federal government and state governments of the respective state they belong, while the private universities are owned by private organisations or philanthropists.

The business schools were chosen because they are particularly suitable for illuminating and explicating theoretical insights for the purpose of the study. Also, as multiple cases, they offer the ability to provide a deeply grounded explanation of the phenomenon through varied empirical evidence (Eisenhardt & Graebner, 2007). Multiple cases typically yield more robust and generalizable theory than single case research (Eisenhardt & Graebner, 2007).

Moreover, the city where the universities selected for this study are located is regarded as one of the commercial, technological and infrastructural locations in Nigeria; thus it is a significant location for this study with regards to availability and use of technology (ICT in particular) in the country. Moreover, the universities are well rated either in the public or private universities' ranks, not only in Nigeria but across Africa.

I treated the business schools both as multiple case studies and as a cross sectional study (Bryman & Bell, 2011). That is, there are two foci to this study:

- The analysis of the cases takes into consideration the unique contexts of these universities; for instance, their ownership, student enrolment, ICT penetration and use, class sizes and so on. Consequently, interpretations are made based on these unique features and characteristics.
- Also, the analysis of the cases sometimes presents a general interpretation of the data such that gives little or no consideration to their unique characteristics but simply, as business schools of Nigerian universities.

The case study approach is a popularly employed approach in both business and information systems research (Bryman & Bell 2011). In case study research, the researcher has absolutely no control over the situation as opposed to laboratory experiments, where researchers maintain control of certain specified variables while sometimes trying to separate the context from the phenomenon being investigated (Myers, 2009). The issue of lack of control of the research situation is often seen as a disadvantage of case study research (Myers, 2009). Interestingly, while this may be a potential pitfall to some studies, it could also serve as an interesting 'cut in the cake' for others. In my study for instance, I would have encountered a related challenge because, some weeks prior to my arrival in Nigeria, the government (federal and state) universities went on strike on a protest for the government to pay the allowances of their academic staff. However, luckily, the schools resumed and were all functioning by the time I arrived Nigeria.

Moreover, despite the limitation of the lack of statistical generalisability in case study research, some scholars argue it is perhaps the most appropriate when the phenomenon is broad, complex and an in-depth analysis is required (Benbasat, Goldstein & Mead,

1987; Yin, 1994). As such, my aim for the results of this study is to produce theoretical generalisations (Eisenhardt, 1989).

3.3.2 Locating the researcher in context

In qualitative research, the researcher is the main instrument of data collection and analysis (Merriam, 2002). As a result, qualitative researchers often minimize the distance between them and their research participants; thus fostering close interaction with them (Creswell, 1998). Such interaction could assume the form of living with or observing the informants over a period of time or in collaboration (Creswell, 1994). The role of qualitative researchers therefore is described as a “personal capture of the experience so, from their own involvement, they can interpret it, recognise its contexts, puzzle the many meanings while still there, and pass along an experiential, naturalistic account for readers to participate themselves in some similar reflection” (Stake, 1995, p.44).

In this study, I positioned himself within the institution in order to get an ‘inside view’ of the research context (Walsham, 1995). I assumed multiple roles (observer and interviewer) for the purpose of this study. While these roles came with different weights at different times and in different places or contexts, I was not necessarily reduced to either of the roles. A combination of, and movement between the roles was employed in order to develop a rich and critical understanding of the case.

I took a trip to Nigeria, spent a total of three months (July and October, 2010) observing, engaging and interacting with the phenomena in question. I went with a checklist of issues of particular interests related to the research problem. I made my observations against these checklists before venturing into any interview appointments. This helped to have a good capture of the environment and in turn strengthened the questions posed to the respondents of the interview. The role of an observer seemed a little challenging for me being an observer because, though I am a Nigerian, and once a Nigerian student, my prior knowledge of the case could be regarded as minimal, as I have been away from the country for over half a decade and bagged my university degrees from universities overseas.

While the observer role proved useful, it seems limited because it sort of prevented me from getting a deeper sense of the research setting that I was looking for. So I had to think of a way to achieve my main objective which is to get people to talk. Before and during the interviews, I had to impress on the participants the essence of my research so they could be forthcoming with the information I needed from them (Walsham, 1995). I spent some time gaining the trust of the participants by first of all chatting about the topic, giving definitions of intrinsic terms/jargons such as ICT, overcrowding, student-staff ratio and teaching and learning. This interaction sets a tone of comfort and trust between me and the respondents such that by the time of the interview session, we had gotten used to each other and the interview went on smoothly (well, at least most of them).

One of the challenges encountered in the data collection process came as a result of the distance in terms of age and ‘status’ differences between me and lecturers of the universities. To avoid being looked down upon, I made it a duty to explain in lay terms the purpose of the research and also ensure their dignity or status is well respected and not sought after to be strained either in the way I addressed them or as a result of the information they divulged. In fact, most of the lecturers were often referred to as “Sir” (for male lecturers) or “Madam” (female lecturers) so they could feel honoured and respected throughout the interview sessions. There were some exceptions to this rule however, as some lecturers had international upbringing; so they humbly requested to be referred to with their first names. As for the students, I was able to maintain a good level of rapport without much caution since they seem me as “equal” to (as we are all students) or even higher than them (as some saw me as a graduate student). The only exceptions were some adult students who were already married with perhaps kids of my age. For those, I employed the respect tactics (Sir and Madam) used for the lecturers.

3.4 Research Design and Data Gathering

In order to effectively determine the process in which events are embedded and the perspectives of those participating in the event (Gorman & Clayton, 2005), I gathered data using mainly semi-structured interviews and observation. The analysis of the data from the two main techniques was supported with publicly available documents. The key benefit of these multiple sources of evidence is the development of converging lines

of inquiry. Meaning, any findings or conclusion is likely to be more convincing and accurate if it is based on several sources and perspectives of information (Bryman, 2008; Lim & Hang, 2003; Tellis, 1997). I selected these sources of inquiry because of their focus on naturally occurring events in their natural settings (Miles & Huberman 1994). I perceived them as capable of helping to elicit a rich and thick description of a phenomenon, especially those with little or no prior understanding. This case under investigation is one of such with few studies on the contributions of ICT to teaching and learning in overcrowded classrooms of business schools in Nigerian universities.

Moreover, because my interest specifically zeroed on students' and teachers' perceptions, opinions and experiences in relation to the research questions, an in-depth method of investigation that could help probe beneath surface appearances were deemed as most appropriate and useful. In other words, I employed the observation and interview techniques because of their typical approach to aid the gathering of intensive information from a purposively derived sample. These characteristics were considered to be consistent with the goal and nature of this study.

Having justified the choice of qualitative approach for study in earlier sections, the following sections present the various tools and procedures employed to garner answers to the research questions posed in this study.

3.4.1 Data Collection Techniques

As a case studies are meant to help in providing the researcher with an holistic understanding of the phenomenon being investigated (Eisenhardt, 1989). Tellis (1997) suggests a list of sources of inquiry that could be of help to this goal. These sources of inquiry include: the use of documents, archival records, interviews, direct observation, participant observation and physical artefacts.

Observation

One of the advantages of case study research is that it allows for observation of phenomena in their natural surroundings (Benbasat, et al., 1987). As a method of enquiry, it facilitates gathering of rich data in their natural setting, free of the researcher's influence (Lim & Hang, 2003). I employed the observation technique by

following an observation checklist and this provided a guide throughout the observation process. The checklist included the following: the size of classrooms, classroom layout, lesson objectives, population of students and teachers, student-staff ratio, learning styles, types of ICT infrastructure in use, non-ICT infrastructure and so on. I also kept a journal throughout the field work for records of pertinent observation features.

I made use of the observation notes to tally the interview transcripts. In other words, I used the observed data to check for biases or systemic distortions in the responses of the interview respondents (Klien & Myers 1999). As informed by Klein and Myers' (1999) principle of suspicion, the exercise helps to be sensitive to cases where some of the respondents tend not to be entirely truthful in their responses about some of the issues probed. For instance, some lecturers were perhaps trying to salvage or not 'pull down' the school's reputation by suggesting the infrastructures that were apparently absent were present, and in use. Moreover, a look into their classrooms, laboratories and even the responses of other lecturers and students reinforced that they were only trying to make things up. The observation check list helped in the check and balances with regards to the responses from the interview participants. Where I observed contradictory issues, I did not fail to make reports of them in relevant sections of this thesis.

Document

I treated the use of document as a source of data that provides both a background and supporting information for the fieldwork and analysis of interview responses. The documents used benefited this research in a few ways (Denscombe, 1998, p. 169): Firstly, they provided an alternative source of evidence that is easy and less expensive to obtain. I was able to connect information from the documents with responses garnered from the interview and observation procedures to help in my analysis and eventual presentation of the data. Secondly, since the documents I used were publicly available, they provided a cost-effective method of data gathering to the study. Lastly, the documents as a source of data are permanent and available in a form that can be checked by others.

Documents often analysed in research range from publicly available administrative documents, newspaper articles to any documents seen as germane to the phenomena under investigation (Tellis, 1997). For this study, I used published and publicly

available documents (Bryman, 2008; Denscombe, 1998). The list of documents I used include: newspaper articles, World Bank and UNESCO reports on higher education, JAMB (Joint Admission Matriculation Board) reports on student enrolments (as seen on the board's website) and other documents that touched on or explained issues surrounding overcrowding, ICT infrastructure and policies.

Tellis (1997) however warned that researchers should be wary of the accuracy and relevance of documents before using them. Tellis advised that should such documents be quantitative, they need to be checked for validity, reliability and accuracy. Be it qualitative or quantitative documents, Bryman (2008, p. 516) also provided a set of criteria for assessing quality of documents. I ensured the documents I used fulfilled Bryman's criteria of authenticity - all the documents I used were genuine and none of them were of questionable origin as sources are explicitly stated in the reference or appendix section; credibility - the documents are free from error because they were published documents by organisations of high repute in the society and as such quality is maintained; representativeness - the documents I used were typical of their kind and are not in any way strange to research of this kind; and meaning - I can confirm that all the documents were clear and comprehensible too.

Interviews

The interview technique is mostly used in interpretive studies as it is assessed as effective in accessing the interpretations of informants in the field (Myers & Newman, 2007; Walsham & Sahay, 2006). Denzin and Lincoln (1998) argue that interviewing is one of the most common and most powerful ways used in understanding human beings. Research interviews are often used by researchers with the aim of eliciting from the interviewee or respondent all manner of information: interviewees' own behaviour or that of others; attitudes; norms; beliefs; and values (Bryman, 2008). Interviews provide multiple realities to a study (Lim & Hang, 2003).

To fulfil my main goal of presenting an in-depth understanding of the research problem for this study, I employed face-to-face semi-structured interview technique. It is a type of interview technique in which the interviewer has a series of questions that are in the general form of an interview schedule but is able to vary the sequence of the questions (Bryman & Bell 2011). Denzin and Lincoln (1998) argue that semi-structured interview

is a form of unstructured interviews because it provides a greater breadth than other types of interviews, given its qualitative nature. The interviewer usually has some liberty to throw in questions in response to what are seen as significant replies. Even though I had a set of questions prepared to ask the respondents, they were in no particular order. I kept the interviews as open-ended as possible in order to allow for flexibility and free flow of ideas on the part of the interviewees (Bryman, 2008; Denscombe, 1998). This is characteristic of semi-structured interviews and it enhances the opportunity of generating some unadulterated perspectives of the interviewees.

I employed this technique in order to allow me collect the respondents' perspective of the research problem and eventually provide answers to the research questions. Not only that, but to also allow for additional explanation and buttressing, counter-questions and open discussion.

A sample of the stakeholders relevant to this study was interviewed. Precisely 13 lecturers, 21 students and 1 IT manager were interviewed. The sampling technique adopted for the study is discussed in detail in the following section. Gorman & Clayton (2005) advised that collecting multiple perspectives in interviews aids the authenticity of the data gathered and further validates the study. The interviews were audio-taped and transcribed for the purpose of analysis. The interviews were conducted in English Language, which is the *lingua franca* and the mode of teaching and learning in Nigeria. The interviews were conducted over the course of three months: July 2010 to October 2010. Time for the interviews ranged from 30 to 90 minutes.

The interview questions were designed to generate answers that aligned with the research questions. The interviews were aimed at garnering the perceptions and experiences of students and lecturers of the business schools as to their use of ICT and its contribution to overcrowding and the teaching and learning activities in their schools. The method I employed in collecting their perceptions with regards to the topic took a step by step approach. First of all, I sought their understanding of key terms used in the questions and ensuring they come to terms with the right definitions before administering further questions. Second, I followed on with questions about their class size, their perception of overcrowding and how they are coping with it either as lecturers or students. Eventually and gradually, I began to ask questions relating to the

contribution of ICT to their learning and ultimately I asked their opinion on the contribution of ICT to their class sizes as well as their ability to teach and learn in the classrooms.

This method I noticed helped my interaction with the respondents and ultimately ensured an effectual flow of information. It also helped me to alleviate every form of ambiguity with regards to the jargons used and the details required. As a result, the respondents understood every question posed to them and hardly did any of their responses suggest a lack of clarity of the topic or questions.

Interview procedure

In order to test the appropriateness of the interview questions, I had initially interviewed two voluntary participants; a Nigerian student and a Nigerian lecturer here in New Zealand. The volunteers helped critique the interview questions and provided the opportunity of obtaining feedback on the alignment of the research questions with the interview questions. From the voluntary interviews, I was able to gain a better understanding of the interview procedure and a glimpse of what was to come before travelling to Nigeria for the eventual fieldwork (see Appendix D for a list of indicative questions I used in the field).

Arriving in Nigeria on the 21st of July, 2010, I sought out to meet the deans of the business faculties of the business schools that were selected as research sites to seek permission to undertake this study. Thereafter, I began meeting with potential participants and obtaining consents (using the consent forms I had taken with me from New Zealand) and appointments for the interviews.

Data analysis was concurrent with data gathering as I transcribed and read through the transcripts in order to identify areas needing supplementary probing. Moreover, according to Tilley (2003), researchers who delegate transcription work to others tend to be distanced from the process of representing interview data as text, during which a number of decisions has to be made by those who are doing the actual work. This was not the case for this study as I personally transcribed all the interviews. This helped in the analysis of the data as the act of transcribing itself is an interpretive act on its very

own (Denzin, 1995). This also helped ensure nothing important was eliminated from the interview in the transcripts as I had to keep an eye on everything myself.

I also relied on thoughts and observation I had scribbled in field notes and my research diary (Miles & Huberman, 1994), to guide not only the transcription process but data analysis as well. As I transcribed each interview, I checked the transcripts against issues I noted in the field notes in order to give a clearer picture of each interview session. This helped me to remember and reflect on tiny yet important details that helped reconcile some seemingly unclear responses. So, as I transcribed, I was able to see, hear and comprehend beyond what the exchange of communication emerging from the audio files. Overall, they helped in identifying and documenting additional contextual information including inexplicit hesitations and silences in the audio files. It is also noteworthy that the data was securely maintained.

3.4.2 The Research Sample

The purpose of this study was to gain an in-depth understanding of the contributions of ICT to business education in Nigeria, with particular references to overcrowding, and teaching and learning. Consequently, I made use of the purposive sampling technique to select the research sites and the research participants. Purposive sampling was used so that respondents were selected because they have experienced the central phenomenon under investigation (Creswell, 2009). In other words, the characteristics of research sites and individuals involved in the study were used as the basis for selection. According to Bryman (2008), most often, research sites or participants are chosen to reflect the diversity and breadth of the sample population. Most importantly, I selected the sites and participants based on their relevance to the research questions.

Research Sites

Three universities were selected as research sites for this study; two government owned (public) universities and one private university. The three universities are located in one of Nigeria's elite cities. As earlier established, the city is highly acclaimed as one of the commercial, technological and infrastructural locations in Nigeria; hence, its significance to the objective of this study. The two public universities exhibit a difference in administration and how they were run. One is owned and administered by

the federal government and the other by the government of the state it belonged. For the purpose of confidentiality, the federal university will be referred to as Faith University, and the state university as Hope University for this study. Also, the private university is tagged Patience University.

Faith University is public university owned by the federal government of Nigeria and is considered to be one of Nigeria's finest universities. It is a prestigious institution and is often regarded as the dream of many students both within and outside the state it is located. There is a perceived level of quality for the school, just as other Federal universities across the federation. Funding for the university is primarily from the Federal government.

In Nigeria, what exists is what could be referred to as political federalism that gives the federal government an advantage over constituent political units, such as state and local government units (Ajayi & Oyebanji, 2010). The advantage is conspicuous in revenue allocation which is often always in favour of the federal government, and this usually creates a disparity in the level of funding of both federal and state universities in Nigeria. As a result, Faith University is one of such universities at advantage in terms of funding from the government.

The background of students at Faith University is considered to be of the bright side with students from all over the country vying for a place in her classrooms. Perhaps because it is owned by the Federal government, the entry requirements are quite high and often difficult to attain for prospective students. However, the school runs a Diploma Foundation course which gives opportunities to students who could not make it through the Universities Matriculation Examination (UME). The business school of Faith University is referred to as the Faculty of Business Administration. There are five departments in the faculty namely: Accounting, Actuarial Science & Insurance, Banking and Finance, Business administration, Industrial Relations and Personnel Management. The school website records that in the year 2003, the faculty witnessed an enrolment of 4,395 undergraduates and 463 post graduate students. Data for recent enrolment was not made available but it appears that the enrolment rate seems to have doubled with barely much development in terms of infrastructure and staff count.

Hope University is owned by the state government of the city surveyed and offers priority to citizens of the state. The background of students at Hope University is quite mixed; a combination of students who got into the school on merit and those who were seemingly given the privilege of university education either because of their citizenship with the state or by informal recommendation of some leaders like the traditional rulers, the state governor and local government chairmen. It is important to note that State Universities like Hope were set up to accommodate specific demands emanating from each state to curb or reduce the impending demand on university education in Nigeria as a whole.

Hope University is a state university with a disadvantage in terms of revenue allocation as funding is often quite on the low. The fortune of state universities is often a product of the subvention from their state governments that are dependants of statutory allocation from the federal government (Ajayi & Oyebanji, 2010). As a result, tuition fees are higher in state universities because it is an essential source of income to the institution compared to federal institutions where the tuition fees are lower because major funding is from the federal government.

The business school at Hope University is tagged Faculty of Management Sciences. There are about eight departments in the faculty namely: Accounting; Banking and Finance; Insurance; Business Administration; Marketing; Management Technology; Industrial Relations and Personnel management; and Public administration. The school's website has no information as to the number of students enrolled.

Patience University is a privately owned university with an acclaimed reputation for excellence and quality. Students of the university are mostly elites of the society. They are either offspring of well-established politicians, business owners, senior civil servants or parents that live overseas. The university, though available to the public, is not affordable for everyone, especially the low or middle class. The cost is often high because it is the major source of income for the school since it is a profit-oriented institution. Moreover, the entry requirements are relatively higher than those required for entry to public universities. Even though the private universities in Nigeria, like other developing countries, were set up to help soak up the threatening demand for higher education, it appears this is not often the case as these universities only seem to

cater for the elite, leaving others in the battle for a seat in the obviously inadequate universities with limited capacity for enrolment.

Located in the heart of a highly commercialized city, with infrastructural qualities close to other elite business schools around the world, Patience University is a member of the Association to Advance Collegiate Schools of Business (AACSB) whilst managing a few partnerships with top business schools across Europe. The school runs several business courses with a focus to produce graduates who are “locally minded but globally focussed”.

Sampling

Social research is often faced with the challenge of collecting data from everyone being researched (Denscombe, 1998). Consequently, researchers often have to rely on a fraction of the people under study with the expectation that the proportion would be representative of the whole population. When deciding the sample technique for this study, I carefully considered the various sampling options and in accordance with the objective of this research, chose what I believe to be the most appropriate; purposive sampling.

Unlike probability sampling, purposive sampling is often used when researchers find it difficult to choose their sample on the basis of probability (Bryman, 2008). Situations like this could be due to and are not limited to the following (Denscombe, 1998): lack of information about the population being studied or difficulty in contacting selected sample through probability sampling technique. In qualitative data collection, purposive sampling is used so that individuals are selected because they have experienced the central phenomenon under investigation (Creswell, 2009). Denscombe (1998) argues that, in purposive sampling, the sample is ‘hand-picked’ for the research. In other words, the people or events involved are selected with a specific purpose in mind, and that purpose reflects in their qualities and relevance to the research problem (Denscombe, 1998). In a purposive sample, the number of people involved is less important than the reason behind their selection (Denscombe, 1998). The characteristics of individuals are used as the basis of selection. In other words, respondents are often chosen to reflect the diversity and breadth of the sample population (Bryman, 2008). Very significant also is the fact that the respondents are chosen based on their relevance

to the research questions. Powell and Connaway (2004) argue that, “no single formula provides the “correct” sample size for a qualitative study” (p.189).

Following the above discussion, the respondents for this study were ‘hand-picked’ based on their qualities, experiences, characteristics and relevance to the research problem and questions. The main respondents were lecturers and students of business schools in Nigerian universities. The lecturers were selected based on their current involvement and/or past experience with an overcrowded class (where students enrolled are more than the resources available to cater for them), which is not at all a rare case in the schools. Their positions cut across various heads of department and course coordinators. The students were also selected based on their ability to answer the questions. I ensured this by first of all chatting up the students before agreeing on an interview schedule with them.

Across the three institutions, I purposively sampled the participants without a particular formula or order but mainly due to the availability of the respondents. This does not mean the respondents were sampled based on convenience; rather they were most selected because of their relationship and significance to the research problem and questions of this study. While the study sought to gain the perspectives of students and lecturers only, I tried interviewing IT managers of the schools as well to gain professional insights into the use of ICT within the schools. However, only the private school had an IT manager. The remaining two publicly owned business faculties only had technicians which were not really IT personnel. They had no IT departments in place.

Moreover, there were several departments in these business schools. Some had marketing, accounting, management information systems departments and so on. To ensure the interviews covered some grounds across these departments, a stratified sampling approach was applied. Students had their unique characteristics (based on their ages, years spent in school vis-a-vis their level of exposure to and experience of overcrowding) and these were revealed in their responses to the interview questions. Most of the students spoke critically because they tend to believe it was an opportunity for their voice to be heard.

Table 3.1 gives a summary of the sample in relation the institutions and other characteristics.

Table 3.1: Sample population representation

INSTITUTION	Students (S)	Lecturers (L)	IT Managers (IT)
Faith	Faith_S = 8	Faith_L = 4	Faith_IT = 0
Hope	Hope_S = 7	Hope_L = 5	Hope_IT = 0
Patience	Patience_S = 6	Patience_L = 4	Patience_IT = 1
Total	Students = 21	Lecturers = 13	IT Managers = 1
Gender	Male = 10 Female = 12	Male = 10 Female = 3	Male = 1 Female = 0

The variety of participants' characteristics in the interview helped in gaining a multivariate perspective with regards to the use of ICT in Nigerian business schools. According to Gorman and Clayton (2005), collecting multiple perspectives in interviews aids the authenticity of the data gathered and further validates the study.

Across the sample population, there were more males than females. Overall, of the 35 people interviewed, 20 of them are males and 15 of them are females. Out of the 21 students, 10 are males and 12 are female. Out of the 13 lecturers interviewed, 10 are males and 3 are females. The community of lecturers in the schools tend to be male-dominated. Finally, the only IT manager interviewed was a male.

I noticed most of the respondents have limited experience with ICT; particularly students of the public universities. Many of the students seemingly only started using ICT when they got into the university. However, students and lecturers of the private university tend to be quite versatile in their use of ICT. The reason is because most of the students are from wealthy backgrounds where since childhood, they have had access to computers and the internet and are therefore grounded in their ability to use it for academic purposes. Nevertheless, there were a few of them who only got their experience of ICT while they enrolled at the school. Their versatility and prowess are far better than most of their counterparts in the public schools however, as they tend to have better access to ICT resources.

3.5 Data Analysis

One of the main challenges of qualitative research is how it rapidly generates a huge, cumbersome database because of its dependence on text in the form of media such as field notes, interview transcripts, or documents (Bryman, 2008; Creswell, 2009). As a result, qualitative data analysis involves making sense out of the ‘cumbersome’ data. Patton (1990) puts it like this, “the challenge is to make sense of massive amounts of data, reduce the volume of information, identify significant patterns, and construct a framework for communicating the essence of what the data reveal” (p.372). Making sense of the data involves the art of ‘processing’ before they are ready for use. Processing the data involves typing up, editing or transcription (Miles & Huberman 1984).

Moreover, qualitative data analysis is often conducted concurrently with data gathering, interpretations, and writing reports (Creswell, 2009). In other words, it is an on-going process involving continual reflection about the data, asking analytic questions and writing notes throughout the study. This is because qualitative data analysis involves a “cyclical approach in which the collection of data affects the analysis of the data, which in turn, affects the gradual formation of theory, which in turn, affects further collection of data” (Powell & Connaway 2004, p.196).

Particularly, case study research involves a detailed description of the settings or individuals, followed by analysis of the data for themes and issues (Creswell, 2009; Stake, 1995). Thus, when analyzing data from an interpretive case study research, researchers are advised to carefully consider some important issues. For instance, data from interviews must be interpreted to elicit the interviewees’ understandings, not as facts (Walsham, 1995). Thus, the interviewees’ personal beliefs and experiences relating to the key themes in the research questions are considered when collecting and analyzing the data. Also, the researcher’s interpretations of the interview data has to be taken into account (Miles & Huberman, 1994).

I employed Miles and Huberman’s (1994) method of qualitative data analysis to reduce and analyse the ‘cumbersome’ data that I got from the field. They described data analysis as three concurrent flows of activities namely: data reduction, data display, and conclusion drawing and verification. I analysed the data following these three

concurrent processes. The pattern I followed is described in the figure 3.1. Under the headings of the three concurrent data analysis activities proposed by Miles and Huberman (1995), I highlight how I analysed the data for this study.

3.5.1 Data reduction

As I have discussed earlier, qualitative data is usually cumbersome; therefore, it needs to be reduced before it can be put to effective use. Reducing the data for this study allowed me to simplify, abstract and transform it towards better management in terms of placing them into categories. Data reduction can also be described as “a form of analysis that sharpens, sorts, focuses, discards and organises data in such a way that ‘final’ conclusions can be drawn and verified” (Miles & Huberman, 1994, p. 11). Practically, data reduction consists of summarizing, coding, paraphrasing, identifying themes and writing memos. The reduction of qualitative data is mainly a choice of the researcher in relation to the research problem, research questions and the theoretical framework informing the study; in this case, the framework of activity theory. Based on the prior information from the review of literature and the lens of activity theory, I was able to code the data and put it into different categories; what I refer to as, *initial categories* (see figure 3.2).

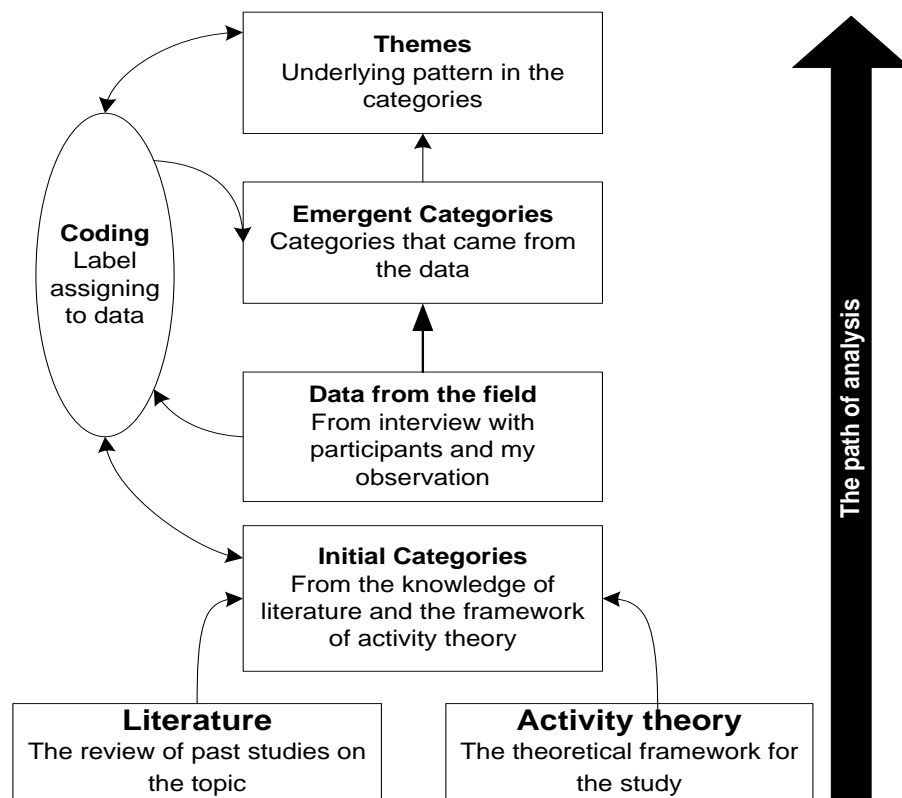


Figure 3.2: Path of analysis followed

Coding is the art of assigning labels to pieces of qualitative data; data in form of words, phrases, in texts, which are later organised and consolidated to bring out meaning to the study (Creswell, 2009). It is a method of fragmenting sentences from transcribed data (interviews for instance) into categories with a term, usually in the actual language of the participants. This segmentation fosters subsequent activities such as checking for similarities, differences, patterns, connections and so on. Miles and Huberman (1984) suggest that “the researcher’s choices of which data chunks to code, which to pull out, which patterns summarize a number of chunks, what evolving story is, are all analytic choices” (p.21). The so-called ‘analytic choice’ of the researcher is a process of data reduction that is not reduced to the aftermath of the data collection. In fact, it may begin prior to the actual data collection, as research questions and study design are also repeatedly refined.

Huberman and Miles (1998) suggest creating a start list of codes upfront prior to the fieldwork using the theoretical framework, research questions, problem statement and/or key variables the researcher brings along to the study. For this study, the data reduction process was not reduced to the aftermath of the data collection. It began prior to the field work (that is, the data collection). Before I travelled to Nigeria, I had created

a set of categories having been informed by retrospective studies as well as the framework of activity theory (see table 3.2). These categories were plotted based on the questions I planned to ask the respondents of the interview vis-à-vis the research questions (that is, my interview schedule). These categories really helped to reduce the large chunk of data collected from the field work. They provided a sort of compartment for the first stage of coding. The transcripts were first of all coded into these categories to help reduce the huge chunk. In addition, the categories helped to check for similarities, differences, patterns and connections and ultimately, helped in reducing the cumbersome data after data were collected.

On my arrival, through an iterative exercise of weaving back and forth between the data from the field and the framework of activity theory, seven new categories emerged. As I transcribed and re-read the transcripts, more categories emerged and I added a total of seven more to make a total of 17 categories, some I used in this thesis and others I decided on using later (see table 3.2 for a list of the categories). Codes which emerged from the initial encounter with the data helped in further breaking down, examining, comparing and conceptualizing; and even create more categories (Bryman, 2008, p. 543). The process resulted in each category later having sub-categories/codes that emerged from the analysis of the data they had in them. That is, sections of text from the transcribed data were assigned one or more codes based on the emerging theoretical ideas, issues and concepts with the help of the categories created.

Table 3.2: List of categories in this study

Initial categories before data collection	New categories after data collection
<ul style="list-style-type: none"> • Access to the tool • ICT and Goals • Perceptions of ICT • Classes involving ICT • Factors affecting the use of ICT • ICT and class size • Factors causing overcrowding • Effects of overcrowding on teaching and learning • Coping with overcrowding • Quality of teaching and learning 	<ul style="list-style-type: none"> • The position of the tool • Linking the tool to the object • Perceptions of overcrowding • Brick and Mortar vs Click and Mortar • The tool, from the perspective of the subjects • Challenges of using the tool • Contradictions in the activity system

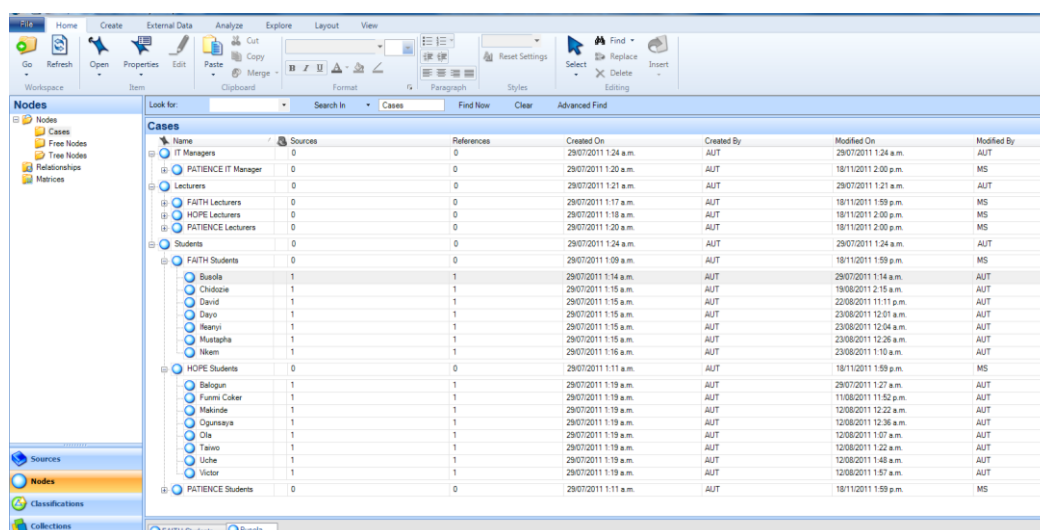
3.5.2 Data Display

Data display is a method of presenting qualitative data in an easily accessible manner. In other words, data display involves taking the reduced data and displaying it in a structured, organised approach so conclusions can be easily drawn. In case study research analysis, interview transcriptions and documentations often appear complex and cumbersome to deal with; this often needs to be organised into an accessible format. Looking at the display would help the researcher to understand what is happening and to do something – further analysis or action – based on that understanding (Miles & Huberman, 1984).

For the coding process, I employed a commonly used computer-assisted qualitative data analysis software (CAQDAS) called Nvivo to organise data. Myers (2009) strongly recommends a good CAQDAS (such as Nvivo) if a researcher employs a research method where qualitative data analysis requires coding, searching, and retrieval of texts. While I used the Nvivo program because it was readily available, it is noteworthy that its capacity for recording, sorting, matching and linking research data assisted in answering the research questions of the study without losing access to the data source or context from which the data came (Bazeley 2007). It is a widely held perception that the use of a CAQDAS could help contribute to the rigour of the data analysis process. Bazeley (2007) notes that “perhaps using a computer simply ensures that the user is working more methodically, more thoroughly, more attentively” (p.3). This perhaps, is because of the number of ways computer programs, like Nvivo supports the data analysis process. Nvivo, for instance, supported the analysis of the research data for this study in a number of ways (Bazeley, 2007; Myers, 2009):

Manage data: I imported all the transcripts, field notes and documents I used as sources of data into Nvivo and succeeded analysing all the transcripts from the field (see figure 3.3). I was able to edit, extend, revise and correlate field notes. While Nvivo did not alleviate my thinking as a researcher, it is crucial in providing an holistic view of the data by helping to pull together all the sources of data were pulled together. It also helped in organising the data in such a way that it was very easy to access and keep track of.

It is noteworthy that the use of Nvivo did not erode my deep, analytical and reflective thinking to uncover underlying patterns in the data; it only provided me the support in doing so. I was not reliant on the software to do the analysis for me; I only made use of its affordances to the benefit of my data analysis. Figure 3.3 presents a capture of data from the software program.



Name	Sources	References	Created On	Created By	Modified On	Modified By
IT Managers	0	0	29/07/2011 1:24 a.m.	AUT	29/07/2011 1:24 a.m.	AUT
PATIENCE IT Manager	0	0	29/07/2011 1:20 a.m.	AUT	18/11/2011 2:00 p.m.	MS
Lecturers	0	0	29/07/2011 1:21 a.m.	AUT	29/07/2011 1:21 a.m.	AUT
FAITH Lecturers	0	0	29/07/2011 1:17 a.m.	AUT	18/11/2011 1:59 p.m.	MS
HOPE Lecturers	0	0	29/07/2011 1:18 a.m.	AUT	18/11/2011 2:00 p.m.	MS
PATIENCE Lecturers	0	0	29/07/2011 1:20 a.m.	AUT	18/11/2011 2:00 p.m.	MS
Students	0	0	29/07/2011 1:24 a.m.	AUT	29/07/2011 1:24 a.m.	AUT
FAITH Students	0	0	29/07/2011 1:09 a.m.	AUT	18/11/2011 1:59 p.m.	MS
Bisola	1	1	29/07/2011 1:14 a.m.	AUT	29/07/2011 1:14 a.m.	AUT
Chidozie	1	1	29/07/2011 1:15 a.m.	AUT	19/08/2011 2:15 a.m.	AUT
David	1	1	29/07/2011 1:15 a.m.	AUT	22/08/2011 11:11 p.m.	AUT
Dayo	1	1	29/07/2011 1:15 a.m.	AUT	23/08/2011 12:01 a.m.	AUT
Iseanyi	1	1	29/07/2011 1:15 a.m.	AUT	23/08/2011 12:04 a.m.	AUT
Mustapha	1	1	29/07/2011 1:15 a.m.	AUT	23/08/2011 12:26 a.m.	AUT
Naam	1	1	29/07/2011 1:15 a.m.	AUT	23/08/2011 1:10 a.m.	AUT
HOPE Students	0	0	29/07/2011 1:18 a.m.	AUT	18/11/2011 1:59 p.m.	MS
Belogun	1	1	29/07/2011 1:19 a.m.	AUT	29/07/2011 1:27 a.m.	AUT
Funmi Coker	1	1	29/07/2011 1:19 a.m.	AUT	11/08/2011 11:52 p.m.	AUT
Makinde	1	1	29/07/2011 1:19 a.m.	AUT	12/08/2011 12:22 a.m.	AUT
Ogunseye	1	1	29/07/2011 1:19 a.m.	AUT	12/08/2011 12:36 a.m.	AUT
Ola	1	1	29/07/2011 1:19 a.m.	AUT	12/08/2011 1:07 a.m.	AUT
Taiwo	1	1	29/07/2011 1:19 a.m.	AUT	12/08/2011 1:20 a.m.	AUT
Uche	1	1	29/07/2011 1:19 a.m.	AUT	12/08/2011 1:48 a.m.	AUT
Victor	1	1	29/07/2011 1:19 a.m.	AUT	12/08/2011 1:57 a.m.	AUT
PATIENCE Students	0	0	29/07/2011 1:11 a.m.	AUT	18/11/2011 1:59 p.m.	MS

Figure 3.3: Nvivo evidence of data coding

Manage ideas: When coding, I was able to attach keywords or tags to segments of the data texts, for easy retrieval thereafter. Having access to conceptual theoretical knowledge that has been generated during the course of the study, together with the data that supports it, whilst retaining ready access to the multiple data source all together, are some of the assistance the computer software afforded me.

Query procedure for data: In addition, I was able to query the data; ask simple or complex questions of the data whenever I need further explanations or in search of particular words or contexts of their use. When a query is given, the program retrieves relevant segments of data texts from its database that helped provide the needed explanations. I was also able to save the results of the queries for subsequent probing and reflection when the need arose.

3.5.3 Conclusion drawing and verification

This stage finalises the analysis in qualitative case research as it involves deciding and according meanings to data. It is a process of taking cognisance of regularities,

differences and/or similarities, explanations, possible compositions, connecting flows, and possible suggestions (Miles & Huberman, 1984). Researchers are advised to hold conclusions lightly with an open mind and a degree of scepticism until they become more explicit and verified. The verification could occur at any time; it could be during writing, discussion with peers and so on. What is important is that meanings that emerge from qualitative data are tested for their credibility, their sturdiness and their 'confirmability'; otherwise, the meanings would just be a collation of interesting stories with no valid truth and utility (Miles & Huberman, 1984).

I based my conclusions or data verifying on the points of conformity and/or divergence with the conceptual framework for this study and existing literature on the subject.

3.6 Summary of Chapter

In this chapter, I presented the philosophical assumptions behind this study. I made claims to the constructionist ontological position that emphasised my view of reality as that which is not essentially empirically constructed but socially constructed. Reality for me as a researcher is interpreted by the participants of my study as related to their beliefs and value system. I also discussed my epistemological position as that of an interpretivist, emphasising that access to reality is only through social constructions such as language, consciousness and shared meanings. These assumptions represent the philosophical foundations of this research.

I provided the methodology appropriate to the research questions and aims of this study, without leaving out justifications for my decisions. This study adopts a qualitative case study approach with techniques such as interview, observation and documents as sources of inquiry. Following a purposive sampling technique, 35 participants (students and lecturers) from three Nigerian universities were interviewed. The participants and the universities have qualities and contexts consistent with the research problem of this study.

I also discussed how I employed Miles and Huberman (1994) method of qualitative data analysis involving three concurrent flow of activities namely data reduction, data display and conclusion drawing. Nvivo, a computer data analysis software helped

organise the data for easy access, management and query. In the following chapters 4, 5 and 6, I present the findings of the research.

