A CRITICAL ANALYSIS OF THE EFFECT OF E-LEANING ON ACADEMIC PERFORMANCE OF DISTANCE E-LEARNERS IN A NIGERIAN UNIVERSITY

by

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Abstract

The emergence of technologies of learning, and recently the use of Open Educational Resources and the increased awareness of the "DotNet (or Y) Generation" have made demands on traditional education and learning systems to be more open, flexible and customised towards what students expect. E-learning has increasingly been used in most parts of the world as a viable alternative to conventional education. It is believed that that the potential of information and communication technology (ICT), and more so e-learning, would bring positive impacts to teaching and learning by providing students and teachers with flexibility, accessibility, more opportunities for participation and collaboration and better outcomes. Any change in teaching and learning strategies is always evaluated by its impact on academic performance. Previous studies have focused mostly on academic performance of traditional on-campus students, but not many on distance e-learners within the Nigerian educational system. The researcher observed from the literature that there was limited research on the effects of e-learning on academic performance of distance e-learners. Most studies on e-learning in Nigeria focused on the problems, challenges, attitudes, prospects and awareness of e-learning. The rationale for this study resulted from this limited research in Nigeria on the effects of e-learning on academic performance of distance e-learners. This study focused on this research gap as identified in the literature.

The purpose of the study was to critically examine the effects of e-learning on academic performance of distance e-learners in a Nigerian university. To achieve this overall aim, the study set out to determine the best predictors of academic performance of distance e-learners and thereby propose a model to enhance academic performance.

This study adopted a mixed-method approach in its data collection process; however, the study was dominated by a quantitative approach, while the qualitative approach was used to consolidate the findings of the quantitative study. A questionnaire was used to collect quantitative data while focus group interviews were used to collect qualitative data. The study was conducted in four selected study centres of the university and a total of 1,025 participants completed the survey-based questionnaire.

The researcher used Spearman's correlation coefficient, ANOVA, T-Test and post-hoc Test in order to determine the effects of each of the factors on academic performance. Ordinal regression was used to determine the best predictors of academic performance of distance e-learners. The quantitative data

was analysed using Statistical Package for Social Sciences (SPSS) while qualitative data was transcribed before analysis. The conceptual framework used in the study was made up of the variables identified in literature and the 3P model of Teaching and Learning. The 3P model of Teaching and Learning was then used to further explain the result of the study.

The findings of this study indicated that there are eight factors which influence academic performance of distance e-learners. These are students' ICT literacy level, frequency of engagement with ICT, marital status, previous academic performance, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and family size. In addition, the findings indicated that age, employment, gender, previous qualification, learner-content interaction, learner-instructor interaction, learner-learner interaction, learning style, work experience, family income, home background and parent education do not influence academic performance of distance e-learners. However, when the data was split based on gender, the result revealed that learner-content interaction and learner-instructor interaction only influence academic performance of female distance e-learners.

Finally, the model developed for this study revealed that frequency of engagement with ICT, students' ICT literacy level, marital status, previous academic performance and previous qualification are the best predictors of distance e-learners' academic performance. This serves as the contribution of the study to the body of knowledge. Based on the findings of the research, recommendations have been made which will assist Nigerian university policy makers and course developers with a view to improving the academic performance of distance e-learners.

Declaration

I hereby declare that this dissertation entitled, "*A critical analysis of the effect of e-learning on academic performance of distance e-learners in a Nigerian University*" is my own work and that all the sources quoted have been acknowledged by means of complete references.

…….. …….

Signature (O. S. Aboderin) Date

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

9 December 2015

Mr Olukayode Solomon Aboderin 214585808
School of Education
Edgewood Campus

Dear Mr Aboderin

Protocol reference number: HSS/1214/015D
Project title: A critical analysis of the effect of e-Learning on Academic Performance of Distance learners

Full Approval – Expedited Application

In response to your application received 24 August 2015, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

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

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

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

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

Yours faithfully

.....

Dr Shenuka Singh (Chair)
Humanitities & Social Scinces Research Ethics Committee

/pm

Cc Supervisor: Dr DW Govender
Cc Academic Leader Research: Prof P Morojele
Cc School Administrator: Ms T Khumalo

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List of Abbreviations

ACADPERF	Academic Performance
ADDIE	Analysis, Design, Development, Implementation and Evaluation
ADL	Advanced Distributed Learning
ANOVA	One-Way Analysis of Variance
C1	Course one
C10	Course ten
C2	Course two
C3	Course three
C4	Course four
C5	Course five
C6	Course six
C7	Course seven
C8	Course eight
C9	Course nine
CAL	Computer-Assisted Learning
CBT	Computer-Based Training
CCSSE	Community College Survey of Student Engagement Report
CD-ROM	Compact Disk Read Only Memory
CGPA	Cumulative Grade Point Average
Computerstd	Hours spent on computer for studies per day
DE	Distance Education
DVD	Digital Versatile Disc
E-Commerce	Electronic Commerce
EL	E-Learning
E-Learning	Electronic Learning
E-Training	Electronic Training
FamilyInc	Family Income
FEIV	Fixed Effect Instrumental Variables
FFW	Fast For Word

FREQICT	Frequency of engagement with ICT
FRN	Federal Republic of Nigeria
GPA	Grade Point Average
HP	Hewlett Packard
IBT	Internet-Based Training
ICT	Information and Communication Technology
ICTLTR	Students' ICT Literacy Level
Intconperday	Hours spent on the Internet per day
IT	Information Technology
IV	Instrumental Variable
JAMB	Joint Admission and Matriculation Examination
LCI	Learner-Content-Interaction
LII	Learner-Instructor-Interaction
LLI	Learner-Learner-Interaction
LMS	Learning Management Systems
MBA	Master's in Business Administration
M-Learning	Mobile Learning
MLR	Multiple Linear Regression
NBDHE	National Board Dental Hygiene Examination
NC	Number of courses offered
NCE	Nigeria Certificate in Education
NCES	National Centre for Educational Statistics
ND	National Diploma
NOUN	National open university of Nigeria
NPE	Nigeria Policy on Education
NTI	Nigeria Teacher Institute
NTV	National Television of Nigeria
NUC	National Universities Commission
ODL	Open and Distance Learning
OLR	Ordinal Regression

PARENTINC	Family/Parent Income
PC	Personal Computer
PISA	Program for International Student Assessment
PrevAcadper	Previous academic performance
QI	Intelligence Quotient
QR	Quantify Rational
SAL	Student Approach to Learning
SD	Standard Deviation
Soicialnetperday	Hours spent on social media per day
SPSS	Statistical Package for the Social Sciences
SSCE	Senior School Certificate
TAM	Tutored Marked Assignment
TIMSS	Trends in International Mathematics and Science Study
TUCE	Test of Understanding College Level Economics
TV	Television
UK	United Kingdom
UME	University Matriculation Examination
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISA	University of South Africa
VARK	Visual, Auditory, Read and Kinaesthetic
WBI	Web-based instruction
WWW	World Wide Web

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1. INTRODUCTION

1.1 Introduction

E-learning has increasingly been used in most parts of the world as a viable alternative to conventional education. Bhuasiri, Xaymoungkhoun, & Ciganek (2012) viewed e-learning as a modern medium of instruction through electronic means that promotes students' knowledge and skills and also leads to improvement in their academic performance. They further said that e-learning brings about a revolution in education which leads to a change in the old system of teaching and learning which was more teacher-dominated but now gives room for learners to actively participate in the process – a learner-centred approach. This was also supported by Mbarek and Zaddem (2013) who referred to e-learning as a mode of instruction that can be facilitated with the use of ICT that allows students to obtain current knowledge and expertise conveyed through electronic means, irrespective of time and place. Various researchers (Al-Harbi, 2010; Bhuasiri et al., 2012; Alkharang and Ghinea, 2013; Al-Marabeh and Mohammad, 2013) highlighted the advantages of e-learning to instructors and students to consist of on-demand availability, self-pacing, interactivity, an increased accessibility to information, content standardisation, accountability, confidence and increased convenience, better content delivery and personalised instruction. Singh (2013) remarked that e-learning enables learners to deal with and manage their studies in a better way. This assertion was supported by Coldwell-Neilson, Beekhuyzen and Craig (2012) who commented that e-learning mediums enable students to regulate their learning. The researcher is of the opinion that if students can regulate their learning positively under an e-learning setting, it may lead to higher academic performance. Yongsheng, Yuanjiang, Yinghua, & Yuanyuan (2012) also commented that e-learning mediums encourage learners to design knowledge and converse with the teachers to boost experience acquired in the process of learning and academic performance of learners.

Academic performance of students is a principal yardstick of academic attainment at university level. Students with higher levels of achievement in higher institutions have high tendency to obtain good employment and salaries. Academic performance is a key factor in education of a country because it can be seen as a determinant of success of education of a country (Coetzee, 2011). Academic performance assumes a crucial role in producing the best quality graduates who will become outstanding pioneers in the workforce in a nation, and hence be in control of the

nation's economic and social advancement. This can only be achieved if a nation values its education and is ready to bring innovation into the delivery system of learning. According to Areepattamannil and Freeman (2008) academic performance is essential because it promotes success of students in modern life. Oye, Iahad, Madar, & Rahim (2012) conducted a study on the impact of e-learning on students' performance in tertiary institutions in Malaysia and reported that e-learning improves academic performance.

Does e-learning have impact on academic performance of students in Nigeria? This was the interest of the present study. In view of the importance of academic performance in our society as explained above, this study considered the effectiveness of e-learning in improving students' academic performance in Nigeria. The literature (Chapter 2) shows that the researcher observed that no comprehensive research has been conducted in Nigeria on the effect of e-learning on academic performance of students, specifically distance e-learners. It is on this premise, that this study critically analysed the factors that affect academic performance of distance e-learners

Nigeria has determined to demonstrate an irreversible and steady dedication to education as a tool for national development, and a right of her populace (Jegede, 2006 & Sam, 2011). The federal government of Nigeria is of the opinion that meaningful changes in Nigerian society will be experienced through a revolution in education. This revolution will be an unrealistic hope if the country fails to embrace the new mode of learning in the 21st century. In spite of the fact that we are in an information age, where e-learning delivery systems are fully in use in advanced countries, most of the institutions in Nigeria are still using a face-to-face- format of learning or a traditional mode of learning as a mode of instruction. In order not to lag behind in technology usage, there is an urgent need to implement an e-learning, system which is believed to be a better alternative delivery system that can bring about innovation and improvement into teaching and learning. The view is that this could eventually enhance the quality of learning and improve academic performance of learners. In the Nigerian context, it is better for a student not to graduate, than graduating with a lower grade which will not secure him or her any job. There is great emphasis on grades in Nigeria before a candidate can be offered an appointment after graduation. The need for e-learning has now turned out to be more essential than before since the target of Nigerian universities is to incorporate provision of a high-level work force for national development, as expressed in the Nigeria Policy on Education (NPE) (2000). This must be accomplished through the latest mediums of instructing, learning and research.

In the context of this research, e-learning is viewed as a means of transmitting useful instruction to learners or a means of acquiring knowledge and skills with the aid of ICT which it is hoped will impact their academic performance.

1.2 Background of the Study

The priority for educational stakeholders is the quality of students' academic performance. The variables that contribute effectively to the academic performance of students at all educational levels have been an issue of interest to stakeholders in education, trainers, policy makers, administrators and researchers. Most studies that have been conducted on variables influencing academic performance of students concentrate more on students at regular universities (face-to-face) in Nigeria but there is little or no research on variables influencing academic performance of students under an e-learning setting and specifically a distance e-learner. This is partly because Nigeria, as a developing country, is at infant stage of technology development, which makes it difficult to implement e-learning as mode of instruction. Recently the National Universities Commission (NUC), a body that regulates university operations, approved four universities to run e-learning in Nigeria. The National Open University of Nigeria (NOUN) was among the universities which received the approval. NOUN is the only uni-mode university mandated for open and distance learning in Nigeria, while the rest are dual mode. NOUN is the first fully fledged university that operates in an exclusively open and distance learning mode of education in Nigeria.

The modern world is experiencing changes in different parts of life, and the most recent decade of the twentieth century and the start of the twenty-first century have seen gigantic advances, particularly in the field of ICT, changes that keep growing at a rapid pace. The field of education is a standout among the most conspicuous zones influenced by this innovation, which has resulted in the development of different types of learning, for example, distance learning. Distance learning is a method for conveying instruction, for the most part at the university level, where students do not need to physically go to class. Enthusiasm for distance learning has developed quickly since the introduction of the Internet. This technique for learning has seen noteworthy development with the development of the Web. At the point when the Internet was recently introduced, it was constrained to content alone in distance learning. With speedy innovative advancement, multimedia applications have begun to assume a critical part in supporting the educational procedure (Georgouli, 2011; Al-Khalifa, 2009).

Due to rapid growth in the world today thanks to scientific and technological improvement, it has become necessary for the educational process to cope with these innovations, and eradicate possible problems such as the increasing numbers of students, dearth of instructors and the enormous distances involved with learning. Consequently, many higher institutions across the globe have implemented distance learning and online programmes using the Internet, which have brought about many changes in that regard (Littlejohn & Pegler, 2007). The utilisation of accessible technology has successfully accelerated the right to high-quality education for all. Speedy developments in communication technology and the Internet have created innovative experiences in teaching and learning at a distance. This now makes it possible for larger numbers of students to benefit from distance education (Moore & Kearsley, 2008). This quick innovation improvement enables poorer nations to neglect older technologies and effectively enhance access to higher education, thereby speeding up the rate of socioeconomic improvement in developing nations (UNESCO, 2011). Distance education can also meet the educational needs of learners with diverse social and occupational backgrounds (George, 2013). Distance learners belong to heterogeneous background in terms of age, experience, socio-cultural, educational and occupational backgrounds. They may be employed, unemployed, retired, single, married, housewives, physically disabled, or have varied social and financial problems. Recently, the system of education in Nigeria has been overwhelmed by the increase in demand for education at higher level in the nation. Insufficient infrastructural facilities, slow human capital improvement, funding and a large group of different factors have generated the present inertia in the educational area. In light of this, it is necessary for higher institutions in the nation to consider seriously the implementation of distance education innovations and online learning techniques as methods for increasing opportunities derived from education in Nigeria (Fakinlede, 2012).

Ogidan (2010) also observed that Nigeria has three million prospective students seeking admission yearly; the rate of demand for higher education is very high. Regular universities cannot handle the current admission challenges because they are short of infrastructural facilities and workforce. One of the ways of solving this problem was the establishment of the NOUN. Adapting to huge numbers of students is not an issue for the university as a result of the extensive utilisation of information and communication technology (ICT) to reach students in remote areas. Nigeria has for some years now introduced the use of e-learning for distance students. However, there is little awareness of what impacts the learning of distance e-learners has had since many are faced with

different challenges when compared to students involved in the face-to-face mode of instruction. Therefore, the researcher set out to determine what correlations exist between the independent variables, students' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and the dependent variable, academic performance. Additionally, the study intends to design a model and determine the best predictors of academic performance of distance e-learners.

1.3 Rationale of the Study

The Nigerian educational system is today beset by numerous problems. None of these is more genuine and tenacious than students' poor academic performance across all educational levels. This is one of the greatest drawbacks to educational advancement. The problem of students' poor academic performance has degenerated to the extent that it has turned into an issue of genuine national concern, requiring to be addressed urgently. Issues concerning students' poor academic performance have been drawing in genuine consideration and worry from various educational stakeholders in recent times. The concept of academic performance has become a source of worry to scholars, especially as the academic performance of students at undergraduate level is declining (Ebenuwa-Okoh, 2010**)**. In spite of the importance attached to students' academic performance in Nigeria, scholars reported that students' performance is declining (Ugoji, 2008; Egbule, 2004). Nigerian society places extraordinary emphasis on education, since it is accepted as the main avenue for national development. This can only be accomplished if learners are actively involved in academic activities which will upgrade their academic performance (Ebenuwa-Okoh, 2010**)**.

The growing concerns being expressed on the issue might not be disengaged from the fact that students' academic performance is not only the end product of all teaching-learning activities, additionally the essential premise whereupon schools' efficiency (whether using the conventional face-to-face educational system or non-conventional educational programmes like distance learning) is assessed. Basically, distance-learning programmes, which happen to be the last hope of many people, are correspondingly beset with the problem of persistently poor academic performance (Adedeji, Olumorin & Daramola (2011) & Ayodele & Adebiyi, 2013). The present study is an attempt to make a contribution towards improving the academic performance of

distance e-learners in Nigerian universities. The study evaluated critically the effect of e-learning on academic performance of distance e-learners in a Nigerian university.

1.4 Historical Background of Distance Education in Nigeria

Ever since the colonial era, correspondence colleges from the United Kingdom have provided intermediate and advanced level training to a number of duly qualified Nigerians through correspondence courses (Owoeye, 2004). This was the only distance education method available at that period. As indicated by Ladipo and Adelana (2013), the history of distance education in Nigeria dated back to the correspondence education which was a way of preparing candidates for General Certificate in Education, a requirement for the London Matriculation Examination. The early indigenous distance education programme was the English by Radio programme of the Nigeria Broadcasting Corporation that came after Nigeria received her independence in 1960. The programme was mainly targeted at primary and post-primary school levels and covered essential courses at both levels, with most emphasis placed on the teaching and learning of Science, Mathematics and English. The technology-inspired distance learning came into being at nearly the same time with the foremost indigenous distance learning being with the emergence of educational television programmes of the then National Television of Nigeria (NTV). There was additionally a Schools Educational Broadcast of the Radio Nigeria transmitted from Lagos throughout the federation. Every radio station was mandated to connect at precise times of the day during school hours for broadcasting of programmes. For the past 31 years, the educational system in Nigeria has seen much transformation in the area of instructional delivery in some higher education institutions.

Oladejo (2010) noted that for some time, distance education has been utilised as an instructional mode in various nations around the world. He further explained that well-known universities, for example, the Open University of Japan, the University of Georgia in the USA, and the Open University in the UK, used distance education programmes to instruct or train Education, Business, Arts and Engineering students. The University of South Africa (UNISA) was the first devoted distance learning university in Africa. The university has enabled the less advantaged individuals to have university education for over five decades. As observed by Oladejo (2010), Nigeria as a developing country has embraced distance education and furthermore has a National Open University that provides university education to her citizenry through distance learning. The

Federal Government of Nigeria, through the NUC, affirmed that student enrolment into the distance learning mode of higher education as a way of meeting the demanding of numerous Nigerians to benefit from different educational privileges. In the National Policy on Education (NPE) in 2004, the Federal Government of Nigeria expressed categorically that the utmost efforts would be made to empower the individuals who could benefit from advanced education to be offered access to open universities (Oladejo, 2010).

As recorded by Jegede (2006), the NOUN was set up in 1983 and was shut down for some months by the federal military government that deposed the civilian government of Alhaji Shehu Shargari.