CHAPTER 4

Exploring the Context

4.1 The Journey

The three chapters dedicated to the findings of this study relate the three important themes of this study. These themes are a higher level of abstraction that emerged from categories that are interrelated. The first (this chapter), '*Exploring the context*' provides answers to the first set of research questions (see in next section) for this study; in order to provide a description of the research problem. The second (chapter 5), '*Locating the tool within the activity system*' elicits how the tool is used to achieve the object of the activity. The focus of the chapter is mainly on how the subjects (participants) theoretically perceive the tool (ICT), how they gain access to the tool for their teaching and learning objectives and how the tool is used for teaching and learning activities. The third (chapter 6), '*The contributions of the tool to the activity system*' reveals the interaction of the tool with all elements of the activity system towards the object. It exposes the contradictions and intimate mesh mechanism of the system as a result of how the tool is accessed and used by the subjects of the activity.

The themes are built up out of the categories to reveal a coagulation of similar categories.

4.2 Introduction

This particular chapter is dedicated to explicating the concept of overcrowding in business schools of Nigerian universities. On this foundation later, I present a substantive explanation on the contributions of ICT to the prevalent large class sizes in Nigerian universities. Therefore, this chapter defines, explains and develops the idea of overcrowding from the perspectives of the students and lecturers interviewed.

The analysis I present in this chapter is both inductive and deductive. That is, even though I had initial categories towards my data collection, I also allowed new and emergent ideas to prevail the core of my findings forming more categories and subcategories in the process. I tried finding, analysing and interpreting pertinent references made to teaching and learning in overcrowded classrooms from the interview transcripts. I interpret the opinions of participants, scholars in the field, as well as my own observations with the aim of providing a deeper understanding of the research problem: the challenge of teaching and learning in overcrowded classrooms of Nigerian business schools and the contribution of ICT to this challenge.

With the initial categories I had created prior to data collection, I was able to establish a backbone for my analysis. Moreover, new ideas came as a result of continuous and reiterative examination of the participants responses. The new ideas brought out new codes that formed new categories and subcategories that are also a part of my analysis. In other words, the initial codes were not rigid but flexible enough to accommodate new, emergent and interesting answers to the research questions. I have to point out that the initial categories I had before the data collection and the new categories after the data had been collected are strongly connected and mutually related to each other. It is the connectedness of these ideas via-a-vis the research problem that provided a platform that allows me to make sense of my data and eventually garner answers to the research questions.

The findings reported in this chapter relate to the first set of research questions, as seen in chapter one:

- *How is overcrowding perceived by the students and lecturers of Nigerian business schools and how does it affect their teaching and learning activities?*

- *How are the students and lecturers coping with overcrowding and its effects on their teaching and learning?*

Reporting the contributions of ICT to teaching and learning in overcrowded university classrooms in a developing country like Nigeria is a challenging task. This is because there are some underlying and intricate contextual factors interacting with each other which must be put into perspective. As a result, it is important to take into consideration the key concepts and socio-cultural perspective of the overcrowding phenomena when presenting the research findings. A significant step in relating the contributions of ICT is to gain insights into entire context of the phenomena; teaching and learning in overcrowding classrooms of Nigerian universities.

The question therefore is: why is it important to report my interpretation of the participants' perspectives in providing an understanding of the context? The answer to this is; the students and lecturers interviewed in activity theory terms are regarded as subjects of the activity system and for any activity system under investigation, the view point adopted is that of the subjects within the activity system (Engeström, 1987). This is why it is imperative to see from the perspective of the teachers and students in order to understand the mechanism of the activity system. That is, how the activity system functions and their respective roles in it. This will help in providing a richer level of understanding as to how they perceive, adopt and use the tools available to them to meet their needs. In other words, how they use ICT for teaching and learning and the consequent impact on the size of their classrooms.

4.2.1 An overview of the categories

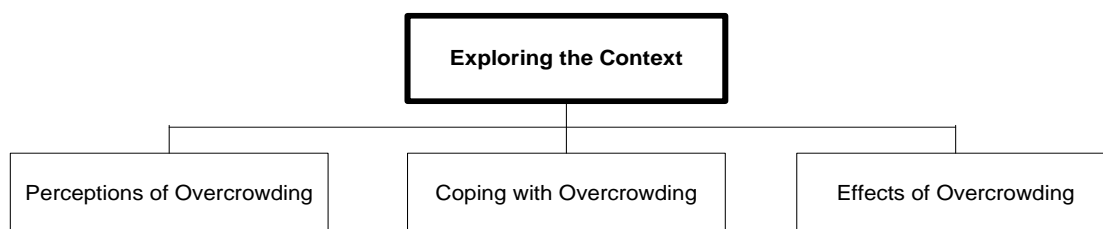


Figure 4.1: Overview of the categories in chapter 4

As explained earlier, I had initial categories before my field work. These categories were informed by a review of literature on the research problem and the framework of

activity theory. They helped in putting together conceptually related codes in an organised manner. It is noteworthy that subsequent categories and sub-categories later emerged inductively from data as a result of continuous, reiterative examination of the interview transcripts. I used the framework of activity theory to integrate the initial categories with the emergent ones from the data. Figure 4.1 enumerates the three categories discussed in this chapter. They have all come under the theme ‘Exploring the context’ as they all relate to explicating the tenets of the research context. The subcategories that came under each of these main categories are buttressed in the rest of the chapter.

4.3 Perceptions of Overcrowding

As established in the literature review section of this thesis, most empirical research conducted in this area tends to be quite quantitative in their approach. As a result, very rarely have scholars tried to delve into providing an analytical account of the large class sizes or overcrowding from the perspective of the stakeholders of higher education. One of the objectives of this thesis was to broaden the understanding of the teaching and learning context of Nigerian universities from the perspectives of students and lecturers. The analysis of their responses reflects two main perceptions of overcrowding (figure 4.2):

1. “It is a normal norm”
2. “In other places, yes; but here, we don’t have overcrowded classrooms”

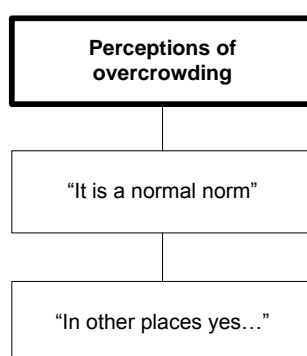


Figure 4.2: Overview of the subcategories under the perception of overcrowding category

These perceptions are based on the type of universities the participants are from. That is, the sub-categories are views from respondents from both the public and private universities respectively. The respondents from public universities perceive

overcrowding as a norm while those from private universities explained that though it is a prevalent issue in public institutions, their classrooms seem well controlled and not crowded. Hence, the responses from the students and lecturers of the private university emanated the theme; “in other places, yes; but here, we don’t have overcrowded classrooms”.

4.3.1 “It is a normal norm”

“Overcrowding is a normal norm in our own part of the country... so overcrowding is part of us; we are just trying to manage it in our own little way” (Chris_HOPE)

When asked about their perception of overcrowding, especially with regards to their schools, most of the participants, especially those from public universities expressed that overcrowding is a norm in universities of developing countries. The emphasis in this section is placed on public schools as students and lecturers of private schools tend to have a different opinion.

The lecturers and students of the public universities do not see anything strange about their often huge class size, or wide margined student-teacher ratio, as this is a common occurrence in that part of the world. In other words, while large class sizes do not seem a challenge exclusive to developing countries, they suggest it is one of the characteristics of public institutions of learning in a country like Nigeria. According to World Bank statistics, Sub-Saharan Africa, of which Nigeria belongs, has the lowest tertiary enrolment rate in the World at just 5% of the age participation rate; however, despite the low enrolment rate, classes are often overcrowded. Institutions often function at a capacity that is beyond what they were initially built to accommodate.

Altbach (1999) confirmed the view of the respondents that, the distinguishing characteristic of postsecondary education in the past half century has been expansion – the emergence of mass higher education worldwide. He argues that “mass higher education has become the international norm at the end of the 20th century. Most countries have large academic systems that educate a growing number of young people and which require substantial resources (p.107).” He noted that many countries of the world have moved from the elitist system of higher education where higher education is only limited to a certain number of the population into what he referred to as the ‘massification’ of higher education due to the pressures of expansion. Especially with

regards to developing countries, for instance, those of Sub-Saharan Africa, Altbach (1999) lamented the significant slow growth of higher education systems as a result of severe long term economic and political crisis. The effect of the long term economic and political crisis is revealed in the limited resources available to higher education systems as they try to cater for the burgeoning demand from their population.

Some of the respondents expressed similar views of the overcrowding phenomena. They confirmed that Nigeria is one of those countries struggling to enrol more students into her university institutions in order to cope with the pressures of expansion. Collectively, the respondents' perspectives tended towards the idea that the enrolment rate seen in their business schools is only a by-product of mass higher education perpetrated by the seemingly long-lived situation of limited physical, social and financial resources. Their views suggest that it is expected and not a surprise that Nigerian universities are experiencing overcrowding. Sifting through their responses, words like "normal", "obvious", "expected", "general" were used to emphasise that overcrowding is a phenomenon that is not entirely strange to see in Nigerian universities:

*Overcrowding is a **normal norm** in our own part of the country. That's what we face every day because the number of universities that we have is not commensurate with the number of students we ought to admit... and Nigeria being the most populous black nation in the whole world, there is a tendency we would have this kind of problem. So overcrowding is part of us, we are just trying to manage it in our own little way. (Chris_HOPE).*

*"...this is a public university; definitely, you should expect more than 5000 students in a year, of course. Overcrowding is very **normal** because everybody has to get into school..."(Sarah_HOPE)*

*"...first day I got into the class, I saw a big classroom and a lot of people there, and I was like... 'wow, this is really much, more than I expected', but then again, **it did not seem real bad because I went to a secondary school that was over crowded. I expected something really big but I got something large...** so yes, it's overcrowded; it just needs getting used to and adapting, and adapting very well" (Monica_FAITH).*

These quotes echo the fact that the respondents either did not deem overcrowding as much of a challenge or they have become entirely used to seeing their classrooms crowded. They emphasise it is normal for their classrooms to have more students than they could actually accommodate and it just needs getting used to over time. In fact, some of them see value in the overcrowding phenomena. In other words, they believe it is necessary to struggle for something of value in order to appreciate it. One student at FAITH University commented:

"You get to a class and obviously the students in class are more than the class can contain, that is basically the experience... it depends on how you look at it, because anything you struggle for, you value it" (Peter_FAITH).

Some of them also respond that university institutions are only being fair by overloading their courses and enrolling more students than they actually should in order to accommodate the impending demand. The definition of 'fair' comes from the school of thought that the prevailing trend all over the world towards achieving economy growth and development is embedded in nations becoming learning societies by showing appreciation for the products and services of higher education systems (particularly universities). According to Mabizela (2007), the forces of globalization have put pressure on national higher education systems to provide competent human resources to live up to the challenges of the knowledge based economies. Altbach (1999) expatiated on this view that "the skills imparted through university or other postsecondary study are demanded for the increasingly complex and technologically-based economies of the 21st century. The certification provided through a college or university degree is important in modern society. University degrees are also seen as important for social mobility. (p. 108)" One student noted;

"Yeah, it's obvious in today's education that Universities tend to overload their courses with students just to meet the requirements... For instance, maybe 1 million students applied and if they take 50, 60 or 100 which is the normal capacity, it won't be fair in terms of the total that applied in" (Maurice_HOPE)

"...everybody wants to be in school... So as much as we are trying to develop Africa and Nigeria as a country, we need to cope with overcrowding because the more we get people educated, the more liberation comes for us" (PETER_FAITH)

Some participants seem very concerned about the number of universities available to the post-secondary student population in the country. They expressed that with the current demand for university education in the country, more universities should be created. It should be noted that Nigeria's higher education system currently has 95 universities - 27 Federal universities, 34 State universities and 34 Private owned universities (NUC, 2009). Every year, over a million potential students apply for enrolment into these universities and barely 10% of them are enrolled (JAMB, 2009). This numbers suggest that the demand for university education in Nigeria is higher than what the capacity of the available university institutions can accommodate.

"Overcrowding is a common phenomenon in this part of the world. When you have about 100,000 or 200,000 applying into a university yearly, I think the universities are not enough to

contain the inflow of the intakes coming in... When you continue to have such a situation and the schools are not there, you cannot help it. We'd keep on having more students for a class" (Roland_FAITH).

This is what some call the African or Nigerian factor. By Nigerian or African factor, they are pointing to the developing economy perspective of university institutions not having enough capacity to enrol students applying into them. A lecturer buttressed this further in his response:

Well, we can say it is due to African or Nigerian factor. You see we have a lot of children who want to go to university, and we have few state and federal universities; even though we have private universities. The student may find it difficult to go those private universities, taken cognizance of what they're paying there (cost); looking at their parent's ability to pay; it may be difficult for these students to go to the private universities. The only option for them is to go to state and federal universities. And when you look at the Federal universities too, there is a limit to which the federal university can absorb, because there is already a quota system over there. Even in the state universities, all these systems are there, but the state factor must prevail there. We can say there is nothing we can do for now, the only thing we can do is to train more people to cope with the number of students we are having (Henry_HOPE).

What operates in Nigeria is the 6-3-3-4 system of education. According to Uwaifo and Udin (2009), it is the type of educational system wherein the recipient of the education spend six years in the primary school, three years in the junior secondary school, three years in the senior secondary school and four years in the tertiary institutions. These continuum is from primary schools to secondary schools to finally, tertiary institutions such as colleges of education, polytechnics and universities respectively. The 6-3-3-4 system is perceived as a job-oriented system in which “enables its recipients to function economically, socially, morally, intellectually and politically” (p. 82). The system over the years, since adoption, seems to create a large pool of secondary school graduates with limited spaces to accommodate them. The tertiary education system in Nigeria seems limited in the option it provides for post-secondary education. While in some countries, students seem to have plausible options for vocational education, polytechnics, and colleges of education should the opportunity of university admission appears difficult, Nigerian higher education system has over the years appraised university education above other forms of tertiary education. Consequently, the huge demand for university education than what the available institutions can provide or cater for.

What is also characteristically recurrent in the participants' responses is the confirmation that the explosive demand for university education in Nigeria constitutes a

major factor to what has made overcrowding a norm in their classrooms. The rate of population growth experienced by the country over the years has a consequent effect on university applications. A lecturer at FAITH University opined that overcrowding is a phenomenon that has developed over the years. He stated that it was not so when he was a university student some years ago but that is now a norm in the system:

“Overcrowding is something that's developed over the years. During my time as a student, we were very few; about 30 in a class and that was very convenient. But overtime, the student population, particularly with the introduction of the 6-3-3-4 educational system, the production from the secondary school system became quite large. And the growth in that population was not followed up by increase in resources in terms of university education” (Matthew_FAITH).

The situation, from the perspective of the respondents, seems to have gotten out of control. It appears nothing could be done about it. They have gotten very used to it and adapted their teaching and learning methods to suit their environment. Their attitudes to overcrowding purport that of ‘adaptation’, ‘getting used to’ and perhaps ‘surrender’, rather than something that could be changed or expected to change over time. Some of the students and lecturers conclude that overcrowding is ‘here to stay’ and there is nothing they can do about it. This is seen in some of their responses:

“...Overcrowding is part of us, we are just trying to manage it in our own little way” (Chris_HOPE_L).

“Principally, our work here, as lecturers, is to teach, we can’t complain about the number of students; whether it’s too large or not.” (Theo_HOPE_L)

“It has not been easy like I said earlier on, but since you know the environment you are, you have to acclimatize yourself to it and see how you could improve.” (Nathan_HOPE_S)

The students of the private university - PATIENCE University, also confirm the overcrowding phenomenon is a norm in public schools, especially those of them that have studied in them before moving on to PATIENCE University. The following responses from private students and lecturers all confirm the overcrowding norm in public universities:

In my days at [Name of public school withheld], we were about 300 in a class that should ordinarily sit about 100 to 120. It was crowded. You had situations where students would miss classes simply because they couldn’t cope with the crowded classrooms. You had situations where students would sit on the floor just to take lectures. You had situations where the, so to speak, ‘connected student’ had friends who would keep space for them before classes begin. And even for those that are in class, you have a situation where the first half of the class is the only half that is paying attention to the lecture; the other half are just doing something else; chatting with friends, sending text messages, playing games on their mobile phones and things like that. (Kyle_PATIENCE_S)

You see the country is not well structured and our educational system, to me, has not been well moulded as to what is obtained in the advanced country. There is this situation where classes are jam-packed that you hardly see even the space. In some cases you don't have cross-ventilation. (Wayne_PATIENCE_S)

the university I attended before Faith University, the number of student far outweighed the infrastructure in place. Even in the computer department, not every student could have access to the computers. So for those who are able to make use of computers, even the computer science students have to go out of their way. Some of them have laptops but for that they would probably not have learnt what they learnt in school. (Yinka_PATIENCE_S)

These are the views presented by the respondents themselves as subjects of the activity system. These views encapsulate the mindset of the students and lecturers on the notion of overcrowding based on their daily experiences. One of the fundamental assumptions of activity theory is the recognition of the importance of context and consciousness; that is, the human mind emerges and exists as a special component of interactions with the environment (Jonassen & Rohrer-Murphy, 1999). Humans are granted with intentionality and consciousness since they orient and plan their activities. In other words, purposeful actions are realised through conscious intentions. These human intentions are directed at objects of activity – i.e., object-orientedness. As Diaz Andrade and Ekundayo (2011) argue, activities are socially and contextually bound and can only be described in the context of the community in which it operates; the above responses are conscious interpretations of the context by the actors of the activity system and are therefore necessary in order to effectively understand the contributions of ICT to the business schools.

4.3.2 “In other places, yes...”

Private universities in Nigeria, as with several developing countries, are regarded as alternatives to public universities in that they help reduce the threatening demand on public institutions. Altbach (1999) attests to this by arguing that the private initiative has been encouraged as a way of serving increased demand for postsecondary education, and private higher education is increasing its share of total enrolments. However, private universities tend not to have the capacity available to public universities and as such, they cannot compete enrolment wise, despite their profit making orientation. Moreover, because of their profit making orientation, financially, they are more expensive than public universities; consequently, they appear as if they

are not open to the middle or lower class of the population. This is because the fees paid at these institutions are not affordable to students from middle or low class origins. One of the lecturers puts it this way, *“It is not a university for everybody because in the first place the cost - the tuition fee is enormous”* (Andrew_PATIENCE_L). Mabizela (2007) confirmed that private institutions have become elitist because the majority of the population cannot afford high fees they charge. This explains why their class sizes are easily controllable and overcrowding seems a strange occurrence in their institutions.

“We do not have overcrowding at Patience University; probably because it’s a private school, and it is an elitist school. There is this belief that the moment you walk into the campus, you are perceived to be one of the 1% of Nigerian population that is perceived to be elitist. It is not a university for everybody because in the first place the tuition fee is enormous.” (Andrew_PATIENCE_L).

“Patience University is such an exception in Nigeria. Only few private universities are somehow close to it in terms of standard...” (Wayne_PATIENCE_S)

Speaking to one of the lecturers at the private university, she expressed claimed that the institution is careful when it comes to the number of students they enrol. She suggested that maximum number of intake per class is 70 and nothing more due to the size of classrooms they have:

“...Here at Patience University, we take great care not to overcrowd. In fact 70 students in a class for us will be the limit; we will prefer 60, not more than 60-65. So because of that there is no room for overcrowding really. We try not to [crowd our classes] because for us, the crowding is not just a question of the material facilities; it’s also a question of giving proper attention to students in class and out of class anyways. You want to give them reasonable, personalized attention, so you have to balance” (Jasmine_PATIENCE_L).

Another lecturer also suggests that the main reason why they control the number of students coming into their institution is because of their mode of teaching. She stressed their mode of pedagogy is such that is not meant for a large class as students are often divided into groups to facilitate discussion:

“We have controlled capacities and predominantly based on the pedagogy that we have adopted at Patience University, which is a case method to facilitate a case-based discussion class. I think one of the elements is that you shouldn’t have more than 70 people, so we always try and keep our numbers sub 70. In situations where we have more than 70 enrolled in a class, we actually split them into two so we don’t have that case of overcapacity” (Gloria_PATIENCE_L)

Private schools too, despite their elitist characteristics, appear to receive a large number of applications annually. However, unlike public universities that are often pressured to accommodating more than they can actually cater for, private universities *“have*

controlled capacities”. In other words, “they pay special attention to the number of students they admit.”

“Patience University is like the ideal situation. I think it’s because it is a private school. In the sense that they pay special attention to the number of students they admit. I think that’s what stands them apart unlike government schools or state schools where you’re bombarded with so many people” (Kyle_PATIENCE_S).

Some scholars even argue that the establishment of private universities is due to the failure of public institutions in the delivery of higher education (Mabizela 2007). The responses from the private university tend to agree to this claim. It appears private universities maintain a high standard from the way they admit students, their style of pedagogy to the fees they charge and so on.

4.4 Effects of overcrowding on teaching and learning

The just concluded section exposed the perception of overcrowding in both the public and private universities. The public university students and lecturers made known that overcrowding is a norm and they just have to adapt to it while the private university students and lecturer lay claim to a lack of overcrowding in their own classrooms. In this section, I uncover the effect of overcrowding on the teaching and learning activities at the public universities. Overcrowding may have become a norm at the universities with the participants adopting ways of adapting to it but the class size still appears to be a challenge to teaching and learning at the universities. Just as I espoused in my literature review chapter from the many studies on class size effects on teaching and learning, the experience of higher education delivery in an overcrowded classroom is different from small sized classrooms (Gibbs & Jenkins, 1992; Biggs, 1999; Cuseo, 2007; Paola & Scoppa, 2011). As a result, there are some challenges faced by students and lecturers in such situations. From the main category, my analysis of the data extended into sub-categories to reflect the main challenges the participants highlighted as a result of the size of their classes. Figure 4.3 reveals the categories exposed in this section of the chapter:

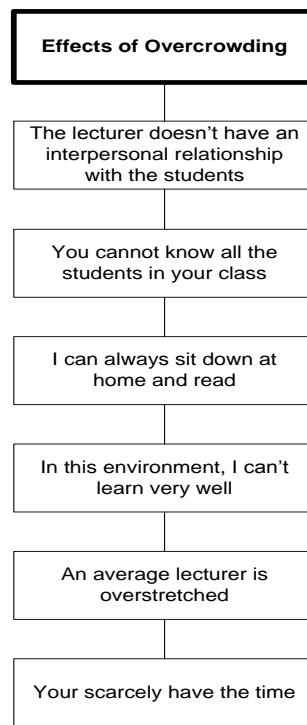


Figure 4.3: Overview of the subcategories under the 'effects of overcrowding' category

Literature remains inconclusive as to the topic of class size effect on teaching and learning. Likewise, there is little qualitative research in literature to this debate. Most of the studies done seem to tend towards finding a statistical figure justifying the effect of class size on teaching and learning. For instance, Hattie's (2009) meta-analysis of 96 studies on effects of class size on student learning revealed that small classes have an advantage over large ones with a result of " $d=0.13$ "; where d reflects the 'effect size' of the population estimate. They further explained that the effect of class size on student learning is dependent on the teacher's ability to adapt their teaching approach to the size of the class in question. Other examples include, Krueger's (1999) findings that reducing class size from 22 to 15 increased both math and reading test scores by 0.2 standard deviations; also, Angrist and Lavy (1999) found that a reduction in class size of seven students raises test scores by about 0.18 standard deviations.

There are few studies that have tried digging deep into this topic by trying to convey qualitative responses from students and teachers. One of the few, Harfitt (2012), interviewed only three English Language teachers working with large and reduced-size classes in Hong Kong secondary schools. His results are that the teachers stressed that smaller classes helped them to "know" their students better and as a result are able to follow up on their progress in the subjects.

The responses of the teachers and students in this study also echoed their views on the various issues related to class size in literature. These issues range from: Student achievement and student learning outcomes to pedagogical methods of teaching. This section of the chapter presents the findings with appropriate references to these issues.

4.4.1 Student Achievement/Learning Outcomes

The students aired their views as to the effect of overcrowding on the quality of teaching and learning that takes place in their classrooms. They were particularly asked if they believe that the overcrowding situation in their classrooms does affect their learning outcomes. Majority of them responded were positive it would affect them. While there are few who were indifferent, their justification for their indifference hinged on the expectation that overcrowding is a norm and that any student coming into the university should be prepared to face it. In other words, they believe the crowd in the classroom should not be a problem for them to learn since they are already used to or expecting that kind of situation. As a result, the onus falls on the student to work hard if he/she must succeed. Working hard means, making use of all adaptive measures possible to gain things from the class as well as utilizing every available resource to his/her advantage.

For instance, Henry, a lecturer at Hope University, believes;

“From my opinion, I don't think overcrowding is affecting students learning outcomes seriously. I think the only problem is that our students are not serious because these days we have good lecturers with international exposure, and there a lot of equipment at the disposal of the lecturers nowadays that can make them to deliver qualitative lecture...it is the students on their own, that are not serious” (Henry_HOPE_L)

Henry blamed the learning outcomes on the student and not on the overcrowding in their classrooms. While he did not deny the existence and impact of overcrowding, he believes students are meant to take advantage of the resources now available to them to make a success from their studies. He argues from the point of view that the resources available to students now were not there when he was a student and that the students of nowadays are just not serious about their studies.

Peter, a student of Faith University, tends to agree with Henry that, learning outcome is a responsibility of the student:

"I don't see overcrowding as a problem. It can only affect the focus of the students. Even if you have an overcrowded room and everybody is quiet, you would be able to gain. If there is any problem, it is actually the problem with the people who are in school [students] and not the facilities" (Peter_Faith_S)

While he emphasised that overcrowding is not a problem, he was sure it is capable of distracting the student from learning. He argues that, should there be an overcrowded situation in the classroom and the students are quiet, the students will still have something to learn. In the words of another student, *"the number is too much, and it's only those who are ready to learn that will get from it"* (Nathan_Hope_S). However, one would only be left wondering if an overcrowded classroom could be conducive enough for students to be quiet. Many of the participants were consistent in their responses that they hardly ever hear what the lecturer has to say in their classrooms. For details of their responses, see *section 4.4.1: Attention and Retention*.

Lucas, a student at Faith University was also one of the few who expressed his opinion as to learning outcome being the responsibility of the students, except with a little twist to his justification. He argues that lecturers are only to guide the students and that the students should take the responsibility of learning as personally theirs:

"...personally from my little understanding of a university, the onus falls on you [the student] to actually learn what you are supposed to learn. What you actually need your lecturers for is guidance. In that respect, I think they are going a long way to provide guidance, but when you actually talk about learning, the real form of learning; then, I think they are falling short of standard" (Lucas_Faith_S)

Lucas, in his response differentiated between providing guidance and learning. While he stressed that the lecturers go a long way to provide guidance to the student, he was quick to point out that they were not really providing learning. He said they were falling short of standard when it comes to providing the students the real form of learning. My interpretation of Lucas's opinion points to the method of teaching in large classes – lecture method; which tends to be very individualistic in nature. According to Biggs (1999), the lecture method, which is the standard method for teaching large classes, its strength lies in communicating (a) information and (b) teacher's personal interpretations, but it makes demands on concentration that drastically undermine its value if not properly handled. The reasons for the low-level learning outcomes usually gained from lectures are in large part due to unbroken activities of listening and note-taking. Studies have shown that, the attention span of students under these conditions can be maintained for about 10-15minutes, after which learning drops off rapidly

(Biggs, 1999; Cuseo, 2007). In fact, one criticism of large classes and particularly lecture modes of delivery is a perceived inability to motivate students and to stimulate higher order cognitive skills (Hall et al., 2011).

Other respondents agreed however that overcrowding affects learning outcomes of students. They point to several reasons ranging from the lack of student-student and student lecturer interaction to low student retention, low student attendance to noise making in classrooms, lecturers' attitude and morale to their increased workload, anonymity of students. These and more are reasons the students referred to as factors that lead to low learning outcomes in reference to their class sizes.

Limited or lack of Student-Lecturer interaction: - "The lecturer doesn't have an interpersonal relationship with the students"

Research on student learning has focused on relationships between students' approaches to learning, their perceptions of their learning outcomes, their personal characteristics, and their learning outcomes (Dart, 1998). From these studies, opinions and evidence suggest that as class size increases, the challenges for promoting active learning, ensuring interaction, and dealing with students' diverse learning needs increase (Burrus et al., 2009). For instance, Larson (2002) found that a greater student-lecturer interaction had a positive impact on learning while class size per se had no significant effect. This means, when student-lecturer interaction is lacking, learning outcome is affected one way or the other. While class size may not be major problem, its consequences are what affect student learning outcomes. According to Ward and Jenkins (1992), "while most problems are not caused directly by the large classes, they are aggravated by them" (p 24).

Some of the respondents commented on the level of interaction in their classrooms and how it affects their teaching or learning experiences as the case may be. Maurice explained the effect of their overcrowded classrooms on the lecturer's ability to allow for interaction:

"Lecturers can't really lecture properly whenever the class is overcrowded. Due to overcrowding, lecturers often adopt a style that would limit students from asking questions, not to delay the lectures because they themselves cannot really cope with the pressure of an overcrowded class"(Maurice_Hope_S)

Maurice believes due to the pressure of overcrowding, lecturers often adopt a ‘one-way traffic’ mode of teaching, where exchange of information is only from the lecturer to the student. Questions and requests for clarification are either limited or not allowed at such times to allow the lecturer a quick escape from the environment as it seem that of immense “pressure”, according to Maurice.

Lucas, a student of Faith University echoed the same view. He talked about the fact that the usually have lectures that last for two hours and because of the size of the class, there is not enough time for the lecturer to address questions and issues students would have loved to raise. He stressed that there are no instances where students have interaction with the lecturers and should the lecturer be kind enough to allow it, they may lose the main topic for the day:

“The lecturer doesn’t have an interpersonal relationship with the students and as such it impairs the learning process. You don’t have instances where you can have one on one interaction with the lecturer, the time we have is a two hour lecture, which should have been enough for that but the class is too large if the lecturer was to permit such we might not even have the topic for the day” (Lucas_Faith_S)

Student-Lecturer Interaction at Patience University

At Patience University, with relatively smaller class size, interaction seems to be taken very seriously. In other words, there is commitment from the lecturers to get students to be active in the classrooms. In actual fact, many of them stress that the teaching method employed in their school is that which every student must participate in the learning exercise. According to Yinka, a student of Patience University, *“there is good rapport between faculty and students”*:

“Well, you get that (Student-lecturer interaction) here because of the commitment of the faculty and they want their students to really understand what they have come here to learn and because of the standard here. There is good rapport between faculty and students. Well, maybe because it’s a private school too” (Yinka_Patience_S)

Another student said, unlike the public universities, *“right from the first day in class, you [the students] are being assessed on class participation and how you contribute positively to class”*. Class participation seems a very core part of their learning process at the school. The student further explained:

“At Patience University, we have class participation, where when you’re discussing cases, you need to actively participate in class discussions. So you’re talking but you’re not just saying

nonsense. You're making sense. With that you can walk up to the lecturer to check your grades in class participation" (Kyle_Patience_S)

Their lecturers too testified to the level of interaction that takes place in their classes. The interaction is both student-student as well as student to lecturer interaction. In fact, she explained that lecturers like to refer to themselves as facilitators; that way, they see themselves as mediators as not the highly respected subject that enforce learning on the students. She claimed that often telling her students she learns from them as well. That way, the students feel free to share what they know; thus, fuelling the level of interaction within the classroom.

"...we are using case-based method. Even when it is not an actual case we're using in the classroom, we want to get our students involved. I always tell them that they are not there to listen to pearls of wisdom coming from my mouth, they are coming to learn from each other and I'm also learning from them. We are here to exchange experiences. You can't do that when it is overcrowded. In fact, we normally call ourselves facilitators rather than lecturers." (Jasmine_Patience_L)

Gloria explains how students are aware of the school's pedagogical philosophy of discussing and interacting in the classroom. Students therefore do not just come to class expecting the lecturer to pass on all the information they need to know. While the lecture notes and cases may have been prepared beforehand and handed to the students, the students also has a responsibility of reading and abstracting knowledge to be shared later in the classroom with the lecturer and other students.

"what we do is because we are a case based school. Every module we teach, we give you a binder with all your cases so you have your binder and you have a schedule so you know before the class, this is what we're discussing in the classroom. So you should have pre-read your case on your own. Our students don't come to class empty. They come to class with some knowledge of what we're discussing ...that's how we teach" (Gloria_Patience_L)

She claimed that she often tells the students that the only way for them to learn is for them to contribute to the learning. They have to come with an open mind to learn from others; at the same time, with a mindset that is prepared to share what they know too:

"What I try and tell them is that in any case- discussion or classroom, you get what you put in, so if you come with this mindset that 'there is nothing anyone can teach me'; you will never get anything out of it. If you come with an open mind, ou come in and can get" (Gloria_Patience_L)

She also confirmed the facilitator's role of lecturers as mentioned by Jasmine;

"I think one of the beautiful things about being a facilitator is you have to learn to adapt very fast... So you have to be very careful not to get self-absorbed but also to realize that you are doing it for the people and as long as they are engaged and they are interacting- that's what is important" (Gloria_Patience_L)

Noteworthy was her mentioning how important it is for the ‘facilitator’ not to get self-absorbed but always conscious of the student by making sure they are engaged and interacting. There seem to be that reference and emphasis to the fact that student engagement and interaction in the classroom is critical to the mode of instruction in the school.

Anonymity and accountability – “You cannot know all the students in your class”

Anonymity is almost a direct consequence of a large class size. When a class is overcrowded, it is almost certain that a lecturer would not recognize each and every student attending his class. Whereas students usually know the lecturer’s name, the lecturers have difficulty recognizing students as well as learning their names (Ward & Jenkins, 1992). As a result, the lecturer becomes oblivious and less accountable to the trend of development of each student in the classroom. Students likewise are likely to be less accountable to a lecturer that hardly knows or able to identify them in person. They are likely to do whatever they like in the classroom; listen to the lecture, join others in making the class a rowdy one or simply choose not to attend the class. All these in variably affects the student’s learning outcome.

The respondents talked about how the size of their classrooms makes it difficult for students to know lecturers and vice versa. A lecturer at Hope University said they [lecturer] don’t know most students until it is time for them to get their final year thesis done and they have to supervise them. This is the time where students are looking for supervisors to guide them on their projects and that might be the opportunity of meeting their lecturer one-on-one since the day they started school:

“...to know students one on one, it'd be a difficult thing. You cannot know all the students in your class at the same time. Before we get to know our students, it's like when they get to like 400level, when they meet with project supervisors, so we make contact with them. In the classroom, it [overcrowding] affects both the students and the lecturer” (Chris_Hope_L)

According to Hall et al. (2005), when students experience anonymity, they can feel less personally responsible and this can ultimately undermine their motivation to learn and increase dissatisfaction and student attrition. No wonder, Nathan, a student of Hope University argues that a proper learning environment should not be overcrowded. It

should be peaceful. He believes students should be given the required attention in a proper learning environment. He advocated for the serenity of a learning space such as the classroom and argues that no lecturer has the capability to know each student in a classroom with 600 students:

“When students are crowded, the concentration will not be there. That’s not a learning environment. A learning environment should be peaceful, quiet and all students have to be attended to because no one lecturer can attend to almost 600 students in a classroom.”
(Nathan_Hope_S)

Kyle, a former student of a public university, now at Patience University has something to say about the anonymity issue in public university. He first of all talked about how it is almost impossible not to be known by your lecturer in the private university he attends because the lecturers assess every students on the level of their contribution to class discussions and activities;

“Right from the first day in class, you are being assessed on class participation and how you contribute positively to class. But you won’t find something like that in public schools. Even if you go to a lecturer and introduce yourself, he or she probably has never seen you in class; he doesn’t even know you” (Kyle_Patience_S)

Accountability at Patience University

At Patience University, lecturers seem very aware of each student in their classes and as such are able to attend to them. One of the lecturers stressed that, because of the nature of their classes, which is largely interactive, it is easier for them to attend to their students and have interpersonal relationship with them. Speaking of how they monitor their students and ensure they get involved in classroom activities, Jasmine explains;

“...we ensure that students are getting involved in the classroom. And even some are a bit silent in the classroom; as long as they are actively engaged in the small group, at least we know they are putting their head into it... The facilitator has to make sure that from one day to another, it’s not always the same people who speak. We have the class plan, so I always take note of who has spoken, how well or whatever, so every now and then you check and you see”
(Jasmine_Patience_L)

From Jasmine’s response, there seem to be an extra commitment from the lecturer as to how they monitor students and trace their learning in the classroom. Once they notice a particular student is not contributing to the class activity, he/she gets on the list of those to be compelled to speak. Some students are shy and if care is not taken, they become invisible in the class.

Gloria also said the lecturers pay particular attention to students and their level of participation in the class; “what they say, how they build on what others have said and so on””

“...we want the students to be able to discuss and share their opinion, so we pay particular attention to class participation which is within the class context: what people say, how they build on what other people have said, etc.” (Gloria_Patience_L)

It would be good to see what their students think about this method. Emma seems to feel quite positive about the idea of having to be monitored for her learning outcome. Her response seems to communicate a sort of accountability to the lecturer and motivation to learn since as a student, she has “no choice” but to get involved in the learning. She explained that;

“When you’re in an environment that there is an eye on everybody and it’s enclosed and not overcrowded. Everybody is involved in what is happening, you find that you have to contribute one way or the other. You have no alternative. You have no choice; you will have to contribute” (Emma_Patience_S)

Kyle, as described earlier, attests that as a student at Patience University, “*right from the first day in class, you are being assessed- on class participation and how you contribute positively to class.*” In their words, the lecturers have their eyes on you and are committed to making sure they know you and cater for your needs in the classroom. This is likely to positively affect the learning outcome of the student from time to time.

Class attendance - “I can always sit down at home and read”

Since most students are usually anonymous to their lecturers, there is the likelihood such students would not be motivated to attend classes. They lose their motivation to learn and as such would prefer to be anywhere else but the classroom since they hard get whatever is going on anyway. Dominique expressed his concerns regarding the size of the class and the consequent lack of motivation to attend classes. However, he pointed out that this is not a good behaviour on the part of the students:

“Some of us believe “I can always sit down at home and read because class is always full; it’s poor” but sometimes it’s not always sitting down at home and reading. You need what the lecturer has to give you first.” (Dominique_Hope_S)

Catherine paints the picture more precisely as she talks about how perhaps discouraging it is to be in an overcrowded classroom. She talked about the characteristics of the

classroom that are capable of making a student feel less obliged to attend classes, not minding the consequences. She even stressed that even lecturers share the same feeling of not wanting to come to class:

“Even the lecturers themselves are not persuaded to come to class because they already have the knowledge of how the class would look like. Very rowdy, very noisy, and people at the back are not listening, not because they don't want to listen but because even if they get attentive, they won't hear what the lecturer is saying. So, he only lectures the first half of the class that could hear him. And even the students are not encouraged to learn. Some even stay back because they know this class is a crowded class” (Catherine_Faith_S)

Her description paints a kind of a picture that is neither conducive for teaching nor for learning; a condition where only a section of the classroom are able to hear the lecturer. She stressed however that the other section of the classroom not listening are not doing it intentionally but because the lecturer is often inaudible to those people.

Kyle, a former student at a public university shared a similar view:

“...just as I mentioned, about a quarter of your class won't bother coming to class at all because the class is overcrowded; the other half in class doesn't bother to pay attention to lecturer” (Kyle_Patience_S).

Class attendance at Patience University

At Patience University, “it is a criminal offence” not to attend classes. Classes are mandatory because of the pedagogical method employed. The classes are usually interactive in nature and every student is required to be in class to participate in class activities. These are the words of Jasmine, a lecturer at the university.

“This is a criminal offence. Not to come to class is a criminal offence. Attendance is [compulsory]...They [students] get into trouble very soon if they miss [classes]. Of course anybody could be sick once in a while but because of the interactive nature of the whole thing, they have to be there” (Jasmine_Patience_L).

It appears the level of commitment required of a student at Patience University is such that gets the student to learn almost by all means. According to Gloria, a lecturer at the university, “we pay particular attention to class participation which is within the class context”. It seems rather justifiable to conclude that students would find it hard to not attend classes at Patience University because they know their lecturers are paying “particular attention” to them and their learning needs.

Emma, a student at the university made a similar conclusion. She said, *“When you look at it, if you know everyone is attentive, it kind of stimulates someone that probably really is not interested to be pulled into the spirit of attentiveness too”* (Emma_Patience_S). Motivation seems to stem from watching other students and even lecturers commitment to classroom activities, according to Emma. Even if a student is one that seems rather unwilling to be attentive in the classroom, the atmosphere is enough to ‘pull’ him/her into the activity.

Attention, retention and student satisfaction

For any student to retain what is being taught, the environment has got to be such that is conducive and appropriate for learning. Many of the respondents talked about the atmosphere in their classrooms evidencing that which is not appropriate or conducive for learning. They made mention of issues such as noise making, ventilation in the classrooms, difficulty hearing what the lecturer is saying and so on. Ola, a student of Hope University was quite blunt in his response to the learning environment in his classroom;

“In this environment, I can’t learn very well. Student will find it difficult to...because with the number of students, I just think students will find it difficult” (Ola_Hope_S)

Several students shared the typical scenario in their classrooms and their experiences tend to echo an environment which is not conducive for learning.