According to him, several years after the university was closed, the convincing reasons that brought about the establishment of the university were still facing the country. Several other factors emerged, for example the need to fill the vacuum made by the Federal Government as a result of the closure of illegal study centres of many regular universities all over the nations.; the demand for financing of education; and the need to exploit speedy improvements in the area of information communication technologies, which have transformed the procedures and techniques for instructional conveyances of distance education.

The National Open University Act of 1983, which was revoked in 1984, was reconstituted in 2002. This led to the revival of the NOUN as we have it today. As indicated by Peters (2007), the reconstitution has made education accessible to individuals that have the capacity and are ready to gain by the quality instruction received through flexible distance learning. The programmes of NOUN are intended to extend the right of entry to education and to guarantee value and fairness of chances for all. They are to be used as an instrument for destitution mitigation, particularly in local groups, by giving opportunities that maintain Education For All and long-lasting learning, and to prepare the Nigerian populace for the increasing worldwide culture of innovative proficiency through its programmes and the utilisation of information and communication technology (Osam& Ekpo, 2009).

Osam and Ekpo (2009) observed that the NOUN is a type of distance education institution which uses distance instruction as the transmission of information through different media, for example, programmed instructions, multimedia applications, home assignment packs, arranged lectures and notes. It empowers learners living in remote or detached parts, or who during fulltime work

experience the ill effects of some physical impediment, to focus on their training at home by lessons through the post, radio, TV or phone. FRN (2004) characterised distance education or instruction as an instructive procedure in which a critical extent of the educating is directed by somebody separated in space and additionally time from the students. It includes the utilisation of a range of media, for example, print, correspondence, sound, video, PC-based media and systems and additionally multimedia for introduction of information and for communication between the university and its learners. Before the introduction of intensive technology usage at the NOUN, school activities were confined to the utilisation of cellphones and the Web for communicating with the students, especially on issues having to do with their admission. Similar technologies were additionally utilised for supporting the admitted students with their course enrolment, which was done both online and offline. During first semester of the university, which started in 2003/2004, the registration was based on accessibility of students to the Internet. The students who had access were made to register online while those without access registered offline. However, in the second semester an innovation was put in place to enable all the students to participate in online registration. This also enabled them to write their examination online and interact with their counsellors and facilitators online (Ogidan, 2010).

There is an urgent need for thorough research in this context to better understand and implement e-learning in Nigerian universities. In view of this, the present study seeks to shed light on the effect of e-learning on academic performance of distance e-learners in a Nigerian university and enrich the literature on e-learning. In addition, the present study designed a model which identifies the factors that influence the academic performance of distance e-learners. It hoped that this research will provide significant information to promote the successful and effective implementation of e-learning in Nigerian universities.

1.5 Statement of the Problem

Academic performance of students is one of the critical factors for judging educational standards and quality in Nigeria. The key reason behind this study is a recent decline in the standard of education in Nigeria and this is evident in the low academic performance in public examinations for all the educational levels, with distance education being no exception, as reported by Adedeji et al. (2011). The decline in standards of education in Nigeria has led to low academic performance of students in Nigerian higher institutions because of disadvantaged education background in both

primary and post-primary education levels respectively. Kolawole and Dele (2002), as quoted by Olanipekun and Aina (2014), noticed that academic performance of Nigerian students is one of the existing educational concerns which have attracted public discussion in recent times because of low level of academic performance in all educational levels. Academic performance of high school and higher institutions students is becoming problematic (Aina and Olanipekun, 2014).

Measuring academic performance of students in tertiary institutions has never been an easy task because it cannot be easily quantified precisely. Student performance may be seen to be a result of environmental, socioeconomic or psychological factors. However, refusal to understand these factors may slow down the educational system and lead to higher failure rates. This does not stop here, but it will create a chain effect by subjecting the throughput of good quality results to an unacceptable level of attrition. Therefore, it is necessary to analyse the factors that relate to suboptimal academic performance in order to set up a possible practical remedy (Schwerdt & Wuppermann, 2008).

Several studies (Abiona, Fakoya, and Adeogun, 2014; Umar, Shaib, Aituisi, Yakubu, & Bada, 2010; Olanipekun & Aina, 2014; Osaikhiuwu, 2014) have been carried out on academic performance, especially on traditional on-campus students, but not many on distance e-learners within the Nigerian educational system. The researcher has observed from the literature review that there was limited research on the effect of distant e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and their academic performance. This serves as an incentive for this research to fill up the existing important research gap in the literature.

The majority of studies (Ajadi, Salawu & Adeoye, 2008: Oye et al 2011 and Okopi & Pindar, 2014) on e-learning in Nigeria focused on the problems, challenges, attitudes and expectations of e-learning and the motivation of distance e-learners' persistence. A small number of studies (Oladejo, 2010; Pitan, 2015; Ojokheta, 2010) on academic performance of distance learners in Nigeria focused on self-regulation, environmental influence and persistence. The researcher has found that there were limited or minimal studies on the effect of e-learning on academic

performance of distance e-learners. The researcher also observed from literature that most of the studies on academic performance in Nigeria were conducted using quantitative methods, but the present study uses mixed methods (quantitative and qualitative study) which provide an understanding of the statistical results. This study will also fill the above identified gap.

1.6 Purpose

The purpose of this research was to critically analyse the effect of e-learning on academic performance of distance e-learners in a Nigerian university. More specifically, the researcher wanted to find out if factors like distant e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day will affect academic performance of distance e-learners.

1.7 Research Questions

The following research questions were asked with the view to achieving the overall aim of the study:

i. What correlations exist between distant e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and their academic performance?

ii. What is the best predictor of academic performance of distance e-learners?

iii. How and why do these factors affect academic performance of distance e-learners in the way they do?

1.8 Research Hypotheses (For the purpose of this study the null hypotheses were represented using H_{0N} and the alternate hypotheses by H_N)

The following null hypotheses were tested at the significance level of 0.05:

H_{01}: – Distance e-learners' ICT literacy level does not affect academic performance of distance e-learners.

H_{02}: – Distance e-learners' age does not affect academic performance of distant e-learners.

H_{03}: – Gender does not affect academic performance of distance e-learners.

H_{04}: – Marital status does not affect academic performance of distance e-learners.

H_{05}: –. Home background does not affect academic performance of distance e-learners.

H_{06}: – Parents' education does not affect academic performance of distance e-learners.

H_{07}: – Family income does not affect academic performance of distance e-learners.

H_{08}: – Frequency of engagement with ICT does not affect academic achievement of distance e-learners.

H_{09}: – Previous qualification does not affect academic performance of distance e-learners.

H_{010}: – Learning style does not affect academic performance of distance e-learners.

H_{011}: – Work experience does not affect academic performance of distance e-learners.

H_{012}: – Learner-content interaction does not affect academic performance of distance e-learners.

H_{013}: – Learner-instructor interaction does not affect academic performance of distance e-learners.

H_{014}: – Learner-learner interaction does not affect academic performance of distance e-learners.

H_{015}: – Employment status does not affect academic performance of distance e-learners.

H_{016}: – Previous academic performance does not affect academic performance of distance e-learners.

H_{017}: – Family size does not affect academic performance of distance e-learners.

H_{018}: – Hours spent on the Internet per day do not affect academic performance of distance e-learners.

H_{019}: – Hours spent on social media per day does not affect academic performance of distance e-learners.

H_{020}: – Hours spent on a computer for studies per day does not affect academic performance of distance e-learners.

1.9 Research Methodology

According to Maxwell (2012), research methodology is an approach that gives a context within which appropriate techniques and methods can be adopted and developed to achieve the overall purpose of the study. The study was dominated by a quantitative approach while the qualitative approach was used to consolidate the findings of the quantitative study. A questionnaire was used to collect quantitative data because it provides the researcher with measurable data that are easily

accessible for statistical analysis (Dambudzo, 2009), while focus group interviews were used to collect qualitative data. The qualitative data was used to get an in-depth understanding of the statistical results and to ensure triangulation (Cresswell, 2012). Based on this, the study can be considered as a mixed-methods research approach. The study was conducted in four selected study centres of the university and a total of 1,025 participants completed the survey-based questionnaire.

This study applied convenience sampling for the quantitative aspect because it was an easy way to contact participants and collect information within a short period of time (Saunders, Lewis, & Thornhill, 2009). Purposive sampling was used by the researcher with the purpose of ensuring that the senior students or experienced students would participate in the interview (Leedy & Ormrod 2013). The data was analysed by employing statistical analysis. The statistical techniques that were adopted are the Spearman's correlation coefficient, ANOVA, T-Test, post-hoc test, ordinal regression model and the level of statistical significance. The statistical methods and the analysis of the study will be discussed in detail in Chapter 5, Chapter 6, Chapter 7 and Chapter 8.

1.10 Conceptual Framework and Theory

The factors namely: ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day, which were extracted from the literature review, formed part of the conceptual framework as explained in Chapter 2. The 3P model of teaching and learning was also used to further explain the results of the study. The 3P model of learning outlines how learning occurs by considering the 3P model factors: presage, process and product. The model was developed with a feedback mechanism which tells the instructors and learners of changes that needed to be made in order to accomplish suitable learning outcomes in any educational process. The 3P model of teaching and learning is further explained in Chapter 3.

1.11 Significance of the Study

Much research has been carried out on academic performance, especially among traditional on-campus students, but not much exists on distance e-learners within the Nigerian educational

system. This study will inform policy makers, stakeholders in education and NOUN management about the influence of e-learning on academic performance of distance e-learners. This study will add information on the role of e-learning in academic performance. The study will reveal the predictive power of distant e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day on academic performance of distance e-learners. The findings from this study will help institutions to find strategies that promote greater use of e-learning in their institutions.

This study should contribute significantly to the current literature on e-learning and its impact on academic achievement. The researcher believes that the result of the study will be useful to future researchers with an interest in examining further the effects of e-learning on academic performance of distance e-learners. This should lead to the generation of new ideas for the better integration of e-learning into the learning process.

This study will provide additional knowledge to the field of e-learning environments, which may benefit university decision-makers, academic advisors, faculty and students. The study would respond to many questions from interested observers, stakeholders, officials, faculty members and learners worldwide, enabling them to assess e-learning and to identify its strengths and weaknesses.

Finally, the study will contribute to the development of Nigeria at large because the nation cannot afford to lag behind in terms of technology, and this will help enable the nation to be better equipped to meet the dynamic educational demands of the 21st century.

1.12 Limitation

The researcher was only able to cover four centres of NOUN in South-Western Nigeria, because of the vast extent of the country and spread of study centres across the nation. Otherwise, the researcher would have covered many more areas (centres) in South-Western Nigeria. Therefore, any prediction or generalisations can only be applied over these four study centres.

1.13 Delimitation of the Study

This study was limited to distance e-learners' academic performance at NOUN in South-Western Nigeria. South West Senatorial district is among the six geopolitical zones in Nigeria. South West geopolitical zone is one of the largest zones in Nigeria.

1.14 Thesis Outline

The study is organised into eight chapters, namely introduction, literature review, conceptual framework and theory, research methodology, results of research question one, discussion of results of research question one, results of research question two, discussion of results of research question two and three and conclusions and recommendations.

Chapter 1: Introduction/Study in Perspective

This chapter has set the research scene and put the study in perspective by providing general introductory information, background information and context, stating the research aims and the problem, listing the research questions and briefly outlining the methodology.

Chapter 2: Literature Review/Study in Context

This chapter positions the research in an international context by presenting the review of literature, related findings and desktop research. The gaps and silences in the study area are explained. The chapter also aligns the study to a broad set of ideas and principles that guide and give structure. It shows the direction of the study and relationships of the different constructs to be investigated in line with the theoretical base underpinning the chain of reasoning.

Chapter 3: Conceptual Framework and Theory

This chapter outlines 3P models together with the variables identified to form an appropriate conceptual framework for this study.

Chapter 4: Research Methodology

This chapter outlines the research design and methods to be followed as they explain research procedures, instrumentation, population and sample, and data collection strategies. These include statistical procedures used in analysing the data and methodological norms in the study.

Chapter 5: Results of Research Question One

This chapter presents the results pertaining to research question one of the study. It shows the extent to which students' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day influence academic performance of distance e-learners in Nigeria. It presents the results to show whether correlation exist between these factors and academic performance of distance e-learners.

Chapter 6: Discussion of Results of Research Question One

This chapter gives a discussion of the results of research question one of the study. The chapter shows the extent to which distance e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day influence academic performance of distance e-learners in Nigeria.

Chapter 7: Results of Research Question Two

This chapter gives the results pertaining to research question two, which deals with the best predictors of academic performance for distance e-learners. Results of the ordinal regression are presented in this chapter. A model is developed based on the results and is used in determining the best predictor of academic performance of distance e-learners.

Chapter 8: Discussion of Research Question Two and Research Question Three.

This chapter includes a critical discussion of the results of research question two with a view to answering research question three. This will include a discussion incorporating the qualitative data in the study. The new themes that emerged from the qualitative part of the study are highlighted and discussed. The chapter also discusses why and how these factors affect academic performance in the way they do.

Chapter 9: Conclusions and Recommendations

This chapter summarises the findings and concludes the study by making recommendations based on the research questions and research methods and proposes new possible areas of further study.

1.15 Conclusion

This chapter discusses the rationale of the study, defined the important concepts in the thesis and other issues relating to e-learning and academic performance. The chapter discusses the background information to the study, defined the problem, objectives of the study, research hypotheses, purpose of the study, methodology, limitation and significance of the study and the research questions that were answered by this study. The chapter ends with an outline of the thesis.

Chapter Two consists of a review of literature related to the problem under investigation.

2. LITERATURE REVIEW

2.1 Introduction

Prior to the integration of ICT into teaching and learning, the delivery system for all educational levels was a traditional classroom setting with an instructor giving a lecture and learners listening and writing notes (Singh, 2013). The 21st-century innovations in the educational system have challenged this mode of learning. The progress in information technology has enabled new educational delivery methods such as e-learning.

As indicated by Covington (2012), contemporary perspectives on education showed that learning comes about in a large number of ways. Learning takes place through information processing, inside or outside classroom environments. Covington (2012) remarked that the classroom, whether traditional or virtual, provides the structured community base within which students need to create an environment and construct meaning from the course narrative. The e-learning setting is a mode of learning that supports learning via ICT, which is different from traditional learning settings. The e-learning setting is such that learners are given an opportunity to decide what to learn, encouraged to interact with colleagues, course contents and facilitators with suitable backing. In the context of this study, the researcher is interested in the learning which occurs when distance e-learners interact with their course contents, facilitators and their colleagues and friends online. Pitan (2015) noted that chances to learn have taken more forms, and distance learning provides good diversity in learning. As stated by Bada (2015), the idea of self-learning is grounded in the conviction that student learning is more successful and viable when it happens within a real-world context, and if learners understand the purposes behind learning. The learning procedure is planned for self-learning and the learner learns by experience.

Distance learners are learners who are responsible for the management of their own learning process. Frick, Chadha, Watson, Wang and Green (2009) reported that academic achievement depends on the five learning standards:

- Learning is advanced when learners are occupied with solving real-world problems.
- Learning is advanced when new information is coordinated with the learner's reality.
- Learning is advanced while existing learning is initiated as a foundation for new information.
- Learning is advanced when new information is integrated into the learner’s world.

- Learning is advanced when new information is exhibited to the learner.

The new information that is incorporated into the distance learners' world is ICT knowledge. This is the interest of this present study – to critically analyse its effect on the academic performance of distance e-learners. Battle and Lewis (2002) commented that in this period of globalisation and technological upheaval, education is considered as an initial step for each human action. They noted that education assumes an imperative part in the advancement of human capital and is connected with prosperity of individuals and opportunity for better living. Farooq et al. (2011) noted that education guarantees the procurement of learning and aptitudes that empower people to expand their profitability and enhance their personal satisfaction. This increment in efficiency lays foundations for the prosperity of a nation.

Jovinius (2015) mentioned factors which are inside and outside school that affect students' quality of academic achievement. These factors are referred to as student factors, family factors, school factors and peer factors. Do these variables only affect the academic performance of on-campus students? Using these variables, this study intends to investigate the variables that influence academic performance of distance e-learners and find the best predictors of academic performance of distance e-learners.

What follows in this chapter, is a discussion of the relevant literature under the following subheadings: distance education, e-learning, types of e-learning, Impact of technology on distance education, academic performance, factors affecting academic performance of on-campus students and distance learners, effect of technology on academic performance of students, comparison of academic performance of distance learners and on-campus students, students' ICT literacy levels and academic performance, frequency of engagement with ICT and academic performance, learning styles and academic performance, socioeconomic status, socio-demographics, Previous Qualification, Interactive Learning, work experiences, previous academic performance, family size, Hours Spent on the Internet and a computer for studies per day and social media.

2.2 Distance Education

Spector, Merrill, Merrienboer and Driscoll (2008) observed that distance learning has a history that covers nearly two centuries, and this period speaks to noteworthy changes in how learning happens and is conveyed. Distance education begins from postal correspondence and extends to

the wide variety of devices accessible through the Internet. As stated by Gulatee and Combes (2007), in the 1970s and 1980s distance learning became common, and was done via mail until the rise of Internet usage. They noted that since the late 1990s the amount of advanced learning increased and the World Wide Web started to be a distributed learning mechanism to support on-campus students and distance learners. The assistance of communication technology enabled the learners to participate in a range of activities such as discussion forums, multimedia, chat, video conferencing and electronic blackboards.

According to US Department of Education (2003), the change in available technology brought about change in distance education in the previous decade; generally, taking classes outside of conventional brick-and-mortar institutions meant correspondence or televised courses. The integration of asynchronous web-based courses (where the instructor and student are not present at the same time) has extended the potential outcomes of distance education to conquer the time factor or geographical area obstacles confronted by students. The US Division of Education (2003) reported that 56% of all two-year and four-year organisations offered distance education courses within the 2000–2001 study years (US Bureau of Education, 2003). Dabbagh and Bannan-Ritland (2005) remarked that the introduction of Internet and web-based technologies have reshaped the boundaries and pedagogies of distance learning by stretching its scope and deepening its associations (Dabbagh & Bannan-Ritland, 2005). According to Dabbagh and Bannan-Ritland (2005), the introduction of Internet and web-based developments have reshaped the limits and teaching methods of distance learning by extending its degree and developing its links.

Owoeye (2004) recorded that distance learning in Nigeria goes back to the colonial period, and since then correspondence schools from UK have given middle-of-the-road and advanced-level training to various qualified Nigerians through correspondence courses. He explained that distance studies in Nigeria started during the 1970s at the University of Ibadan and this was followed by correspondence-focused, low-maintenance programs offered by routine colleges and different schools, proceeding with instruction projects of the Adult Education Department of the colleges, and programs offered by the Nigeria Teacher Institute (NTI) and NOUN.