“It’s only people who will be at the extreme front are the ones that will benefit. When students are too much, the concentration will not be there. That’s not a learning environment. A learning environment should be peaceful, quiet and all students have to be attended to” (Nathan_Hope_S)

“...you won’t hear most of what the lecturer is saying. It’s only half of the classroom that will hear what the man is saying. And even sometimes, the lecturers are too fast that you’ll not be able to jot down things. People at the back - the noise and everything like that - you’ll hardly jot down something meaningful. So it really affects...” (Theresa_Hope_S)

Nathan and Theresa’s comments on the classroom atmosphere emphasise the typical lecture method for teaching large classes. According to Biggs (1999), lecture is the standard method for teaching large classes and its strength lies in communicating information and the lecturer’s personal interpretations. However, it makes demands on concentration that drastically undermine its value if not properly handled. Biggs also argue that lectures are quite ineffective for stimulating higher-order thinking as sitting

listening to a lecture is a sustained and unchanging low-level of activity. Activities like this have been assessed as capable of lowering student concentration whereas it requires concentrated effort to follow lecture content. Biggs concludes that, “The larger the class, the slower things get done” (p. 103). Davis (2007) argues that words such as “ineffective”, “cold”, “distant” and even “boring” are descriptions often linked with the lecture method.

In a typical lecture oriented classroom, lecturers are often fond of standing in front of the class trying to explain or dictating lesson notes for students to write down. It is not hard to imagine, through Nathan’s description of their overcrowded class that, it would be hard for some students to hear the lecturer as he tries to get the students to take notes for the class. Theresa also pointed out that the noise level in the class is usually high and in the end, as a student, it is a hard task to come out of that class with something learned.

Tola shared a similar experience too;

“From my own experience, when I was in my second year, I would just come, and imagine someone talking on my side and I wouldn’t even hear the lecturer. By the time I’m through and I go out of the class, I don’t even remember what the lecturer said” (Tola_FAITH_S)

Tola’s response echoes the difficulty of a student garnering anything from the teaching that takes place in an overcrowded classroom. He said most times, by the time he is out of the classroom, he is not able to remember anything the lecturer said inside the classroom. Noise making is typical of large classes and particularly overcrowded ones. They take the message away from whatever the lecturer has to offer and distract students from the significance of the class activity. Paolo & Scoppa (2011) offered similar argument that, in a large class, students are likely to benefit less from teacher explanations and have fewer opportunities for interactive discussion to ask for clarification.

Another thing is that when a classroom condition is not favourable for teaching and learning, distractions are inevitable. Students are often distracted either by the noise of their fellow students or by their chaotic behaviour. Roland, a lecturer at Faith University shared this view;

“When the students are crowded, they tend to distract others, thereby causing commotion and if one is not careful to put such situations under control, it might affect the quality of teaching. If the lecturer is not able to put the situation under control, then they may have a chaotic situation

whereby others that are ready to learn would not be able to benefit anything at all; that is where I feel the impact might occur” (Roland_Faith_L)

Roland argues that students often tend to go haywire when the class is overcrowded. The behaviour of a group of student trying to cause commotion in the class is likely to affect others that are serious about their learning. When this happens, even the serious students walk out of the class with nothing learned. He however said this may be minimized if a lecturer is able to put the situation under control. It is not clear the measure of comfort such control will give to students willing to learn.

Talking about convenience in the classroom, it appears not to be just about the noise level of students causing a distraction to others and to the class activity, but also of the infrastructure available to students for the purpose of learning such as the desks, chairs, public address systems. When the right facilities are lacking or not in a good condition, it would be hard to have a conducive class lecture. Facilities such as classroom furniture do have influence on students’ ability to learn, according to Dominique, a student of Hope University;

“These things [pointing to the classroom furniture] are not conducive enough. We as students, we don’t have a good learning environment. The quality of learning is poor here, so students don’t catch it very well when lectures are going on. And you always lose interest in class, when you know you have to suffer so much to learn” (Dominique_Hope_S)

Dominique seems very concerned about the condition of the infrastructure in the classroom. He believes with a poor state of infrastructure, students are subject to ‘suffering’ while trying to learn. He particularly stressed that when the condition of the infrastructure is poor, students are capable of losing interest in the classroom activity; thus impacting on their learning outcome. His conclusion was that, they don’t have a good learning environment.

Student and teachers of the private school too tend to share the same views with the counterparts in the public schools. Gloria said;

“When you have too many people, when you have overcrowding, it creates a lot of distractions on the part of the students because the moment you have an overcrowded class, the students begin to lose focus. Because what happens is that; a lot of times when you have an overcrowded class is that the students begin to talk to themselves and beg for spaces to sit down. One way or the other, there is always that distraction and when there is a distraction, it won’t be fun to teach. One of the best basic requirements is for you to have a class that is focused- the students focused on the subject and the lecturer is also focused on the subject. In a crowded class, you won’t achieve much.” (Gloria_Patience_L)

Gloria argues that an overcrowded classroom is one that is not fun to teach in. This is because both the students and the lecturers would not be focused on the class activity. Most likely, the lecturer would be disturbed by the noise in the classroom and because students are not accountable for their actions due to the size of the class, they continue to do whatever they like. Her summary is that, in an overcrowded classroom, only little can be achieved.

Yinka too talked about how such environment would make teaching a difficult task. He talked about how the lecture only benefits those who sit in front of the classroom because they are the only ones able to hear the lecturer;

“Yes, it does. In an overcrowded class especially like the ones we have in our conventional universities here in this country where the sound system does not work, for the lecturer to use in order for the whole class to hear. You find a situation whereby only those people in the first three rows that can hear the lecturer; all others at the back are ‘on their own’ and that makes it difficult for quality teaching” (Yinka_Patience_S)

4.4.2 Lecturers’ work load – “An average lecturer is overstretched”

Large classes may be very cost effective to run but it poses quite a huge risk on the quality of teaching and learning (Oliver, 2007). When classes are overcrowded and students are more than the resources available to cater for them, lecturers tend to be at the receiving end. The responsibility of the lecturer to provide lessons that recognize and cater for the diverse needs of the students in that class is one thing and another is assessment of such learning activities at the end of the day.

One lecturer lamented;

“Yes [overcrowding affects teaching quality], because an average lecturer is overstretched. Where you’re supposed to take a class of about 100 in the morning say 8-10; and you might have another lecture for 2-4 in the afternoon, a class of about 150. It [class] is always large and coping is a problem but if this task is shared between two lecturers, life is easier and the schedule is smaller leading to better performance” (Louis_Hope_L)

Louis talked about how overcrowding is capable of stressing out a lecturer. He believes it is quite hard for a lecturer to cope if he has to take lectures in such classes twice a day. According to him, when a lecturer is stressed, it is hard for him to be at his best in the classroom. The stress would be very hard to conceal in the classroom thus making the lecturer adopt a style that is unfavourable for learning.

Maurice shares his view on this;

“...and Lecturers, it stresses them too. Lecturers can't really lecture properly whenever the class is overcrowded but where they have few students in the class, they are able to communicate and questions can be raised easily. Because most times, because of the number of questions coming in from various angles, lecturers might just adopt a style that would limit students from asking questions, not to like delay the lectures because they themselves cannot really cope with the pressure of an overcrowded class” (Maurice_Hope_S)

While Maurice, a student, noticed how their class size stresses their lecturers, he was quick to point out that it affects the delivery of the lecture. He compared this with a smaller class size and said, the lecturers are able to communicate better and students have the opportunity of raising questions. When the class size is overwhelming, the lecturer will not be able to address any concerns students have to raise. The lecturers are likely to be defensive in a way that would make them leave the class at the earliest time possible for them.

Another area of concern is the assessment of students when the class size is large. If a lecturer has to teach multiple overcrowded classrooms in one day and still has to assess their learning outcomes, it is possible to argue that the work load would increase the stress level of the lecturer. A lecturer described it as *“carrying more load than you are supposed to carry”*. He concludes that, *“it is only reasonable to conclude that you are going to be tired. It is certainly going to affect the quality”* (Jason_Faith_L).

How this tells on students' assessments reflects from Yinka's response;

“A situation whereby you have close to a hundred scripts/papers to mark; by the time you think of that, that alone is exhausting, because the number of students is so overwhelming you might not have time for every student or most students” (Yinka_Patience_S).

When it comes to assessing student's work, there are a lot of things that could overwhelm a lecturer that teaches an overcrowded class. First, the volume of the marking required. Marking the scripts of 500 students is sure a hard work. Lecturers may also feel overwhelmed, thus are unable to give proper attention and concentration to it. For instance, if they have to give useful and comprehensive feedback to students, it would be hard to do so considering the number of students. Consequently, students will miss out on getting feedback on their learning. Secondly, this pressure of marking scripts could be aggravated by the required turn-around time. The sheer weight of marking and the short time allowed to produce the marked scripts may affect the quality

of the assessment. For instance it would be difficult to maintain a consistent standard for the volume of students a lecturer need to mark. However, should the work be split into two to allow another lecturer to help in the marking, the consistency of such exercise is likely to be questionable. It will be very difficult for lecturers to spot plagiarism or cheating (Ward & Jenkins 1992).

Another effect of the excessive work load on lecturers, a student suggests perhaps is why lecturers are not persuaded to come to class;

“...the lecturers themselves are not persuaded to come to class because they already have the knowledge of how the class would look like” (Catherine_Faith_S)

“Also, there are some lecturers that do not even come to class [not] once in a semester because they feel the exams they are setting are multi-choice questions. All you would have access to is probably the syllabus; teach yourself; educate yourself and come for the exams.” (Gabriel_Faith_S)

It could be discouraging for a lecturer taking overcrowded class day after day. Perhaps the reason is because of several issues they have to deal with; for instance, having to shout at the top of their voices so students could hear them as they teach, the thought of the rowdiness and chaotic setting of the classroom, the volume of assessment scripts that they have to deal with and so on. These are factors capable of crippling a lecturer's motivation to teach or even attend to students. All these factors will eventually affect the students' learning outcome.

Time for research – “You scarcely have the time”

Another way the impact of overcrowding is seen is the balance between the times lecturers have to teach, do administrative work and research. Opportunities to participate in professional development activities and scholarly research are essential components of being a university lecturer. Santiago (2004) noted that satisfaction in the workplace for lecturers is naturally associated with their working conditions. For lecturers, working conditions are more associated with factors such as the percentage of time they have to spend on their research and professional activities, not just their teaching in classrooms. If the lecturers are not able to spend enough time on their professional development, particularly research, their satisfaction in the workplace is not guaranteed.

Many of the lecturers were asked if in spite of their work load, and as a result of the number of students they teach, they are still able to find time for research and other professional activities. The responses were mixed with some lecturers saying they have enough time while others lament about the volume of administrative work they take on daily.

Matthew, a lecturer at Faith University was quite comprehensive in the way he responded to the question. He was one of those who lamented the volume of teaching activities choking up their research outputs;

“That is an aspect of the work that one would aspire to or want to achieve but you scarcely have the time to do that because you have enumerated with a number of things...Even here the slogan is 'publish or perish' but you find that everybody is perishing because you do more teaching, meetings, administrative responsibilities, course advisory work, grading of scripts, preparation of student results; by the time you finish that, you are exhausted. For instance, teaching experience here starts from 8am to 8pm, I have some courses I have to take, 6-8pm. Part time postgraduate lectures are taken in the evenings. By the time you finish and you get home, you are already fapped out [tired]. Even if you are not, you find that you got home and there is no power. There is not much that you can do. The next thing is either to use generating set, which creates its own problem: cost and noise and all that... so, it's an ideal that has not been attained” (Matthew_Faith_L)

Matthew's conclusion summarized his whole response. Time research and professional activities “is an ideal that has not been attained”. He believed the ideal thing is to have time for research too. However, the nature of his job as well as other militating factors such as the ‘poor’ power supply in the nation would not make that possible, even if he were to plan to research at his own time at home. Research, from Matthew's perspective, has to be done but the factors militating against getting it done far outweighs those in its favour.

Another lecturer that shared the same view, Brad from the same university confirmed that their administrative duties are choking up their time and motivation for research;

“For now, we are overwhelmed with so many administrative duties. The university is encouraging all lecturers to do collaborative research with those in the industry. And do collaborative research with other departments that are not there. But we hope that most of the administrative duties would be taken off our desk so that we can devote our time to teaching and research work and not all these administrative duties” (Brad_Faith_L)

According to him, they are overwhelmed by the volume of administrative duties such that despite the encouragement from the university to collaborate with those in the industry, time would not let them. He voiced his hope as well as that of others that the

university would take off most of their administrative duties to allow them focus on teaching and research duties.

Another lecturer, Henry from Hope University, attributed the lack of time for research and other professional activities to what he referred to as the “African Factor”; That is, the volume of students they have to cater for.

“Yes, we must have more administrative work because of the number of students we attend to unlike the developed economies where maybe the students you attend to may not be more than 10. But here you may be forced to attend to maybe 20, 30, 40 students; definitely it’d take your time. That is what they call African Factor! We even work more than our colleagues in the developed world and spend a lot of time attending to our students. We still have time for research but relatively not much time and it also depends on the individual.” (Henry_HOPE_L)

Henry’s response echoed that the causal effect of having a large number of students to cater for is lack of time for research. He believes he and his colleagues actually work more than their counterparts in developed countries, judging from the number of students they have to cater for and the time they need to spend attending to them.

Another side of the views above came from some lecturers who responded that they have time for research just that they need to plan their time. My interpretation of their views does not seem quite opposite to the ones above; rather they advocate for adequate time planning if research and professional duties must be taken seriously. For instance, Louis, the Head of the Department of Marketing at Hope University said,

“Well, it depends on how you fix your time. As Head of marketing, like 8 o’clock, I go to my office. I pick all the mails. I sign all the mails. Make sure that all the administrative duties are tackled between 8 and 9am. I don’t fix my class till anything earlier than 10. 10-12, 12-2, 2-4. If I have been allotted two courses in a whole semester, I can actually teach Monday, Tuesday and dedicate Wednesday, Thursday and Friday to other things. Wednesday can be for research, then Thursday may actually be for going online, interacting. I’d still be in school but I may not be teaching. I might have to read in the library. So, other days come so fast... Mondays, project students come between 10 and 2. I guide them - that’s project supervision. They come here and we tackle it and they go” (Louis_Hope_L)

From Louis’s explanation on how he tries to find time for research, it is not hard to see the volume of administrative work he has to overcome before that is possible. In the way he seems to have scheduled his time, he seems only to have Wednesdays only allotted to research and professional development. What he failed to add on to the list are times he spends preparing his classes and attending to students’ assessments. As the head of the department, more weight rests on his shoulders than perhaps other lecturers in the department. He is likely to have his time choked than others. But like he said, “it

depends on how you fix your time”. Louis appears to have his time scheduled to meet his research and professional development needs. The question therefore would be, how much would he be able to deliver with that time?

Roland shares similar views with Louis, stating that having time for research and professional development duties is not the question but how well a lecturer is able to manage his time:

“I believe having time is somehow relative. We all have 24hours in a day. It depends on how you plan your time. Here at Faith University, there are opportunities for consulting and seminars and conferences. A lot of our lecturers are involved in such. It depends on how you manage your time.” (Roland_Faith_L)

Roland revealed that opportunities abound at the school for research and professional development activities. His response seem to hold the view that it could be challenging making time for these activities but if a lecturer is able to plan his time very well, he would avail these opportunities.

4.5 Coping with overcrowding

After a comprehensive revelation of the perception and effects of overcrowding on the teaching and learning activities of the participants, it is important to now look at the coping strategies they have adopted towards overcrowding. This section is divided into two; how the lecturers cope with overcrowding and how the individual strategies the students employ to ensure they are able to make something out of their classroom activities despite the size of their classes.

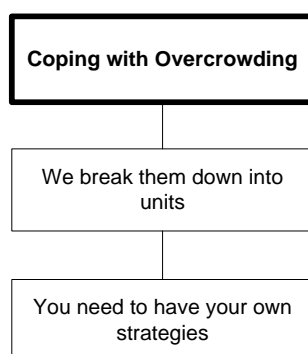


Figure 4.4: Overview of the subcategories under the 'coping with overcrowding' category

Figure 4.4 shows the two subcategories under the ‘coping with overcrowding’ category. The first talks about how the lecturers and school administrators cope by breaking their students down into groups to reduce their numbers in order to reduce overcrowding. The second talks about the individual strategies the students make use of to cope with overcrowding in their classrooms. The students have different strategies with which they cope; this is why the subcategory carries the heading “you need to have your own strategies”.

While overcrowding may seem a norm that has come to stay in Nigerian institutions, the participants talked about how they cope with it. Activity theory acknowledges humans as subjects of activity systems. In other words, humans are granted the intentionality and consciousness that helps unify their attention, intention, memory, reasoning and actions (Jonassen & Rohrer-Murphy, 1999). As such, humans can shape and in turn be shaped by their environment. Therefore, students and lecturers of Nigerian universities (subjects of the activity system in this study) are capable of shaping their activity systems because of their nature or consciousness and intentionality. The ultimate cause for the activity of human beings is their ‘needs’. The needs of humans often lead to the creation as well as continuous modification and appropriation of tools (and strategies) to meet them.

4.5.1 How administrators and teachers cope - “We break them down into units”

The need for students to learn and institutions to produce quality graduates appears to have led to various measures and strategies of coping with the overcrowding norm at the public institutions. Without tools and strategies to cope with overcrowding, students will find it hard to learn and lecturers will find it hard to do their jobs. For instance, Erinoshio (2008) commented on the state of overcrowding in most universities in Nigeria; “lecturers are forced to mark hundreds or thousands of [examination and assessment] scripts and no wonder quite a number simply do not just bother to mark them but merely supply marks to departmental examination officers. Results are not released on time and students that need transcripts for admission or for some other purposes face a hard time obtaining them” (p 51).

One particular coping strategy common to the institutions appears to be grouping students into smaller units to deliver lectures, as some of the respondents noted:

“when we have large number of students, we break them down into units such that we can manage – sizeable number so that you can control them, monitor them, give them assignments and so on and the numbers are reasonable” (Theo_Hope_L)

“The arrangement is such that students are grouped in accordance to spaces available. They are grouped by departments, having in mind the number of students. At the 100 level, which is the first year, each department admits on the average about 69 and we have about 5 departments. Then, in addition to our students, we also have the education students, from the faculty of education. They too have about that number. If you add up, you have about 500 students approximately and the capacity there is for 180 students. So, we have 3 groups. That is, each group is made up of less than 200 students.” (Brad_Faith_L)

“There is a kind of system we put in place in our university. We try to put them in groups, use a large theatre hall and we use public address system in lecturing. In some little way, it eases the effort of the lecturer in delivering the lecture” (Chris_Hope_L)

One of the lecturers argues however that even though they are dividing the students into groups, the exercise is only helping to reduce overcrowding, not to stop it. He said, *“We have about three groups and each group consists of about 2-3 departments. Notwithstanding this grouping, the students are still more than the capacity of the class.”*

From the responses, we can also deduce the confirmation of activity theory’s principle of tool mediation. Human beings fashion tools to meet their needs. In other words, for every need of humans, they use their mental capacity to create artefacts to help meet their needs. The mental capacity is what differentiates human beings from other elements of the activity system. It appraises the role of humans to create and recreate their world; what is commonly referred to as ‘survival instinct’. The respondents mention the use of tools such as Public address systems, ICT in forms of projectors, electronic boards in their bid to cope with their overcrowded classrooms.

*“Well, if there is a **microphone**, I can communicate. Without a microphone, I do sometimes but I may not be able to teach to that length of time required of me. If I am supposed to teach for two hours, I may just end up teaching 1hr, 30 min or 1hr 15min because I may be a bit tired. Because I have to be audible if the class is very large... For a good number of times, we use microphones and it’s very good” (Louis_Hope_L)*

*“What we’ve tried to do in this faculty is that we now apply **audio speakers** which the lecturer uses so that those at the far end of the class can hear what he is saying. Hearing what he is saying is one thing, seeing the board and being able to follow what is being done in front is another, so it’s still a major problem” (Matthew_Faith_L)*

Apart from the contribution of artefacts such as public address systems (microphones, audio speakers) and other ICT resources, majority of the lecturers talked about some of

the strategies employed in coping with overcrowding in the classrooms. These strategies however do not involve the use of artefacts but conscious measures to keep classrooms in order for teaching and learning to take place. For example, Mr Roland of Faith University said,

“There are situations when the class is too much. You just need to introduce strict measure for you to curtail the students. When the students are so much, they tend to distract others, thereby causing commotion and if one is not careful to put such situations under control, it might affect the quality of teaching. But if you good enough to keep the situation under control, it won't affect the quality of teaching. In my own case, I do apply strict measure and students think I am too strict or wicked.” (Roland_Unilag_L).

Mr Roland's statement reflects the use of strict measures to put the situation of classrooms under control such that it is conducive for learning. Strict measures may mean, having to ask some wayward students to leave the class when caught disturbing the peace of the class or perhaps getting them to serve a punishment for breaching the peace of the class. Punishments in this sense are often strict so as to get the students to be serious about maintaining decorum in the classroom such that it is convenient and conducive for teaching and learning. Lecturers' working hard to keep the classroom under control is a common thing in classrooms of Nigerian institutions. It appears there is a measure of strictness the lecturer is allowed to impose on his/her students to keep the class under control.

4.5.2 How students cope – “You need to have your own strategies”

Just as the universities' administrators and teachers have developed tools of various forms to cope with the volume of students enrolled, students too have their own strategies for coping. Some students that are serious about their learning and want to get something out of every class ensure they are not beaten by the overcrowding challenge. What is inherent in the responses of these students is the determination (whatever it takes) to not be a victim of overcrowding. They go the extra mile; do what majority of their mates would not do, just to access what they are in school to acquire – learning. It may be tough for lecturers to communicate to the whole class but these students will do all they can to be at places where they can listen to the lecture and not miss out of anything the lecturer has to pass across.

Phillip is one of such students. He clearly stated that to get anything out of their classes, as a student, you need to develop your own strategies:

“As a student [to cope in an overcrowded class], you need to have your own strategies. One of my strategies is I always make sure I am in class, punctual in class, such that even before the lecturer comes in, I’m in class and I’ll be able to take the front seat and that’s what I’ve been doing from 100L [first year of university] till date. I make sure that at most I shouldn’t be more than first 4 rows in front” (Phillip_Hope_S).

Phillip was in his fourth year of studies at Hope University. He lays claim that since he got to the school, he has made it a habit to always get seats in the first four rows in front. Due to the noise level usually in overcrowded classrooms, the likelihood of 50% of the class hearing what the lecturer has to say is a doubt. The only way to get what the lecturer has to pass across is to sit ‘underneath his nostrils’. Phillip’s coping strategy is to always be punctual to every class he has. Aiming for the first few front rows is the key. The front rows, according to Phillip, are the best places to find a seat, not just so you could hear the lecturer, but so you would not be disturbed and consequently lose motivation as a result of some students that usually find their seat in the back rows because they always want to cause nuisance in the classroom. Since the classroom is so large and students are less accountable, they get away with most things they do that are not in favour of the class lecture.

Sarah describes what the classroom sometimes looks like. She talked about how when the lecturer is frustrated and does not feel like stressing himself further, he just quits talking his loudest so the whole class would hear him. He speaks with a low tone and with an attitude that does not seem to care if the students are listening or not. Only those who are in front of him – that is, the first few rows – will hear what he is saying.

“It’s just like they [lecturers] don’t really care because, “fine oh, I’m being paid whether I teach you or not, they’re paying me so you hear or you don’t hear, they’ll just keep saying it [teaching]”. Sometimes, most of them, they don’t even like stress themselves, they’ll just be talking normally - “If you can hear, fine, if you can’t hear, fine” - So, it gets to a stage that the class would just be kind of...most people would not be concentrating because they can’t hear what the lecturer is saying. Some people would just be having their own discussions and once it’s two hours and the lecturer is through, everybody just...You find out most people don’t take part in the class though they are in the class. You find people sitting, you find people lapping each other, you find people...most people, standing, which is, it’s really, really....” (Sarah_Hope_S)

Sarah shared her own coping strategy which sheds more light on the overcrowding phenomena:

“The way we have lectures here; from 8:00am-10:00am, 10:00am – 12:00noon, 12:00noon – 2:00pm. So sometimes, before we get to a lecture hall, it must have been [full]...okay, let’s assume the class is by 10:00am. Maybe we had one course by 8:00–10:00am and the lecturer stops exactly at 10 O’clock; before you get to the lecture hall, maybe it’s going to be like 5 past 10, and definitely, some departments that don’t have lectures in the morning must have been

there so if the crowd is much already, I just try to squeeze myself somewhere and after squeezing myself there, I try as much as possible to try to just shun every distraction around me. I just try to put my head up, so I can hear [what the lecturer is saying], just stay focused.

Even if it's notes, because most people don't copy...in that kind of situation, most people don't copy notes because they don't get to hear what the lecturer is saying and, Fine, some people start...when the lecture starts, they start copying notes but it gets to a stage that they'll just be like ah okay fine, I'm no more copying. They'll just close their book, they'll sleep, some will just be gisting [talking], some will be browsing [surfing the internet on their phones] and doing different stuffs in class. I don't blame them anyways but for me, basically for me, I think, I just, I try to get it. If I get into the class and the lecture has started, maybe I missed like a page...I don't even want to know, I'll just take my pen, I'll count a page. Then exactly where it is he's dictating from, I'll just continue exactly from there." (Sarah_Hope_S)

Sarah's coping strategy has to do with discipline. She believes the only way to get something out of her classes is to shun every distraction and focus. It is hard to focus in an environment where students are not accountable to the lecturer and their purpose for coming to class. Most students are in class to catch up with friends, sleep (as she mentioned) or surf the internet from their phones. The atmosphere is not conducive but for Sarah, her strategy is to keep her heads up, try as much as possible to listen to what the lecturer is saying and shun every distractions.

Tola, like Phillip and Sarah ensures she is punctual to class. According to her, if a student is really interested in learning, he/she has to get to class an hour before the class starts to lobby for a place to sit.

"From my own experience, when I was in my second year, I would just come, and imagine someone talking on my side, and they will just talk, talk, and I wouldn't even hear the lecturer. And by the time I'm through, I would just go out, and I don't even remember what the lecturer said. I have to get there one hour. Before it was that bad, that you have to get there like 2 hours before the seat, and at that time, they would have lectures here, so we'll be in front of the door, so as they are coming in, we're all rushing out. I mean, sorry, as they are coming out, we're all rushing in to get seats. Yea, so imagine me staying at the side of this place, I'll just throw my bag to the seat that "Don't sit there. That's where I'm sitting"" (Tola_FAITH_S)

The challenge of punctuality is when another class is going on in the same classroom where she would be having her next lecture. Tola spoke about how students of her class would wait at the door of the classroom for the ongoing class to finish. Once they are done, while the other students are trying to make their way out of the classroom, they rush in throwing bags on chairs to book highly coveted spaces – usually in the first few rows in front of the lecturer - for themselves. This is what they students have to go through every day. Should a student be late for class, he/she would find learning a huge ordeal that day.

Gabriel, a student of Faith University shares what it is like to miss a class:

“Ok, on the part of the students, imagine you were not able to make it exactly for a class and say you are like 10mins late. By the time you get there, there is absolutely no seat again. You’d end up standing outside or you end up standing at the back and gist the whole 2hours away.”
(Gabriel_Faith_S)

Coming late to an overcrowded class means a student is virtually absent, according to Gabriel. He is likely not to find a place to sit in the class. As a result, he will either be outside of the class or at the back where it is nearly impossible to hear what the lecturer is saying. To avoid this, Gabriel’s strives to come to class early to secure a space to sit.

For those who are able to cope with the situation and adapt to the way things are, they learn. However, those who are not able to cope would always find it difficult. This is the conclusion of Monica, a student of Faith University:

So those ones would tend to adapt better, and you know, they would get more of teaching but those ones that are [not able to adapt], the majority, most times are those people that don’t really get, as in, a lot from the overcrowding environment... at the same time, it depends on the individual, personally I think” (Monica_Faith_S)

Monica acknowledges that surviving in an overcrowded environment like theirs, a student must have his/her strategies. As noted by other students, these strategies include, being punctual to class so as to secure a seat very close to the lecturer; keeping one’s focus on the lecturer even if others are doing what they like in the classroom and taking notes that are dictated by the lecturer. Not all students are able to adapt to these coping strategies. This is the reason why Monica concluded that, *“it depends on the individual”*.

4.6 Summary of Chapter

In this chapter, I explored the context of my study by providing my interpretation of the participants’ perspectives. Using an integration of initial categories that emerged from literature and new categories from the data, I have explored three main categories in this chapter namely: Perceptions of overcrowding, effects of overcrowding on teaching and learning and coping with overcrowding.

In my analysis, I discovered some major differences in the context of public and private universities. The perceptions of overcrowding and the context of teaching and learning is not the same for both types of universities. Their teaching methods as well as the nature of teaching and learning activities are different. In the table below, I summarize the differences under the categories they feature in:

Table 4.1: Differences in findings between public and private universities

	Public Universities	Private Universities
Perceptions of Overcrowding		
	<ul style="list-style-type: none"> • Overcrowding is a normal experience and it is part of day to day teaching and learning activities. • Lecturers try to avoid the classroom most times knowing the challenges therein. 	<ul style="list-style-type: none"> • Classroom capacities and students enrolment are controlled. The schools take extra measures not to exceed their capacities because of their method of teaching which involves interaction with the lecturer. • Lecturers are seen as and are supposed to be facilitators in the classroom.
Effects of Overcrowding		
Interaction	<ul style="list-style-type: none"> • There is limited or lack of interaction between students and lecturers. • Lecturers adopt a method of teaching that discourages students from asking questions. 	<ul style="list-style-type: none"> • Student-lecturer interaction is part and parcel of teaching and learning. • Lecturers keep record of students' participation in class. • Lecturers do not 'lecture', they facilitate discussion amongst students.
Anonymity & Accountability	<ul style="list-style-type: none"> • Lecturers hardly know their students because of the crowded nature of the classrooms. • Students are not accountable to class lectures because they feel their lecturers do not know them anyway. 	<ul style="list-style-type: none"> • Lecturers ensure students get involved in the classroom. • They know their students by name and keep record of their learning progress.
Class attendance	<ul style="list-style-type: none"> • Students and lecturers are usually not motivated to attend classes because of the very rowdy and noisy nature of the classrooms. 	<ul style="list-style-type: none"> • "It is an incriminating offence", punishable by the lecturer should a student fails to attend class without taking permission.
Attention, retention & student satisfaction	<ul style="list-style-type: none"> • It is hard for students to pay attention in the classroom as overcrowding tends to encourage noise-making. • There are many distractions to both students and lecturers which militate with their level of concentration in the classroom. 	<ul style="list-style-type: none"> • Students pay good attention in the classroom as they tend to be more accountable to the lecturer than their counterparts in the public schools.

These categories discussed in this chapter collectively relate the entire context on which this research is based; that is, teaching and learning in overcrowded classrooms of Nigerian universities. The contribution of this chapter is such that relates the idea that if the contribution of the tool (ICT) is to be well understood; the context of its use must first be explained. As such, this chapter serves as a foundation on which subsequent chapters build on. Chapters 5 and 6 relate how ICT is used in this context and its contributions to the context.

CHAPTER 5

Locating the tool in the activity system

5.1 Chapter Overview

In the previous chapter, I explored the context of this study in terms of the participants' experiences and perceptions of overcrowding, its effects on their teaching and learning activities, and the coping strategies they have adopted in addressing it. In this chapter, I present my analysis of the data on the position of the tool within the activity system; that is, how ICT is used for teaching and learning in the universities. As in chapter 4, in chapter 5, the process of discovery started from the initial categories which I had collated prior to data collection (as informed by my review of literature and the framework of activity theory) and the new categories which later emerged as a result of reiterative examination of the transcripts.

The rest of the chapter is organised as follows: in the next section, I present an introduction to the chapter to relate its relevance to the thesis and in the following sections after that, I present my analysis of the categories explored in this chapter.

5.2 Introduction

The research question this chapter aims to answer, as seen in chapter one, is:

How are ICT tools used for teaching and learning activities in the overcrowded classrooms of Nigerian universities?

The analysis I present in this chapter is based on my interpretation of the participants' perspectives as to how they use ICT for their teaching activities as lecturers and learning as students. As subjects of the activity system, activity theory emphasises their view point as critical to providing answers to the research questions of this study. For this reason, I put into consideration the embedded cultural-historical activities pertaining to the use of ICT in their overcrowded classrooms for the purpose of teaching and learning.

The theoretical lens for this study is the activity theory framework. As such, the principle of activity theory that is expanded in this chapter is the concept of 'tool mediation'. This principle states that, because human activities are endlessly multifaceted, mobile and rich in variations of contents and forms, tools link human subjects and their objectives (see figure 5.1) (Engeström 1999). In other words, tools are mediating artefacts that help to achieve the outcomes of human activity.

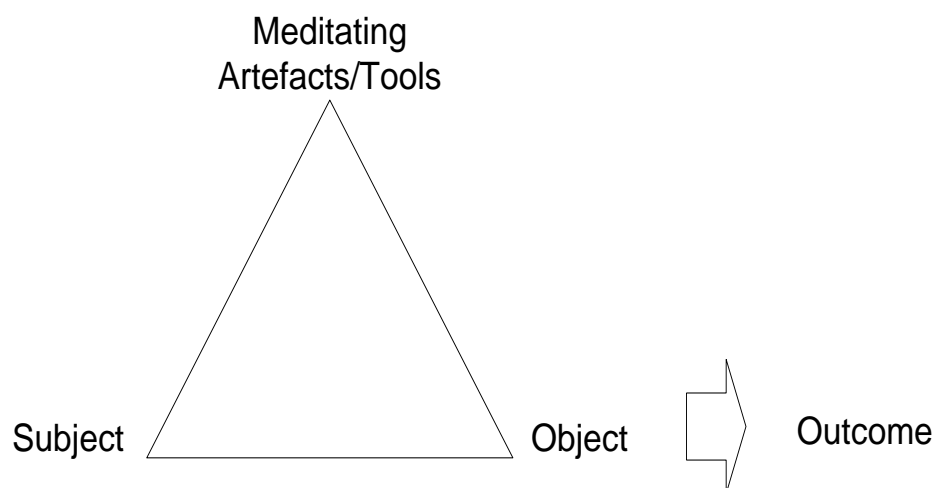


Figure 5.1: The triadic representation of human activity (Engeström 1999)

As figure 5.1 depicts, the connection between the subject of an activity and the objective of the activity is the mediating artefact (the tool). We live in a socially constructed world and consistently make use of artefacts - tools that makes living possible or as a matter of fact, easier (Diaz Andrade & Ekundayo, 2011). According to Feenberg (2006), technology as a tool, is fast becoming the new basis for belief. In other words, it is increasingly reshaping our cultures gradually to be what we think of as “rational”. Nearly every activity of human beings has embedded in it the element of technology. As such, some technological enthusiasts find it hard to fathom a world or the accomplishments of tasks without technology (Mlitwa, 2007).

Oliver (2002) argues that the role of ICT is becoming increasingly important and the importance will continue to grow and develop in the 21st century. The interaction of technology with human endeavour therefore becomes an imperative phenomenon for investigation so humans can continue to understand how to administer technology to their personal needs and those of their organisations. It is therefore important to understand how a tool is positioned within the activity system towards achieving the objective of the activity. In the context of this thesis, this means, how ICT is used by the students and lecturers of Nigerian universities to achieve their teaching and learning objectives in their overcrowded classrooms.

Moreover, to comprehend the analysis presented in this chapter and chapter six, I present table 5.1 to show the elements of the activity system for this study and their definitions thereof:

Table 5.1: Elements of the activity system and their definitions

Categories	Definition	Elements of analysis
Subjects	The humans from whose perspective the activity is being explored	<ul style="list-style-type: none"> • Lecturers • Students
Object	The object of the activity is to learn and engage in class activities	This objective if broken down include: <ul style="list-style-type: none"> • Lecturers imparting knowledge on their students • Student learning in and out of class
Tools	ICT and non-ICT tools that mediate the interaction between the subjects and the object of classroom activity	<ul style="list-style-type: none"> • ICT Tools (CD-ROMs, Internet bandwidth, computers, projectors, public address systems, software, etc) • Non-ICT tools (learning and teaching tools, classroom infrastructure, chalkboard/white board marker, desk, chairs etc)
Rules	Procedures and policies that mediate	<ul style="list-style-type: none"> • School disciplinary rules

	between the subjects and their community which includes, the entire university and the National Universities Commission (NUC)	<ul style="list-style-type: none"> • Rules guiding teaching procedures • Learning models followed by the school • Expected student behaviour • Implicit and explicit beliefs of learning and performances • Provision of ICT resources required to teach subjects • ICT policies guiding the use of ICT • Academic staff training policies • Costs and budgets • School curriculum
Community	The socio-cultural context and environment of the activity system	<ul style="list-style-type: none"> • University administration • National Universities Commission that oversees university activities in the country • IT managers • Parents • The society at large
Division of Labour	Differing roles and responsibilities work together to achieve the object of the activity	<ul style="list-style-type: none"> • Teachers prepare learning materials, coordinate learning activities in the classroom and assess students' performances • Likewise, students are expected to produce results that meet the expectation of their lecturers and behave ethically during lecture times (individually or collectively). • Administrators and staff with designated roles functioning in their various capacities.

Having shown the elements of the activity system and their definitions for this study; I relate the focus of this particular chapter with figure 5.3 below:

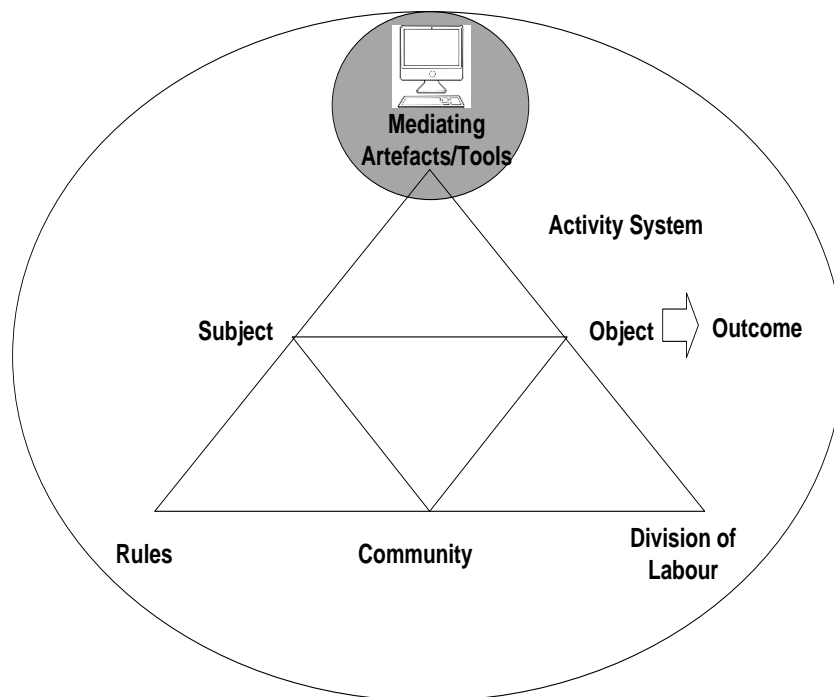


Figure 5.2: Locating the tool in the activity system

In figure 5.2, I highlight the mediating artefact to reveal the focus of this chapter. Amongst the elements of the activity system, the position of the tool is significant as one of the strengths of activity theory is its ability to help in analysing a context with the presence of a tool such as ICT. To effectively conceptualise the contribution of ICT (discussed in the next chapter), it is imperative to first of all comprehend how the tool is used. This is because tools, ICT for instance, alter human activities and are, in turn altered by the activities.

There are different kinds of tools: physical tools such as computers, projectors or printers; and mental tools such as mathematical models or heuristics (Jonassen & Rohrer-Murphy, 1999). Physical tools are used to handle or manipulate objects, whilst mental tools are used to influence behaviour in one way or the other (Mwanza, 2001). The physical tools being looked at for this study are ICT tools such as computers, electronic boards, the internet, mobile phone and so on. While other tools (non-ICT tools for instance) are involved in the activity system under investigation, providing answers as to how ICT is positioned within the activity system is one of the main objectives of this research. Moreover, the outcome of the activity is teaching and learning that is perhaps deemed as improved; thus, the centre of analysis is on how ICT is used for teaching and learning in the universities.

The categories I had prior to the field work, as informed by my review of previous studies, form the bedrock of the analysis I present in this chapter. However, the analysis is not limited to the initial categories alone, new categories as well as sub-categories emerged after collecting the data, as a result of a continuous and reiterative examination of the transcripts and information garnered from activity theory. Two of the emergent categories are reported in this chapter – ‘The position of the tool’ and ‘the tool, from the perspective of the subjects’. The ‘access to the tool’ category is one of those formed before data collection. Figure 5.3 lists the categories; the subcategories under them are enumerated as well as elaborated in subsequent sections of the chapter.