Cavanaugh (2004) commented that distance learning can be traced to the early years of the nineteenth century, when courses were offered through correspondence. Abdulaziz (2008) commented that in the mid-twentieth century, distance learning was informally established in

Britain until 1971, and was formalised by the Open University, and later spread to the US, Canada, Australia and other nations. Moore and Kearsley (2011) characterised distance education as means of instruction and arrangement of learning in independent spaces that require correspondence through technological and special institutional organisations. The correspondence innovations for distance education have advanced from paper-based correspondence to electronic delivery components, for example, TV, video conferencing, web learning administration frameworks and versatile applications. Geographic distance secured by distance training programs has extended from nearby towns and urban areas to remote nations and continents (Beldarrain, 2006; Zhang & Kenny, 2010). As described by Allen and Seaman (2011) and Moore and Anderson (2012), distance education constitutes a basic part of the US higher education framework as there was a huge and developing number of school courses and degree programs offered online to geologically scattered students far and wide.

As indicated by Mason (2003), two decades after the opening of the Open University in the UK in 1969, numerous more open universities were established in Europe and other nations around the globe. This has led to significant development in the attainment of distance education. Distance education gives chances to the learners to pursue useful and accessible education which does not consider age, race and religion or ability. It gives room to individuals in various locations such as rural or urban to have the same opportunity and access to the latest technology. This method of instruction is practised in most developing nations throughout the world.

Dillon and Greene (2003) explained that distance education is described as a learner-focused framework, which puts learners in the first place, concentrating on the learner's states of mind, practices, capacities, choice and learning inclinations, with the educator as a facilitator of learning. The obligation of the educator is to encourage self-determination in the learners and to supplement references and other essential materials that the learners need. In addition, it is essential for the educator to keep in mind that distance education solutions incorporate a broad role for the them. Tait (2003) remarked that plurality, not uniformity, of approaches is needed in supporting learners occupied with distance education. Glen (2005) explained that open learning implies strategies and practices that allow passage to learning with no or few boundaries concerning age, sex or time requirements and with acknowledgment of earlier learning. Dhanarajan (2008) viewed distance education as a method by which the instructor is actually taken to the students, and it is a teaching

and learning process in which students are isolated from the educators by a physical separation which is regularly crossed over by communications technologies.

There are several ways of defining the term open and distance learning (ODL). Adebayo (2007) defined ODL as the kind of education that takes place outside the customary educational system, and is imparted without having individual interaction with students. Soetan et al. (2015) described distance learning as an instructional procedure in which a large part of the instruction is led by somebody far in distance and/or time from the learners. Al-Dabbasi (2002) identified the advantages of distance education from three viewpoints. The first, from the learner's point of view, is that of higher education characterised by distance education as a removal of geographical barriers or flexibility in the requirements of time, place and age, with access to more opportunity for further training. The second one is the business's point of view which saw distance education to mean giving chances to staff for building up their expert aptitudes, and empowering them to obtain new abilities with moderately low expenses without the need to disturb their professions for a drawn-out stretch of time. The third one is a state or nation's point of view that education ought to mean expanding the quantity of students' learning opportunities to the individuals who are far from higher institutions at affordable costs without the requirement for setting up new structures.

In the context of this research, distance education is viewed as education received by distance e-learners outside the four walls of the classroom and without regard to the location or distance of the learner. As indicated by UNESCO (2002), ODL is a standout among the most quickly developing fields of education, and its potential effect on all education delivery systems has been highlighted through the improvement of Internet-based information technologies, specifically the World Wide Web, using approaches that focus attention on opening access to education and training provision, liberating learners from the constraints of time and place and offering adaptable learning chances to people and gatherings of learners. According to Jimoh (2014) distance education implies the conveyance of valuable learning opportunities at an advantageous place and time for learners, independent of their background.

Does this reflect in the academic performance of distance learners? Investigating this is the purpose of this study. Edvardsson and Skarsson (2008) showed that distance education has allowed access to educational institutions at the university level to different groups of non-conventional students, for example individuals in rural groups, married couples with children and individuals over 25.

This has resulted in countless students acquiring a university education through distance education. The extent of distance education is wide. It has demonstrated that it can connect with an extended portion of the unreached, underestimated and the poor.

With regard to this research, distance e-learners are defined as learners who are working class and those who are not able to attend conventional universities due to high demand for enrolment and limited human and material resources.

2.3 E-Learning

The present NPE perceives the situation of an e-learning instructional outline in accomplishing deep rooted education and attests that long-lasting instruction should be the basis of the country's education approach. This anticipated the development of an e-teaching and e-learning instructional programme of the nation. The NPE characterised e-teaching and an e-learning instructional framework as the mode of instruction in which learners are separated in time and space from the instructor. It utilises a mixture of media and technology to give and/or enhance access to great quality education for an extensive number of learners wherever they may be. As indicated by the NPE, the objectives of e-teaching and an e-learning educational support are to:

- Provide access to quality education and equity in educational opportunities for those who otherwise would have been denied it.
- Meet the special needs of employers by running special certificate courses for their employees at their work place.
- Encourage internationalisation, especially of tertiary education curricula.
- Ameliorate the effect of internal and external brain drain in tertiary institutions by utilising experts as teachers regardless of their locations or places of work (NPE, 2004).

Information technology has influenced all parts of human lives, and distance education is no exception. The Internet, which is a result of information innovation, has changed the way individuals work together (e-commerce), the way individuals communicate (e-mail), the way individuals train/instruct (e-training), and the way individuals learn (e-learning). E-learning is an imaginative improvement in every single educational institution (Foray, 2004). E-learning is an ideal learning environment using modern technological innovation, through the integration of

information technology and educational content to fashion a new learning mode which can transform the role students' play to produce an effective work force (Ma et al., 2008).

Electronic learning is viewed as the use of ICTs to enhance and support leaning, teaching and research (Eteng & Ntui, 2009). E-learning is expected to redefine education; for instance, the classroom will no longer be demarcated by brick walls, but rather "students can communicate with their teachers from their bedroom or wherever they are, especially during strikes, while housewives can receive lectures from their kitchens without having face-to-face interaction with their teachers (Sam, 2011). Christie and Ferdos (2004) characterised e-learning in advanced education as a system to improve learning encounters, and as a device to teach students through computerised media, with or without the direction of their educators. E-learning can be used to replace traditional face-to-face teaching completely, for example, via distance learning or only partially, for example as an additional teaching tool to be used alongside face-to-face teaching. Fry (2000) and Wild et al. (2002) described e-learning as the delivery of training and education via networked interactivity and distribution technologies. Roffe (2002), Schank (2002) and Sambrook (2003) viewed e-learning simply as learning and communication exercises across computers and networks or for that matter any other electronic sources. Khan (2005) remarked that e-learning has been described in various ways as learning using a number of different technologies and methods for delivery, for example Computer-Based Training (CBT), Internet-based training (IBT), Web-based instruction (WBI), advanced distributed learning (ADL), distributed learning, distance learning, online learning, mobile learning (or m-learning) or remote learning and learning management systems (LMS). Al-Ammari and Hamad, (2008) noted that in an e-learning system, students are able to interact at any time from any place with different instructional material (text, sound, pictures, video and so on) through the Internet. In addition, learners can communicate with teachers and classmates both individually and as a group discussion with the use of message boards, instant message exchanges and video conferencing.

Lin (2006) pointed out that e-learning is turning out to be increasingly important to learners as they can consolidate their learning backgrounds together with the evolution of information technology. This method of learning gives the learner more self-sufficiency to continue at their own pace, while their progress is checked to survey their accomplishment (Rhode, 2009; Spector et al., 2008). With e-learning, there is a movement from the traditional method of instructor-

coordinated instruction to modern techniques where computer technology assumes a significant part, subsequently enhancing the quality, proficiency and adequacy of educating, learning, research and educational management.

Electronic learning can help adults in building up their education and numeracy aptitudes, while additionally constructing ICT skills in life and work (CILIP, 2005). According to the World Bank (2003), e-learning is seen as a conceivably effective apparatus to meet these requests, especially when distance and lifelong learning is an issue.

Ellis (2004) disagreed with Nichols (2003), who characterised e-learning as entirely being available utilising technological apparatuses that are electronic, web-conveyed or web-skilled. The view held by Ellis is that e-learning covers not just content and instructional techniques conveyed by means of CD-ROM, the Internet or an Intranet included sound and tape, satellite telecast and intelligent TV. The difference is that Nichols (2003) strictly defined e-learning as limited to the usage of technological tools such as web-based, web-distributed or web-capable for learning, but Ellis believed that the e-learning definition goes beyond content and mode of instruction delivered by means of CD-ROM, the Internet or an Intranet but also includes audio- and videotape, satellite broadcast and interactive TV.

Tavangarian et al. (2004) included the constructivist theoretical model as a framework for their definition by stating that e-learning is not only procedural but also shows some transformation of an individual's experience into the individual's knowledge through the knowledge construction process. Ellis (2004) and Triacca et al. (2004) believed that some level of interactivity needs to be included to make the definition truly applicable in describing the learning experience, even though Triacca et al. (2004) added that e-learning was a type of online learning. Garrison and Anderson (2003) as quoted by Covington (2012) described e-learning as learning that facilitates online network technologies. The nature of e-learning environment and the pedagogical approach provide students with more opportunity to take responsibility for their own learning development. With the support of web-based higher education courses that use synchronous and asynchronous technologies as the primary mode of instructional delivery, e-learning offers more control to the learner of both instructional resources and technical tools provided in the learning environment (Spector, 2007).

Urdan and Weggen (2000) defined e-learning as the conveyance of content by means of all electronic media, including the web, intranets, extranets, satellite telecast, sound/video tape, interactive TV and CD-ROM. As stated by Meyen, et al. (2002), e-learning can be characterised as the acquisition and utilisation of information dispersed and encouraged by electronic means. These definitions present e-learning as a method for exchanging the content to the learner through the electronic media.

Clark and Mayer (2007:10) characterised e-learning "as instruction conveyed on a PC by a method for CD-ROM, web, or intranet with the following features:

- Includes content pertinent to the learning objective;
- Uses instructional techniques, for example, illustrations and practice to help learning;
- Uses media components, for example, words and pictures to convey the content and strategies;
- May be teacher driven (synchronous e-learning) or intended for self-guided singular study (asynchronous e-learning); and
- Builds new information and skills connected to individual learning objectives or to enhanced hierarchical performance."

2.4 Types of E-Learning

Al-Musa and Al-Mobark (2005) and Al-Soraiey-Alqahtani (2010) explain the following types of e-learning.

2.4.1 Synchronous E-Learning

This type of e-learning enables learners and instructors to communicate online concurrently with the benefit of prompt response or immediate feedback. This kind of e-learning requires current hardware and rapid system connections. Al-Soraiey-Alqahtani (2010) listed the following tools or facilities as the tools that are useful for synchronous e-learning: video conferencing, sound conferencing, chat rooms and whiteboard.

2.4.2 Asynchronous E-Learning

This kind of e-learning does not require students and instructors to be online concurrently. The advantage of asynchronous e-learning is that the students will have the capacity to pick a reasonable time to get to what they need, and will permit them to do their learning at their own pace (Sussman, 2006). Ellis (2004) stated that in this type of e-learning students are unable to get immediate feedback from the instructor and are more isolated than in the case of synchronous e-learning. In the two types of e-learning, the student should be motivated for learning in order to conquer the negative effects of the separation from one another and from their instructor.

E-mail and discussion boards are tools utilised to conduct asynchronous e-learning (Horton, 2006). The innovation that arose because of the development in the global network of information has added to the increase of various strategies and procedures of teaching and learning, of which the virtual classroom is a part. Virtual classrooms offer distinctive tools that make courses more viable. They imply simple approaches to transferring and sharing materials, for gathering and cross-checking students' assignments, for making online visits and for recording students' grades (Cole, 2005). One of the benefits of virtual classrooms is that they accommodate a number of students, regardless of age, geographical location and time. This kind of e-learning is related to this study because distance e-learners interact with their colleagues and instructors without seeing each other.

Synchronous virtual classrooms are a mode of instruction that empowers the instructors and students to communicate online simultaneously from different locations (Hrastinski, 2008). One of the benefits of a synchronous virtual classroom is the likelihood that the educator and the learner can see each other in the midst of the communication and in the course of discussion. Al-Mubarak (2004) clarified that instructors and learners in synchronous virtual classrooms frequently require advanced devices as well as a fast Internet connection.

2.4.3 Asynchronous Virtual Classrooms

Hrastinski (2008) explained that asynchronous virtual classrooms are self-guided e-learning frameworks that empower students to survey the instructional material and in this way interface with the course content by means of the web at the suitable time and place. The main advantage for asynchronous virtual classroom is the adaptability in time, where the learner can sign on to an asynchronous virtual classroom at any time to send messages to the educator or associates and

download reports. It gives enough time to contribute more insightfully when compared with the synchronous classroom environment (Papastergiou, 2006).

LMSs have been defined as learning management software that can provide a variety of tools for sharing and delivering different types of instructional materials, and facilitate tasks such as giving immediate feedback, student registration etc. (Mimirinis & Bhattacharya, 2007; Ozdamli, 2007). There are two types of LMSs, commercial LMSs such as SchoolGen, WebCt and Blackboard, and non-commercial LMSs which are open-source software and generally free to use, such as Claroline, Bazaar, and Moodle (Ozdamli, 2007). Distance education is provided in either a synchronous or asynchronous manner. Synchronous distance courses are more similar to traditional courses than asynchronous (Miller & King, 2003). Although geographically separated, the instructor and students meet at the same time. This is conducted by interactive television or during chat sessions (Holcomb, King & Brown, 2004). According to Miller and King (2003), the synchronous mode of distance education has become static, while the numbers of asynchronous courses have tripled. One possible reason for the substantial growth may be the characteristics of asynchronous courses. The preferred type of distance courses for the institutions, faculty and students are the asynchronous. Institutions favour asynchronous, particularly web-based, courses due to the lower cost to provide them (Holcomb, et al., 2004).

Brown (2003) remarked that e-learning has been seen by many as a major shift from the teacher-centred model in the traditional learning system to a learner-centred model. In a traditional mode, the educator is the centre of the learning process. Educators behave in a didactic manner and activities rely heavily on textbooks. All learning activities in the traditional mode take place in classrooms and laboratory settings (Shui-Fong & Yin-Kum, 2007). In a traditional classroom setting, the primary mode of assessing student learning is viewed separately from teaching, and occurs almost entirely through an in-class examination at the end of the course. In this environment, students work individually and in competition. The key concept of old methods of learning is that learning is viewed as a process of transmission of knowledge from educator to students through textbooks. In contrast to the above, learning under an e-learning setting prioritises a student-centred approach; fashioned to meet the conditions and needs of the students.

2.4.4 E-Learning Tools

E-learning tools are any computer software or application, ranging from sophisticated, online, real-time, multi-player games to basic applications like Microsoft PowerPoint and Microsoft Word. These tools perform many functions in the teaching and learning process such as content presentation, assessment administration, collaboration facilitation, communication facilitation, management of assessment results and information dissemination. In the current study, the students' ICT literacy levels were measured by asking them to indicate their level of competency in the software applications listed above. According to Border et al. (2006), there are four main categories of e-learning tools; 1) LMS; 2) synchronous collaboration applications; 3) all other computer tools/applications including asynchronous communication applications; and 4) game play or simulation software. According to Brown and Johnson (2007), LMSs can be viewed as the systems of information that are managed by instructor-led as well as e-learning courses. LMSs assist in monitoring student progress, including training, evaluating and tracking results. Examples of LMSs are applications similar to Blackboard, Moodle, WebCT and Desire 2Learn. These LMS applications can be moderately robust in recording of self-contained surveys or independent surveys or evaluations, in order to track personal usage of the course website and all of the machinery involved for learning, thereby creating a forum for asynchronous and synchronous learner-to-learner and learner-to-instructor communication. Synchronous collaboration tools create live communication and interaction between users by means of voice and video, as well as a virtual whiteboard, text-chat and possibly application-sharing capabilities (Brown & Johnson, 2007). Synchronous collaboration tools include, but are not limited to, applications like Wimba, CentraOne, HorizonLive, Elluminate and NetMeeting. E-mail, instant messaging, blogs, podcasts, surfing the Web, CDs, DVDs, MP3s and online and offline computer applications which can be used to deliver e-learning. These tools can facilitate real-life assignments such as distance learning and distributed authoring. Games and game play are the emerging fourth type of e-learning delivery tool (Border et al. 2006). According to Border et al. (2006) gaming is making its way into education through a number of approaches, from the use of Solitaire in Business Education classes to assess mouse skills to SIMS in middle school Social Studies to teach types of government.

In the context of this study, e-learning is viewed as a means of transmitting useful instructions to learners or a means of acquiring knowledge and skills in order to yield a better academic performance and improve low academic performance.

2.4.5 E-Learning (Blended learning) for On-Campus Students

A stronger learning environment has emerged by combining the strongest aspects of the two available approaches to remove the deficiencies of traditional learning and web-based learning. This new learning approach is blended learning. According to Kazu and Demirkolb (2014), in international literature blended learning is also referred to as hybrid learning and mixed learning and it is used in very different ways by many researchers. Singh and Mohamed (2012) argued that the introduction of online resources into an on-campus course merely changes the process of delivering information to students rather than influencing student achievement. Graham (2006) defined blended learning as the combination of two different education models, traditional face-to-face learning and distance learning. Wilson and Smilanich (2005) viewed blended learning as the implementation of the most effective learning solutions in a coordinated way to achieve the desired learning targets. Horton (2006) viewed blended learning as combining some strong and advantageous aspects of online learning and learning in the classroom. Yılmaz and Orhan (2010) stated that the best way to solve the lack of interaction problem faced in technology-based learning is to blend traditional learning and online learning. Throne (2003) emphasised that the blending of these two learning approaches occurs by combining CD ROM, e-mail, conference, online animation, audio message, multimedia technology and real classroom environment and he stated that it should be presented to the student with traditional classroom management and face to face learning. These previous studies (Chen et al., 2010; El-Deghaidy & Nouby, 2008; Tsai et al., 2011; Woltering et al., 2009; Yılmaz, 2009) reported that there was a positive effect between blended learning and academic achievement of students. El-Deghaidy and Nouby (2008) found that there was a significant effect of blended learning on academic success. Tsai et al. (2011) found that academic performance increased under blended learning situations. Bawaneh (2011) found that a blended learning approach adopted in regular university courses consist of hard copy study materials, face-to-face sessions and communication via e-mail, coupled with the more recent Internet-based message boards and other online resources. Ituma (2011) remarked that students' learning experience and performance can be improved when online resources are integrated with traditional forms of course delivery, such as face-to-face lectures and tutorials. Bawaneh (2011) reported that improvements can be achieved if online resources are introduced by complementing the existing course delivery systems which bring about improvements. For the purpose of this

study, the academic performance of distance education students under an e-learning setting was investigated.