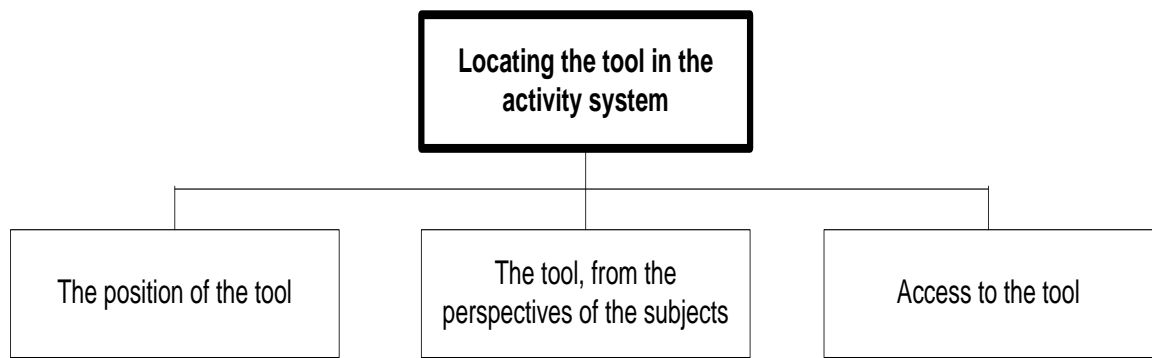


Figure 5.3: Overview of the categories in chapter 5

5.3 The position of the tool

‘The position of the tool’ explores how the tool being examined (ICT) mediates the teaching and learning activities of the subjects; that is, the lecturers and students. My interviews with the lecturers and students of the public universities reveal that ICT appears to be at a primitive stage in Nigerian business schools. The most common form of ICT, computers, were not seen in their classes. All of the classes I perused had no computers and projectors in them. The ICT tools commonly seen in the classrooms of universities of developed countries (like New Zealand) were not seen there. The position of the tool is not within the classroom. In other words, ICT does not mediate teaching and learning activities within the classroom. This is in accordance with Adam’s (2003) observation that in most universities in Africa (especially public universities), “ICTs are just extras that are not integrated into the education system” (p. 198). His observation is similar to mine at both Faith and Hope University in Nigeria. ICT does not seem to be a tool for use in the classrooms. The students do not consider its presence a norm in their classrooms.

While the use of ICT for academic purposes seems prevalent, its use was more outside of the classrooms either for research purposes or to prepare for classes, as in the case of lecturers; or to “do assignments” or school projects as many students reported. This again reinforces that the position of the tool in the activity system is not within the classroom but outside it. ICT mediates teaching and learning not from within the classroom but from outside the classroom. The lecturers and students’ use of ICT for their teaching and learning activities is mostly outside the classroom; for instance, the laboratory.

Noteworthy is the presence of computer laboratories in the schools. These are sites where students are allowed to make use of computers for a limited period of time. The computers are not sufficient to go round and departments in the faculties are assigned times and days they could have access to the laboratory for use. There is a resource, space and time constraint for the use of the laboratory because of the number of students enrolled into the faculties. The laboratories are mostly used for classes where the demonstration of the use of computers was of necessity. Besides the use of computers in the laboratories, all other uses are outside school.

In the private school however, it is a different story. Computers were positioned inside the classroom for their teaching and learning activities. Projector screens were also available and lecturers were able to use them to achieve their teaching goals. Figure 5.4 enumerates the subcategories under the 'position of the tool' category I explore in this chapter.

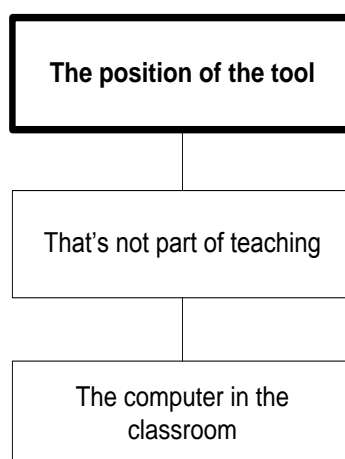


Figure 5.4: Overview of the subcategories under 'The position of the tool'

The two sub-categories are contrasting in the evidences they purport. “*That’s not part of teaching*” reflects the analysis of the use of ICT in the public universities where ICT is not a main component in the classroom. On the contrary, “*The computer in the classroom*” subcategory reflects the analysis of the use of ICT in the private university where ICT is a main component of the classroom. The following sub-sections report the analysis of the findings under each category in detail.

5.3.1 “That’s not part of the teaching” | Public University experience

“That’s not part of the teaching” said Louis, a department head and lecturer at Hope University said when asked if he uses ICT in any of his classes. This reinforces the position of ICT is not within the classroom. ICT does not mediate the teaching and learning activities of the lecturers and students from within the classroom but from outside it.

What is prevalent and practiced at Hope University like many other public universities in Nigeria is the traditional lecture method that involves a lecturer standing in front of the classroom, talking, using the chalkboard/marker and dictating notes to students without the aid of computers or projectors. This is the practice that seems to have worked for these institutions over the years. The use of ICT tools outside the classroom is very rampant but hardly ever used in the classroom. Louis’s response reveals that classroom teaching and the use of ICT do not go together at Hope University. He explained that;

“The only thing technical about classrooms here are the microphones. If you give students assignments to do and submit online, that is an arrangement. That is a kind of arrangement. That’s not part of the teaching.” (Louis_Hope_L)

In other words, the microphone is the electronic equipment used in the classroom at Hope University. ICT is not a tool used in the classroom to aid lectures. In fact, students are not required to submit assignments online or by email except when specifically asked or it is an *“arrangement”* between the students and the lecturer. However, the use of ICT outside the classroom seems apparent. The majority of the lecturers including Louis acknowledged the use of ICT (e.g. internet on their laptops) outside of the classroom to prepare for lectures. That seems to be the only way ICT is involved in his classes. The involvement of ICT in class lectures is very indirect; Louis continued:

“Well, I teach quantitative courses...most of the courses I teach, apart from the quantitative courses are theory based and they are lettered, graphics sometimes, not all the time. I prepare my stuffs with my laptop” (Louis_Hope_L).

Ironically, the contribution of ICT to teaching and learning in the classroom happens outside the classroom. While Louis’s classes involve graphical and mathematical contents that could perhaps have been better presented to students with the aid of computers and projectors in the classroom, he is not able to use these tools as they are

not available at his disposal, particularly for use in the classroom. Louis still seem to achieve his teaching goals as he uses his marker board to sketch anything he is trying to pass across to the students and further buttress them with words and teaching notes. This is predominantly how teaching and learning activities within the classroom is like at the public universities.

Other lecturers said similar things about the use of ICT at Hope University. They use computers and the internet to prepare for classes but they do not use them in the classroom. Theo explained that as lecturers, they try not to have anything to do with ICTs within the classroom:

“Anything that has to do with ICT, for example, computer; we are not the ones that handle that. We send Students to the ICT department; we have computer departments that handle such situations.” (Theo_Hope_L)

Should there be any reason for the use of ICT for classroom purposes, students are directed to the ICT department of the school. Lecturers are not involved in matters that have anything to do with ICTs. **However, I observed that the ICT department of the school is non-existent.** It appears from time to time, experts from outside the school are brought in on contractual basis to either install things that need to be installed or to resolve issues affecting the ICT systems already in place. Theo also acknowledged that he uses the internet and computers for his research activities and to keep up to date with trends around the world:

“We need to go to the internet to know the latest on what is going on around the world... University system is about teaching and research and you have to be current. You have to link with other bodies all over the world. You have to see what is going on; the latest journal, textbooks pertaining to the topic in which you are handling to be able to impart on the students.” (Theo_Hope_L)

Again, Theo emphasises the idea that the contribution of ICT to teaching is outside of the classroom at Hope University. Activities outside of the classroom, such as research, information search and retrieval, appear to champion the use of ICT. The use of ICT in this manner is mainly to help lecturers keep up with things happening in their field around the world so they can perhaps update and improve on their curriculum and teaching, and subsequently pass on to their students in the classroom. That way, they are able to pass on current and relevant practice to their students.

At Faith University, I noticed a similar approach to the use of ICT. The only difference is that they emphasised that classes where the use of ICT seems very important, are taken to their computer laboratories. However, besides the use of computers in the computer laboratories, all other uses of ICT are outside the classroom just as described by the lecturers at Hope University. Their classrooms likewise lack projectors, computers or anything related except for a few classes which had some electronic boards in them. I was told, as I would portray later that only a lecturer who had just arrived from the United Kingdom (after obtaining his PhD) knows how to use the board. Other lecturers do not touch it and would rather use the normal marker board in the classrooms when they come to teach.

Brad explains that the classroom lecture is only to introduce theoretical terms to the students while the practical aspects of his courses are taken to the laboratory. As such, while ICT tools are not used in the classroom, should there be a need for it, they have laboratory sessions where students could make use of them:

“Yes, I use ICT for my classes, in the lab. We have a computer lab where we put to practice most of the theories that we teach... we demonstrate fitting of distributions with the computers, in the computer lab. Not necessarily teaching with it in the class. In the classroom, I go in there and introduce the theory, the concept and all that using the white marker board. But once a week, we go to the lab, do some of the practical” (Brad_Faith_L)

The use of ICT in the classroom, whether as projectors to project slides on the screen as presentations to students or as a tool to foster interaction amongst students or between the lecturer and students is not popular at Faith University. ICT is seen as a tool to put to practice the theories taught in class. Students only have access to such facilities once a week within the confined space of the laboratory. I observed that the laboratory is not open to students whenever they need it. Each department has allocated times they can access the laboratory for their use. It is more like a sacred place students can only go to whenever their lecturers are there to supervise or teach them.

Jason is another business lecturer at the Faith University. He was blunt about how he uses ICT and stressed that he does not use any ICT facility in the classroom. He referred to his lack of ICT in the classroom as “unfortunate”:

“...unfortunately, I prepare my lectures; once I enter the classroom, I just teach the students and go away. I don’t use any ICT facility. But I use ICT to prepare my lectures. Ok, I can prepare my lectures in the form of PowerPoint presentations but because I won’t carry my laptop there, I

print it out and then use it in talking. It is not projected to them at all. They don't see my lecture notes except for the ones I give to them." (Jason_Faith_L)

Ironically, Jason goes all the way to prepare his lectures as Microsoft PowerPoint presentations but only as a personal teaching material and not to project to students during teaching. He emphasised that even though he may have prepared the slides with using ICT, he does not make use of ICT in the classroom. His response tends to confirm again that the contribution of ICT to teaching and learning at Faith University is an out of classroom affair. It seems clear that Jason and perhaps other lecturers have the knowledge of ICT as evidenced by its use to prepare for their classes but just do not use them in the classroom. May be if the ICT resources are made available to them in the classroom and they are trained to use them; maybe they would be poised to using them. Even then, the issue of the electronic boards installed in the classroom that only gathered one lecturer's attention comes to mind.

Matthew, another lecturer at the business school also emphasised that the use of ICT is restricted to the laboratory;

"As at now, we don't use ICT in the classroom but what we've done is that assignments do involve ICT because we have a centralized computer room where students can go and do their assignments. Also, for lectures, research, publications and all that, we access the internet. We do all sorts of ICT enhanced research." (Matthew_Faith_L)

Just as the others have said, the use of ICT comes across as an innovation; one that makes going to the library to read through books a soon to be forgotten experience. Matthew made claims to using ICT to prepare for his lectures as well as do research but not particularly in the classroom. He also stressed that the laboratory (which he called the centralized computer room) is available to students should they want to use computers. The question therefore is whether the ICT tools available in the laboratory are sufficient and enough to meet the need of the student population.

The students shared similar views on how their lecturers use ICT and how they use ICT too. Their responses further reinforced the position of the ICT tool in the public universities. When asked if they used ICT in their classrooms, Sarah replied,

"Everything does involve ICT because some assignments lecturers give us; for instance, we have to make research and submit; so I think everything does. However, the school has not made sufficient ICT available to us. It's our duty to find access to it." (Sarah_Hope_S)

Just like their lecturers, Sarah emphasised the use of ICT outside of the classroom to conduct research activities relevant to their learning in the classroom. While the school provided ICT tools in the laboratory, it is not enough to cater for the number of students. The tools provided are not enough to meet the need they were provided for. The objective of providing a computer laboratory is for students to be able to learn using ICT tools and resources but in the situation where the number of students is more than the tools, it will be difficult to achieve that objective.

Phillip also explained how he uses ICT for his assignments and research activities.

“My course is a very interactive one, in fact without ICT, it’s often difficult because you have to consult some articles that you cannot get from books... the use of ICT has always proven valuable as far as my course is concerned.” (Phillip_Hope_S)

He stressed that his course is an interactive one which involves the use of ICT outside the classroom. It raises the question how such courses are taught by the lecturers in the classroom without the use of ICT. Students like Phillip that have to search for articles online to meet the requirements of their courses would at least need to be taught (if not shown) how to search and retrieve relevant information on the internet. It appears the students have to learn on their own how to make use of ICT to achieve their learning goals for their courses since they do not have the opportunity of learning how to use the ICT tools and functions in the classroom.

It is noteworthy that the laboratory is not always free for use for the students. There are times allocated to departments of the school to use ICT. In other words, the laboratory is not always available. Nathan explains:

“We have an ICT section [laboratory] in our school that each faculty... during the day they have allocated a browsing day for each faculty, departments in Hope University. So on your day, you have to go browse and see what you can do.” (Nathan_Hope_S)

According to Nathan, departments have their “own days”; quoting her, “...on your day...” There is a time table from Monday through to Friday. The departments are shuffled between the days and time slots on each day. There are about five departments in the business school and only one laboratory is available to them. The only way to make it accessible to all is to schedule the timing of its usage; else it would always be crowded.

Dominique made this more explicit in his account:

“Well, within class, no ICT. Outside class, the department was organizing one but I think that’s still under construction. But the ICT available within the school is very functional but not sufficient for students. The ICT [Computer Lab] given by Zenith bank; they had to arrange it in such a way that different faculties will have different days. If it was huge enough to contain the entire school, then we could just walk into it anytime and come out. But because the facilities are not big enough to contain everyone in the school, they had to ration it and; Monday- particular faculty down to Friday- different faculties.” (Dominique_Hope_S)

He also confirmed that the use of ICT in the classroom is absent. He also stressed that the capacity of the computer laboratory is not enough for the students it was built for. Walking into the laboratory whenever desired is not a possibility because of the capacity constraint. Schedules given to faculties and departments are tight but must be adhered strictly to. This is also a measure the school have put in place to cope with the volume of the students they have enrolled. An effort that could be of highlight is the investment of private organisations into the university towards the provision of ICT. Dominique noted that the computer lab was provided by Zenith Bank, a multinational corporation in Nigeria.

Students at Faith University, like their counterparts at Hope University, share the computer laboratory. Time constraints and the volume of students would not make ICT resources available to all, as and when desired. Gabriel, a student of Faith University lamented having to go in batches to use the laboratory:

“...most times, because of the time constraints and then number of students, you have to come in batches so that everybody gets to access the computers – at least you get to touch the computer by yourself. They are saying... this is what you need to know; this is how it is going to be like in the exams, so when you get there, don’t be looking lost. So, it’s not really having access to the computer whenever we want but at a given time.” (Gabriel_Faith_S)

Particularly inherent in Gabriel’s response is the effect of the student numbers and time constraints on their use of the ICT laboratory and the learning that takes place inside of it. He acknowledged that the time allotted to them is not enough to grasp or comprehend what is being taught. The experience is only enough to allow a student have a feel of what it is to use the computer and not to “look lost” in the exam hall when the questions that require the use of the computers are set before them. It appears the kinds of courses that take them to the laboratory are such that require hands-on knowledge of the computer. However, due to the insufficiency of the number of computers available, the goal of visiting the laboratory is at least to have a feel of what it feels like to use the

computer for that course. This may not mean much if the courses are management courses that do not require the essential use of computers but for courses like research methods where students would need to be shown how to use computer software like SPSS, learning may be affected.

Pertaining to the absence of ICT in the classrooms and further confirmation of the limited space and time the computer laboratory affords at Faith University, Jonathan said;

“We are doing a course right now in our final year which is Management Information System, but you know, most of it is just theoretical things, you know, we’ve not actually done much of practice...” (Jonathan_Faith_S)

Jonathan stressed that despite most of their classes involving a lot of theoretical concepts, they have not done much of practice. The practical is done in the laboratory and it can be said that their lack of or limited practice is due to constraints in terms of resources, availability and time to use the laboratory. Invariably this poses some challenges to learning and retention for students.

5.3.2 “The computer in the classroom” | Private University experience

In the private university, the position of the tool was found to be different. They had computers in their classrooms. Not only that, they had projectors and screens too. The ICT tool mediates the relationship between the subjects and their objectives from inside the classroom.

Some scholars like Mabizela (2007) argue that the establishment of Private universities in Africa is due to the failure of public ones. The public failure claim is assessed from two perspectives; first, the shortage of public funds to meet the rising demand for higher education and secondly, failure to provide enough variety of courses and programmes to suit the need of potential students. Private universities are therefore seen as an alternative to their public counterparts. Hence, resources that are often limited in public universities are available in private ones, even though at a higher cost for students, since the institutions are mostly profit oriented. ICT resources are available for the purpose of teaching and learning in private universities and are often scarce in public ones.

While it is rare to see public universities have computers and projectors in their classroom, it is almost fundamental to see these facilities in private universities. They have the funds available to create a learning environment that is more modern for their students since they pay highly for it. They build relatively sophisticated classrooms, hire ICT literate staff and equip them with resources they need to teach students. This is the case at Patience University whereas analysis shows a different pattern in the contributions of ICT to teaching and learning at both Faith and Hope University.

Lecturers at Patience University have computers in their classrooms. They are able to project their lectures onto the projector screen for their students. The only complaint of Jasmine, a lecturer at the university is that the computer in their classrooms lacks access to the internet. She laments how she would have loved to show videos from Youtube, interview from the internet and so on, to buttress her teaching, interviews:

“The computer in the classroom which we use to project our slides is not connected to the internet. This is something that I think needs to change because... there are very interesting things on the internet. For example, for leadership training, you can get short videos; interviews with business leaders who have faced one problem or the other but they don't let you use it” (Jasmine_Patience_L)

The internet is a great tool for teaching and learning according to Jasmine. Relevant materials that could be of help to foster students' learning are available on internet platforms such as Youtube. However, she is unable to play those videos in the classroom and likewise, Youtube would not allow downloads. Without access to the internet in the classroom, teaching with the videos is almost impossible. This is something she thinks needs to change in order to improve teaching and learning at the university.

She was quick to admit that they initially agreed on not using it as it could cause distractions to students while classes are on but now that they have banned students from using their laptops in class, it is time to bring the internet back to the classroom:

“I think first we decided not to have it in the classroom because we were not really using it and we didn't want students when there is no facilitator around just doing all sorts. ...at the moment, we don't allow laptops open in the classroom because the students play a lot of mischief, so you think they are actually taking some notes on the class but they're playing computer games or typing sending their own private mails or things like that..” (Jasmine_Patience_L)

The school disallows students from using their laptop in the classroom so they can pay full attention to the learning activities in the class. While Jasmine seems to see the internet as a distraction to students, she also sees it as a tool that could foster learning, if properly put to use by the lecturer. If the students can pay attention and the resources are available at the beck and call of the lecturer, ICT could be of help in achieving the learning goals of facilitators at Patience University.

Another lecturer, Gloria says she uses the ICT resources available to her to facilitate interactions in the classroom. While she has what she referred to as “technical materials” given to students in class, she does mini-presentations using the computer and the projector to create a discussion within the classroom:

“...in terms of using ICT, we often use it to give presentations or share conceptual, technical materials that are best shared using already prepared material. To break the monotony of the class, you can also have a mini-presentation where you just have a few slides and you discuss an issue” (Gloria_Patience_L).

It appears Gloria’s method of teaching involves involving her students in forms of activities that disallows monotony. Apart from the traditional presentation slides in the classroom, Gloria also uses blogs to teach her students.

“Other ways of technology that I use; I use blogs to communicate with my students, it’s another thing that I use. What I try to do is I have a ‘BlogSpot’ for the course and I get people to preview classes there... anything I have to announce or anything I have to do with the course, I put on there and I also have a folder; a shared folder where I put all the documents relating to the course so they have access to download it by themselves.” (Gloria_Patience_L)

Gloria’s use of blogs is to announce news related to the course or give students access to other materials related to teachings in the classrooms. While the school lacks a Learning Management System (LMS) online, this is Gloria’s way of pushing resources to her students for more learning beyond the classroom. BlogSpot is a free blogging platform owned by Google to allow people share and retrieve ideas, experiences and resources on the internet. This reflects two ways of using ICT tools at Patience University: both in and outside the classroom.

Andrew, another lecturer at the school emphasises the use of ICT in the classroom;

“Mostly I use PowerPoint but there are also times I also use word. If there are times I have a certain paper I want to share with the students, I simply go into my memory stick and pull it out and show my students the section that communicates exactly what I want to say... to substantiate what I’m saying” (Andrew_PATIENCE_L)

He also talks about using other platforms apart from the PowerPoint to strengthen his teaching materials. Andrew seems like a lecturer that is very ICT conscious; thus, often carries external drive around such that should there be a need to use previously stored material to help the students learn better the topic he is teaching.

All the lecturers at Patience University tend to possess this type of awareness and consciousness as regards the use of ICT for their teaching. In actual fact, all of them tend to go the extra mile one way or the other to use ICT beyond just what is provided in the classroom to help students learn better.

Their students too did not seem naïve to the ICT resources available to them. They talk about how they use ICT both in the classroom and outside the classroom. Most of them refer to how they make presentations in class in forms of seminars in the presence of their fellow students and their facilitators. This would not have been possible should they have overcrowded classrooms as the constraints of time and space would not have allowed them. Kyle explains;

“...we use ICT a lot, and it’s been a very important tool for learning at Patience University. For example, a marketing class where you want to show a pitch by a company, you need to show that on a slide or the projector and you need a computer for that. Only in very few cases do you submit hard copies of assignments. In most cases, you email it to the student administrator, who now sends it to the lecturers involved” (Kyle_Patience_S).

Kyle made specific references to how ICT helps to understand his learning materials. Access to ICT in the classroom, according to Kyle, makes further explanations of learning materials possible. He particularly said, “It’s been an important tool for learning”. I believe that statements emphasises the contribution of ICT to Kyle’s learning goals. Having ICT to help expand and put images to his learning materials seem very important to him. He did not fail to talk about the use of ICT outside of the classroom. The contribution of ICT outside of the classroom is seen in how, unlike the public universities, they are able to submit assignments online to their students’ administrator. Ready arrangements are made by the school for students to submit their assignments using ICT means. The level of adoption of ICT may not be very high at Patience University but it appears there is a commitment to its use both inside and outside of the classroom.

Another student, Yinka, talks about this commitment a little further. Right from the first year at Patience University, students are encouraged to use ICT for their learning activities. In Yinka's words, *"one way or the other you'll learn"*:

"Virtually all our classes involve ICT. Its either you have to work on Microsoft word or excel or you have to go to the internet to search for some things. You can't run away from it. If you've not made use of a computer before, when you come to Patience University, you have to type your assignments, you have to work with excel. In one way or the other, you'll learn. In a few classes, you will have to use excel." (Yinka_Patience_S)

Yinka's response explicates how every student has to imbibe the ICT culture at Patience University. Students must learn to use any software related to their courses. For Kyle, it was Excel he had to deal with more. As a student, you must learn how to use the projector because you will be required to make presentations in your class. It is part of the rule guiding the activity system of the classroom to use ICT. In Yinka's words, *"you can't run away from it"*. ICT is part of the teaching and learning philosophy at Patience University and every student has to learn it if he/she must succeed at the school.

And for the contribution of ICT to the personal learning objective of the student at Patience University, Emma shares her experience:

"ICT in some way is aiding what you are doing...Just seeing a slide or two slides in a classroom for a particular course could help you grab more of what it is that is being explained or communicated to you. And that kind of helps because it connects with individuals differently and it sticks up there." (Emma_Patience_S)

Activity theory's tool mediation philosophy comes at the centre of the subject and object of the activity. In other words, the tool is meant to mediate between the subject and the object if the intended outcome of the activity must be reached. Thus, the tool provides the subjects, the means to achieve their objectives. Emma's account relates the mediation of ICT towards her learning. This is what Emma was trying to say when she said, *"It connects the individual..."* The slides projected on the screen provide a connection between learner and what is being taught by the lecturer. She mentioned the contribution of ICT (that is, the slides projected on the screen) as to how it helps provide extra level of understanding to what is being taught in class.

From the account of the students and the lecturers at Patience University, ICT is injected into the system. Students and lecturers have access to ICT. It may not be to a level comparable to those of developed countries but the contribution in the classroom

and outside of the classroom seems visible. The lecturers talk about their commitment to using ICT in the classroom. The students likewise talk about how their courses involve them learning how to use ICT in the classroom.

5.4 Access to the tool

While several ICT enthusiasts talk about the use of ICT in higher education, what most of them often fail to realize is that access to ICT is the first step that has to be considered. For a developing country like Nigeria where ICT penetration seems to be on the rise, access to ICT could still be quite challenging. For instance, in universities experiencing overcrowding - where the number of students enrolled is more than resources available to cater for them - access to ICT is bound to be a challenge. A challenge like this and many others creates barriers to the use of ICT among students and lecturers.

Lecturers expected to use ICT in their classrooms or for their research duties encounter various challenges – environmental, personal, policy, etc – that could either encourage or discourage their adoption and use of ICT. Students also are not immune to these challenges. According to Ani (2009), while the use of the internet has become a common practice among Nigerian undergraduate students, it appears that not much has been achieved towards the provision of equitable access or effective and efficient accessibility to the internet in relation to the enormous increase in student populations in different universities across the country. To talk about access to ICT and not talk about student population in Nigeria will be a work undone. Amidst limited ICT resources, student numbers continue to surge thereby increasing barriers to the available resources. Computer laboratories and internet centres in libraries are not enough to accommodate the number of potential users. They have to seek other means of accessing ICT; either by buying personal computers, through their mobile phones or by patronizing public internet centres like the cybercafés but all these come with a common challenge - cost. In Nigeria, the cost of ICT resources is still a major challenge. As a result, many still find it difficult to have access to ICT. For instance, buying a personal computer or laptop, obtaining an internet modem still seem challenging for a country in which majority of her population has been assessed to live on less than a dollar a day, according to the World Bank.

Data analysis for this category revealed four major points of access reported by the participants:

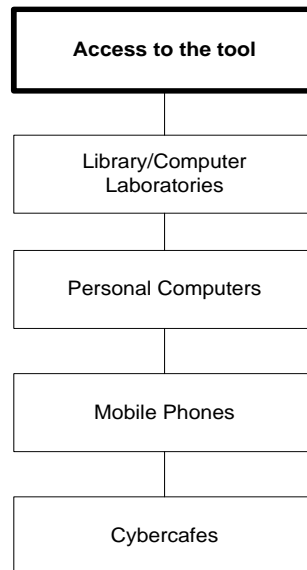


Figure 5.5: Overview of the ‘access to the tool’ sub-category

First, libraries or computer laboratories – these are often provided by the school and are mostly free for use. Second, personal computers for those who can afford them. Third, mobile phones – the rate of mobile phones use in Nigeria has grown rapidly since GSM technology was introduced just over a decade ago. Fourth, cybercafés are major providers of access to ICT to respective communities but not without a cost. Ani (2009) recorded that, private or commercial internet cybercafés, both on and off university campuses, are often responsible for providing the needed access to ICT resources with attendant financial implication on the students, most of who are from poor families.

5.4.1 Library/Computer Laboratories

The most common places students and lecturers access ICT resources in the universities visited are the libraries and computer laboratories. The universities provide these centres free for use of students and their lecturers. The challenge however, is the number of students the laboratories are able accommodate or cater for at a sitting. Even private universities are not exempted. The resources are limited and cannot cater for all. Students and lecturers acknowledge them as places where they access ICT resources but not without complaints about how the resources there are limited and cannot cater for

their population and the stiff scheduling that does not allow students access whenever they desire.

Andrew, a lecturer at Patience University said,

“I think we only have a few computers in the library but the truth is that you have to be very honest. I don’t think you will find anybody queuing up to use the computer. We have very limited number of computers, the demand for the computer are not that much because the people that come here- they have their own laptops...” (Andrew_PATIENCE_L)

Andrew acknowledged that the computers available in the library are few. Students and lecturers in private universities like Patience University are usually rich enough to afford a laptop. They connect to the internet through their laptops and do not have to crowd or queue up to use the few computers in the library. It is possible to conclude that the supply of computers in the library is more than the demand for them.

Unlike Patience University, not all public universities students are able to afford a laptop. They depend more on access to ICT resources within the school than outside since it is free. The challenge however is the limitation of space, numbers and time available to use these resources.

“At times when you go to the library, probably you want to consult the internet; you find out that the whole place might be jam-packed. You might not have access to it. You cannot compare the number of computers available and the facility per head of student; such that sometimes, you might have to wait for hours before you have access to the facility. At times, they might tell you the server is down.” (Phillip_Hope_S)

Phillip’s response epitomises the consequence of relying on computer laboratories or the library to provide access to ICT. He acknowledged that the number of computers available is limited when compared to the number of potential users, including students and faculty members. Apart from the limited number of computers, the functionality of the resources is also questionable, according to Phillip. After queuing up for hours, a student might be turned back from using the computer as a result of internet server break down. The best thing perhaps for students is to get their own personal laptops but that comes with its own challenges as well.

5.4.2 Personal Computers

Some of the participants said that their access to ICT and the internet is through their personal computers; e.g. their laptops. It appears most of the lecturers - either from the private university or public universities – have a personal computer at their disposal. The only question is their access to the internet on their computers. There are some of the participants, not very many of them however, who point out that they have access to the internet on their personal computers both within the school premises and outside of it (e.g. at home). This group of people are able to not just afford a personal computer but also an internet modem provided by the Internet Service Providers (ISP) in Nigeria and the cost of monthly subscription to maintain it.

Chris, a lecturer at Hope University said he has a personal computer with internet access on it.

“Everything I do within the school premises, I can still do outside. My laptop is a mobile something I carry all along” (Chris_Hope_L)

By saying, *“everything I do within the school premises, I can still do outside”* points to the fact that Chris has access to the internet on his laptop and could therefore access the internet even outside the school premises via his laptop.

Emma, a student at Patience University, is also one of those students with access to a personal computer and the internet.

“I have access to a computer, a personal PC, an internet modem and that’s about it. When you’re out of school, you can always get a chance to still check on the internet or surf or do a few things that you have to do to get certain assignments done” (Emma_Patience_S)

She explains how important it is to have access as it enables her do her school work outside of the school premises. Without access to these resources, it might be a difficult task trying to get school work done outside of school.

Other participants said they have access to both personal computers and the internet;

“I have my own personal computer; I have internet service, that if perhaps I want to do some serious work and I think school might not be the option for me, I will just probably buy some airtime to load up and use for my personal use.” (Phillip_Hope_S)

“I have my personal laptop at home, with mobile internet access” (Roland_Faith_L)

"I have a computer. I have my own modem" (Nathan_Hope_S)

Some of them explained that it was not cheap having access to the internet on their personal laptops. The cost could be a barrier to access. For instance;

"...My personal laptop, my personal internet, my mobile phone. Yea, my laptop; if it is not that I have my laptop, I wouldn't have been able to do my PowerPoint and I'd have only been depending on the schools laptop; yea computers and everything, and the internet. But although, it's quite expensive maintaining it I guess, and paying for internet connection every month, but it helps" (Tola_FAITH_S)

Even though Tola maintained that it helps having access to the internet, she could not help but mention that it is quite an expensive venture paying for the monthly subscriptions. The cost of the subscription is also a barrier to access. Many who cannot afford paying monthly for the internet would only have their laptops for use without it.

Yinka shared his ordeal in getting himself a laptop and an internet modem. He acknowledged that the cost was on the high side for him and that if it had not been made necessary by Patience University, he would perhaps not have bothered because he had to borrow to get one for himself.

" I remember I had to borrow some money to get the laptop because I heard it was necessary. After that it took me some time before I got the modem. A friend got it for me; I hadn't the money for that, at that time and I had to pay monthly subscription, depending on the plan. Because of that I didn't get it for a long time, I was using the school's. So if I go home, I don't have access to the internet." (Yinka_Patience_S)

Before Yinka borrowed money to get a laptop, and a friend helped him buy the internet modem, he was using the school's ICT facilities. This reflects the typical challenge a university student faces in Nigeria. It is a challenge having access to ICT; and when they do, the cost of the internet on their computers could be quite discouraging.

There are some others too with access to a personal computer but without internet access on them. I observed that one of the main barriers to accessing the internet on personal computers is the high cost of monthly internet subscriptions.

Jonathan, a student at Faith University is one of them:

"Yea I have access to ICT outside of school, but you know, I actually have a desktop system in my house, but it is not connected...." (Jonathan_Faith_S)

The subsequent part of his response detailed how he would go to the cybercafé to access the internet whenever he needed internet services outside of the school. He often goes there with his external hard drive to copy or save materials relevant to his studies on them for further exploration and reading on his desktop later when he gets home:

“Most of the internet access I have are actually based in the school environment. The only help my desktop computer provides is when I need to type my assignments. Actually when I go online and get the resources I need, I save them on my flash drive and I bring it home and do a review of what I’ve gotten.” (Jonathan_Faith_S)

ICT access comes in different ways and for different reasons for Jonathan, a student of a public university who cannot afford the internet on his desktop computer at home. Access to the internet for Jonathan is outside of both home and school. He maximises cost and time when he gets to use the internet at public cybercafés by saving his documents for use later when he gets home on his desktop computer. The desktop computer at home mainly functions to retrieve and integrate whatever he gets from the internet café and to eventually type his assignments.

Matthew, a lecturer at Faith University, at the time of the interview, also said he has computers at home but he is only just trying to install internet on them. The reason for this he would not disclose but he appears certain to get it installed soon:

“Basically, I have computers at home. I have laptops. I have tried to install internet access in the house, just to continue work at home and everywhere” (Matthew_Faith_L)

To be able to continue his work at home, Matthew believes access to the internet is vital. Leaving work only to the office table is as a result of his lack of access to the internet. With the internet available in his own home, the flexibility of working from home would be an added advantage to him.

5.4.3 Mobile Phones

Mobile phone technology is one of Nigeria’s foremost technologies since it was brought into the country just over a decade ago (Fink, Mattoo & Rathindran, 2003; Tella, Adetoro & Adekunle 2009). Millions of Nigerians now subscribe to internet on their mobile phones through the services of mobile phone companies like Blackberry, Nokia and Apple iPhones. The proliferation of the Blackberry Smartphone in Nigeria can only

be referred to as a phenomenon as it has succeeded in providing internet access to the country's population at a cost cheaper than the internet modems. According to one of Nigeria's business dailies, there are *"about 2.4 million Blackberry devices in the country's four GSM networks MTN, Globacom, Airtel and Etisalat, as at December 2011. This is up from about 925,000 about a year ago"* (Okonedo 2012). This is the reason why most students and lecturers claim to have access to ICT, especially the internet.

Here are some examples:

"The phones I use, I use Nokia 6500, which is quite connected and there is nothing I cannot do on my phone. I can store anything on my phone. Virtually, everything I do..." (Chris_Hope_L)

Chris claims to have access to the internet on his phone and that he could do virtually all he could do with his personal computer on it.

"...there are times too, I might be in the bus and I want to just check some things, I log through my phone to access information" (Phillip_Hope_S)

Phillip talks about how access to the internet on his phone affords him the opportunity to even do his school work while on the bus on his way to a destination. This is an advantage the mobile phone offers because of its portability. It is easy to carry around and useful even when there is limited space.

Kyle talks about how he could use his mobile phone for internet access while on transit to a destination:

"...I can access the internet from my mobile phone. It's a smart phone. It makes me work faster; in the sense that I can send documents... For example, I am working on a transcript; I can read the transcript while I'm on transit, work on it, edit it, send it and stuff like that. It makes my work a lot easier" (Kyle_Patience_S)

Kyle believes access to the internet on his mobile phone helps him work faster. He made reference to the potentials of his mobile phone to read, edit and send documents from anywhere and at any time, even while on transit.

Joshua talks about his blackberry phone:

"I have a blackberry. At home I have wireless. In the office, I have but I know for a whole lot of people, it's a different ballgame. What would I do without my blackberry? It's helping me tremendously" (Joshua_Patience_S)

Joshua made particular reference to his blackberry device. He believes he is fortunate to have access to the internet on his phone and wirelessly on his computer too. By this he means, for some students, access to the internet could be quite a challenge.

Another reference made to the Blackberry relates there is constant access to the internet; according to James:

“I carry a blackberry which means I always have access” (James_Patience_S)

James’s response equates possessing a Blackberry to automatic internet access. This is the belief in Nigeria, even though subscribing to the Blackberry Internet Service (BIS) comes with a monthly fee. The fee seems more affordable than the subscription for internet modems for use on laptops; this explains the proliferation of the blackberry amongst the Nigerian population – students and lecturers included.

The advantage of the phone is that almost everyone owns one. Overcrowding in classrooms does not affect access to a phone or the internet subscriptions on it. This is one of the reasons many of the participants equate their access to ICT to owning a mobile phone. Their ability to access the internet from their mobile phones, as some of them suggest, meets their academic objectives. From their mobile phones, they not only have access to their teaching and learning materials, they can create, store and are able to work on them even while on transit. This trait of ICT is what technology advocates usually emphasise in their appraisal of the use of ICT in higher education; that it removes the barrier of time and space (cf. Schrum & Ohler 2005; Daniel 1996; Perraton 2007).

5.4.4 Cybercafés

Cybercafes are everywhere in Nigeria. They are usually the point of call for students and lecturers who due to overcrowding and limited resources are unable to access ICT in their schools; or due to lack of funds are unable to afford a laptop and a Smartphone coupled with monthly internet subscriptions. Ani (2009) explained that they are responsible for providing the needed access to ICT resources with attendant financial implication on the students, most of who are from poor families. In other words, access

to ICT in cybercafés are not without a cost attached to them, but they provide perhaps a cheaper, from-time-to-time means of access compared to having to subscribe monthly to it or the bulk funds required to buy a personal computer.

“Yes, not connected to the internet, but I can... but if I actually need to get myself connected, I go to the [cyber] café, in order to surf online” (Jonathan_Faith_S)

Jonathan has a desktop personal computer at home but not connected to the internet. Whenever he needs to use the internet, his point of access is a cybercafé.

When asked about his access to the internet outside of the school, Kyle replied, *“Limited access, except I go to a cyber café”*.

He continued,

“In Nigeria, so many people probably learnt how to use a computer in the cyber cafe. Most people, except for the few that attended private schools. You find that most people probably had their first exposure to computers in secondary school. And it’s this kind of thing where you go to the computer lab and it’s the sacred temple, so to speak” (Kyle_Patience_S)

It is important to note Kyle is a student of Patience University, the private university in this study. He is one of those who are unable to afford a personal computer talk less of monthly internet subscriptions. His saving grace is access to ICT via cybercafés. As Kyle described; most students’ access ICT resources through cybercafés. Their parents may not be able to afford a desktop or laptop computer at home and also may not be able to buy them one for their study. Their only resort would be cybercafés. After several months and years of using the computer at the cafes, they learn a few things. This perhaps explains why most Nigerian students are either technophobic or have limited knowledge of the computer (Ani, Edem & Ottong, 2010).

There are more participants whose only saving grace is the cybercafés in their community. When asked about their point of access to ICT resources and the internet, they responded:

“I visit the cybercafé. When I go to cybercafé, I have to print out some material that I need and make use of them. It is not free, I have to pay and it is sort of expensive” (Mario_Hope_S)

Mario made it clear that it is expensive for him to even use cybercafés but he hardly has a choice. To save him money, instead of spending much time reading materials over the

internet, as soon as he finds what he is looking for, he prints them out for subsequent use. Many students do this as it helps them save money.

Maurice and Jonathan shared a similar strategy of using the cafe too:

"I am with a flash drive, which tells you that anywhere I go, I always look out for the opportunity that I would have to use one of the facilities which can be linked to functions of ICTs and as such I would be able to grab the opportunity of saving whatever I have gathered from there." (Maurice_Hope_S)

"The only help it [my desktop computer] could do is when I need to type my assignments. Actually when I go online [cybercafés] and get the resources I need, I save them through flash drive and I just bring it home and do a review of what I've gotten..." (Jonathan_Faith_S)

Their flash drive is always with them to avail them of any opportunity to use the internet at the cybercafés. According to the two students, their flash drive serves as a home for a collection of useful and relevant materials which they later go back home to chew on using his personal computers. A simple 'copy and paste' of free scholarly articles, news and reviews on a Microsoft word document is Maurice and Mustpha's strategy to save money and not spend too much time at the cybercafés.

5.5 The tool, from the perspective of the subject

Without doubt, knowing how the participants view ICT provides insights into their adoption and use of it as a tool for teaching and learning. There are two dominant views of ICT gathered from the participants are determinism and instrumentalism – the philosophy that ICT is neutral and there is a complete separation between means and end. The perception most of the participants posed is that ICT is the means to an end; the resource required for their teaching and learning to improve. The determinists suggest you do not even have to do anything else but provide access to ICT tools and all will be well as regards their teaching and learning activities; while the instrumentalists believed once you are able to put ICT to use, it is a sure means to improve teaching and learning (Feenberg, 2006; Mlitwa, 2005). Critical theorists however believe that ICT will only benefit when the focus is not on the technology but on the need (Feenberg 2006). In other words, human beings need to appropriate the potentials of ICT to meet their needs. Figure 5.6 below relates the overview of the subcategories expanded in section of the chapter:

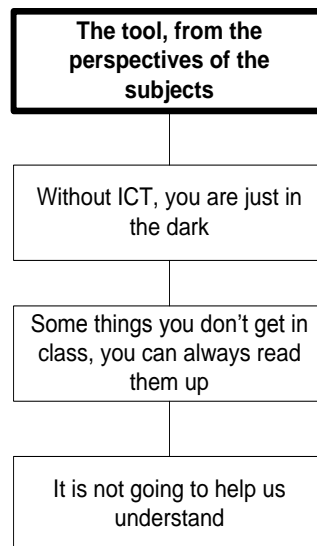


Figure 5.6: Overview of the subcategories under 'the tool, from perspectives of the subject'

5.5.1 “Without ICT, you are just in the dark” - Determinism

The title phrase came from Theo, a lecturer at Hope University:

“I don’t think there is anyone in this day and age that would not use ICT; because without ICT, you are just in the dark. That’s ICT for you. ICT has shrink the whole world into a very small – they call it global village” (Theo_Hope_L)

Theo clearly sees ICT as a determinant of change and progress that is independent of the user. His response implies, to survive in the higher education environment today, either as a student or lecturer, ICT is a must have. According to him, everyone in this day and age uses ICT. That sounded like a conclusive deterministic statement. It sounded just like the way Selwyn (2007) put it; “...universities must either ‘transform or die’ in the face of technological progress” if they do not adopt or use ICT (p. 83). Critical theorists would refer to his response as unnecessary “technology praise-singing” (Mlitwa, 2005, p. 4). They are likely to make reference to the subject of digital divide in literature that reflects the fact that ICT is not yet accessible to all. There is still a divide between those who have access to ICT and those who do not in the world today. Those lacking access to ICT resources are still living their lives and not necessarily living in the “dark”.

Roland, a lecturer too shares a deterministic philosophy of ICT

“ICT makes the world a global village. The essence of it cannot be quantified. Without it, there would be isolation of knowledge; there won’t be any form of cohesion, adding to the body of

knowledge. It has really helped the quality of delivery and body of knowledge significantly”
(Roland_Faith_L)

Again, to the critical theorists, this would come across as ‘putting the cart before the horse’ (Mlitwa, 2005). Roland’s belief that ICT is the reason behind the growth in the body of knowledge today appears rather conclusively deterministic. In other words, without ICT, there is bound to be little growth in knowledge or the isolation of it. It is like saying, ‘without technology, the body of knowledge will be static’. Critics of this perspective would question how knowledge grew when ICT was perhaps non-existent or not as prevalent as it is today. In other words, technology does not define our existence or growth; we define our growth and existence by the way we use technology.

Matthew espouses the idea of an autonomous, means to an end potential of ICT

“It has helped because it reduces the volume of work that you have to do. For instance, when you use Multi Choice Questions (MCQ), you forward it to the Computer Processing Unit, who would now grade, so that reduces your work load, to that extent...the expectation that the more you try to introduce ICT into the teaching process, into research and interaction with industry, I think a lot will be done to improve the quality, the content, and the output of the faculty”
(Matthew_Faith_L)

Matthew, a lecturer at Faith University believes the introduction of ICT is enough to improve teaching and learning in their business school. According to him, that is the aspiration of the school. Matthew used the pronoun ‘who’ for ICT, suggesting the computer could be likened to a human being with a brain and mind of his own and can perform tasks on its own accord. There reflects a deep perspective of determinism in his response.

Other references to determinism in the response of the participants include:

“This age, without ICT, we are nowhere to be found, because your ability to compete favourably with your colleagues in other countries and in other continents of the world also demands that you should be versatile when it comes to the use of ICT. The use of ICT is very important. It enhances learning and even makes learning more convenient” (Phillip_Hope_S)

“One of the basic elements directing the whole world is ICT. So, as a university, if we do not go in line with that direction, we'd be left out and we do not want to be.” (Chris_Hope_L)

5.5.2 “Some things you don’t get in class, you can always read them up” - Instrumentalism

The title for this category came from Dominique’s view of ICT;

“It helps academic really because I don’t have to go into library to search out books. It’s hectic checking out book... It’s good; it helps work- it makes work easy. It makes study easier and fun because you get more information. Some things you don’t get in class, you can always read it up by yourself. And you get yourself more informed. You don’t have to struggle so hard to read it in books that are scarce” (Dominique_Hope_S)

Dominique’s technological perspective is that which sees ICT as a tool to enhance learning. He suggests that ICT could help enhance learning after class if you have it. According to him, it is easier reading off his computer than going to the library to get books to read; this is what he refers to as a “hectic” exercise. Dominique’s viewpoint tends to obscure the potency of teaching and learning in the days when there were no computers. While access to the internet does guarantee access to multitude of information, it is imperative to note that not all the information are genuine, relevant or quality. It requires a measure of skill to be able to discern which of them is of quality and relevant; an exercise that could also be quite ‘hectic’.

Mario, a student of Hope University shares similar views with Dominique.

“There are some facts that we usually get from the internet that aids our studies. And also sometimes when we have assignment, we might not easily find textbooks; we usually visit the internet to get those information to use for those assignment or project work” (Mario_Hope_S)

Mario talks about finding learning materials online for his school work. From his response, he seems to have adopted the belief that everything he gets online aids his studies. I could paraphrase his responses as; “so long as you have access to the internet, you will find information that will help your studies.” Again, reality is; one can find lots of information on the internet but it requires some skill to discern which are viable, true, reliable and even useful. What is the essence of having access to tonnes of information that are not useful or relevant to one’s academic objectives? The internet as a tool would then be meaningless. The essence of the tool is to help subjects meet their needs. The need is clearly not access to information but teaching and learning. Moreover, Mario seems to express the idea that it is difficult finding information in textbooks. Critical theorists would argue that and question what happens to those without access to ICT (Mlitwa, 2005).

Another instrumentalist response came from Tola who sees ICT as a tool to get more information to help in her studies:

“There was a particular assignment the man [lecturer] gave us on a course like that. And we actually had to get more information through internet sites and actually, by the time I collated everything; I actually found out that, I still understand the topic till now, than even what the man even taught us. Yea, and I actually think because ICT helped; because you get different perspectives, different definitions, different things, explanation; so for you to like get together and have your own opinion” (Tola_FAITH_S)

Tola believes ICT helps in providing a multivariate perspective to the things she learns in class. According to her, these perspectives help her to understand better what is being taught and not only that, to retain the knowledge for a long time. Her account is adjudged as instrumentalists in the sense that she sees ICT as a mean to several possible ends; “to get different perspectives; different definitions...explanations” and above all to retain the knowledge. The question a critical theorist would ask is if without ICT, all these are not possible. Truth is they are all possible without ICT.

5.5.3 “It is not going to help us understand” – Critical Theorists

Not all participants share a similar perspective of ICT as a determinant of world change or progress. There are people, others, who believe technology does not define our existence or growth rather we define our growth and existence by the way we use technology (Mlitwa, 2005). Catherine is one of them, and her perspective of ICT can be seen in her response:

“A lecturer can just come to class, give us an handout, and say this is like three topics in one; So, just read it... but we need him to explain. He still needs to pass the message to us. We are going to read it though but we need him to pass the message to us. The ICT is just going to help him reduce the time he is going to maybe dictate the topics and everything. It is not going to help us to understand... we might understand when we read it but we need a better understanding like deep explanation.” (Catherine_Faith_S)

Catherine’s explanation reflects the view that ICT is not ‘everything’. ICT is no world changer. Humans have a huge role to play if the effect of ICT has to be seen. In particular, students have to get a deeper explanation of a topic, sit to study the topic, before the effect of ICT can be seen on student learning. Her account brings to fore the significance of the consciousness and intention of the subject of an activity. Humans have a choice to use or not use technology to aid their activity. Should the technology

be used, the success of the activity does not depend on the technology but on the choice of the user.

Another critical theorist, Peter believes that the fact that ICT is available should not stop people from reading:

“Academic study for me is much more about reading apart from internet, sourcing for information. I don’t think that there is really that much that ICT should affect, because I don’t think that the fact that we have ICTs should stop people from reading. We might just say we would not need to carry bulky textbooks around again, and if you still have bulky textbooks, you get the same information you get. It is the same; it is just in soft copy. Personally for me, I do not even like reading with computers because first of all, the light is beaming at you and it is already a disadvantage. Secondly, how do you make notes? If you’re reading from a pdf, how do make notes? How do you underline, how do you highlight? And if you are using a Microsoft document, you don’t want to lose the integrity of the document, you don’t want to start editing it here and there. When you have a hard copy you can just paint the side that you read, underline them, bookmarks and so on” (Peter_Faith_S)

While Peter agrees ICT has a role to play, he believes ICT cannot do the reading for a student. Whether there is access to ICT or not, a student still has to read and you necessarily do not need access to ICT to read. He made criticism of ICT applications like the PDF that does not allow for things a reader would like to do like highlighting a chunk of text and underlining key statements. He advocates that a student should not be tamed by ICT, thereby seeing it as a ‘cannot-do-without’ tool. Human control is still very much significant to the use of technology. In the words of Mlitwa (2005), “the problem is not with technology as such but with our failure so far to devise appropriate institutions for exercising human control over it” (p. 9).

5.6 Summary of Chapter

In this chapter, I discussed the theme ‘locating the tool in the activity system’. This relates the idea of how ICT is used for teaching and learning in the overcrowded classrooms of Nigerian universities. I explored three main categories in this chapter:

The position of the tool: this category relates to how ICT is used for teaching and learning by the students and lecturers. I found that in the public schools, ICT is not used in the classroom but outside it, for teaching and learning activities. However, in the private university, students and teachers used ICT within the classroom for their teaching and learning activities.

Access to the tool: this category relates how the students and lecturers access ICT for their teaching and learning activities. I found that the most common forms of ICT are computers, mobile phones and the internet. ICT is commonly accessed at public cybercafés, school computer laboratories/libraries and on mobile phones. Not many of the participants have access to personal computers and those that do struggle to maintain internet access on them. I summarise the differences in the table below:

Table 5.2: Summary of differences in analysis of the categories in chapter 5

	Public Universities	Private University
The position of the tool in the classroom		
	<ul style="list-style-type: none"> • ICT is not a tool present and used in the classroom. • ICT is used outside of the classroom for teaching and learning activities in the classroom; e.g. Lecturers use computers and the internet in their offices, at home and at public cybercafés to prepare their lecture notes. • In courses where the use of ICT appears essential, students are taken to the libraries or computer laboratories where access to ICT is limited. 	<ul style="list-style-type: none"> • ICT is present and used within the classroom. • Lecturers are encouraged not only to prepare their lecture notes outside the classroom but to present them using computers and projectors. The only limitation to this is the absence of the internet in the classroom as it's deemed as a distraction to students.
Access to the tool		
	<ul style="list-style-type: none"> • There are limited computers in the computer laboratory or library. Students can only use the computers when they are scheduled on the roster to have access. 	<ul style="list-style-type: none"> • There are few computers in the computer laboratory or library but they are hardly used as students can easily afford their own laptop
	<ul style="list-style-type: none"> • Not all students can easily afford a laptop of their own. 	<ul style="list-style-type: none"> • Most students can easily afford a laptop

The tool, from the perspective of the subject: in this section of the chapter, I relate the philosophy of ICT held by the participants following Feenberg's (2006) classification. I discovered the majority of the participants held the deterministic and instrumentalist philosophy of technology; the idea that technology is autonomous and neutral or human controlled and neutral respectively. Others, though few held the critical view that technology is human controlled and value laden at the same time.

The analysis I presented in this chapter is theoretically embedded in the framework of activity theory. I integrated the initial categories I had prior to my field work with the emergent categories from the data using the framework.

CHAPTER 6

The contribution of the tool to the activity system

6.1 Chapter Overview

In chapter 5, I discussed the analysis of the position of ICT within the activity system; that is, how ICT is used for the purpose teaching and learning in the universities. In the public universities, the participants revealed that ICT was being used outside the classroom for classroom purposes while in the private university, it was not, as ICT was used within the classroom for the purpose of the classroom. I also discussed how the students and lecturers access ICT for their teaching and learning objectives and their theoretical perspective of ICT. Having gained understanding of the position of ICT within the activity system in the previous chapter; in this chapter, I present the findings on the contribution of ICT to the teaching and learning activities of the subject.

6.2 Introduction

As in the previous chapters, the process of discovery for this chapter also began from coding into the initial categories which I had formed prior to data collection. After data collection, I allowed new categories to emerge as a result of reiterative examination of the transcript as well as employing activity theory as a theoretical lens. The analysis I present in this chapter reflects the categories related to the contribution of ICT to teaching and learning at the universities.

The research questions this chapter aims to answer, as seen in chapter one, are:

- *How does ICT contribute to teaching and learning in the overcrowded classrooms of Nigerian universities?*
- *What are the inherent factors affecting the use and integration of ICT for teaching and learning in Nigerian universities?*
- *What systemic tensions or contradictions emerged from the views of students and lecturers on the use of ICT for teaching and learning in the universities?*

The contributions of technology to various facets of human life have been reported in literature from various disciplines. Technology has been espoused as a problem solver in some, and in others, as only a contributing factor to others in proffering solutions to problems. Some have appraised ICT as a ‘*messiah*’ while others have discounted such claims suggesting it only has a role to play. In the words of Adam (2003), “in some education circles, ICT is regarded as a solution for the problem of having to do more with less, providing access to increasingly diverse demography of students and faculty and improving both the quality and quantity of educational content” (p. 197). My intention is to elicit through my analysis of the data the role ICT is playing with regards to the sensitive and inconclusive debate on the effect of class size on student learning and achievement. For this reason, I went to the field with the notion to garner answers as to the “contribution”, not just the impact, or effect, or influence. This notion implies that ‘contribution’ could be positive, negative or perhaps just neutral or insignificant as the case may be.

This chapter concludes the journey of the chapters on the research findings. The focus of this chapter is embedded in figure 6.1

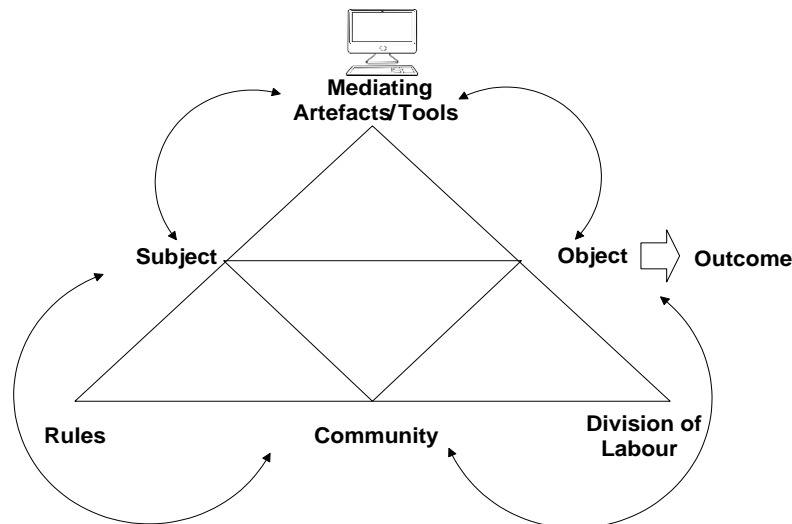


Figure 6.1: The contribution of ICT to the activity system

The contributions of ICT to relate the interaction of the ICT tool with other elements of the activity system. This is not just limited to the triadic relation between the subject, tool and the object but also the systemic interplay in the entire activity system that relates to the use of the tool. Therefore, in this chapter, I not only discuss the use of the tool in and outside the classroom but how the tool contributes to teaching and learning activities within the entire activity system. In other words, I discuss the complex web of interactions that take place within the activity as a result of the position of ICT in the system. These interactions involve how the subjects use ICT to meet their goals (that is, the tool as a link between the subject and the object of the activity), the contradictions (or systemic tensions) within the activity system relating to the use of ICT and the challenges of using ICT within the activity system. The contradictions and challenges also reflect the interaction of the tool with the activity system. That is, they elicit how the use of ICT interacts with the division of labour, the community of the activity system, the rules and norms guiding the existence of the activity system. It is again important to reiterate that the analyses reported in this chapter are theoretical insights based on the interpretations of the participants' perspective of the contribution of ICT to their teaching and learning objectives. As subjects of the activity system, their view point is adopted to provide answers to the research questions of this study.

The initial categories I had before my field work form the bedrock of the analysis reported in this chapter. However, the analysis was not limited to the initial categories alone as new categories and sub-categories later emerged from data as a result of a

continuous and reiterative examination of the interview transcripts and information garnered from activity theory. From a total of 16 categories, six are reported in this chapter. Table 6.2 lists the categories; the sub-categories under them are enumerated in subsequent sections of the chapter.

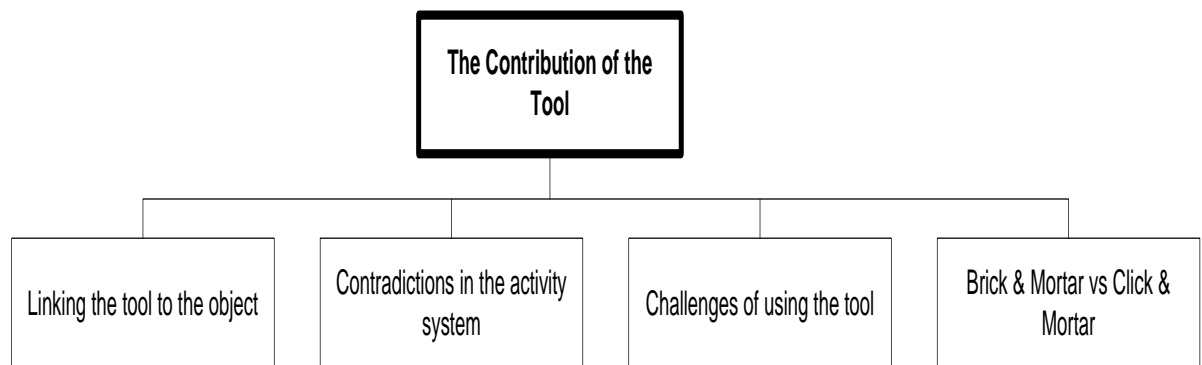


Figure 6.2: Overview of the categories in chapter 6

6.3 Linking the tool to the object

Linking the tool to the object talks about how the tool connects the subject to the object of the activity. In other words, how the tool helps subjects meet their need. The tool mediates the actions of the subject towards the object. The term object describes the purpose for which the tool is being used. In this study, this means, the use of ICT to meet teaching and learning goals and objectives of lecturers and students respectively. In this chapter, I talk about how ICT contributes to achieving these goals of teaching and learning from the perspectives of the subjects.

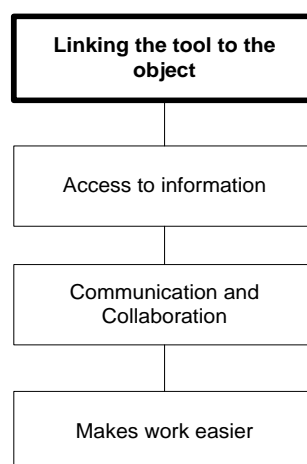


Figure 6.3: Overview of the subcategories under 'Linking the tool to the object'

The participants talked about the contribution of ICT to their teaching and learning goals. Since ICT were not used in the classroom, the participants talked less about the contribution of ICT to their learning in the classroom. However, they talked mostly about how the use of ICT outside of the classroom helped their teaching and learning goals in the classroom. Many of them stress the importance of ICT and its positive contributions to their teaching and learning activities. The issue most raised is access to information.

The prevalent contribution of ICT to teaching and learning for the participants is their ability or improved ability to access information on the go, especially from their mobile phones. Many of them talked about how easy it has now become for them to go on their phones and search for information almost wherever and whenever desired. Despite the many challenging factors mentioned in the previous sub-section, many of them still acknowledge that ICT is helping to meet their academic goals. There are other issues mentioned such as communication; which is also mostly as a result of the penetration of the mobile technology. The email application is one tool popularly mentioned by the participants. Some of them also talked about the convenience ICT brings to them in that it reduces paperwork; thus helping to reduce their workload one way or the other.

6.3.1 Access to information

Access to information reveals the significance of the internet to the participants. A popular consensus amongst them is their ability to be able to search and retrieve information as at when they need to do so. Many of them compared searching for information from books and searching on the internet. They point to the easy retrieval of information the internet platform gives compared to books on the library shelves. Some of them even referred to searching for information in textbooks as “stressful”, “waste of time” and “hectic”. For instance;

*“You get information and through the ICT, you tap the knowledge. For example you might not have to go to the library these days to get any information. Even **going to the library is a waste of time. With search engines; you can just get your information and whatever information you want, you have it right there on your desk.**” (Theo_Hope_L)*

Some of the participants like Theo, see going to the library as a waste of time when ICT resources are available at one’s disposal. It is like choosing to stress oneself should one

take to books in the library, forgoing the time saving potential of the internet. To Theo and many others who share his kind of perspective, ICT is a tool to quickly get desired information. He did not totally put off the ability of the library to provide access to information as well but he suggests that it takes longer to get information from the library than the internet. Some people with similar views as Theo even claim some information cannot be gotten from textbooks and the only way to get them is through the internet:

*“It really, really has [helped me in achieving my goals] because, **there are some things that you can’t get from your textbook and even if you do, you won’t be enlightened enough** ... when I go through the computer, I’ll just check like six or probably ten [discussions on a topic] if I have time...But if you want to start getting textbooks, would you say you want to start buying ten textbooks or eight textbooks? It doesn’t really sound well.” (Sarah_Hope_S)*

According to Sarah, textbooks are limited in the information they provide and until the internet is consulted, one may not have access to some vital information. She puts it like this, one “*won’t be enlightened enough*”. To Sarah, the internet improves her enlightenment; opens her eyes to the more information than she would have access to if she only relied on textbooks. Another thing Sarah said the internet provides for her is the ability to see and sieve through a variety information sources. While access to information from the internet does not guarantee enlightenment, the point Sarah is trying to make is that access to the internet provides for her wider access to information than picking books from the library. In other words, she is able to read from different sources to finally pick her desired information. This, she suggests, is a tough task if she only relied on textbooks from the library. The internet itself is a tool that cannot replace the brain of the learner. While a learner garners information using the internet platform, it is the duty of the learner to abstract insights from the information in order to be enlightened.

Like Sarah, some others argue that the internet is where you get access to “new things”. That is, new, current and up to date information. Textbooks are stale, perhaps. It takes a while to get them published and perhaps by the time they are eventually published, the information is no longer new to them.

“I found myself going to the net and searching for information- searching for new things. Most of our lecturers don’t really allow us to go on the old materials. What they need is up-to-date materials, so it has really made us go more on the net; try to access the internet more because we try to satisfy them.” (Nathan_Hope_S)

For Nathan, the ability to access new and up to date information is critical and ICT helps to achieve that. His reference to “old materials” refers to textbooks. He elicits that the internet is a profound source of “up-to-date materials” which is the requirement of most of their lecturers. To satisfy his lecturers, is to search for new information, which he contends the internet is capable of providing rather than textbooks. Like one other student puts it, *“It makes me to stay connected”* (Theresa_Hope_S). Stay connected means, staying up-to-date on trends around the world. This could also mean getting to learn even more than what is taught in the four walls of the classroom. The internet provides a platform for up-to-date and real-time information. News correspondents are now using blogs, websites, and Wikipedia to launch information as they are happening. This may be one of the strengths of the internet. However, what is crucial is the ability of the internet user to decipher what is true and quality information from the internet.

Another contribution of the internet to a student is the ability to learn more than is taught in the classroom:

*“There are times we are given assignments to do and these things, you cannot just easily access them in textbooks; so we end up going on the internet. And getting to the internet, after searching for what relates to the subject, I just try to read through some other online journal or some free e-books... **At least that has helped to actually put some things in my head; that’s aside the things we’ve learnt in class.**”* (Gabriel_Faith_S)

For students like Gabriel, who seems more explicit in his response, learning more than what the lecturer is able to pass across in the classroom is a goal and ICT helps to meet that goal. Gabriel, like Theo and Sarah argue that some information is not easily retrieved from textbooks and the internet is the quickest source of such information. Whilst textbooks could also provide extra knowledge than what Gabriel gets from the class, his preferences appears to be the internet. This I perceive is due to his ability to access a variety of sources like others previously mentioned.

Some participants like Gloria, a lecturer at Patience University argue that the internet allows them to be aware of their environment and what is going on.

*“When I come to class and I want to talk...**I have to know what is going on, who is doing that, what is going on where**, etc. So technology helps me to poke-nose into everybody’s life without being in everybody’s office, etc.”* (Gloria_Patience_L)

To a lecturer like Gloria, to be able to deliver her teaching materials, she argues that she has to be able to “poke-nose” into what is going on around her. Having access to

information such as ‘what is going on’, ‘who is doing what’ without leaving her own personal space is what Gloria sees as crucial and benefiting where ICT is concerned, especially for her as a lecturer.

Another lecturer that tends to share similar views with Gloria is Roland from Faith University.

*“...as you see me doing now, I am writing a particular paper right now; I am doing research. If I am going to class now for example, it is **what I deduce from this research that I would impart in my students.**” (Roland_Faith_L)*

For Roland and Gloria, it is important to stay up to date so they can deliver relevant and current information to their students through their teaching materials. They relate the idea that ICT helps them in achieving this kind of goal.

6.3.2 Communication and collaboration

The ability to communicate through the internet is one of the issues identified by the participants. The ability to talk over the phone or send documents to another person in real time without the sender leaving where he is was identified as a goal ICT is helping to meet. For instance, Jasmine, a lecturer at Patience University commented on how wonderful the Email technology is:

“It makes life so much better - the email is a marvellous thing. I hate telephone but I don’t like also looking for stamps and going to the post office and it is for me a completely outdated thing. So the email is a marvellous thing, you connect with people, you answer-that is a marvellous thing, it helps a lot.” (Jasmine_Patience_L)

The time saving potential of the email in that one does not have to go to the post office looking for stamps to send a message to someone living in another city is a plus for Jasmine. Moreover, according to her, she hates the telephone – talking on the telephone for hours. The email is the tool Jasmine uses to communicate with her colleagues; for example when she needs more information from them to perhaps supplement her teaching materials, research ideas and knowledge about the courses she teaches. According to her, the email saves her from having to communicate through the telephone whenever she feels like saving time in communicating with someone elsewhere. She kept repeating “email is a marvellous thing” and that demonstrates her preference for email technology against perhaps other methods of communication in meeting her teaching goals.

For Andrew and Emma, the use of ICT is more than just communicating through the email. Their goals are being met in that ICT provides a platform on which they can be creative in the way they communicate their thoughts, ideas, teaching and learning materials to their listeners.

“Yes, it has [helped in achieving my goals]; I’m from a creative industry- the advertising, branding public relations industry - and that is the industry that helps producers to sell whatever they want to sell. Now if you’re going to sell any products in any competitive environment, you have to bring in elements of creativity into it and for you to be able to acquire clients, you must develop creative selling materials, you must develop creative advertisements. The creative process begins even at strategy level - how do you want to present your message? What sort of message are you presenting to the consumers? All these things must be said in a creative way. These are the things we try to pass on to our students” (Andrew_PATIENCE_L)

“You’re going to have to make presentations. You’re going to have to communicate with people and you need certain things that will aid you; so you being familiar with how to make use of those special devices available at your free hand is a good thing... Even with all the challenges, ICT is still helping one to achieve one’s goals.” (Emma_Patience_S)

Andrew is a lecturer in the marketing department and for him; creativity is at the heart of what he teaches and practices. From creative advertisements, branding to selling; communicating creativity is crucial and Andrew suggests this is one way ICT is helping him achieve his goals not only as a practitioner but also in the classroom while he teaches his students. Creativity is when he is able to use ICT tools to infuse some attractive elements like images, graphs and videos into his presentations. This is what he must teach his students and has also to be creative at doing so. There are several ways to be creative in making presentations. Long before the use of ICT technologies, marketing existed and there were ways marketers presented their products to their buyers. In this day and age however, it appears the industry is more ICT-driven and thus new generation marketers like Andrew and his students find ICT technology necessarily inclusive in achieving their goals.

Emma, one of Andrew’s students also endorses his views on the use of ICT. He expressed that communication is enhanced when “special devices” are used because they aid the delivery of the message and perhaps the understanding of it. Emma stressed that the ability to use ICT is “a good thing”. The use of a tool in achieving an objective is to either quicken the process or make it easier to achieve. While the use of ICT does not guarantee automatically achieving the objective of the intended use, it assists the

user towards it. This is what Emma and Andrew seem to be passing across from their responses.

Phillip, a student of Hope University referred to the creativity of presenting through ICT as interactive:

“You will agree with me that most times, when you are using the internet it is more interactive. There are certain articles... for instance, they could use PowerPoint to shoot it and it makes more sense than the use of just text- textbooks and the likes so definitely ICT enhances learning.” (Phillip_Hope_S)

For Phillip, the goal of understanding his learning materials better is what ICT helps to achieve through the “interactive” way information is presented. Phillip’s comparison of the internet to textbooks is a matter of preference. He prefers the interactivity of the internet to those seen in textbooks and to him; that helps to achieve his learning goals.

Another way ICT is helping to meet goals through communication, Tola succinctly puts; *“to get information from other people about things they’ve done, through the mobile phone”* (Tola_FAITH_S).

For Tola, a student, there are times when she misses class and would like to know what happened in her absence. According to her, the mobile phone helps to meet this goal by providing a platform to communicate with her fellow students who were in the class at that time. She calls them up and they chat about how the class went, tasks that were given to them to accomplish perhaps before the next class, key issues highlighted by the lecturer and so on. While a phone conversation may not necessarily replace a lecture session, the goal is to capture as much information about the class as possible within the time spent communicating over the phone. For instance, if the lecturer had mentioned key or focus areas for exams or texts; or assignments that must be done before the next class; all these can be gotten from communicating with a classmate over the phone. With information like this, acquired over the mobile phone, Tola feels she better prepared for the next class.

6.3.3 Makes work easy

Every machine or tool is meant to aid, enhance, or improve work either by saving time or energy for the user. Some of the participants suggest that the use of ICT is helping them achieve their goals faster and perhaps in an easier way. To some, they are able to type instead of write using a pen and paper; for others, ICT helps to reduce paper work and the ease at which they get things done.

For Jasmine, it is the fact that she no longer has to spend time writing with a pen and paper:

“Actually I’ll tell you I can’t live without my computer which is ICT- in that sense yes of course. Now I can’t face the idea; I love writing, I’ve always been writing and I used to. Before the computer days of course you write by hand and I can’t do that anymore. If I don’t have my laptop or my battery is too low, there is no electricity or the generator is not on, I will wait... You can keep so much more you don’t have to print everything.” (Jasmine_Patience_L)

Writing with a pen and paper seems a stressful ordeal for Jasmine. As a result, she sees the ability to type what she needs to write through her computer as an advantage. According to her, she has gotten so used to typing that whenever her laptop is not charged as a result of poor power supply, she would wait till the opportunity arises again. It has become so hard to write with the hands for Jasmine since she is so used to typing on her computer.

Jason, a lecturer at Faith University shared about how easier computer software helps him prepare his reports and teaching materials within a short time.

“Yes. I said that because it takes me a very short time to prepare reports and put it in print. And if I have to make a presentation using Excel, it’s easier. So, to a very large extent, it helps me achieve my objectives both in consultancy and academics.” (Jason_Faith_L)

Preparing reports for consultancy purposes or gathering and aligning information for teaching purposes could be quite a tedious task if one would have to do it without the aid of a computer, software and printer. These are the objectives Jason sees ICT as a tool for; without which he suggests would require him spending a lot of time. This is not to say the use of the computer, software or printers do not require a lot of effort or knowledge, according to Jason, they just make the work easier and they reduce the time it takes to get the work done.

How about the ability of some software to help edit and correct spelling mistakes as the user writes on? This, and a few more, is what Kyle refers to as “unimaginable” benefits of using ICT.

“You’re thinking of giving a speech somewhere, instead of writing, and you’re not sure of what tenses to use, just type it out and Microsoft word will tell you what is right and what is wrong and you correct it, proofread and all that makes my work a lot easier. For example, I am working on a transcript; I can read the transcript while I’m on transit, work on it, edit it, send it and stuff like that” (Kyle_Patience_S)

Kyle is not a professional editor but a student. As a result, he fancies the ability of any software to ‘make his work easier’ by telling him “what is right and what is wrong” – tenses, spelling errors - so he could make the corrections. While this may be true, what Kyle did not mention is the intellectual ability required to assess what is right and what is wrong when using ICT software to edit his work. The software does not do that part for you. In fact, most software like Microsoft Word for instance, only highlight the suspicious mistakes, the discretion of the user is still required to make judgements. This is why in activity theory, agency is only granted to human subjects because it is emphasised that tools and technology cannot substitute for human consciousness and intentionality. Tools are there to assist humans in meeting their objectives not to think for them. In this case, it can be said that the software provides assistance to Kyle in the editing of his school work.

In addition, the convenience ICT brings to his academics is flattering too. While on transit to school perhaps, Kyle sees the ability to use his phone to retrieve, edit and send information related to his academics as a goal he perhaps would not have been able to meet without ICT. While it is possible to edit school assignments on transit sitting on a bus without the use of ICT tools like the internet, it may be impossible sending them off online either to fellow students or to the lecturer if required. This is where ICT assists as a tool in meeting the objectives of a student like Kyle.

6.4 Contradictions in the activity system

As established in chapter two, activity systems are constantly working through contradictions; thus making them both disturbance and innovation inducing systems (Murphy & Rodriguez-Manzanares, 2008). Contradictions can be identified as disturbances to the free running of an activity (Engeström 1999). As Engeström (2008)

points out, “when activities and working environments are analysed with a keen eye on their inherent contradictions, many disturbances and dilemmas in everyday flow of work begin to make sense” (p 258). This means, when used as a tool for analysis in educational contexts, contradictions could help draw a researcher’s attention to important factors to consider when analysing teaching and learning activities (Hu & Webb 2009). Little wonder Mwanza and Engeström, (2005) argue that activity theory’s principle of contradiction serves as a “*means by which new knowledge about the activity being examined emerges*” (p.457).

Identifying contradictions within an activity system requires a keen understanding of the dynamics of the activity, making visible nuances and identifying any disturbances within the system (Turner & Turner, 2001). In a teaching context, identifying contradictions would therefore require understanding the intricacies of the teaching and learning activity and recognising contextual issues that could cause a breakdown in the activity. Murphy and Rodriguez-Manzanares (2008) made reference to contradictions providing an opportunity to explain and understand how teaching practices can change when ICTs are introduced into teacher’s activity system. With a deep understanding of the teaching activity, analysis of the introduction of ICT exposes systemic tensions in forms of either resistance to achieving the goals and objectives of using ICT, or contradictory cultural beliefs associated with the use of ICT (the Internet, for example).

Moreover, as I mentioned in chapter two, it is important to note that contradictions are not only identified with disturbances and breakdowns in the activity system; they could also act as agents of change. As Turner and Turner (2001) reflect, “contradictions are breakdowns or opportunities for change and learning” (p. 1). In other words, they could also appear as driving forces in an activity system to create innovative attempts to change the activity (Hu & Webb, 2009). Engeström and Meittinen (1999) also stressed that contradictions are significant within an activity system because they can result and be the motive force of change and development.

In this section of the chapter, I make use of the principle of contradiction as a tool for analysis in order to uncover inherent tensions in the teaching and learning activities of the case studies. While my analysis brought to fore, several tensions in the universities,

I only discuss in this thesis those which possess strong links with the use of ICT tools. That is, the contradictions with no link to the tool (ICT) are not part of my study.

Two levels of contradictions (as explained in chapter 2) were identified in the universities in relation to the adoption, integration and use of ICT: Primary contradictions which are usually within a single node (element) of an activity system and Secondary contradictions are contradictions that exist between nodes (elements) of the activity system (Turner & Turner, 2001). There are other levels of contradictions including Tertiary and Quaternary contradictions but both of them were not identified in this study.

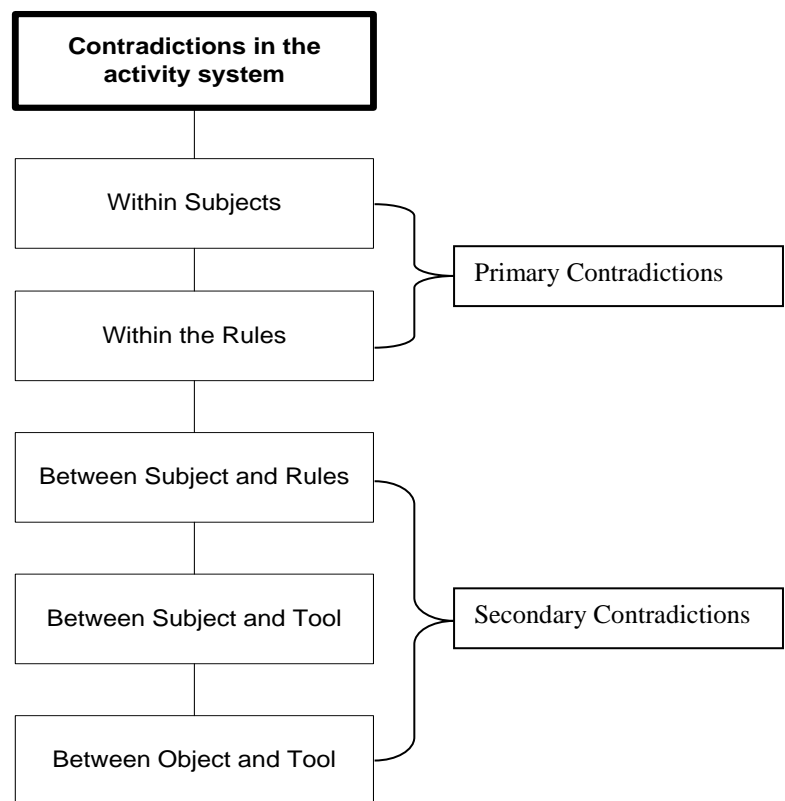


Figure 6.4: Overview of the contradictions in the activity system

6.4.1 Contradictions within subject

Subjects: Students and lecturers

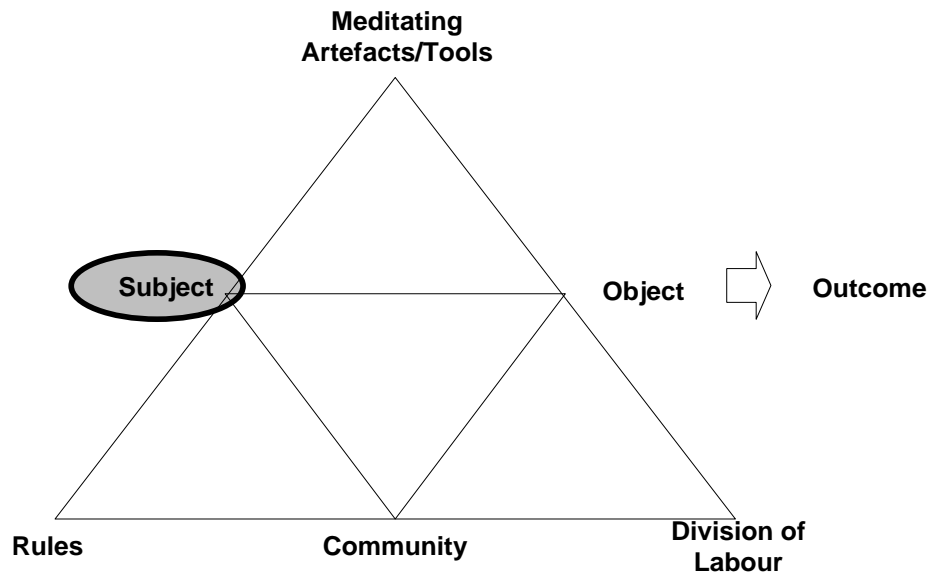


Figure 6.5: Activity theory depiction of contradictions within subjects

There are contradictory beliefs as to the potential of ICT and its impact on teaching and learning amongst the participants. Some relate the idea that ICT is a change agent and a means to an end when it comes to the teaching and learning activities.

“...when you are using the internet it is more interactive. There are certain articles...for instance, they could use PowerPoint to shoot it and it makes more sense than the use of just textbooks and the likes so definitely ICT enhances learning.” (Phillip_Hope_S)

“I don’t need to keep much paper work now. All I need, I just need to put them in my laptop. I can work freely; I can go anywhere and access information. I can access so many journals; even my bedroom, I can access international journals, latest developments in the world, and definitely that has enhanced my teaching quality.” (Henry_HOPE_L)

This group of people are not only ICT enthusiasts but also deterministic in their philosophy of ICT. They tend to see ICT is autonomous without the need for human control or intervention. To them, once ICT is put in place, or people are provided access to ICT, everything is alright and there is bound to be progress. Phillip’s words have this philosophy embedded; the idea that once you are able to shoot learning material through the Microsoft PowerPoint, students will learn better. People like him and Henry fail to see the pedagogical implications of using ICT beyond just providing access to it.