2.5 Impact of Technology on Distance Education

Neto & Brasileiro (2007) noted that the developments in computers and computer-related technologies have cultivated the development of e-learning and given distance learners better opportunities to decide when, where, what and how to learn. These researchers (Andrews & Haythornthwaite, 2007; Beldarrain, 2006) are of the opinion that these innovations will remove the difficulties of geographic separation that isolate learners from institutions, teachers and each other. The innovation in ICT has achieved fast development in every aspect of learning, making it a necessity for educational institutions to benefit from this speedy development in ICT to enhance learning situations and adapt to the continually expanding interest for education and training. Does this affect the academic performance of distance e-learners? This study intends to provide an answer to this question and make a finding that will be useful for research purposes.

Malala (2004) and Sonwalkar (2002) pointed out that educational institutions and privately-owned businesses have rushed to offer distance education programs. With latest innovations, and the widespread utilisation of personal computers (PCs) and the web, it has become easier to provide distance education through the Internet where a concept such as e-learning emerged (Akkoyunlu & Soylu, 2006).

As indicated by Wolf (2006), for distance education to be fruitful, staff should have been prepared in the innovation and in addition the teaching method of distance education. Teaching online is a new experience, different from teaching in the classroom because it requires a different set of skills and a different pedagogy.

Al-Amusa and Al-Mubarak (2005) recorded four eras of ICT that are used in instruction, beginning with correspondence where the post and phones were utilised and collaboration was uncommon. The second era was embodied by radio, TV and video with communication at the same level as in correspondence. The third era was distance learning which focused more on electronic interaction and the communication between the student and his tutor. Finally, he identified the fourth era, the present time, with the Internet and its improvements.

In the fourth era, all possible ICT and media – print, audio, video, radio, computer and multimedia – are brought into the systems to remove barriers between the educators and learners. The time of information technology we live in has brought about a knowledge explosion. Students who for various reasons could not register for formal education now enroll in distance education. This has enhanced their abilities and learning and readiness to show signs of improvement bearer alternatives. This has improved their skills and knowledge and able to get or secure a better job opportunity. Distance learners receive information at any time and anywhere with the aid of ICT.

ICT supports distance learners in autonomous and dynamic learning. It creates responsibility regarding learning. It assists in gaining literacy skills, certainty and enthusiasm. ICT makes learning fascinating and viable. Distance learners engaged in different activities which enable them to get materials related to their courses through the Internet, e-mail and so on. Along these lines their spare time and space of learning. ICT encourages e-learning, Internet learning, virtual classroom that are useful for distant learners (Anderson, 2007; Osam & Ekpo, 2009; West, 2009).

In light of this, this study set out to critically examine the effect of ICT (e-learning) on academic performance of distance e-learners. Distance learners learn at their own pace (Singh, 2013). Singh (2013) reported that distance education gives a viable learning environment to students who search for genuine instruction which is dynamic, valuable and intelligent.

Meyer (2002) found that in order to help reduce the demands of travel, educational institutions utilised available technologies, such as audio connections, video tapes and television to perform distance education efforts. Rajesh (2003) found that each distance teaching institution is quick to adjust to the latest mode of teaching and learning with a specific end goal of staying informed concerning new developments in educational technology.

ICT is a means of transmitting information to the learners through a wide variety of media in a way that advances knowledgeable discussion and in addition gives direction. Covington (2004) conducted a study to survey the student's state of mind concerning online and computer-mediated distance education and professional communication. Stella (2005) found that distance learners use computer-assisted instructions in their learning. Singh (2013) examined the issues connected with ICT versatility in developing nations with regard to distance education. He said that information

technology had come to assume a dynamic part in democratising education in the developed nations as well as in the developing nations.

Golightly (2008) found that multimedia technology in teaching is more powerful when contrasted with the customary print-based teaching techniques. Robinson (2008) found that utilisation of distance education and ICT increased rural teachers' learning opportunities and as a method for policy makers and planners to strengthen teachers' proficiency in ways that empower teachers. Bermon (2008) emphasised that ICT usage provided for the distance education needs of rural populations, and concluded that in all three nations (India, Sri Lanka and Bhutan) the traditional media, such as radio and TV, should play a key long-term role to guarantee that education is available to the widest conceivable scope of students.

ICT innovation empowers individuals to work and learn autonomously, regardless of time and space, so groups are no longer identified by geographical proximity (Peters, 2007). Oskarsson and Edvardsson (2007) affirmed that education has reformed teaching and learning where innovation empowers the exchange and transmission of content, pictures and video free of the imperatives of time and space. This has quickly expanded the number of university students as non-conventional students have entered the universities in numerous countries. Are these advantages of information technology affecting the academic performance of distance e-learners? This is an interest of this present study.

2.6 Academic Performance

Ahmad et al. (2011) defined academic performance as a way of quantifying the academic success of a student. Academic performance is related to the knowledge and skills developed by a student in various courses of study. Garner-O'Neale and Harrison (2013) noted that the level of academic performance is calculated using tests, assignments and final examination results and is dependent on the standards put in place by the educational institution. Pitan (2015) remarked that today's modern society expects everybody to be a high achiever. She noted that the key criteria to determine one's actual potentials and capabilities may be academic performance, which has turned into an index of the student's future and upward mobility. Academic performance is usually measured by levels and test scores (Kingdon, 2007; Rockoff, 2003). As indicated by the Cambridge University Report 2003, academic performance is the performance level in the

examination and major modules. In South Australia, Tan and Yates (2007) noted that academic performance is measured in terms of past examination performance, performance in the midterms and failure in modules. Maiyo & Ashioya (2009) commented that in Kenya, education is examination oriented and consequently the main assessment for performance is through examinations. As stated by Ali et al. (2009), the social and economic improvement of the nation is fundamentally connected with student academic performance. Academic achievement assumes an essential role in delivering the best quality graduates who will become leaders and the workforce in the nation in charge of the nation's monetary and social advancement. According to Singh (2013), academic performance refers to how students deal with their studies and students manage their studies and how they adapt to or fulfil diverse assignments given to them by their instructors. Academic performance can be defined as perfection in all academic disciplines in class as well as extracurricular activities. It includes excellence in sport, behaviour, confidence, communication skills, punctuality, assertiveness, arts, culture and the like.

Academic performance can be measured in several ways. The majority of researchers (Broh, 2000; Darling, 2005; Galiher, 2006; Stephen & Schaban, 2002) across the globe utilised the GPA to measure student performance. In Pakistan, Hijazi and Naqvi (2006) used test results to measure students' performance for the specific subject in a particular semester. Martha (2010) studied the variables influencing student performance and measured the students in Uganda's achievement as their performance in tests and coursework. The most critical and appropriate approach to measure the student academic performance in Malaysia is the Cumulative Grade Point Average (CGPA). Nigeria as a developing country also uses GPA to measure academic performance of students semester by semester.

Stevenson, Shin-Yin and James (2001) conducted a study on Chinese, Japanese and American students' academic achievement in Mathematics and measured performance in perceptual speed, coding skill, spatial abilities, vocabulary, verbal memory and general information. They found that Japanese and Chinese students performed better than their American counterparts. The outcomes in these distinctive parts of performance influence academic achievement in Mathematics. North Central Association (2000) gave methods for measuring student learning outcomes. These are evaluating learning increases through pre-test and post-test measures, and survey and self-report measures. Measurement of outcome is viewed as the best method for discovering data about

students. In this study, the academic performances of the distance e-learners are measured by using the results of their previous semester.

2.7 Factors Affecting Academic Performance of On-Campus Students and Distance Learners

Considine and Zappala (2002) reported that parent's income or social status positively affects students' scores in examinations. According to Minnesota (2007), higher education performance is dependent upon the academic performance of graduate students. Many studies have been conducted in the area of students' performance and these studies identify and analyse the number of factors that affect the academic performance of the student at school, college and even at university level. Their findings reported the students' effort, previous schooling, parents' educational background, family income, self-motivation of students, age of student, learning preferences and entry qualification of students as important factors that have an effect on the student's academic performance in different settings. The current study is aimed at determining the factors that affect the academic performance of distance learners under an e-learning setting in a Nigerian university.

The investigation of Oregon State University (2003) on final-year admissions stated that ordinary measures of educational potential and academic performance such as secondary school GPA scores indicated that just 30% of the deviation in the beginning of the first year at school. It is vital to note that even these studies do not concur with the previous studies which investigated whether previous academic performance influences the future performance of the students in schools. They found that the admission scores are identified with academic performance at university level but to a minimal or insignificant extent. Jeynes (2002) reported that the socioeconomic status of the parent, parents' education, professional qualification, family income and occupational affiliation influence academic performance of students. The outcomes of numerous studies affirmed that the academic achievement of students depended on the parent's socioeconomic status. Students from higher socio-economic backgrounds will perform better than other students from low socio-economic backgrounds. Jeynes (2002) noted that social and economic status of a student is generally determined by combining parents' qualification, occupation and income. Is academic achievement of distance e-learners dependent on parents' socio-economic status as found in the above study? The current study provides specific findings to the above question.