However, there are some others who criticise the deterministic belief of ICT adoption suggesting adopting ICT does not necessarily improve teaching and learning; the human

control aspect still needs to be intact. Lecturers must be able to convey their teaching materials in a way that their students are able to comprehend and process for their learning objectives to be met. For instance, Catherine emphasised that...

*“A lecturer can just come to class, give us a handout, and say ‘just read it’ but we need him to explain. He still needs to pass the message to us. **The ICT is just going to help him reduce the time he is going to maybe dictate the topics and everything. It is not going to help us to understand...**” (Catherine_Faith_S)*

While a classroom may be equipped with ICT, for teaching and learning activities to meet the required objectives, the right pedagogical approach must be put to use. It is crucial to know that there is nothing inherent in ICT tools that automatically guarantees learning for the student (Preeraer & Van Petegem, 2010). ICT is not going to replace the pedagogy. As an artefact, its presence or use is to mediate the activity of the subject to meet his objectives (Engström, 1999). Lecturers still have to pass the message across and to do this, they must implement the right pedagogical approach, a decision ICT cannot make for them. They still have to make that choice. They still have to teach. They still have to do what they need to do for the students to understand their learning materials.

Some others also see ICT as a distraction in the classroom and argue that it may be affecting the attention of students in the classroom.

“...the use of ICT has also become a bit of a distraction in the sense where people now expect as proof that I attended this course, all I need is my handout and I don’t have to listen in class. Overdependence on the presentation has also created a form of distraction where people don’t come to class to pay attention anymore” (Gloria_Patience_L)

According to Gloria, access to ICT could be a form of distraction to students; distraction from attending, listening or participating in classroom activities. Gloria specifically referred to this as ‘overdependence on ICT’ and argues that it offers little help to teaching and learning in the classroom arguing that ICT should rather be seen as a supplement tool for teaching and learning, not as the ‘major tool’. Access to ICT is not a license to bypass the role and duty of a teacher. Watson (2001) refers to the technocentric approach of lauding the manipulation of ICT as a catalyst to create positive change instead of focussing on the use of ICT to assist teaching and learning as instrumental rationalism. He stressed that “‘raising the standards’ of teaching and learning has become intertwined with the use of ICT” (p. 252).

ICT tools should never replace the pedagogical skills required for a lecturer to convey the learning material to his students. In the words of Sutherland, Armstrong, Barnes, Brawn & Breeze, et al. (2004), it is important to stop treating or regarding ICT tools as “unproblematic innovations” that will somehow lead to enhanced learning and eventually replace ‘older’ ways of doing things (p. 423). They suggest that the starting point for productive integration into teaching and learning activities of schools is that a teacher has to be able to adequately teach with the chosen tool.

The contradiction can be seen in the two sets of beliefs about the adoption of ICT for the purpose of teaching and learning in the classroom. Many schools like Faith and Hope University install ICT infrastructure with the hope that it would suddenly turn around teaching and learning but that is usually not the case. Lecturers still have to deliver, explain and interact with students, while the students in turn need to participate in classroom activities, listen to, and interact with their lecturers in order for the goals of teaching and learning to be met (Biggs, 1999). The right approach is putting pedagogy first before technology and not the other way round (Watson, 2001; Sutherland et al., 2004; Tearle, 2003).

6.4.2 Contradictions within rules

Rule: The University is meant to provide the resources (including ICT) needed for every teaching and learning activities in the curriculum. In other words, courses with ICT embedded in their curriculum design, the university administration must ensure there are enough resources available for lecturers and students for the course.

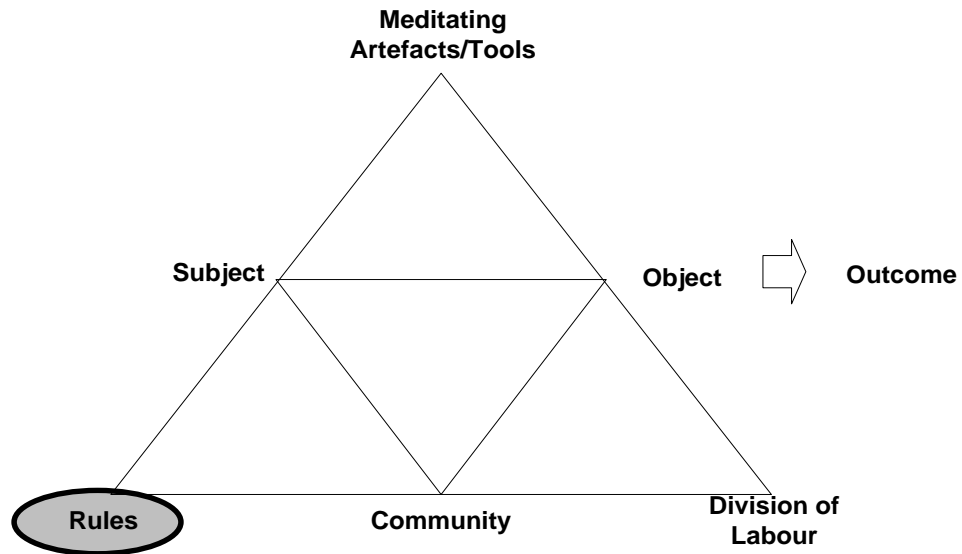


Figure 6.6: Activity theory depiction of contradictions within rules

In the public universities, contradictions were identified within this rule. Some courses had ICT embedded in the curriculum design but access to ICT tools and resources to satisfy the requirements of the courses were limited to both lecturers and students.

Where students have ICT components in their curriculum design, it is the duty of the school to ensure the resources are provided to deliver the courses as stipulated in the curriculum. However, I observed, and the participants also revealed that their computer laboratories are not available to students whenever they want to use them but have to keep to a specific time table. The computers made available to students in the laboratory are not for their constant use, they only have access to them whenever their lecturers need to demonstrate how computer software can be applied to their courses.

Brad, a lecturer at Faith University said,

“We demonstrate fitting of distributions with the computers, in the computer lab. Not necessarily teaching with it in the class.” (Brad_Faith_L)

Students talked about the nature of their courses relating to ICT applications and also how their lecturers give them assignments that require the use of computers:

“My course is a very interactive one, in fact without ICT, it’s often difficult because you have to do so many assignments; you have to consult some articles that you cannot get from books” (Phillip_Hope_S)

“Most of our lecturers don’t really allow us to go on the old materials. What they need is up-to-date materials, so it has really made us go more on the internet” (Nathan_Hope_S)

“There are times we are given assignments to do and these things, you cannot just easily access them in textbooks; we don’t really have textbooks around that you can get most things from. So we end up going on the internet.” (Gabriel_Faith_S)

Despite taking courses or being given assignments requiring the use of ICT tools, the ICT the universities provide for them is limited. The ideal is that the ICT tools needed to satisfy the requirements of the course or curriculum be provided to the students. Not only that, but the ICT tools should be provided in adequate measure to meet the demands of the students they have enrolled. This is not the case however. Many of them are forced to go outside the school (for example, cybercafés) to get their academic goals met. For instance, Dominique, a student at Hope University said:

“It [ICT] is not so sufficient... you have to wait till your turn. Assuming you have something to do the day that is not your turn, then you forcefully go outside” (Dominique_Hope_S)

Phillip puts it like this,

“...Right now you cannot compare the number of computers available and the facility per head of student; such that sometimes, you might have to wait for hours before you have access to the facility. At times, probably they might tell you the server is down. At times, they give you cock and bull story” (Phillip_Hope_S)

On one hand, students are expected to know how to use ICT; they are expected to use ICT for their courses, in their assignments but the ICT resources available to them are limited; difficult to access. This constraint has its implications especially to students’ use of ICT for their learning purposes. This is why Sutherland et al., (2004) advised before integrating ICT into curriculum design, it is important to understand and unpack the inter-related issues that could both enhance and constrain what is possible. In this case, the university did not seem to make assessments of the ICT tools available before integrating ICT into their curriculum. They would probably have been able to make an informed judgement should that assessment been made before the curriculum was designed.

This reflects the ability of contradictions to induce change and innovation in an activity system. If ICT must be integrated into the curriculum, subsequent curriculum design should first of all assess the resources available to cater for the needs of the students.

The university administration, particularly policy and decision makers at the university must audit the ICT resources and ensure the number of students registering for the courses match the available resources. Watson (2001) suggests, “Until there is a ratio of 1.25 machines to every pupil, and every teacher has a personal computer on their own desk, all preferably portable laptops, it is unrealistic for schools to be asked to deliver a balanced ICT using curriculum”. Bottom line; the available ICT resources must be commensurate to the number of pupils taking the course and the requirements of the course curriculum and design.

6.4.3 Contradictions between subjects and rules

Subjects: Lecturers and students

Rule: It is a norm that students do not submit assignments online

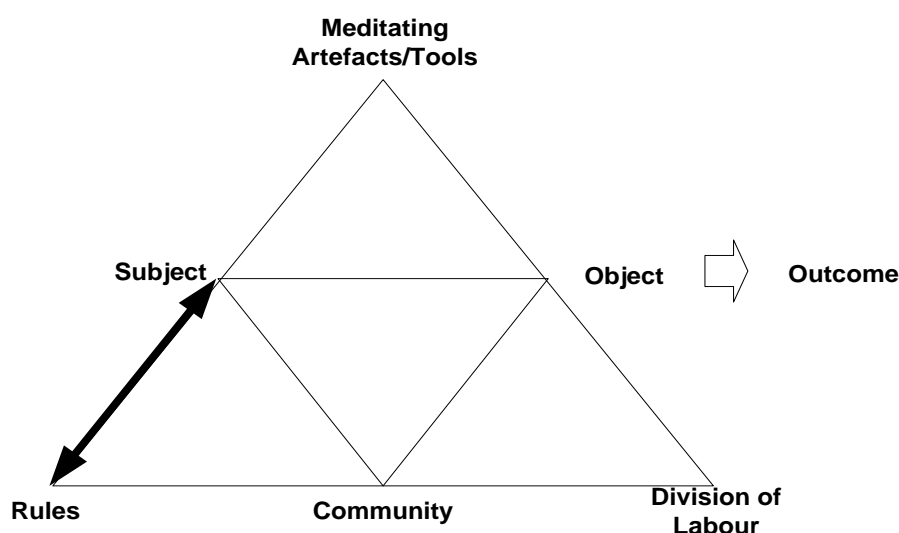


Figure 6.7: Activity theory depiction of contradictions between subject and rules

Rules in activity theory terms talk about norms, culture, custom within an activity system. This reflects what people have become used to as a result of the history of their culture, community or environment. It also relates the cultural historical (principle of activity theory) nature of the activity system over time. At both Faith and Hope University, contradictions were seen between some lecturers’ intentions to apply a form of ICT to their teaching and how students considered it a “strange” practice. This is similar to an example of contradictions seen in Murphy and Rodriguez-Manzanares’ (2008) study as a result of the previous history of participants as users of technology against their beliefs, culture and expectations related to the use of that technology.

Some students relate their experiences of this contradiction:

“A lecturer came and he was like, “if you have any questions, any enquiries, send it to my email”. Immediately he said that, we were all surprised... everybody started laughing. It was very new to us because, normally he should say, “submit to your governor”, and if you have any questions, when he comes you’ll ask him. In essence, what I’m saying is that it is really strange...” (Monica_Faith_S)

“You don’t get to submit assignments by email. It’s only one lecturer that requires you do so but mostly you submit to the lecturers in hardcopies.” (Theresa_Hope_S)

What is usually the practice at both Faith and Hope universities is for a lecturer to request that students submit their assignments in prints. Even if the assignments might have been typed on a computer, the normal practice and requirement is that they print out the document and hand it in to their lecturer. In some cases, students are required to not type the assignment but write it out with pen on paper. It is not normal for a lecturer to ask his students to submit assignments online or ask questions about lectures via email. A lecturer’s request for students to submit assignments via email is considered contradictory to the custom or rule of the activity system. This is a visible nuance to the dynamics of teaching and learning at the universities.

Louis, a Head of Department at Hope University said, *“If you give students assignments to do and submit online, that is an arrangement. That’s not part of the teaching.”* In other words, should a student be required to submit his or her assignment via email, it is a strict arrangement between the lecturer and the student. The word ‘strict’ is very crucial in the last sentence because it emphasises the fact that it does not usually happen. It is not a norm at the schools. This contradiction opens up the issue of introduction of a new technology into an activity system. It is not an easy task; it could be met with lots of resistance and perhaps frustrations on the part of the innovator. Sutherland et al., (2004) observed a similar issue about the introduction of new technology or new ways of doing things claiming that, new ICT tools often challenge an existing practice of teaching and threaten a well-established knowledge domain.

Traditionally, the activity of the lecturers and students was void of online submissions. The introduction of the email seems a ‘disruptive innovation’; hence, the students were surprised and responded with laughter. This type of contradiction is capable of inducing change in the system. From that incident, or from the identification of a contradiction

such as this, policy and decision makers may look into adopting online submissions for students at the universities. The studies of Hu and Webb (2009) and Murphy and Rodriguez-Manzanares (2008) on the systemic tensions caused by the introduction of a new technology also share similar views. According to Murphy and Rodriguez-Manzanares (2008), this type of contradiction could help reconceptualise the practice of teaching and learning and perhaps even transform it in some way. This again reflects the innovation inducing ability of contradictions in an activity system.

6.4.4 Contradictions between subjects and community

Subject: Lecturers

Community: Administrators of Faith University

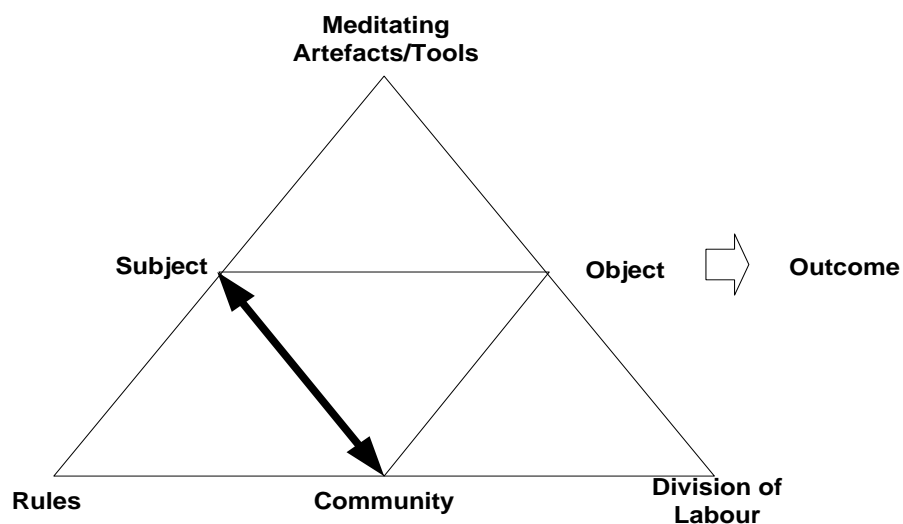


Figure 6.8: Activity theory depiction of contradictions between subjects and community

The administrators of Faith University are regarded as part of the community element of the activity system because they are not subjects of the activity system. The subjects are the students and lecturers only. There are contradictions between the intentions of the administrators of Faith University for their lecturers to use ICT resources to support their pedagogy and the competence of the lecturers to use the resources. This contradiction is only identified in the analysis of the interview transcripts from Faith University.

The administrators of the university had Hitachi electronic starboards installed in the classrooms in order to aid lectures but reports suggest that none but one lecturer had the competency to use the boards. According to Jonathan, a student of the university,

“What is being installed now is the Hitachi starboard for almost a year plus. But the only person that I’ve actually seen using it is a particular lecturer; he just came back from abroad” (Jonathan_Faith_S). Others remained faithful to the old marker boards. Some lecturers are technophobic and hence are resistant to new technology such as the electronic board.

“... we can see our projector board, apart from the students, its only one lecturer, who I know, has used the board to actually teach... it’s just the fact that the teachers do not like the idea of moving towards that ICT” (Lucas_Faith_S)

Jason, a lecturer at Faith University confessed to Lucas’s claims that most of the lecturers do not know how to use the electronic boards installed by the university administrator. This is the reason why they are just up on the wall in the classrooms gathering dusts.

“If you visit the classrooms you will see the Hitachi starboards all over the place but I doubt if many of us know how to use it.” (Jason_Faith_L)

Many of the lecturers do not have the requisite knowledge to make use of the board. Perhaps others are just resistant to change. Reports according to Jason suggest that the university administrators tried training lecturers on the use of the boards but the training met with ‘hiccups’ and failed to materialise.

“when we try to teach all the lecturers how to use the Hitachi starboard, power fluctuations made it impossible because I remember on several occasions the expert came to teach the lecturers but unfortunately, there was no power supply and that was the end.... Unfortunately, it did not materialise because of power problem.” (Jason_Faith_L)

This contradiction exposes a core problem with regards to the use of ICT in Nigerian universities. The next section in this chapter about the challenges of the contributions ICT revealed that the issue of poor power supply is top of the list on them. It is a nationwide problem in Nigeria and it has to be addressed if ICT tools are to be used for teaching and learning.

6.4.5 Contradictions between object and tools

Object: Teaching and Learning with ICT

Tool: Non-ICT tools (e.g. electricity)

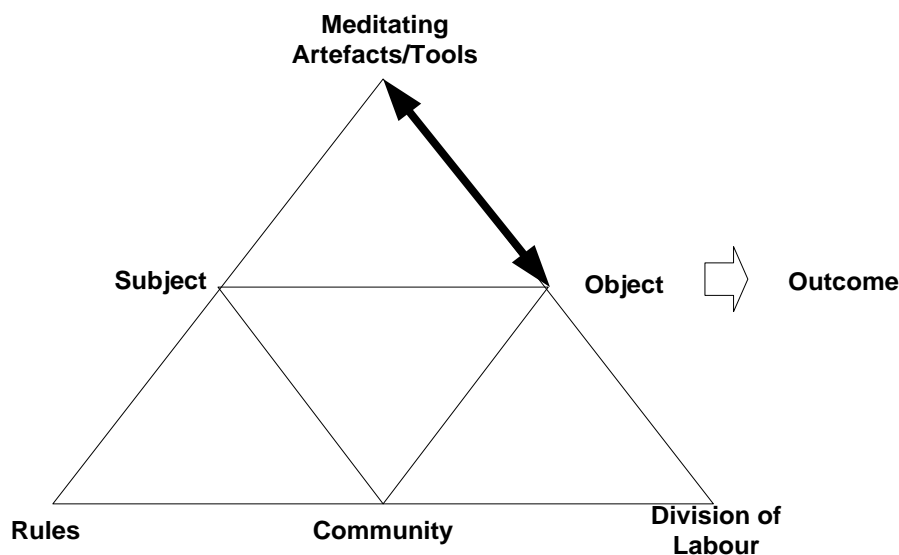


Figure 6.9: Activity theory depiction of contradictions between object and tool

Some lecturers and students talk about how ideally, they should use ICT for their teaching and learning objectives; however, due to limited ICT resources available to them, they cannot do so. For instance, Jason said,

“Ideally speaking, we should be using PowerPoint in our presentations in lectures but despite the fact that not all our lecturers have access to laptops; even though the university is trying to ensure that every lecturer has a laptop. It is not that easy to have the facilities where you can use PowerPoint presentations if you are giving lectures to students; so most of us still resort to either using whiteboards, using markers...” (Jason_Faith_L)

According to Jason, the ideal is that they possess the requisite knowledge and skills to be able to use ICT for their teaching activities in the classrooms but that ideal is impossible because of limited access to ICT resources. The ICT resources available are not enough, limited and there is no training being provided to lecturers to make use of the ICT tools. I was told of a time when training sessions were organised for lecturers where the school administrators brought in professionals from Hitachi to train lecturers on how to use the newly installed Hitachi starboards. Reports reveal that power supply was a major barrier to the training sessions as it happened at a time when the school generator had developed a fault. The Hitachi trainers went back and till the time when I conducted my interviews, the training had not been rescheduled. The electronic starboards lie almost never used in the classrooms as a result.

Moreover, some lecturers emphasised their lack of basic ICT tools like a laptops. While the ones with access to a laptop can prepare their notes and perhaps conduct research, the ones lacking access usually visit cybercafés or avail themselves of the limited facilities provided by the school at the library. Beyond the availability of ICT tools are threatening issues like limited basic infrastructures like electricity. The school has to put on generators every time and the cost of fuelling the generating set is enormous.

Students and lecturers willing to use ICT facilities for their learning activities are often met with barriers of space and time. Space in terms of computers in that there are not enough in the laboratory to go round the number of students; time in the sense that students cannot access these resources whenever they want to. Times are allocated to them and they are constrained by these schedule. Some students commented on this issue:

“...most times, because of the time constraints and then number of students, you have to come in batches so that everybody gets to access the computers – at least you get to touch the computer by yourself. Time constraints – it is not as if you get to understand what they are saying but you get this is what you need to know” (Gabriel_Faith_S)

“...the faculty of accounting, we actually have a lab right now. Like, how many computers right now? Like, 100 computers right now, which is actually good, like 2 people, 2 persons to one computer...” (Tola_FAITH_S)

“The ICT available within the school is very functional but not sufficient for students.” (Dominique_Hope_S)

The objective of learning with ICT at the university is challenging because access to ICT resources are limited. The ICT resources are not sufficient enough to go round the number of students enrolled. Beyond the availability of ICT resources is the issue of poor basic infrastructure. These issues reflect a contradiction between the intention to use ICT resources and the challenges of limited access to both ICT resources and basic infrastructure to support the ICT tools.

6.5 Challenges of using of the tool

Even though human beings create tools to meet their objectives, the uses of tools are not without challenges. These challenges sometimes help to shape the tool and in turn help

to better the objectives of humans in the long run. The challenges could be as a result of the capacity or ability of the subject, issues in and with the community, division of labour, rules, and the complexity of the objective or even the nature of the tool. The use of ICT in Nigerian universities is a complex, contextual and socio-cultural issue. It involves a complex web of issues that are context specific to the cases.

Scholars like Ekundayo and Ekundayo (2009) document factors challenging the use of ICT in higher education in Africa. However, not many studies have done so at faculty levels. Many of them explored this topic with a country wide focus and often lacking deep and rich descriptions of the factors, particularly from the perspectives of students and teachers. This study adds to the body of knowledge by revealing contextual factors affecting the contributions of ICT to teaching and learning in overcrowded classrooms.

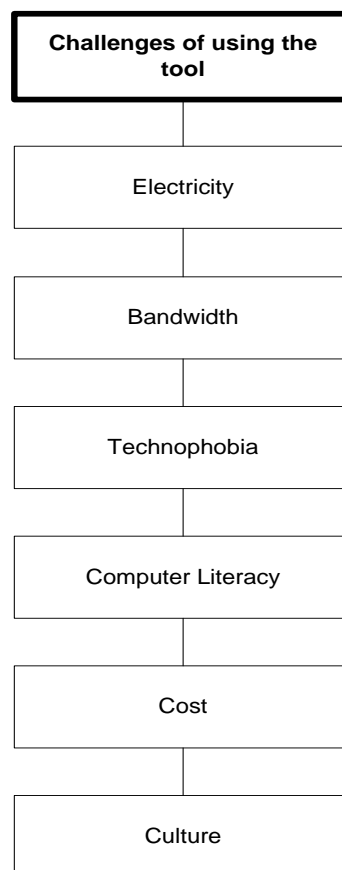


Figure 6.10: Overview of the ‘challenges of using the tool’ sub-category

Communicating these factors could help policy makers, university administrators, and other stakeholders have a perspective of things to deal with when considering reinforcing ICT resources in university institutions/classrooms. They will perhaps be

able to make guided decisions as to feasible and effective reforms that could help overcome the factors. The factors include:

6.5.1 Electricity

The most talked about factor is electricity and this is because the challenge affects everyone. No one is exempted; be it those in private universities or public ones. Adomi (2005) confirms that the body in control of power generation and supply in Nigeria - Power Holding Company of Nigeria (PHCN) – does not supply stable electricity and there are often frequent power outages. Even Internet Service Providers (ISP), cyber cafés and telecommunication companies have to make stand-by electricity through various generating plants which makes their services costly for the users as the costs are passed on to them. In other words, apart from the fact that the poor power supply impedes the use of ICT for users, it also increases the cost of access as service providers and telecommunication companies have to add the cost of fuelling their power plants to their normal service charge. The participants expressed their frustration on this issue in their various responses:

Theo's response emphasises anger, frustration. He said;

"Talk about electricity; that is a major impediment of ICT. For example, if you talk about an area where you do not have constant power, ICT is useless" (Theo_Hope_L)

The only way ICT functions is if it is used but poor supply of power incapacitates users of ICT; thus leading to frustration. As Theo puts it, "...where you do not have constant power, ICT is useless". ICT can be rendered useless if power supply is in a mess. Its contribution to teaching and learning would be far from obvious.

Chris, a lecturer at Hope University expressed similar frustration when he said;

"The issue of poor power supply. That is one of the major backdrops of ICT development in a developing country because electricity in Nigeria is nowhere to be found. We rely more on generators. Break down of electricity and the light, breaks down on ICT implementation" (Chris_Hope_L)

Chris clearly points out that for ICT to be functional, constant electricity is crucial. Almost all ICT resources make use of electricity as they are mostly electronic. The only way to cope is for users of ICT to rely on power generating sets and this comes at a cost

ranging from daily fuelling the generators to servicing their engines. Generators are not easy to maintain as the cost of diesel tends to increase often.

Three people that really explained the effect of using generating sets for their use of ICT for academic work are Phillip, a student of Hope University, Jasmine and Andrew, both lecturers at Patience University. Although their explanations seem long, they relate the context with examples in a way that is very comprehensive.

“Power does affect because there is always fragmented power supply in Nigeria and it affects so many things because although educational sector are not profit making but still they spend a lot. And a situation where they are not profit making and they spend a lot, probably on fuelling their generators so as to make these things [teaching and learning] available; there are times when they have to like, “lets reduce the number of hours we [switch] on our generator.”

I will give you an example; I think yesterday, I decided to browse through my personal system [computer] and power supply just went off for hours (3-4hours), coupled with the fact that at times, maybe the power holding company (PHCN) are on strike so they [the school] have to like switch off the generator for no reason. If there could be any reason, I think it should be probably they want to reserve their fuel. That will be the most genuine reason for them to switch off the generator and that also paralyse so many things because the hours I ought to have used to complete my work, you have to be excluded for the power supply because by the time your laptop battery goes down, you have to wait for power supply to come before you now start so that also contributes to it.” (Phillip_Hope_S)

Jasmine also shares her own experience;

“...lack of electricity but we have a generator, it costs us a fortune of course because in fact the power supply is very bad we are mostly on generator and we remain open till 8pm. To facilitate people who want to stay on to study the library now is open till 8, so the gen is on constantly. It's expensive but it doesn't really interfere with the teaching because we make sure it doesn't. It's just that there was one day- I remember one terrible, horrible day in which I almost...The 2 generators were down and there was no electricity, and the house was full of people. It was hot and it was terrible because we are always teaching them about crisis management and alternative scenarios. So it can be extremely embarrassing sometimes.” (Jasmine_Patience_L)

Andrew too shared his;

“Electricity is not a constant thing in Nigeria, it fluctuates, it's epileptic, and it is crazy. What that means is that you have to rely on other sources of power generation and this cost a lot of money. You want to be in a very good environment when you need to research. What it means is that your air conditioner has to be on and for you to have power- for you to be able to generate power on your own. Then it means you must be using a big generator and if you do the kind of research that I do where you work 18hrs a day, then what it means is that you cannot - you will need more than 1 generator, that's what it means and what it means is that you must have the resources to cope with the use.

I use this generator- a big generator, I have 2 of them, you put one on 35liters for 12hrs, a litre of diesel is about #110Naira, multiply that by 35 and for your generator to last long, don't use it for 12 hours. The moment you use it for 6 hrs, stop it and go on the other one and you have to constantly service it and all these things cost money.” (Andrew_PATIENCE_L)

These quotes relate explicitly how the poor nature of electricity in Nigeria affects the contribution of ICT. The participants' perspectives provide the typical struggle of stakeholders of higher education attempting to use ICT and the challenge they face as a result of poor power supply in the country. Various emotional statements were used by the participants to express their frustration on this issue. Andrew said, *"It is crazy"*; Jasmine acknowledged that *"it can be extremely embarrassing sometimes"*. These and many more are reasons why the contribution of ICT is still minimal and limited in Nigerian universities. It is difficult to stay afloat over the challenge of electricity because it is not just an institutional problem, it is a nationwide phenomenon.

6.5.2 Bandwidth

Another most talked about factor affecting the contributions of ICT to teaching and learning is the factor of limited bandwidth. According to Adam's (2003) observation, bandwidth is the scarcest ICT resource in African universities and this is mainly due to vetoes on academic institutions' accessing international circuits and high licensing fees for connecting to advanced circuits for obtaining authorisation. While Adam said that almost a decade ago, the statement is still very relevant today. The participants of this study are not oblivious to effect of thin bandwidth on their use of ICT.

Gloria acknowledged:

"The other problem we have is bandwidth. We have serious bandwidth constraints in this country... bandwidth is a main issue and until it is available in the public domain, then maybe people can sit. Like for me for example, I have many webinars that I've been invited to... but sometimes, you're hearing the contents 5 minutes after... it's not very encouraging..."
(Gloria_Patience_L)

What is the purpose of participating in a live webinar when the content only reaches the attendant 5 minutes later? This is the nature of the internet in Nigeria. It is often slow and unreliable such that it is discouraging enough to be used for academic purposes. Gloria in her response calls for the bandwidth to be improved upon such that it is available in the public domain.

Roland, acknowledged that the speed of the internet is too slow;

"I do know that sometimes the quality of the internet delivery is not good. Sometimes, it would fluctuate; sometimes, the speed is very slow. I was at a seminar where the resource person said, until he came to Nigeria, that was when he discovered why people always mailed him to ask for

softcopies or articles and he would be like, “but it’s right there on the internet and they could download it”; but on getting here, he said he has not been able to open that site because the internet here is just too slow.” (Roland_Faith_L)

This is sure one of the factors impeding the contributions of ICT to teaching and learning in Nigerian universities. When the internet speed is such that is frustrating when the user is trying to retrieve or download a resource material, it would be hard to encourage users to make use of ICT. From the example Roland gave, students and lecturers tend to rely on overseas contacts to help them retrieve information and documents from the internet because the bandwidth constraints in Nigeria. There are reasons they would make such requests; either the page they are trying to download the material from takes a long time to open or the size of the required document(s) is such that the bandwidth would take a long time to download. The user has no choice than to save time and perhaps cost by requesting an overseas contact to send it via email. Though it may require the same amount of time to download; however, the time it takes to look for the information is saved.

Yinka, a student at Patience University, paints the picture even clearer of the typical challenge a student faces as a result of thin bandwidth:

“Bandwidth is a problem, yes. You are working to meet a deadline; you need to get some information from the internet; you can’t get access to the internet because it’s slow. Sometimes it doesn’t go [connect]. You wait for almost 30minutes-1hour to get to a site – just one site! And you’re talking about several sites. Before you know what is happening, what you’re supposed to do – your school work is there, you’ve not done it – you’re waiting for the internet to load.” (Yinka_Patience_S)

It is hard to go through to a difficult situation like Yinka explained and still be encouraged to continue using ICT. If there are other means of achieving one’s goal without using ICT, and such means is perhaps faster and less frustrating, a student is likely to opt for such. Should a student fail to meet several deadlines as a result of internet fluctuations or slow speed, it would be difficult to convince such a student to use ICT to meet subsequent deadlines. This is one way the contribution of ICT to teaching and learning is affected.

Even when a user subscribes to unlimited internet; Andrew, from a lecturer’s perspective said it is equally frustrating:

“Bandwidth is a problem. I’m using an internet service provider (I won’t mention the name) and I am on the highest one – unlimited access, 24hours – and yet the internet access; the service they provide me is poor. It takes a long time for a page to download.” (Andrew_PATIENCE_L)

Unlimited internet access in Nigerian terms appears to still have limits; limits that are not defined by the amount used but by the constraints on bandwidth. For a lecturer that has to search for information to aid the preparation of his lecture materials and a student that needs to get more information from the internet to stay updated on world trends, frustration is usually what they meet with as a result of bandwidth constraints. No matter how much they intend to use the internet, they are constrained by a factor they have absolutely no control over. Unlike the electricity constraints where a user could spend more to fuel a generating set to last longer, the bandwidth constraints presents the user with almost no choice but to wait till as long as it takes to respond.

6.5.3 Technophobia

Weil and Rosen (1995) citing Jay (1981) defined ‘Technophobia’ as anxiety about interactions with computers or computer related technology. They suggest that technophobia is caused by an ingrained psychologically-based belief system and often appears in three forms: “the resistance to talking about computers or even thinking about computers, the fear or anxiety toward computers” (p. 96). The study of Rosen and Weil (1995) also found several traits connected to technophobia including; computer experience, age, gender, teaching experience, computer availability, ethnicity, and school socioeconomic status.

Some of these traits were highlighted by some of the participants as a constraint on the use of ICT in their institutions. Either as a result of competence or resistance to change, some students and lecturers try to avoid ICT. Some lecturers would do all they can not to get involved with ICT so perhaps their students would not be able to assess their level of competence or computer experience. A typical example is Theo, a lecturer at Hope University, when asked if any of his teaching involves the use of ICT, replied;

“Anything that has to do with ICT for example, computer, we are not the ones that handle that. We send students to the ICT department; we have computer departments that handle such situations” (Theo_Hope_L)

Theo seems like one of the lecturers that would not want to have anything to do with ICT, if he can avoid it. There are other lecturers within the school that were interviewed who gladly use ICT for their teaching purposes, mostly to prepare for lectures but Theo seems like one of those who does not want to have much to do with it, perhaps other than his personal use.

Some lecturers also fear the destructive effect of frauds (scams) that are common on the internet and as a result try to avoid it, either due to past experiences or stories they have heard. Matthew, a lecturer at Faith University talked about this:

“...because under freedom of information and all that, you find that students might be exposed to information they are not supposed to. Again, some fast people (hackers), they can corrupt your system through viruses and all that or even hack into your own system or take your data or whatever information you have stored there. There are those fears. Introduction of certain security profiles would be of advantage to guard against some of those possibilities” (Matthew_Faith_L)

Matthew’s response reflects two concerns: First, the loads of information available on the internet to students that could cause a distraction from their learning; secondly, the fear of hackers – people who are skilful enough to gain unauthorised access to data on other people's computers by circumventing security systems. Generally, lecturers fear that should they allow themselves to use ICT, some students are very skilled to the extent that they could hack into their system to either access their results and play around with their grades or even cause harm to the lecturer by accessing private information on their computers. As a result, most lecturers only use their emails for personal purposes and would not give it to students for any academic related concerns the students might have.

Some also are resistant to change. Lucas made this clear in his response:

“...ICT, there are just few [lecturers who use ICT]. Even if they know, or even when they know the benefits or actually appreciate that the benefits outweigh the cost, most of them still actually do not want to get into it; maybe because they're afraid of learning. I won't say it's a computer literacy problem, it's the phobia. The school actually organise computer programmes for them. To a good extent, I know that they know how to use it but they just don't actually want to move towards that line.” (Lucas_Faith_S)

There are only a few lecturers who use ICT at Faith University’s business school. This is not because other lecturers have no knowledge of ICT but because they do not want to learn how they can make use of it for and in their teaching, according to Lucas. ICT

resources are available to them but they ignore them and choose the traditional methods of teaching that they are used to. They do not want to experiment with a new method. They resist the change that is almost inevitable.

As Yinka puts it, *“I mean, for a student, who is not interested in ICT, you can’t break his or her head and put ICT in there. Even if you have all the computers and all the laptops available to the person, the person will not make use of it.”* Technophobic students and lecturers are not just keen to use ICT. Rosen and Weil (1995) made a similar finding in their study where computers were available for nearly all teachers' use however, only about half the teachers actually used them. The reason could either be that the teachers were educated at a time the introduction of computers to teaching and learning was not popular or they simply chose to avoid the use of computers. Their fears, anxiety and perhaps inexperience with computers appear to have overcome possible willingness to use ICT resources.

6.5.4 Computer Literacy

Another factor affecting the contributions of ICT is computer literacy. Some students and lecturers are not computer skilled. They perhaps find it difficult to relate to the potentials of ICT resources available to them. Most of them come into the university without having used a computer all along from their previous schools or in their homes. Some of them do not even have email accounts. Some lecturers likewise, are perhaps only able to do so little with their computers; maybe just to check, send and reply to their emails online. They are completely unaware or ignorant of software programs that could enhance their teaching activities.

Chris, lecturer at Hope University admits this and puts it succinctly,

“Another thing is literacy level; computer literacy is quite not so on the high side. We are just getting there little by little.” (Chris_Hope_L)

Computer literacy is growing but not all lecturers and students are literates yet, Chris admits. As time goes on and the awareness continues to increase, they will learn to use ICT. To abolish or reduce computer illiteracy however, schools must be well equipped; not only universities, but every pre-tertiary level of education – primary and secondary schools included. Some students get to the university without any knowledge of the use

of computers. When they get to the university too, access to computers are limited and probably have a difficulty affording one.

Kyle and Jonathan both paint the usual picture:

“...among students, there is no appreciation for ICT. In the sense that so many people probably learnt how to use a computer in the cybercafé. Most people, except for the few that attended private – private nursery and primary schools that had computers in their computer labs – You find that most people probably had their first exposure to computers in secondary school. And it’s this kind of thing where you go to the computer lab and it’s the sacred temple, so to speak. You need to behave in a particular way; you need to handle things in a particular way. You might not be able to explore as much as you would have if you had your personal computer or ICT back home” (Kyle_Patience_S)

“I could tell you that even in final year now, most students do not even know how to use internet. I wonder how we could move from 100level (first year) to 400level, and then we could still see some of us who could not use the internet. Those that actually know how to use it very well are those that actually have access to laptop or maybe they actually go on online trying to find things or stuffs, because you know... you could see some challenges when people come to final year and they have to find out project materials and they have problems and all they could do is just go into project library and then swap one for the other and just make photocopy and you know, submit to the supervisor. So, I think it is a big problem.” (Jonathan_Faith_S)

Students whose parents cannot afford to send them to private primary and secondary schools hardly have any experience of the use of ICT until they get to the university. Most public primary and secondary schools in Nigeria lack computer laboratories and as such, their students lack access. Like Kyle said, some students’ first hand encounter with a computer is either at cybercafés or when they get to the university. However, it appears the overcrowding in the universities further limits their access to the computer. Like Kyle puts it, the computer labs are treated like sacred temples; where students are not just allowed to do whatever they want with the computer systems. You could not blame the schools if the computers are mishandled as there is no accountability when the number of students is more than the resources available to cater for them.

Jonathan too talked about the consequence of students not being able to make use of ICT resources as a result of illiteracy. Some of them go off on the wrong foot by simply repeating previous projects. Some other people pay their fellow students or people in business centres to do their projects for them. Our educational system is at risk. In fact, employers will find it hard to hire university graduates should this continue. It is very imperative in this day and age to be computer literate as almost every occupation now involves the use of computers. It would be difficult for graduates who are not computer literate to survive in a globalised world that is defined by advances in information

technology. There are suggestions that there are students in their final year of university still struggling with the use of computers. In fact, reports suggest that the percentage of computer illiteracy is high amongst students, between 28-40%.

“It is kind of annoying or sad to see that half of the class does not know how to use computers because... I mean the main reason why it’s sad is because by the time we leave school, anything we want to do outside, is all based on ICT. And if we can’t do that right now that we are in school, it’ll later affect them when we graduate” (Peter_Faith_S)

“Funny enough, there are still some students that are not computer literate...” (Monica_Faith_S)

Some final year students of the university still appear to be computer illiterate. Even though the statistics Peter and Monica put forward are mere guess estimates, they know their classmates well enough so they could be close to the truth.

Should a lecturer not be adept with the use of ICT, it is often difficult to train such because of their age and years of experience, Matthew, a lecturer at Faith University acknowledged:

“Instructors themselves are not yet versatile with the ICT framework (resources); and therefore it inhibits their usage of it for instruction. So there would be need for some kind of ‘train the trainers’ kind of situation. You can’t give what you don’t have... And you know sometimes, ‘it is difficult to learn left-handedness at old age.’” (Matthew_Faith_L)

Matthew admits that some lecturers need to be trained before they can begin to use ICT for instruction delivery but admits that it is often a difficult venture, training lecturers, especially those with years of experience and who are already used to the traditional mode of teaching. He used the adage, *“it is difficult to learn left-handedness at old age”*. The adage is a Nigerian dictum that depicts how difficult it is for someone who has been using his right hand mostly since birth to want to pick up the habit of using his left hand in old age. It comes with a lot of challenges. It must involve some reorientation, constant practice, encouragement and support.

Again, in activity theory terms, the implications of the subjects not being able to use the tool to achieve their objective could be a slow, time consuming and frustrating experience. Humans make tools to be able to achieve their objectives faster. The inability of a human to use the tool for its intended objective is almost as good as not having the tool. Computer illiteracy breaks down the link the tool provides between the

subject and the object. This means, the subject is directly linked to the object resulting in the old, time-consuming way of achieving the objective. This means the cultural historical development of achieving the objective (which the tool provides) would be missing.

6.5.5 Cost

Affordability is still a major issue when discussing the topic of ICT contribution to teaching and learning in a developing country like Nigeria. Adam (2003) argues that the cost of ICT (resources, maintenance, upgrading, and skills development) has remained high in African countries. These costs often include computers and peripherals, video equipment, specialised tools like digital microscopes, electrical wiring, internet access, lighting, air-conditioning, network equipment, software, manuals, books, videos, audio-tapes, and other supplies. Adam (2003) added that the presence of these supplies is depressingly low in African countries.

Nigeria is not left out as the participants did not fail to make reference to the high cost of purchasing or accessing ICT resources. Chris, a lecturer at Hope University puts it succinctly, *“The cost of ICT infrastructure is quite so exorbitant and it affects the adoption of ICT in education”* (Chris_Hope_L). His comment, though short, did not fail to elicit the consequence of the high cost on its adoption to teaching and learning activities. Joshua, a student of Patience University also said, *“The cost is still rather high. In this part of the world, it’s still rather high”* (Joshua_Patience_S). Citizens of most developing countries are known to be quite poor. For this reason, it is difficult for them to be able to afford resources available to citizens of developed countries, especially when sold at the same price.

Most students are not able to afford a personal computer. For example, Jonathan, a student at Faith University can only afford a desktop computer which is cheaper. However, the problem is, he cannot afford to connect to the internet on his desktop computer. He said;

“...for those that are (from poor backgrounds); like myself, I use more of desktop than laptop because I’ve not been able to afford one of the laptops. For a desktop, you know... major problem I have is actually, the power supply, and at the same time, connection to the internet which is more expensive here” (Jonathan_Faith_S)

Apart from the fact that a laptop is beyond reach for Jonathan, as well connection to the internet is also expensive. Jonathan is not alone in this kind of struggle. Even lecturers comment on the price of ICT infrastructure in Nigeria. Jason said;

“Like if I use myself as an example, you might not get up to a standard phone or mobile phone that you want maybe because they are expensive. Talking about laptops; laptops are still quite expensive also. So, you need enough money to do all these things. Even internet services after you get a laptop, though not very expensive but you still need enough to do that. You pay monthly; you get a modem and all that.” (Jason_Faith_L)

If a lecturer still sees some types of mobile phones, laptops and internet services as expensive, it is not hard to imagine why some students are not able to afford them. In relation to what Jonathan said initially, it is not only about getting a computer, but getting internet access on the computer is a serious challenge as you have to buy an internet modem and be prepared to pay monthly subscriptions. This is enough to discourage some lecturers and students in adopting ICT, consequently affecting the contribution of ICT for their teaching and learning activities.

6.5.6 Culture

Culture is very important when analysing a phenomenon that pertains to humans. Human beings are part of a social system, as such they are bounded by things they believe constitute the norm for them. In Activity theory terms, culture is part of the “Rules” that make up an activity system. These rules guide how subjects behave and their beliefs, and even how they use tools to meet their needs. Should their culture be such that it does not support the use of a particular tool, it would be hard for such tools to mediate their actions towards meeting their needs. Some of the participants in this study mentioned the role of culture in the analysis of the contribution of ICT to teaching and learning in their schools. For example, Chris said,

“...because we do not have the local technology of our own so it is very difficult to comply or imbibe this culture of ICT. It is not locally made; it is not made in Nigeria. So we find it difficult, because of the cultural beliefs and all other social means... people find it difficult and they ask, “Is it a taboo; is it not?” (Chris_Hope_L)

Some students and lecturers in Nigeria still see the penetration of ICT as a strange culture. They see it as foreign and thus hard to accept and adopt. Some of them challenge the inherent characteristics that come with adopting technology such as the exposure to all kinds of information. I observed that amongst lecturers, some of them

mention that the internet sometimes constitutes a distraction to student learning. Some students get carried away with other things on the internet such as pornography and spend excess times on social network platforms like Facebook, Twitter, Four square and so on, leaving their academics to suffer. While the internet and other ICT infrastructure tend to expose students to unbridled information from all over the world, some lecturers suggest that the exposure is perhaps too much; some of which is not culturally acceptable.

Some lecturers and students tell you that ICT is a move away from tradition and what is normal around here. For example, the case was mentioned of a lecturer at Faith University who uses ICT to the extent that his students see his teaching methods as ‘strange’. Jonathan and Monica are his students and they talked about his unusual, out of the norm use of ICT:

“They [Hitachi Starboards] have been installed for a while now, almost a year plus but you know, the only person I’ve actually seen using the board in the... umm.. in this faculty is a particular lecturer. He just came back from abroad [overseas]. He just really is the only person that has actually emphasised the usage of that board all the time, and except we are actually making presentations, the boards are not put into use.” (Jonathan_Faith_S)

“...you have an assignment you have to submit, email it or maybe the lecturer goes through your assignment and then replies you or email or something, or you have questions; no, we don’t really [have that]. It’s only one particular lecturer and it’s when we are having... he’s a tall lecturer. So he came and he was like, “if you have any questions and enquiries, anything, send it to my email”. Immediately he said that, everybody (students) was like “eh”; we didn’t understand; we were all surprised. It was very very new, so it was really funny because normally you’ll say, “submit to your (class) governor”, and if you have any questions, when he comes you’ll ask him. But he said, “if you have anything, anything, you can send to my email; my email is....” So immediately he said that, everybody started laughing. So in essence, what I’m saying is that it is really, strange in this part of the world. In this department that I am in, there’s no ICT per se. It is not yet developed; as in, it is not full blown, it is still growing.” (Monica_Faith_S)

I observed that Jonathan and Monica were talking about the same lecturer. He had just arrived from overseas as Jonathan said and had brought the ICT culture from there to Nigeria. As a result, students found his style a strange one and could not help but laugh at his request that should students fail to understand any of his teaching materials, they should send him an email. He even went as far as giving them an email. In Nigerian universities, lecturers are seen as ‘semi-gods’. The email addresses of lecturers are not published for students to see, talk less of them giving it to students themselves. It is not the culture. Moreover, the Hitachi starboards provided by the school to aid teaching activities in the classroom could only be used by the said lecturer. Others had no business with it; perhaps waiting to be trained on how to use it. The “tall lecturer” knew

how to use it and always used it for his teaching. The times he used the board were the only times the students ever saw the boards being used.

It is hard to change people whilst they are still within their culture. Things that are seen as against tradition are likely to be kicked against and not accepted. This is one of the factors affecting the contribution of ICT. On a positive note is the fact that the ICT culture is gradually kicking in. From one lecturer, if the vision is shared, soon, it would become two lecturers till the whole school finally accept it as a norm.

6.5.7 Government funding and Institutional Support

Saint et al., (2003) criticised the Nigerian higher education system as lacking the financial resources to maintain educational quality at a time of significant enrolment expansion. They argue that government funding of higher education in Nigeria has been guided neither by criteria linked to strategic national priorities, nor by a concern to attract talent into careers linked to public good. Since the government is almost the sole funder of higher education in Nigeria, apart from private institutions, the government must continue to seek ways funding would be enough to support all activities needed for teaching and learning in the universities.

Many of the participants lay blame on lack of government funding and institutional support when they talked about the contributions of ICT to teaching and learning in their business schools. Some of them suggest that if the government shows their support for ICT by providing funds or public enlightenment for it, then its contributions to their teaching and learning activities may be more visible. For instance, Roland, a lecturer at Faith University said;

“Faith University is a federal university and it is still under government funding. Funding is a major problem. The funds available are not enough. There are all these bureaucracies with funding” (Roland_Faith_L)

Roland called for more funding and support from the government. He suggests that there are bureaucratic issues linked to funding and should the contributions of ICT be visible, funding of university institutions must increase. The proliferation of ICT into the university system today is conspicuous and the government must move with the

flow by supporting it. Students these days can no longer afford to take their courses without appropriately learning the courses and using computers to do so.

Wayne challenged the government to provide for public universities else they will continue to lack infrastructures that are pertinent to quality teaching and learning. He said,

“Government have not been able to give enough public enlightenment in this direction. Then the money too – the funds; most of these institutions don’t have it, especially the public schools or conventional universities. They don’t have the wherewithal to get these things [ICT infrastructure]. If the money is not there, if the sensitisation is not there...If you don’t have the fund, you will lose.” (Wayne_Patience_S)

Two things Wayne mentioned are public enlightenment and funding. He argues that these are primary assignments of the government since they are the major funders of higher education in Nigeria. The government must lead the way in the provision of ICT resources by funding it and making its citizens aware of its benefits. As Phillip succinctly puts it, *“if government could encourage it, I think it should contribute more to making the [ICT] facility available”* (Phillip_Hope_S). When the funds are lacking, it would be difficult to see the contribution of ICT to teaching and learning in the classroom because institutions will find it hard to purchase ICT infrastructure.

Maurice suggests more collaboration between the government, school administrators and private organisations in the provision of ICT infrastructure.

“If the government and the school authorities can try and establish more institutes within the campuses where ICT can be assessed... where students can go into their ICT departments there, browse [surf the internet] at a very cheap rate... That improves and bridges the information gap to these ICT facilities.” (Maurice_Hope_S)

All over the world, governments are beginning to collaborate with private organisations to provide ICT infrastructure for university institutions (Hawkins, 2002; Ndou, 2004). Maurice gave an example of such collaboration in Faith University and how students are benefiting from it. He suggests such collaboration should be further encouraged in Nigeria. Maurice acknowledged that it is perhaps a medium in which to perpetrate the integration of ICT to teaching and learning in Nigerian universities. A move like that would bridge the information gap amongst students and improve their knowledge of ICT resources. Eventually it would help them to compete with their counterparts worldwide.

6.6 Brick and Mortar versus Click and Mortar

The final analysis on the contributions of ICT is on the ability of ICT to perhaps allow for more students to be enrolled without depleting the quality of teaching and learning. The question the participants answered was “If ICT was fully deployed in your school, do you think the school would be able to enrol more students and at the same time retain the quality of teaching and learning or perhaps improve it?” Two main categories emerged from their responses: ‘Click and Mortar - *More ICT, more students*’ and ‘Brick and Mortar - *More structures, more teachers*’. I employed Feenberg’s (2006) theoretical notions of technology framework (discussed in chapter 2) to analyse their responses.

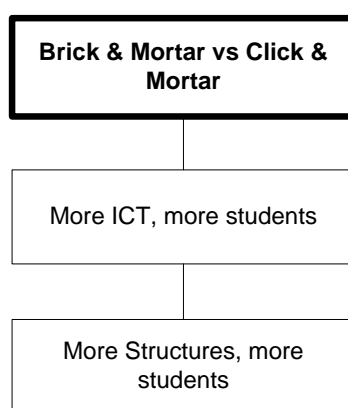


Figure 6.11: Overview of the subcategories in the brick or click versus mortar category

6.6.1 Click and Mortar - *More ICT, more students*

In appreciation of the contributions of ICT to their teaching and learning, some of the participants suggest that with more ICT in place, their school is capable of enrolling more students. *More ICT, more students* is triggered by the enthusiasm these participants have for ICT as a tool for teaching and learning. They relate the notion Feenberg (2006) classified as neutral (complete separation of means and ends). Like several ICT enthusiasts all over the world, they argue that ICT can improve the quality or the quantity (access) of university education in Nigeria in cost-effective way. Their responses further reflect their beliefs in the ability of ICT to help their schools enrol and teach more students without losing the existing quality. Some of them emphasised that this is the practice in most developed countries and why they hardly have overcrowded classrooms. In addition, they present the idea that more resources would be at their

disposal and therefore, aid flexible delivery of learning materials translating to less stressful than it currently is for them. In other words, some of them could stay back home and learn and would not have to be present in class which would reduce overcrowding and increase student enrolment. What many of them did not mention however are the challenges that comes with the click and mortar practice and the factors that would militate against its success if deployed.

“In the situation where the school is fully equipped with ICT facilities, lecturers could come to class and probably shoot a slide on how various models applies to our field of knowledge and how you can benefit maximally from it... if those are in place, everything to enhance learning and even help you to see it more practical; definitely they should be able to accommodate more students” (Phillip_Hope_S)

Phillip’s response reflects his hope in ICT to improve teaching and learning if fully deployed. Phillip’s response reflects a deterministic philosophy of ICT. This relates to the idea that ICT is autonomous, void of human control and neutral; the notion that once access to ICT is made available, everything works or will work.

His courses are very interactive; as such, images are essential to his learning. According to him, instead of his lecturers having to draw with their hands on the board as they teach, they would be able to shoot real images and perhaps videos on the projector screen, with the aid of ICT. Currently, what happens is the lecturer coming in to explain all he can and students have to go read up, search for images and links to more information in order to understand what they are being taught. Phillip argues that with ICT fully deployed, their lectures would not just be filled with theoretical explications but with creative revelations bolstered by the creative potentials of ICT. He concluded with that in place, the school “should” be able to enrol more students. His ideology is that which deems ICT as a world changer and if made available to his school, efficiency, productivity and progress are automatic by-products.

The potential of ICT to aid flexible delivery without the limitation of time and space, some refer to as what could help their schools enrol more students.

“You could even have people sitting outside of the class and attend lectures. Infrastructure is a challenge; we are not quite there yet.” (James_Patience_S)

In James’s words, his perspective of ICT is instrumentalism; ICT is a tool, human-controlled and if used, it will give the user a better result in everything. He suggests that

the main reason why there is overcrowding in universities is because the ICT infrastructure is not there yet. If the tool is there, most things are possible like the ability to distribute information to more people per time. In his words, “*you could even have people sitting outside of the class and attend lectures*”. Seemingly, James is referring to distance learning. Access to the tool is one thing; making use of it is another; ultimately using it to yield the intended results is not certain. Watson (2001) stressed that when access to technology is put before pedagogical considerations, a technological initiative is likely to fail.

Some other participants share similar instrumentalist philosophy like James; that with ICT fully deployed their schools can successfully run distance learning institutes thereby helping them enrol more students.

“...people like some of us who are working, who don’t have the time to go to the classroom, ICT will definitely help a lot to facilitate and ensure that the learning and the knowledge is passed across. There is no distance.” (Wayne_Patience_S)

“When you talk of improving the ability of the faculty to take students, I think if they can actually run a situation where people can learn from their homes, the idea will be DLI [Distance Learning Institute]. I don’t think they [students] really need to come down to the campus. If you can encourage distance learning to work anywhere, people will learn how to use ICT tools; you work online, you send your work to the person [lecturers]” (Lucas_Faith_S)

Currently there are some Nigerian students studying overseas via the aid of ICT and distance learning. Lucas contends that if such programmes are run in Nigeria by Nigerian institutions, it would help to reduce the number of students in traditional classrooms as well as increase student enrolment. According to Lucas and Wayne, if ICT is fully deployed, a student need not come to the class. He might as well just stay home and receive lectures via the internet. It is evident Wayne and Lucas are technology enthusiasts that are usually full of praises for ICT without considering the contextual issues that could affect its deployment in an environment like Nigeria.

Peter explained it in more personal terms:

“If you need to know, I don’t want to even be coming to school, seriously... Just tell me you are scheduling my lecture for 11 and I’m online getting what you are supposed to tell me, after that I can move. I can still be doing other things and at that point when I need to receive my lectures.” (Peter_Faith_S)

A student like Peter seems frustrated with attending classes; he wants to be able to perhaps engage in other activities concurrently while studying. His frustrations are hard to miss in his response. He does not care if the school puts thousands of students in a class but if it can be done outside of the classroom at the convenience of the students, without loading them in a classroom space. Peter appears to be deterministic in his philosophy of ICT. His emphasis seems to be placed on the presence of ICT. He places access to ICT over pedagogical considerations or contextual challenges and there seem to be a misfit if looked at critically. On the positive side, he imagines working with a schedule that allows him do other things and at the same time receive his lecture online when he needs to; all these he suggests that ICT could help deliver if fully deployed and the school will be able to enrol more students.

Gabriel relates that the deployment of ICT in schools is the difference between Nigerian universities and those of the developed world.

“If each student has a laptop to himself, the classes won’t be overcrowded; I mean, lecturers can actually deliver their lecture notes online. It makes it easier for us and we don’t necessarily have to be in class...” (Gabriel_Faith_S)

“It is not easy to be a Nigerian student”, said Gabriel. Having to study in overcrowded classrooms, some without personal laptops at their disposal is a challenge that impedes the performance of a student, according to him. He contends that if each student owns a laptop, as is the case in developed countries, students can attend lectures online and do not have to be present in the classroom. As such, the classrooms will not be overcrowded and the quality of teaching and learning would not be affected. He also stressed the opportunity it will provide for students to be able to work and earn money around their university schedule. The limitation of having to be present in class at all times makes working outside more of a strain. This is in line with the philosophy of most e-learning and distance learning enthusiasts but it is easier said than done in the context of Nigeria that still has challenges of power, bandwidth and cost to contend with.

6.6.2 Brick and Mortar - *More structures, more students*

Not all participants agree that fully deploying ICT in their schools is all that needs to be done to enrol more students. Some of them mention the importance of other infrastructure, tools, facilities and most importantly human intervention to aid the deployment of ICT. This is the critical philosophy that sees ICT as both human-controlled and value-laden. According to them, without the upgrade or addition of other tools and the essential requisite knowledge, skills and experience of humans, the contributions of ICT cannot or would not be seen. In other words, while they agree that ICT could have a role to play; they acknowledge more structures, teachers, facilities must still be put in place to realise the goal of enrolling more students. There are elements of classroom activity that ICT cannot make up for and these elements must be catered for equally.

Louis, a head of department at Hope University said in plain terms:

“Yes, the university can enrol more students if ICT is fully deployed but we need more structure to accommodate these projectors, all the equipment. We need bigger classes...” (Louis_Hope_L)

While Louis suggests that *the more the students, the better*, he acknowledged the fact that ICT equipment and tools still needs to be housed for them to be used. In other words, if projectors are provided, they still have to be used in classrooms and for the projector to cater for a much larger class size, then more halls have to be built. For Louis, it is a case of ‘more bricks, more students’.

Mario, a student of the same university critically adds, *“It depends on how large the class not how big the projector is”*. The quality of teaching and learning still has a lot to do with other facilities present in the classroom and not just ICT tool. Some conditions must be met if ICT would assist in the teaching and learning objectives of lecturers and students. ICT is only a tool, and not the means to the end in the classroom. He continued,

“Even if the school has to provide the ICT facilities, at least there is going to be a number of students the class would be able to accommodate for them to be able to have a glimpse of what is going on in class. That depends on the capacity of the class and other reasons” (Mario_Hope_S).

These ‘other reasons’, according to Emma, a student from Patience University, must *“go hand in hand”*. She continued...

“If ICT is present as an aid to facilitate in the whole communication process, it’s still the same space they’re constrained with. Yes, people will listen but how comfortable would they be within that environment. It has to go hand in hand.” (Emma_Patience_S)

Emma sees beyond the potentials of ICT to effect change autonomously. From a critical perspective, she suggests that learners need to be comfortable in the learning environment to be able to learn even if ICT were fully deployed. She emphasises the human-controlled philosophy of ICT, according to Feenberg (2006).

Another student of Hope University, Sarah was certain that no matter the extent of ICT deployment, if other measures are not put in place to support it, overcrowding will continue to persist and the school will not be able to accommodate more students. According to Sarah, they *“just need more structures”*.

“What I think we need here is more structures and more dedicated teachers and lecturers that are always willing to teach.” (Sarah_Hope_S)

The certainty in Sarah’s response cannot be hidden as she explains that enrolling more students and improving the quality of teaching and learning is not a feat ICT resources only can help the school achieve. More classes, lecture theatres will have to be built for that dream to be a reality. Apart from establishing more structures, Catherine, a student at Faith University said, *“they’d have to continue adding... upgrading and upgrading and upgrading”* (Catherine_Faith_S). The old structures need to be upgraded too if more students would have to be enrolled. The maintenance of infrastructure is a must. Having the ICT resources or structures in place is not enough, Nathan said, *“It now depends on how these universities are able to maintain these infrastructures.”*

For some, it is an issue beyond ICT and structures. Jason, a lecturer at Faith University acknowledges that university education is in a crisis in the nation and universities must respond by providing courses that would suit all types of students, no matter their background. Jason’s response reflects the critical theorist’s philosophy of ICT that is usually wary of technological praise-singing. Everything should not just be tied to technology; not the quality of teaching and learning nor access to universities. In his words, *“it has nothing to do with ICT”*.

“Enrolling more students really has nothing to do with ICT... And I say whether ICT is there or not people are becoming very conscious of university education. Nobody is interested in polytechnic or college of education, everybody wants to go university. (Jason_Faith_L)

According to the annual data from the Joint Matriculation Board, it can be said that the consciousness of the value of university education in Nigeria is rising. What needs to be done is for universities to plan on how to cater for all kinds of potential students instead of trying to deploy ICT. According to him, *“it has nothing to do with ICT”*. Since the government is the sole sponsor of public universities, this is an issue for the government to consider. Perhaps there should be a balance across the tertiary institutions in the country to manage the demand for university education.

6.7 Summary of Chapter

The mediational influence of the tool on the object is not only a function of its presence in the activity system (that is, providing access to it) but also the characteristics of other elements within the activity system. For instance, providing access to ICT without the culture and funding to support its use, or making available basic resources like electricity and the required internet bandwidth, or training lecturers to use it, such ICT initiative will only end up as effort in futility.

As the chapter depicts, while ICT may appear useful in providing access to information, improving or ‘making work easy’, communication and collaboration, the usefulness can only be realised if basic needs (such as electricity) are met. Designing courses with ICT embedded in the curriculum without providing the required access to ICT is meaningless and futile. It will only result in systemic tensions which would eventually result in the breakdown of the teaching and learning system.

CHAPTER 7

Discussion and Implications

7.1 Chapter Overview

In chapters four, five and six, I presented the analysis of the two key issues of this research; the context of overcrowding and the contributions of ICT to teaching and learning in overcrowded classrooms. In this chapter, I finalise the research activities I put forward in chapter three. First, I highlight the major findings in chapters four, five and six in line with the research objectives and questions in chapter one and relate them to previous findings in existing literature.

I embarked on this study to investigate the complexities around the use of ICT in the overcrowded classrooms of Nigerian universities. Therefore, the central tenet of this study is captured in applying activity theory to aid understanding the complexities around using ICT for teaching and learning (concept of tool mediation) and the overcrowding phenomenon (the context) in Nigerian universities. For university students and lecturers of a developing country like Nigeria, it appears overcrowding makes the experience of higher education different from those of developed countries. Literature suggests that large classes in developed countries like the United States of America, Australia and the United Kingdom means student numbers are more than 20 and are hardly more than 200 (Blatchford & Lai 2010). Even when they are more than 200, what seems particularly inherent in these developed countries is that for the large classes, the resources available to students seem adequate. The only issues debated in literature are the issues of one instructor managing such classes or the pedagogical approach used in such classrooms (Mulryan-Kyne, 2010). Gibbs and Jenkins (1992) argue that while there are no rigid definitions as to how many students make a class large, what is of relative concern are what resources, accommodation and facilities are available to cater for the students (Gibbs & Jenkins, 1992).

For developing countries however, the resources available to students in the large classes have been assessed as inadequate. In Nigeria for instance, Ajadi's (2010) reveals that "there is a gross inadequate provision of university education in Nigeria due to the absence of improved facilities to cope with the increasing demand for university

education.” Akpotu and Akpochafo (2009) also argue that the resources required to provide quality education have been scarce, while students’ desire for university education continue to mount. In their words, “resources for university education in terms of staff needs, funds, physical facilities and equipment have continuously been in a state of shortage in Nigeria” (p. 23). As aforementioned in previous chapters, class sizes of Nigerian universities are usually ‘larger than large’, reflecting the resource situation available in the institutions. The facilities and resources available to cater for students are not commensurate with the number of students enrolled.

Though, there have been suggestions in literature that ICT resources may have a role to play by perhaps making up for the resource situation or improving teaching and learning in such situations the findings from this study reveal that teaching and learning in overcrowded classrooms are not down to access to or perhaps use of the tool (ICT) alone but a lot of other factors that are contextualised to the activity system are also critical.

7.2 Overcrowding and the contributions of ICT

The analyses in the finding chapters are largely informed by the framework of activity theory. As such, the chapters reflect the perspectives of the participants of this study as subjects of the activity system and my interpretations of them. In chapter four, they shared their experiences of overcrowding context; their perception of it, coping strategies they have employed to address it and the effect it has on their teaching and learning activities. In chapters five and six, they shared their experiences and opinions on the contributions of ICT to their teaching and learning, how they access ICT, how ICT is used for their teaching and learning activities, the challenges of ICT access and use, the link between the use of ICT and their teaching and learning objectives, and the contradictions pertaining to the use of ICT within their institutions. The analysis of the data provided answers to the research questions I highlighted in Chapter One.

From the analysis of the data collected from the three universities, and through the lens of activity theory; three themes emerged as represented in chapters four, five and six. Apart from the first theme which is an exposition of the context, the themes are embedded in the principles of activity theory. The principles I explore include the

cultural-historical development of activity systems, the tool mediation concept and the principle of contradictions. Cultural-historical development refers to nature of the activity system in relation to the history behind the activity that takes place in it. The tool mediation concept refers to the interaction of the tool with other elements in the activity system towards the objective of the activity. The principle of contradiction emphasises the systemic tensions embedded in the activity system. The themes are exploring the context, locating the tool in the activity system and the contribution of the tool.

In this chapter, I compare and contrast the themes with findings and claims from relevant literature on key issues in this study (as shown in chapter two). These are effects of large classes on student learning and achievement, the use of technology in large classes and the use of ICT in Nigerian universities. The discussion in this chapter further contributes to the understanding of the use of ICT for teaching and learning in overcrowded classrooms.

7.3 Theme 1: Exploring the context

Uncovering the overcrowding phenomenon requires providing an expository account of the entire context from the perspectives of the subjects (the participants). In order to understand the interplay between the use of ICT and teaching and learning in the crowded classrooms of the universities, it is important to first of all understand what the classrooms are like, the perception of the participants with respect to the size of their classrooms, how they cope with their class size and finally, how it affects their teaching and learning activities. Chapter four was aimed at presenting findings related to these issues in accordance to the first set of research questions in chapter 1:

- *How is overcrowding perceived by the students and lecturers of Nigerian business schools and how does it affect their teaching and learning activities?*
- *How are the students and lecturers coping with overcrowding and its effects on their teaching and learning?*

Most of the findings within this theme confirmed reports on the large class size debate in literature. For instance, Teferra and Altbach (2004) contend that, “In virtually all

African countries, demand for access to higher education is growing, straining the resources of higher education institutions. Students have had to be admitted into institutions originally designed for fewer students and enrolments have escalated but financial resources have not kept pace” (p. 25). I found this observation true as results of my study confirm it. My personal assessment of the public universities in my study is not far from Teferra and Altbach’s (2004) observations.

In addition, the students and lecturers I interviewed perceived overcrowding as a norm in Nigerian public universities. In the words of one of the lecturers, “*it is a normal norm*”. The demand for university education increases by the day without a corresponding increase in the resources required to cater for them, especially in the public universities catered for by the government (Ajadi, 2010; Erinosh, 2008). This is why it would be unlikely to see a public university in Nigeria where the classrooms would not be crowded with students struggling for spaces to sit and lecturers having to scream at the top of their voices if they do not have microphones to communicate to the multitude of students in their classrooms. This corroborates with my literature review in chapter two: Burruss et al.’s (2009) argues that the shortage of educators and the expanding enrolments of students in all academic programs are the reasons behind increasing class sizes all over the world. My observation suggests these universities enrol students beyond what their size could possibly accommodate. Erinosh’s (2008, p 43) study points out that Nigerian universities “have begun to enrol more students than they can handle effectively”. Akpotu and Akpochafo (2009) also reveal that, in the absence of improved facilities to cope with increased demand, Nigerian universities are as a result exceeding their carrying capacities. This is why it is possible to see 250 students in a classroom space built for 100 students. The public universities I visited had this kind of scenario. I observed that during lectures, students did not sit comfortably. They battle for spaces to sit, where to place their notebooks to take notes in class. Some sit on the floor and even on the laps of their fellow students. A bench meant to accommodate about five students had about 8 students squeezing to fit on it. I took pictures of the classrooms but for ethical reasons, I am not allowed to include them in this thesis.

According to the students and lecturers I interviewed, overcrowding has come to stay and they just have to adapt and cope with it, which they have been doing. I also found

that the challenge of overcrowding is fuelled by pressure to enrol more students as a result of the huge demand. Beyond the threatening demand are other compelling factors such as lack or limited infrastructure in the schools, lack of planning on the part of the institutions, limited human resources, limited number of institutions to accommodate students and the cost effectiveness of attending public schools over private ones. This confirms Erinoshio's (2008) observation of Nigerian universities that there is a "rapid expansion in student enrolment without corresponding and perceptible increase in the number of quality staff and improvement/expansion of physical facilities" (p 42). Ajadi (2010) also argues that there is a gross inadequate provision of university education in Nigeria due to the absence of improved resources to accommodate the increasing demand. Akpotu and Akpochofo (2009) report a similar finding and emphasise that "resources for university education in terms of staff need, funds, physical facilities and equipment have continuously been in state of acute shortage in Nigeria" (p. 23). Okebukola (2004) also contends that the absorptive capacity of Nigerian universities would soon become worse. This means if something is not done to make sure there is a corresponding increase in infrastructure as enrolment increases, overcrowding would indeed linger (cited in Ajadi, 2010).

I also found that the experience is a bit different for private universities. The factors causing overcrowding in the public universities are almost non-existent in the private university. This confirms the argument of some scholars that the growth of private universities in Africa is as a result of the failure of public ones (Akpotu & Akpochofo, 2009; Mabizela, 2007; Banya, 2001; Ajadi, 2010; Erinoshio, 2008; Obasi, 2007). In other words, private universities are alternatives to public ones. Akpotu & Akpochofo (2009) contend that the failure of public universities manifests in forms of enlarged teacher-student ratio, overcrowded classrooms, poor quality teaching and research, examination malpractices and incessant strikes of staff. They conclude that these are the reasons why "more parents and guardians tend to opt for private universities where strikes and other vices associated with public universities are virtually non-existent" (p. 23). Ajadi (2010) also identified the failure of public universities to satisfy the growing social demand for university education in Nigeria as the void private universities are helping to fill.

For instance, the participants noted that Patience University, like most private universities in Nigeria, is not pressured by the demand to enrol a large number of students, instead proper planning goes into the number of students it enrolls. In other words, careful measures are put in place to ensure the classrooms at Patience University are not crowded. The university ensures the infrastructure available is enough for the number of students they enrol and likewise, the human resource available to them is adequate to meet the needs of their students. As literature on private universities in Africa and Nigeria reflects, it appears private universities are in direct contrast to the public ones where overcrowding is concerned (Mabizela 2007; Akpotu & Akpochafo 2009; Ajadi 2010). In the words of one of the lecturers at the private university, “in other places, yes (there is overcrowding), but here we don’t have overcrowded classrooms”. Obasi’s (2007) study on the growth of private universities in Nigeria from 1999-2006 suggest that private universities are now setting the pace in Nigeria, and serving as a source of positive challenge to the public universities. He emphasised that they are creating a healthy competitive environment which is necessary for the future growth and diversification of the entire higher education system in Nigeria. Ajadi (2010) however warns that some private universities are now experiencing explosion in student enrolment and the once available facilities are not enough. He argues that this is bringing a lot of vices into the institutions (such as examination malpractices) that were alien to them.

Since overcrowding is a “norm” and has “come to stay” as one of the participants noted, what is crucial to knowledge are the strategies the institutions are adopting to cope with it. Gibbs and Jenkins (1992) acknowledge that, universities and higher education systems are developing ways of coping with large classes. They also stressed however that these coping strategies have their costs, particularly in terms of drop-outs and failures. On how the lecturers cope with overcrowding in the public universities; their major strategy is attempting to divide the students into groups in order to reduce their population per class or per lecture. The question however is, how economical is it to teach different groups of students at different times when they could have been taught at once? Certainly, as Gibbs and Jenkins (1992) argue, this strategy is not without a cost attached. In this case, the cost is usually economic in nature. Several scholars including Hall and Binney (2005) and Moore (2003) argue that large classes are economical to run claiming it affords institutions and educational systems economies of scale.

Kokkelenberg et al., (2008) put it like this; “schools often look to spreading the costs of faculty over more students by increasing class sizes or by increasing workload (number of courses taught per term). The latter method is resisted by faculty senates, unions, and often trustees, leaving the easier option of marginally increasing class size as a way to realize economies of scale” (p. 222). While Oliver (2007) agrees to the economies of scale report, he argues that it is not without some risks.

When students of large classes are grouped into small classes to be taught separately, the economies of scale advantage seems lost. In other words, institutions have to pay more for students to be taught. Another risk perhaps is the burden it places on staff to have to teach twice instead of once. Waddington (2010) clearly suggests this would result in time and resources management difficulties as class sessions would have to be repeated. He argues that this places unjustifiable burdens on participating staff.

Some of the lecturers also commented on how they use strong measures of discipline to contain and maintain decorum in their classrooms. Blatchford and Lai (2010) argue that pupil discipline tends to be more difficult in large classes with more intrusion into the teaching and learning process. This is the reason why lecturers tend to adopt a strong disciplinary approach to managing their classrooms. Moreover, because of the large class size, students tend to be less accountable. They engage in all sorts of activities that are unfriendly to teaching and learning and if they are not handled very well, the purpose of the classes may not be achieved. This correlates with Ehrenberg et al.’s (2001) findings that teachers perceive smaller classes as easier to control than large classes. The teachers stressed that managing student behaviour tends to be easier and student misbehaviour is less compared to large classes. This finding is also consistent with a recent study by Harfitt (2012) on teachers’ perception and practice of teaching both large and reduced class sizes. He found that large class sizes provide teachers with more discipline problems. Similarly, the studies of Messino et al., (2007) and Cooper and Robinson (2000) both suggest that lessened individual accountability and increase in noise and distractions are particularly inherent characteristics of large class sizes making it difficult to manage for instructors.

On the other hand, students in my study had their own way of coping. Some of them simply force themselves to focus while in the classroom. They try to shun the noise

from their colleagues and listen to the lecturer as much as they can. As Messineo, Gaither, Bolt and Ritchey (2007) argue that students in large classes are likely to become accustomed to adopting a passive or anonymous role in class if care is not taken. This is the reason it requires a personal and perhaps determined effort on the part of the students to ensure their learning goals are met in the large classroom. Moulding (2010) also reports that large class sizes could force students towards passive adoption of learning materials because of lecture method usually obtained in such classes. Other students ensured they get to the class very early before their classes to secure a good space close to the lecturer so they are not distracted. These are the strategies the students had to use if they must make anything out of their classes. I observe that this aspect of my findings has not been well reported in literature. I did not find any study that particularly addressed the strategies with which students personally coped with large class sized classrooms.

My findings reveal that the large class size affects both the teachers and students not only within the classroom but outside of it as well. Lecturers complained that their enormous work load stressed them out. In the interview, a lecturer described it as “carrying more load than you are supposed to carry”. The same lecturer commented that “it is only reasonable to conclude that you are going to be tired”. Archibong, Ogbiji and Anijaobi-Idem (2010) in their study on ICT competence amongst Nigerian universities’ academic staff found that most of the lecturers complain about their workload. They complain about their excess workload and how it “does not give them time to train or even improve upon their ICT skills” (p 113). They stressed that some lecturers, as a result of their excess workload lack interest in ICT while others are unwilling to exercise the patience to learn. Agbonlahor (2006) findings also reflect that the level of access to computers significantly influences both the frequency of computer use as well as the number of computer applications used by lecturers. This means, the administrative work of lecturers as a result of student numbers could affect their access to ICT which in turn is likely to affect their frequency of computer use and knowledge of its applications. According to the lecturers in my study, the number of the students they have to attend to affects their morale and in turn, the quality of their delivery in class.

Outside of the classroom, when it comes to marking students' assignments and projects, it becomes a tiresome task that is capable of overwhelming the lecturer. It not only affects the lecturer but also the quality of the marking. It is usually very hard to maintain a consistent standard across the overwhelming scripts and also the pressure to turn-around the scripts could lead to a poor job being done. Students also suggest that the reason why some of their lecturers fail to appear in class for lectures is because of the chaos in classrooms as a result of the class size. The multitude of students in the classroom and the task of managing them are factors capable of crippling a lecturer's motivation to teach or even attend to students.

Moreover, lecturers find it hard to attend to students personally. As a result, students miss out on getting feedback from their lecturers. It is hard to take questions in the classroom or even give students time to see personally due to the overwhelming response that is likely to emerge. Another thing it affects is the time for research and consultation. Lecturers also bemoan how the number of students they cater for and the administrative duties that follow sucks out their time for research. Sangowusi (2003) made a similar finding in his study that Nigerian university academics are often overwhelmed by teaching and administrative chores allowing them very little time for research.

Overcrowding affects the students as well. In the classrooms, there is limited or lack of interaction going on either it is student to student or student to lecturer interaction. There is also the problem of anonymity and lack of accountability. Lecturers do not know the students and as a result, the students act anyhow in the classroom. Moreover, lecturers cannot attend to the individual needs of their students. They find it hard to 'know' their students one on one or be able to relate to them to understand what their learning needs or goals are. Another thing I found on the effect of overcrowding was about class attendance. Overcrowded classrooms also discourage students from attending class just as it discourages their lecturers too. Since they are accountable to no one, some students feel no need to attend class so long as they can get the notes from their fellow students that attended the class. My findings also reveal that the attention, retention and student satisfaction in overcrowded classrooms are very low. The chaos in the classroom affects the attention of students and consequently, their rate of assimilation and retention. Issues mentioned include distraction, lack of convenience,

and condition of infrastructure. In literature, several studies confirm these issues about the effect of large classes on students' learning and achievement. Cuseo (2007) in his study found that large classes reduce the frequency and quality of student-student and student-lecturer interaction, as well as the depth of thinking of students in the classroom. Burruss et al., (2009) also made a similar finding about significantly lower peer interaction in large classes than in smaller classes. Hall, Binney, and Kennedy (2005) also reported issues of feelings of anonymity and isolation amongst students in large classes. Oliver (2007) confirms in his study that large classes tend to be impersonal to many students. Blatchford and Lai (2010) found that large classes led to students having a passive role in class.

7.4 Theme 2: Locating the tool within the activity system

The main question answered in chapter five and my reflections concerning the findings:

- *How are ICT tools used for teaching and learning activities in the overcrowded classrooms of Nigerian universities?*

The main theme explored in chapter five was 'locating the tool in the activity system' and this relates how ICT is being used within the activity system (universities). The three main categories that informed the findings in that chapter include: the position of the tool; access to the tool; and the tool, from the perspectives of the subject.

The position of the tool brings about a very important finding in this thesis that is hardly explicitly stated in literature. While most scholars have talked about the lack of ICT in the classrooms of universities of developing countries like Nigeria, what most of them fail to do is to investigate the use of ICT outside the classroom for teaching and learning objectives. I found that in the public universities, the most common forms of ICT are computers, internet and mobile phones. This is consistent with Adetimirin's (2011) findings that the most common forms of ICT in Nigerian universities are computers, mobile phones and the internet; with mobile phones having the highest frequency of use.

The ICT resources are not available for teaching and learning in the classroom at present. Both from my observation of the classrooms and the responses gathered from the interviews, the most common form of ICT - computers - are not used in the classroom. However, lecturers and students do use ICT outside the classroom for their teaching and learning activities. Lecturers lay claim to conducting research on the internet while preparing for their classes so as to make sure their lecture notes are up to date. The students also said they used ICT outside the classroom to help with their assignments, to further aid their understanding of their courses, and assist with research on their projects. This is consistent with a few findings in literature. For instance, Ajayi (2008, p. 210) in her study of the use of ICT in Nigerian higher education institutions found that in the classrooms, *“ICT facilities such as internet, electronic boards and projectors were not available... and ICT facilities were not adequately used for teaching”*. While Ajayi’s (2008) claim to the inadequacy of the use of ICT facilities seems ambiguous, what is clear is that there are no ICT facilities in the classroom. Achimugu et al., (2010) study on the impact of ICT diffusion in one of Nigeria’s universities also found that even though the school has ICT installed within the confines of the campus, the classrooms were still an exception. Students and lecturers make use of ICT facilities outside of the classroom for their classroom teaching and learning activities. Ani (2010) also confirms in his studies that Nigerian students use ICT resources mainly for academic purposes. 87.1% of the 180 students in his study use the internet mostly for research related activities (e.g. information search for their term papers, seminar presentations and projects); 80.1% to help with their class assignments and 52.4% to make-up their lecture notes. He contends even the non-academic use of the internet still had links with academic activities such as school registrations, payment of tuition fees, reading online newspapers, and searching and applying for scholarships.

The question therefore is; how do they *access the ICT resources* for their teaching and learning objectives? The second category in the chapter provided answers to this. The most common access to ICT resources are cybercafés, school libraries/computer laboratories and mobile phones. The cybercafés provide access to ICT not only for students but also for their lecturers. Not many students can afford personal computers (which are also a platform of access to ICT) but once in a while, they go to the cybercafés, pay the required amount of money to use the computers, printers, scanners and the internet there. They consider the cost of going to the cybercafé cheaper than

owning a personal computer. Owning a personal computer comes with the cost of buying internet modems, subscribing to and maintaining internet access on their computers. The use of mobile phones to access the internet is a popular activity amongst Nigerian students and lecturers. The Smartphone technology has made it possible to access the internet at a cheap subscription cost compared to personal computers. The Blackberry Smartphone is the most common of them. The students and lecturers talked about how they are able to access the internet; edit their school work on the go and communicate with their colleagues. These findings are consistent with literature. Archibong et al., (2010), from a survey of 300 academic staff of the two Nigerian universities reveal that 62.3% of them access the internet at public cybercafés, 31% from their personal computers and 6.7% within the school premises. The ones with personal computers create their own means of access to the internet “by buying modem and air time from internet service providers” (p. 112). Also in Adetimirin’s (2011) study of 1476 undergraduate students from seven Nigerian universities, mobile phones were found to be the commonest form of ICT and internet access even though the percentage of its use varies across the universities. The findings also reveal that the students used their mobile phones for academics purposes. The study of Fatoki (2004) on the impact of the internet on undergraduate students in one of Nigeria’s university reveals that the students access the internet for their academic work mainly from commercial cybercafés. In Ani’s (2010) study on internet access and use in Nigerian universities, he found that while some staff had access to the internet in their offices when connected, students mainly had access through some access points on campus such as university library, ICT centres in departments and faculties. The majority (82.6% of 180 students) access the internet from outside the school at commercial cybercafés.

Just as Ani’s (2010) study reveal, other points of access to the internet are the school library or computer laboratories. For the public schools, the students and lecturers complain severely about the inadequacy of the laboratory to cater for their academic needs due to the large number of students and the limited time they are scheduled to use them. The laboratories are not such that the students can go there anytime they desire. They have to work with a time table provided by the school which emphasises the day and time allocated to each class. In other words, a student is only allowed to visit the laboratory on day allocated to his course. He or she is prohibited to come into the laboratory on other days or time. Several participants believe this is as a result of the

overcrowding phenomena and the time table is just a method of coping the school subscribes to towards maintaining the laboratory and the resources in it. This is consistent with findings in literature; for instance, Adetimirin (2011) found that the number of ICT in the seven universities they surveyed was inadequate when compared with the number of undergraduates in them. His findings also highlight limited duration of the use of available ICT infrastructure as one of the challenges of ICT literacy amongst Nigerian students. Agbonlahor's (2006) study shows that while some departments of Nigerian universities in the study have computer laboratories that provide access to ICT, the infrastructure available are insufficient for the needs of faculties and students. The study further reveals that the level of access to computers significantly influences both the frequency of computer use and the number of applications used by the lecturers in his study. Achimugu, Oluwagbemi and Oluwaranti (2010) also reveal in their study on the diffusion of ICT across Nigerian higher institutions that while computers are available to use in the institutions, they are not readily accessible to the students because of the low ratio of available personal computer (PC) to number of students.

However, in the private university, the situation is different. Most of the students and lecturers have their own personal computers and mobile phones with access to the internet. Only a few of them use the services of cybercafés. This is possibly because a private university is deemed an elite institution with students whose parents can afford to pay high and exorbitant fees for them to be enrolled. Therefore, buying a laptop for them or paying for monthly internet subscriptions is not that much of an ordeal. They have computer laboratories and computer sites in their library but they are usually empty as students prefer to work on their personal laptops.

7.5 Theme 3: The contribution of the tool to the activity system

The questions answered in chapter six and my reflections concerning the findings are:

- *How does ICT contribute to teaching and learning in the overcrowded classrooms of Nigerian universities?*
- *What are the inherent factors affecting the use and integration of ICT for teaching and learning in Nigerian universities?*

- *What systemic tensions or contradictions emerged from the views of students and lecturers on the use of ICT for teaching and learning in the universities?*

The main theme dealt with in chapter six is tagged ‘The contribution of the tool’ because it emphasises the meditational activity of the tool within the activity system. It also captures the challenges facing the use of ICT and the systemic tensions unravelled in the activity system as a result of using ICT.

Linking the tool to the object relates the analysis of the direct contribution of ICT to the teaching and learning objectives of the students and lecturers. As the title relates, the analysis of that section of the chapter elicits the meditational activity of the tool between the subjects and the objective of their teaching and learning activities. In other words, it explores how ICT is linked to their academic goals. I found that access to information was the main contribution of ICT that the students and lecturers talked about. In the public schools, ICT is not positioned in the classroom; as a result, lecturers use their computers and the internet outside of the classroom to access information to either aid the delivery of their lectures or for the purpose of research. Likewise, students and staff use their computers, mobile phones and the internet to search for information to help with their school assignments (for students), projects and research work. Ani, Edem and Ottong (2010) had a similar finding in their study of the use of the Internet by academic staff of Nigerian university, reporting that the academic staff used the internet as infrastructure to obtain information make-up lecture notes as well as information for research. Nwagwu, Adekanbi and Bello (2009) also found that Nigerian students and lecturers use the internet as the first point of call for information search and retrieval for the purposes of teaching, learning and research. Osunade and Ojo (2003) likewise reveal in their study that Nigerian university students used the internet more than they used the library to acquire academic information. Ani (2010) also found that students’ appraisal of the internet is attributed to the claim that it provides them with “quick and timely access to information within and outside university libraries” (p. 561).

The students talked about how they also use ICT to communicate. For instance, when they are absent from class, they are able to call their classmates to get themselves up to date as to the things they missed. Lecturers also talked about how emails have made life easier in that they do not have to wait for days to pass their messages across to others. This finding is consistent with the findings in Nwagwu, Adekanbi and Bello’s (2009)

study of factors influencing the use of the internet in a Nigerian university. They found that students and faculty members used the internet most for educational purposes amongst other uses. One of such uses is communication; students with their lecturers and their friends. Ani, Edem and Ottong (2010) also found that staff of Nigerian universities use the internet more for communication “through email to enhance their teaching/research activities” (p 542).

I have also found that there are contextually embedded challenges as regards the use of ICT. Among many others, the most commonly mentioned is electricity problems. Nigeria, though an oil producing nation is still plagued with the problem of erratic power supply. It is a long standing and nationwide problem. It is a basic need without which other needs depend or rely on, particularly the use of ICT. Computers, mobile phones, projectors; most of these tools are electronic in nature and therefore need electricity. Where the supply of power is irregular and inadequate, the use of these tools will be affected. Moreover, it raises the cost of using them because individuals, institutions have to rely on private generating sets to provide electricity. Archibong, Ogbiji and Anijaobi-Idem (2010) found that “electricity supply which is critical to the usage of ICT facilities is very epileptic in Nigeria which makes ownership of a power generator mandatory for ICT users” (p 113). These generating sets rely on fuels – petrol and diesel mostly. The scarcity of these fuels is not alien to the Nigerian citizens just as much as the frequent rise in their prices (well, the hike is a worldwide phenomenon). Power supply is a major impediment to the use of ICT in Nigerian universities and this finding is consistent with literature. Recent studies on the challenges of ICT in Nigerian universities point out that the frequency of ICT use often suffers from major impediments like power supply (Omotayo, 2010; Agbonlahor, 2006; Adetimirin, 2011; Archibong, Ogbiji and Anijaobi-Idem, 2010). Adetimirin (2011) like most other scholars found irregular power supply as the highest ranked challenge to ICT literacy in his study. Interestingly, in the seven universities he surveyed, irregular power supply was the only constraint for which the pattern of response was similar. He argues that the reason for this is because the power supply challenge is a “national problem faced by all in the country” (p. 10).

Another highly emphasised challenge is the issue of internet bandwidth. The participants lament the slow internet in Nigeria as a result of bandwidth constraints.

Even when subscription is made for unlimited access, some of them suggest, it is still poor and slow. In the words of one lecturer, “it takes a long time for a page to download”. I also found that Technophobia and computer literacy as still part of the challenges of using ICT in Nigeria. Some lecturers, especially those of the public universities do not seem to yet appreciate the idea of using ICT for their teaching. Archibong, Ogbiji and Anijaobi-Idem (2010) made similar findings in their study but argue that one cause of this challenge is the “excess workload” of the lecturers as a result of the number of students they deal with on a daily basis. They also found that majority of the academic staff (53.3% as compared to 40% moderate and 6.7% high) in their survey rated their competency in the use of ICT as low suggesting that, “academic staff are still not competent in utilising ICT” (p. 112).

Some students likewise, because of their limited access to computers and the internet, are technophobic and lack knowledge about using them. Some of the participants also complained of the cost of ICT. This includes the cost of laptops; monthly subscription to the internet and smart phones that easily makes access to the internet possible. Not many of the students could afford these costs and thus, it is a challenge to the use of ICT. This finding is similar to Oyeyinka and Adeya’s (2004) in that internet access and cost of access are significantly correlated. Their findings reveal that cost constraints largely foreclose ownership of PCs and for this reason students and lecturers look for alternative avenues to access the internet. They also found that most of the Nigerian academics they surveyed had private internet accounts with the few existing Internet Service Providers (ISP) while others rely more on internet cafes.

I observed that culture plays a role when it comes to the use of ICT. Culture refers to the norms of the society or institution. I found that some lecturers still perceive ICT as a distraction especially to classroom activities. The advent of social media platforms like Facebook, Twitter and GooglePlus is perceived by this group of lecturers as perhaps detrimental to the learning of students. Some of them also suggest ICT is encouraging fraudulent acts (like the Nigerian banking scam) amongst youngsters in the country and that it is exposing them to a lot of information that are perhaps not ‘culturally acceptable’. Adebayo (2008) confirms this finding in her study on the use and challenges of ICT in Nigerian universities. Her study reveals that in some parts of

Nigeria, the culture tends to see ICT as a means to corrupt students' behaviours thus inducing a negative attitude to norms and values of the society.

Every activity system has embedded in them culturally historic tensions capable of causing breakdowns or serves as opportunity for change and learning (Turner & Turner, 2001). As activity systems are inherently dynamic, contradictions are part of activity theory's approach to capture the intricacies of the series of activities taking place in them. The analysis of contradictions in an educational system is useful in opening the eyes of policy makers and curriculum developers to contextual issues pertinent to the decision on the appropriate pedagogical approach that meets the needs of teachers and students (Hu & Webb, 2009). In my analysis of the contribution of ICT to teaching and learning in the universities, I noticed some historically embedded systemic tensions. I particularly identified five of them both within and between the elements of the activity system.

I notice some contradictions within the rules; that is, some courses had ICT embedded in their curriculum yet, access to ICT was limited to both lecturers and students. Students have to take turns to use computers in the laboratory as a result of the number of students enrolled. I observed that most lecturers do not even have desktop computers provided for them by the school in their offices. What I saw were laptops which I believe were personally owned by the lecturers. I also noticed contradictions within the subjects; that is, contradictory beliefs amongst the participants as to the contributions of ICT to their teaching and learning activities. While some believe all that is needed is more access to ICT and all their objectives would be met; others express that access to ICT is one thing, appropriating the potentials of ICT to their objective is another.

A similar finding can be seen in Hu and Webb's (2009) study on the integration of ICT to higher education in China. They also discovered contradictions within the subjects of the activity system relating to their beliefs on the potentials of ICT to improve student learning. While some teachers in their study were enthusiastic and positive about the potentials of ICT to improve student learning because it provided new opportunities, others had doubts about its value and argue that it is a major source of distraction from learning. Even though Hu and Webb's (2009) study was done in China, it reflects similar findings as to possible varying perceptions of ICT amongst subjects of an

activity system. Basharina (2007) also found contradictions within groups of students from different nationalities in his study. The students had different expectations as to their use of ICT, particularly the online discussion forum for their course. Mexicans had an informal way of posting on the forum by abstracting knowledge from their readings before posting while the Russians tend to be formal and academic which is almost like a 'copy and paste' of their readings. The Mexican students criticised the Russians of plagiarism. Subjects of activity systems are human beings and as such, they have the right to their own beliefs; and if they do not share similar backgrounds, perceptions, norms or value systems, there is likely to be a clash. An analysis of this type of contradiction could help to foresee a clash of cultures and provide decision makers with a framework on how to mitigate it.

In addition, contradictions exist between subject and rules. It is the norm that students do not submit their assignments by email to their lecturers. However, some lecturers' request that their students should submit their assignment online exposed a systemic tension. Students saw the request as strange as it was not usually the case. They could not believe their ears. The students point out however that the lecturers that made these requests were not home-grown; that is, they had only just come from overseas having completed their PhD studies there and as such, were not used to the culture at the school. I also found contradictions between subject and community as school administrators provided electronic board (Hitachi starboards) for lecturers to use but unfortunately, most of the lecturers lack the required competence to use them. As a result, the boards lie waste in the classrooms at Faith University as reports suggest only one lecturer knows how to use them.

Findings of this nature (between elements of the activity system) also exist in literature. For instance, Hu and Webb (2009) in their study reveal a contradiction between subject and rules. In the Chinese institution, the ICT policy reflects that teachers' use of ICT resources for their teaching depends on the size of the class rather than the actual need for it. Some of the teachers saw this as an impediment to their intentions to adopt ICT for their teaching activities. The intention of some of the lecturers to adopt ICT is met with the challenge of the ICT policy statement that subjects their adoption of ICT to the size of their classes. Demiraslan and Usluel (2008), in their study of complex pedagogical, social, and technological issues in Turkish schools reveal a few

contradictions between elements of the activity system. For instance, contradictions including between subject and division of labour – teachers were willing to use ICT resources but support from school administration was insufficient; between subject and tools – teachers were willing to use ICT resources for their teaching activities but the resources are limited as the schools lacked computers in classrooms; rules and tools – classes were expected to be interactive and engaging but resources to facilitate such activities in the classroom were lacking.

This reflects that every academic community has context specific tensions in their activity system. The principle of contradiction is useful in any context to expose these tensions.

7.6 Summary of Chapter

In this chapter, I explored the relationships between the categories that make up the themes. The analysis and discussion in relation to the three themes provide answers to the research questions of this study. I exposed the analysis of the major findings under each theme, and compared and contrasted them with existing literature evidence. Apart from the first theme which is about the context of the study, the two themes were informed by the framework of activity theory.

The analysis and discussion I have made in this chapter informs the theoretical generalisations I make in the next chapter of this thesis.

CHAPTER 8

Conclusions

8.1 Chapter Overview

In chapter 1, I relayed the objectives of this study and here in chapter 8, I can attest that those objectives have been fulfilled. For instance, in chapter 4, I provided an account of the context - teaching and learning in the overcrowded classrooms of Nigerian universities. In chapters 5 and 6, following the framework of activity theory, I presented an analysis of access to ICT and its contributions to teaching and learning in the overcrowded classrooms of Nigerian universities.

In this chapter I conclude my presentations of this study while leaving suggestions for future studies on this topic. This chapter is outlined as follows: In the next section, I present my personal reflections and consider the implications of the findings of this study. My reflections were used to address the pertinent question I posed in chapter one. Thereafter I proceed to both the theoretical and practical contributions of the study. I also talk about the limitations of this research work and explain how future studies can benefit from the findings therein.

8.2 Implications and reflections

The research problem that prompted this study was the teaching and learning activities in the overcrowded classrooms of Nigerian universities. Hence, I carried out this study to investigate the contributions of ICT to teaching and learning in the crowded classrooms. From the analysis of the data collected from three Nigerian universities through the lens of activity theory; two main themes emerged which were represented in the last two chapters (five and six) eliciting the research findings. From the findings that emerged from undertaking this study, I can provide explanations to aid understanding the underlying factors influencing the interplay between the use of ICT and teaching and learning activities in the overcrowded classrooms of universities in a developing country like Nigeria. These explanations provide answers to the pertinent question I raised in chapter one. I answered the question based on my reflections on the results of this study. The question is:

Does access to or use of ICT automatically guarantee that students and lecturers will achieve their teaching and learning objectives in the classroom?

Based on the results of this study, my answer to this question is NO, for a number of reasons. Access to ICT is one thing, and teaching and learning with ICT is another. According to Watson (2001), raising the standards of teaching and learning should never be intertwined with the use of ICT. Also, in the words of Peeraer and Van Petegem (2010, p. 2), “there is nothing inherent in technology that automatically guarantees learning”. This study has made me realise that a deterministic or technocentric approach to ICT initiatives aimed at teaching and learning could result in efforts in futility. Most of the participants of this study tend to have this deterministic approach to the use of ICT. However, this study reveals that access to or the use of ICT alone would not improve teaching and learning in Nigerian universities until some conditions are met. Some measures have to be put in place if investments into ICT initiatives would not result in a waste of resources. As Watson (2001) suggests, understanding the use of ICT for teaching and learning in any academic scene demands a consideration of some fundamental educational issues. Peeraer and Van Petegem (2010) also claim that learning is a shared activity that is distributed between the technology, the learner, and the context. As such, there are issues that are contextual with significant implications to the use of ICT in a particular setting.

Maslow’s (1943) classical framework on human needs and motivation is useful in explaining my point of view for developing countries in particular. In his work, Maslow classified the most basic human needs as deficiency needs (esteem, friendship and love, security, and physical needs) and argues that until these basic needs are met, an individual is likely to lack motivation to gravitate towards meeting higher order needs. Similarly, ICT could be seen as a higher order need because some other basic needs have to be met before it can be used. These basic needs are linked to the deficiency needs identified in Maslow’s work. Self-esteem (or mastery orientation) is one of them: this means, the belief users of technology have in themselves that they can use the system to achieve their goals. For them to have this motivation they must be trained; they must be re-orientated, carried along in the policy making decisions, their culture must be put into perspective. The empirical evidence from both Faith and Hope

Universities confirms issues of culture, technophobia and computer literacy as barriers to the use of ICT for teaching and learning activities.

Perhaps not a deficiency need according to the Maslow framework but significant if the goals of ICT initiatives would be realised is electricity. Poor and irregular power supply in Nigeria is not only a national issue but also a long standing one. Any ICT initiative must recognise this need as a major challenge and therefore put into perspective as to how to mitigate or manage it. Many private organisations provide computers and other ICT tools to universities, failing to put the issue of electricity into perspective. As a result, the computers either lack regular use or develop serious faults as a result of on and off electricity. Empirical evidence from the three universities put electricity as the topmost challenge facing the use of ICT. It is easy to prescribe private generating sets as a solution to this challenge but what immediately comes to mind is the challenge of fuelling the set. There are two issues surrounding the fuelling of the generating set. First, the cost of petroleum products is on the high side all over the world and even though Nigeria is an oil producing state, it is not exempted. Second, Nigeria, from time to time, suffers from scarcity of petroleum products. At these times of scarcity, fuel prices are always on the rise, making it difficult for individuals and institutions to fuel their generating sets. The budgets made for electricity supply has to be flexible enough accommodate these irregularities.

Empirical evidence from the three universities suggests that computers, mobile phones and the internet are major ICT facilities currently in use in Nigerian universities. Reports also suggest that the use of the internet could be quite discouraging as a result of low bandwidth. Many of the participants express their frustrations with regards to this issue. Some of them said it could be frustrating as to expecting a document to have downloaded by morning while the user goes to sleep at night. Providers of ICT initiatives in Nigerian universities must put issues like these into perspective should they expect their objectives to be met.

This is not to say ICT does not have a role to play in addressing the challenge of overcrowding. However, it is not the panacea or ‘messiah’ to the teaching and learning objectives of lecturers and students in crowded classrooms. In the context of a developing economy like Nigeria where student enrolment is threatening the ability of

the higher education system to provide resources enough to cater for them, what is likely to work would be initiatives that have carefully considered the uniqueness of the context. The uniqueness of the context emphasises the socio-cultural, pedagogical and technological aspects of teaching and learning in that environment. As earlier emphasised, the adoption, use and integration of ICT into institutions of a developing country like Nigeria is largely contextual and every string must be paid attention to if any ICT initiative must meet its set objectives.

8.3 Contributions

This study was conducted using a case study approach from three universities in Nigeria to investigate a practical phenomenon. As stated in the research objectives in chapter one, the results of this study have met the goal of providing a valuable and applicable contribution to both theory and practice. In the subsequent subsections, I elicit both contributions.

8.3.1 Theoretical Contributions

This study applies activity theory to explain the complexities surrounding the use of ICT in overcrowded classrooms of Nigerian universities. While the past four decades have witnessed a burgeoning literature on the effect of class size differences on teaching and learning as well as the use of technology in large classes, most developing countries' (particularly African countries) perspective to the topic has not been well captured and reported. In the words of Blatchford and Lai (2010), "research evidence is usually based on class size normally experienced in countries within North America, Europe, Australia and New Zealand. However, average class size can vary greatly between countries and in some countries can be very much larger" (p. 202). The experience of large classes in developing countries, for instance Nigeria is different from those of developed countries. It is usually a case of crowded classrooms with the number of students exceeding the resources available to cater for them - overcrowding. The first contribution this study makes is that it offers a scholarly and theoretically grounded perspective on the effect of class size on teaching and learning from a developing country's perspective, particularly Nigeria.

Even in Nigeria, I observed that studies are rare that are peculiar to class sizes especially in higher education and their effects on teaching and learning. Most of the studies on Nigerian higher education systems tend to shy away from class size issues. Even though they mention the issue of overcrowding in the institutions, they rarely delve particularly into their effect on teaching and learning activities in the classrooms and student achievement. The closest study Okebukola (1986), delved into the problems of large class in a chemistry course. The study was done in 1986 and since then, it is hard to find a notable study that probed into the topic. Olaofe (1994) and Okoye (1994) conducted studies on teaching comprehension and technical communication in large classes respectively but they did not assess the effect of the class sizes on the teaching and learning activities. The studies were aimed at providing a guideline on methods of teaching for those subjects in large classes.

Not only do the results of this study contribute to on-going discussion on the effect of class size on teaching and learning from a developing country perspective, they provide a qualitative perspective of lecturers and students. It is a design that is not common in this topic. It has been pointed out that most studies done on this topic have not had designs strong enough to draw reliable conclusions (Blatchford & Lai, 2010; Finn, Pannozzo & Achilles, 2003). Blatchford and Lai (2010) stressed that “unfortunately, there are methodological weaknesses in much research in this area. Studies have been relatively anecdotal...” (p. 203). The results of this study are methodologically strong, theoretically informed and ethically grounded, reliable and capable of drawing relevant conclusions to on-going debate in literature.

They also purport evidence worthy of contributing to knowledge on the topic of technology use for teaching and learning in large classes. While there are several studies on the use of technology in large classes from developed countries (for instance, Wentling, et al., 2007; Riffell & Sibley, 2004; Bongey et al., 2005; Patry, 2009; Barnett, 2006; Poirier & Feldman, 2007), studies seem very limited from developing countries with a focus on class size. Most of them explored the use of ICT in higher education institutions with a rare focus on the subject of teaching and learning in large classes (for instance, Eyitayo, 2005; Adetimirin, 2011; Ani, 2009). The findings of this study have added to existing knowledge not only on the contribution of ICT to teaching and learning but in large classes of Nigerian business schools.

Lastly, the theoretically informed nature of this study is a contribution to knowledge. In the words of Silverman (2001), “Without theory, research is impossibly narrow; without research, theory is mere armchair contemplation” (p. 110). The use of theory helps to widen the world view of the researcher and provides more comprehension of the gaps in knowledge that is being investigated. While some studies have been conducted using activity theory to analyse the use of ICT in higher education institutions (e.g. Benson et al., 2008; Scanlon & Issroff, 2005; Lim & Chai, 2004; Blin & Munro, 2007), I did not find any study that has used the framework to analyse a concept such as the use of ICT in large classes. Also, as shown in chapter two, the use of activity theory seems to have received more attention in developed countries than in developing countries. This study is likely to be the first of its kind with a focus on Nigeria and possibly on a university in Africa.

8.3.2 Practical Contributions

Governments, institutions, and every other stakeholder of higher education in developing countries of the world can benefit from this study for future initiatives towards providing access to ICT for teaching and learning purposes in higher education institutions. The implications of this study can help policy makers and educational administrators in making informed judgements and decisions about initiatives of this nature in order for them to make the most of their investments. Based on the results of this study, I suggest that stakeholders of higher education systems in developing countries take into cognisance the following conditions when looking into the subject of educational consequences of class size differences and the contributions of ICT to teaching and learning in large classes.

To start with, the results of my study emphasises that providing ICT resources – computers and the internet - where the basic infrastructure is still lacking is a recipe for the failure of that initiative. It is effort in futility when students and teachers are provided access to computers and cannot use them to meet their teaching and learning goals because they lack basic resources such as electricity. The cost of providing electricity poses a great challenge for most institutions as they have to continuously rely on generating sets fuelled by diesel or petrol which are not always in supply (at least in

Nigeria, for instance). Lack of or limited basic resources are enough to discourage the use of ICT.

Also, providing ICT resources without adequately training the users is meaningless. For instance, some private organisations invested in providing Hitachi electronic boards for lecturers to use for their teaching at Faith University. The boards were left in the classrooms gathering dusts as the lecturers did not know how to make use of them. While they made efforts to train the lecturers, it was after they had installed the boards into the classrooms. The first investments should be into training the lecturers on how to use the boards before providing the boards. Should the training be successful and all other resources (like electricity) have been provided, then the boards can be installed.

Additionally, when considering ICT initiatives for university institutions in a developing country like Nigeria, the number of students must be taken into perspective. Providing 100 computers for a student population of 500 will likely not give the users the required access they need for their learning objectives as they will only struggle in terms of time and space to make use of the computers, as the case of Faith and Hope University depicts. While the resources are available, they are limited such that the students hardly get enough time to make use of them to meet their learning objectives and still end up paying to go to cybercafés.

Moreover, the use of ICT to teaching and learning is a social phenomenon linking the technology, learning and the context (Preeraer & Van Petegem, 2010). It is not a one-size-fits-all initiative. The fact that an ICT initiative worked in a developed country does not mean it will work in a developing country like Nigeria, for instance. There are several factors in form of challenges to be considered when looking to apply ICT initiatives to a particular context. Such challenges must not be taken for granted. Activity theory's principle of contradictions could help dig out historical and culturally embedded systemic tensions that combat such initiatives. This would help in better decision making which could ultimately lead to the success of the initiatives.

Lastly, private universities seem to have an approach to the use of ICT for teaching and learning that public universities in Nigeria could learn from. While the model may be successful because the private universities have less students in their classrooms, my

results suggest that students at Patience University seem to be more involved in their learning than those of Faith or Hope. They appear to have a connection with their lecturers and their learning materials. Patience University lecturers make use of ICT tools (e.g. blogs) to communicate with students outside the classroom. I believe that this could be a useful tool for public universities lecturers and students. While Learning Management Systems (LMS) may still not be available, students are likely to still be able to connect (for example, pose questions or ask for elaboration of things done in the class) with their lecturers outside the classroom.

8.4 Limitations of this study

One of the limitations of this study relates to its scope, specific to universities in Nigeria. Moreover, while this seems a limitation, it presents itself as an avenue to new research opportunities. Future research can build upon this study, benefit from it and extend the findings.

In addition, I only report the perspective of students and lecturers in this study and that is also a limitation of the study. Perhaps involving more stakeholders of university education in Nigeria like members of the Nigerian National Universities Commission, parents of students and potential employers of university graduates could provide more insights than I am able to provide in this study.

Another limitation of this study is related to the main data collection technique – interviews. Some of the lecturers were unwilling to be engaged in an interview session for an hour because of their busy schedule. As such I alerted the participants in advance as to the time the interview might take and ended up interviewing those willing to commit to the time frame.

8.5 Future Research Areas

In light of the results and limitations of this study, I suggest the following as possible future research:

In this study, I applied activity theory as a means of foregrounding the complexities around the use of ICT for the teaching and learning activities of lecturers and students in overcrowded classrooms of Nigerian universities. It will be important to investigate the contributions of ICT to student achievement in higher education institutions of developing countries. It would be illuminating to see whether access to and the use of ICT contributes to students' grades and achievements in overcrowded classrooms.

Also, a new dimension could be seen if future research builds upon the results of this study to conduct a quantitative study towards a statistically generalisable outcome. The results could help generate empirically testable hypotheses worthy of contribution to knowledge and the field of information systems as well as higher education.

I also suggest presenting another perspective to a study like this by involving more stakeholders of higher education. This study only presents the opinions of lecturers and students in answering the research questions. Therefore, I suggest future studies look into collecting the opinions of other stakeholders like members of the Nigerian National Universities Commission (NUC), parents of students and potential employers of university graduates. This may likely provide more insights than the results I have in this study.

Lastly, future studies could also look into other types of schools beyond universities – for instance, polytechnics, monotechnics and even colleges of education in Nigeria. Interesting insights are likely to emerge from them too. I would also like to encourage research from all over Africa and other developing countries. It would be illuminating to see how ICT contributes to teaching and learning in overcrowded classrooms in other countries across Africa.

8.6 Concluding Remarks

The purpose of this study has been to provide insight into the contribution of ICT to teaching and learning in the overcrowded classrooms of Nigerian universities. My quest was to examine the seemingly unerring faith in the higher education 'technical fix' as reflected in the several investments in ICT in universities around the world (Selwyn,

2007). I was careful not to approach this study from a technocentric point of view so I could present a report that is free of bias towards technology.

In Selwyn's (2007) words, "despite huge efforts to position ICT as a central tenet of university teaching and learning, the fact remains that many university students and faculty make only limited formal academic use of computer technology" (p. 84). His reflection closely relates to the findings of this research. My findings confirmed that access to ICT, whether within the classroom or outside does not guarantee teaching and learning with it. Teaching and learning in overcrowded classrooms comes with several challenges, most of which are contextual and the presence of or access to ICT does not entirely alleviate or dispel them. Mainly, ICT as a tool contributes to teaching and learning by providing access to information for research and school assignments; a platform for communication and collaboration for both students and teachers, and an avenue to do academic work wherever they have access.

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APPENDIX A

Consent Form Interviews



Project title: “The Use of Information and Communications Technology to Improve Access to and Quality of Business Education in Nigeria”

Project Supervisor: Dr. William Wang

Researcher: Samuel Ekundayo

- ☐ I have read and understood the information provided about this research project in the Information sheet dated 20th July 2010.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that my identity and the information I divulge during the interview session will be kept confidential and I agree to keep the information confidential too.
- ☐ I understand that the interview session will be recorded and also transcribed.
- ☐ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ☐ Should I withdraw, I understand that while it may not be possible to destroy all recorded information of the interview session, which I was a part of, the relevant information about myself including transcripts, or parts thereof, will not be used.
- ☐ I agree to take part in this interview.
- ☐ I wish to receive a copy of the report from the researcher (please tick one): Yes ☐ No ☐

Participant's signature:

Participant's name:

Participant's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 6th July, 2010 AUTEK Reference number 10/91

Note: The Participant should retain a copy of this form.

Participant Information Sheet

INTERVIEWS - Lecturers

Definition of Information and Communications Technology (ICT)

ICT is the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge

Date Information Sheet Produced:

14th April 2010

Project Title

The Use of Information and Communications Technology to Improve Access to and Quality of Business Education in Nigeria

An Invitation

My name is Samuel Ekundayo. I am a doctoral candidate of Auckland University of Technology (AUT), New Zealand. This research is part of my doctoral degree requirement. I invite you to participate in this research investigating the contribution of ICT to business education in developing countries. Your participation is entirely voluntary and you may withdraw from this research at any time prior to the completion of the data collection.

What is the purpose of this research?

The purpose of this research is to gain understand of the contribution of Information and Communications Technology (ICT) to business education in developing countries. This research is required for the PhD degree that the researcher is undertaking. The research findings will be published in the form of a doctoral thesis.

How was I chosen for this invitation?

You have been chosen based on these following criteria:

- Your relationship with the research problem; that is, your experience of an overcrowded class and the use of ICT for school related activities.
- Ability to answer the questions
- Aged above 20 years
- A bonafide member of the institutions being investigated

What will happen in this research?

A consent form will be passed on to you if you are eligible. You have to **read, understand**, put down your **signature** and return back the form to the researcher. Once consent form is received, you will then be asked to propose a time, place and date you

will be available for the interview.

The interview session will take maximum one hour of your time. As the discussion ensues, you are free to discuss issues related to how ICT has contributed to business education from your own perspective; its impact on access and quality in your institution.

This is a one-on-one interview and the interviewer will be the researcher. He will be administering the questions to you. You may choose either to respond or not to any of the questions during the session.

What are the discomforts and risks?

Very minimal discomfort or risk is anticipated for you as a participant. The issue in question (the limited capacity of Nigerian universities to accommodate students) may cause a form of embarrassment to you because it is a long standing one for a developing economy like Nigeria. However, it is an issue common to most developing countries of the world.

How will these discomforts and risks be alleviated?

You are assured that your identity will be kept confidential. Your name will not be reported with the data; rather, you will be given a pseudonym (false name) to represent your opinions as well as information divulged. Also, you may withdraw at any point in time you feel uncomfortable with the discussion. All the information regarding your participation will be kept strictly confidential.

What are the benefits?

This research will provide valuable information on contribution of ICT to business education, its impacts on widening access and improving quality.

How will my privacy be protected?

You are not going to be identified with your real name. Pseudonyms will be assigned to you in the presentation of the data and the analysis thereof.

What are the costs of participating in this research?

The only cost of participating in the interview is your time.

What opportunity do I have to consider this invitation?

Please inform the researcher within seven days if you would like to participate in the research. Your participation is fully voluntary and you have the opportunity to seek further information if required by contacting the researcher.

How do I agree to participate in this research?

You will need to complete a Consent Form which you return to the researcher either via email or when he visits to collect on 31st July, 2010.

Will I receive feedback on the results of this research?

You are welcome to email Samuel Ekundayo (samuel.ekundayo@aut.ac.nz), if you wish to receive a copy of the results of the research.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr. William Wang, william.wang@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTC, Madeline Banda, madeline.banda@aut.ac.nz, 0064 921 9999 ext 8044.

Whom do I contact for further information about this research?

Researcher Contact Details:

Samuel Ekundayo,
Samuel.ekundayo@aut.ac.nz
Mobile: 0064 211 433843

Project Supervisor Contact Details:

Dr. William Wang
william.wang@aut.ac.nz
Telephone: 0064 9219999 ext 5048

Approved by the Auckland University of Technology Ethics Committee on XX, AUTC
Reference number XX.

Participant Information Sheet

INTERVIEWS - Students

Definition of Information and Communications Technology (ICT)

ICT is the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge

Date Information Sheet Produced:

14th April 2010

Project Title

The Use of Information and Communications Technology to Improve Access to and Quality of Business Education in Nigeria

An Invitation

My name is Samuel Ekundayo. I am a doctoral candidate of Auckland University of Technology (AUT), New Zealand. This research is part of my doctoral degree requirement. I invite you to participate in this research investigating the contribution of ICT to business education in developing countries. Your participation is entirely voluntary and you may withdraw from this research at any time prior to the completion of the data collection.

What is the purpose of this research?

The purpose of this research is to gain understand of the contribution of Information and Communications Technology (ICT) to business education in developing countries. This research is required for the PhD degree that the researcher is undertaking. The research findings will be published in the form of a doctoral thesis.

How was I chosen for this invitation?

You have been chosen based on these following criteria:

- Your relationship with the research problem; that is, your experience of an overcrowded class and the use of ICT for school related activities.
- Ability to answer the questions
- Aged above 20 years
- A bonafide member of the institutions being investigated

What will happen in this research?

A consent form will be passed on to you if you are eligible. You have to **read, understand**, put down your **signature** and return back the form to the researcher. Once consent form is received, you will then be asked to propose a time, place and date you will be available for the interview.

The interview session will take maximum one hour of your time. As the discussion ensues, you are free to discuss issues related to how ICT has contributed to business education from your own perspective; its impact on access and quality in your institution. This is a one-on-one interview and the interviewer will be the researcher. He will be administering the questions to you. You may choose either to respond or not to any of the questions during the session.

What are the discomforts and risks?

Very minimal discomfort or risk is anticipated for you as a participant. The issue in question (the limited capacity of Nigerian universities to accommodate students) may cause a form of embarrassment to you because it is a long standing one for a developing economy like Nigeria. However, it is an issue common to most developing countries of the world.

How will these discomforts and risks be alleviated?

You are assured that your identity will be kept confidential. Your name will not be reported with the data; rather, you will be given a pseudonym (false name) to represent your opinions as well as information divulged. Also, you may withdraw at any point in time you feel uncomfortable with the discussion. All the information regarding your participation will be kept strictly confidential.

What are the benefits?

This research will provide valuable information on contribution of ICT to business education, its impacts on widening access and improving quality.

How will my privacy be protected?

You are not going to be identified with your real name. Pseudonyms will be assigned to you in the presentation of the data and the analysis thereof.

What are the costs of participating in this research?

The only cost of participating in the interview is your time.

What opportunity do I have to consider this invitation?

Please inform the researcher within seven days if you would like to participate in the research. Your participation is fully voluntary and you have the opportunity to seek further information if required by contacting the researcher.

How do I agree to participate in this research?

You will need to complete a Consent Form which you return to the researcher either via email or when he visits to collect on 31st July, 2010.

Will I receive feedback on the results of this research?

You are welcome to email Samuel Ekundayo (samuel.ekundayo@aut.ac.nz), if you wish to receive a copy of the results of the research.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr. William Wang, william.wang@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTECH, Madeline Banda, madeline.banda@aut.ac.nz, 0064 921 9999 ext 8044.

Whom do I contact for further information about this research?

Researcher Contact Details:

Samuel Ekundayo,
Samuel.ekundayo@aut.ac.nz
Mobile: 0064 211 433843

Project Supervisor Contact Details:

Dr. William Wang
william.wang@aut.ac.nz
Telephone: 0064 9219999 ext 5048

Approved by the Auckland University of Technology Ethics Committee on XX, AUTECH
Reference number XX.

APPENDIX D



Interview on the contribution of ICT to business Education in Developing countries

Interview questions

Three groups of participants are intended: students; lecturers; universities' administrators and IT managers. The questions are therefore arranged according to the groups.

Definition of Information and Communications Technology (ICT)

ICT is the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge

Group 1: Students

- Share your experience of an overcrowded class?
- In your opinion, why was/is your class overcrowded?
 - What are the factors causing overcrowding in your class?
- Do you think overcrowding affects the quality of teaching and learning in your class?
- Does any of your class involve the use of ICT?
 - Has the use/will the uses of ICT improve teaching and learning? How?
- What do you as a student perceive as the advantage or benefit of ICT-mediated teaching and learning?
- Does ICT help in achieving your goals – teaching and learning?
- What ICTs do you personally have access to outside of school?
 - Does access to ICT outside of school help your school work? How?
- Do you think ICT has potentials to improve the capacity of your business school to accommodate more students?
- Comment on the quality of teaching and learning in your school?
 - How can the quality be improved, in your opinion?
 - Do you think ICT can help improve quality of teaching and learning?

Group 2: Lecturers

- Share your experience of an overcrowded class?
- In your opinion, why was/is your class overcrowded?
 - What are the factors causing overcrowding in the classes you teach?
- Do you think overcrowding affects the quality of teaching and learning in your class?
- Does your teaching involve the use of ICT?
 - What types of ICT do you require in your teaching?
- How is ICT used currently in your work?
- In your opinion will/has the use of ICT improve the quality of your teaching?
- What do you as a teacher perceive as the advantage or benefit of ICT-mediated teaching?
- Does ICT help in achieving your goals?
- What ICTs do you personally have access to outside of school?
- Do you currently have time for your other activities aside from teaching e.g. research?
- Comment on the student-staff ratio within the faculty?
 - Does this affect the quality of teaching and learning in anyway?
- Comment on the quality of teaching and learning in your faculty
 - In your own opinion, can ICT help improve the quality of teaching and learning?

Group 3: Universities Administrators and IT Managers

- Please comment on the general perception or opinion of the faculty on the use of ICT
- What ICTs are in place within the faculty?
 - How are they currently used?
- What are the contributions of ICT to your classes?
- What policies are in place for the use of ICT within the faculty?
 - How do these policies affect the adoption, use and integration of ICT in classrooms?
- Are there strategic plans for the future use of ICTs within this faculty?

- Comment on the student-staff ratio in the faculty
 - In your own opinion, what are the reasons for the current student-staff ratio?
 - What is being done to improve the capacity of the faculty to accommodate the demand for business education?
 - In your opinion, can ICT be of help in improving access into this faculty?
- Comment on the quality of teaching and learning in the faculty
 - Do you think ICT can help improve the quality of business education?

APPENDIX E



MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: William Wang

From: **Charles Grinter** Ethics Coordinator, AUTEC

Date: 6 July 2010

Subject: Ethics Application Number 10/91 **The use of Information and Communications Technology (ICT) to improve access to and quality of business education in Nigeria.**

Dear William

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 12 June 2010 and that I approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 9 August 2010.

Your ethics application is approved for a period of three years until 6 July 2013.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/research/research-ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 6 July 2013;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/research-ethics>. This report is to be submitted either when the approval expires on 6 July 2013 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTECH is notified of any adverse events or if the research does not commence. AUTECH approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTECH grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this. Also, if your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply within that jurisdiction.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact me, by email at ethics@aut.ac.nz or by telephone on 921 9999 at extension 8860.

On behalf of the AUTECH and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

On behalf of Madeline Banda, Executive Secretary

Auckland University of Technology Ethics Committee

Cc: Samuel Ekundayo samuel.ekundayo@aut.ac.nz