Considine and Zappala (2002) in their study on the effect of social and economic problems in the academic performance of school students stated that students from parents who have social, educational and economic advantages recorded higher levels of success than those without. Considine and Zappala (2002) observed that children of parents with a low income are found to have a low literacy level, low retention rate, problems in school behaviour and show a negative attitude towards studies and school. According to Eamon (2005), students who come from low financial status families scored lower compared to their counterparts from high financial status families. It was expected that youngsters' academic performance is unequivocally influenced by the standard and kind of educational institution in which students get their training. The educational environment of the school attended sets the parameters of students' learning results. These studies led the researcher to investigate if educational environment determines the academic performance of distance e-learners who were trained in Nigerian institutions. The outcome of the results is explained in detail in Chapter 6.

Considine and Zappala (2002) demonstrated that school environment and instructor expectations of their students have a strong impact on student performance. The majority of the educators working in poor schools or schools having run short of basic facilities often have low performance expectations of students, which directly resulted in poor performance by the students. Kwesiga (2002) contended that the performance of the students is influenced by the school in which they studied, yet he additionally said that the number of facilities a school offers dictate the quality of the school, which in turn affects the performance and accomplishment of its students. Sentamu (2003) contended that schools influence the educational process in content, organisation, teacher and teaching-learning and eventual evaluation. Educationists and researchers concurred with the rule that schools have a high influence on academic performance and educational achievement of students.

Students from world-class schools are relied upon to perform well because these schools are extremely rich in resources and facilities. Crosne and Elder (2004) noted that school facilities, procurement of premises and accessibility of assets in a school are an essential part of the school. Private schools, because of the better financing, small class sizes, standard of teachers and access to learning resources, for example PCs, perform better than government-funded schools.

Contrary to the above, Pedrosa, Norberto, Rafael, Cibele and Benilton (2006) conducted a study on educational and social economic background of undergraduates and academic performance at a Brazilian university, and found that students coming from disadvantaged socioeconomic and educational homes performed relatively better than those coming from higher socioeconomic and educational backgrounds. They referred to it as educational elasticity. It is obvious and true that the criteria for categorising socioeconomic standards in different nations are different, depending of their norms and values. The criteria for low socioeconomic status for a developing country will be different from the criteria for developed nations and the same will be the case in developing and under-developed countries. The researcher is in agreement with the above authors because the criteria for low socioeconomic status in Nigeria as a developing country are different from other developing nations. Escarce (2003) pointed out that due to residential stratification and separation, the students belonging to low-income backgrounds usually attend schools with lower funding levels, and this situation reduced achievement motivation of the students and high risk of educational malfunction in future life endeavours.

Garzon (2006), Kahlenberg (2006) and Kirkup (2008) observed that students with high level of socioeconomic status (SES) perform better than the middle-class students and the middle-class students perform better than the students with a low level of SES. The achievement of students is negatively correlated with the low SES level of parents because it hinders the individual in gaining access to sources and resources of learning (Duke, 2000; Eamon, 2005). Low SES strongly affects the achievement of students, dragging them down to a lower level (Sander, 2001). Rouse and Barrow (2006) observed that the economically disadvantaged parents are less able to afford the cost of education of their children at higher levels and consequently they do not work at their fullest potential. Krashen (2005) concluded that students whose parents are educated score higher on standardised tests than those whose parents were not educated. Educated parents can better communicate with their children regarding the school work, activities and the information being taught at school. They can better assist their children in their work and participate in school activities (Fantuzzo & Tighe, 2000). The academic performance of students heavily depends upon the parental involvement in their academic activities to attain the highest level of academic success (Barnard, 2004; Shumox & Lomax, 2001). The low SES causes environmental deficiencies which resulted in low self-esteem of students (US Department of Education, 2003). The relationship between gender and the academic achievement of students has been discussed for decades (Eitle,

2005). A gap between the achievement of boys and girls has been found, with girls showing better performance than boys in certain instances (Chambers & Schreiber, 2004). Gender, ethnicity and father's occupation are significant contributors to student achievement (McCoy, 2005). These researchers identified many issues that must be tackled before distance learning can be successful. These issues are: problems with technology (Andrusyszyn, Soeren, Laschinger, Goldenberg, & DiCenso, 1999); feelings of isolation (Rodger & Brown, 2000; Swisher & Mandich, 2002); lack of effective communication (Ali, Hodson-Carlton, & Ryan, 2004); lack of face-to-face interactions (Rovai & Barnum, 2003); insufficient technology support (Lee, 2002); and faculty time commitment (Ali, Hodson-Carlton & Ryan, 2004). Previous studies on distance learners' academic performance have attempted to determine if there are any student characteristics that may influence academic performance (Cheung & Kan, 2002; Alstete & Beutell, 2004). This study is similar, but the above studies were conducted in Canada, Hong Kong and the USA.

The researcher observed that studies were conducted on distance learners in general education courses, professional courses and healthcare courses. Also, gender, entrance examination results and previous academic achievement are some of the variables that had been studied to determine what type of students perform better in the distance learning environment. Some of these researchers found that women performed better in a distance learning setting when compared to men (Cheung & Kan, 2002; Alstete & Beutell, 2004), while other researchers found that there was no relationship between gender and academic performance (Barakzai & Fraser, 2005). Cheung and Kan (2002) found no relationship between student age and academic performance. In contrast, Alstete and Beutell (2004) found a significant positive relationship between students' ages and grades received in online courses offered in a Master's in Business Administration program. In contrast to Alstete and Beutell's study, this study cuts across all disciplines, and includes both undergraduate and postgraduate students.

2.8 Effect of Technology on Academic Performance of Students

A few researchers reported that there was no evidence to show the key role played by ICT on academic performance (Angrist & Lavy, 2002; Banerjee et al., 2007; Goolsbee & Guryan, 2002) while some reported a genuine effect of ICT on students' achievement (Coates et al., 2004; Fushs & Wossman, 2004; Sosin et al., 2004; Youssef, et al 2008). Coates et al. (2004) reviewed three matched pairs of face-to-face and online principles of economics courses taught at three different

institutions. The students' score in the Test of Understanding College Level Economics (TUCE) given towards the end of the term was utilised as the measure of learning outcomes. Subsequent to considering choice predisposition and contrasting student characteristics, they reported that the average TUCE scores were just about 15% higher for the face-to-face format than for the online format. Anstine and Skidmore (2005) examined two coordinated sets of on-campus and online courses, one in statistics and the other in managerial economics. They reported that in the wake of considering student characteristics and selection bias, students in the online format of the statistics class exam scored 14.1% less the those in the traditional setting, though for the managerial economics class, the test scores within both formats were not significantly different.

Terry, Lewer and Macy (2003) researched 240 students in a programme offering courses in the three formats, online, on-campus and hybrid. Using a standard regression model where the final exam score is the dependent variable and student characteristics are the independent variables, they reported that predicted exam scores for students in the online courses were significantly less than those of students in the on-campus and in the hybrid formats. There was no significant difference in exam scores between students in the hybrid and students in the on-campus classes.

Brown and Liedholm (2002) analysed students in a matched pair of online and face-to-face principles of economics course taught by the same educator. They reported that exam scores, after considering contrasts in student characteristics, were roughly 6% higher for the on-campus format than for the online format. They attributed the relatively better performance in the on-campus classes to the benefit of face-to-face teacher-student interactions, and attributed the relatively poorer performance of the students in the online class to the lack of self-control vital for effective autonomous learning in the online environment.

Leuven et al. (2004) found that there was no evidence for a relationship between increased educational use of ICT and students' performance. In fact, they found a consistently negative and marginally significant relationship between ICT use and some student achievement measures. Students may use ICT to increase their leisure time and have less time to study. Online gaming and increased communications channels do not necessarily mean increased achievement.

Sosin et al. (2004) constructed a database of 67 sections of Introductory Economics, enrolling 3,986 students, taught by 30 instructors in 15 institutions in the United States of America during

the spring and autumn semesters of 2002. They found significant, yet low, positive effect on student performance as a result of ICT use.

Fuchs and Woessman (2004) adopted global information from the Program for International Student Assessment (PISA) in Germany. They demonstrated that while the bivariate relationship between the accessibility of ICT and students' performance was strongly and significantly positive, the correlation became small and insignificant when other student characteristics, like age, sex and background, were taken into consideration. This study is similar because it investigated the relationship between students' ICT literacy levels and academic performance of distant e-learners. Li et al. (2003) pointed out the following: First, web-based instruction presents information in a non-direct style, permitting students to explore new information via browsing and cross-referencing activities to investigate new data through searching and cross-referencing exercises. Second, web-based teaching supports active learning processes emphasised by constructivist theory. Third, web-based education enhances understanding through improved visualization and finally, it is convenient, as it could be used any time, at any place

This study analyses the effect of technology on the academic performance of distance e-learners who are fully engaged in e-learning.

2.9 Comparison of Academic Performance of Distance Learners and On-Campus Students

A few studies have discovered statistically significant differences in student outcomes based on delivery type (Faux & Black-Hughes, 2000; Paden, 2006; Shoenfeld-Tacher, McConnel, & Graham, 2001). Paden found a statistically significant difference in student performance between online and conventional courses. Faux and Black-Hughes conducted research into student performance between different delivery modes of a social work course and found that a statistically significant difference existed between post-test scores by delivery mode. Extra investigation showed that students in the online segment did not perform as well as students in the traditional section. Russell et al. (2008) reported in a comparative study of distance learning and on-campus face-to-face students in health informatics. They found that there were no significant differences between the two, based on GPA scores.

Barakzai (2003) examined two distance course formats when contrasted to traditional face-to-face course design concerning their adequacy on students' accomplishment and fulfilment. A multiple-choice exam based on the objectives of the course was used to compare the achievement of the students featuring in the three groups. The Likert scale was used to compare students' satisfaction in the three groups. The outcome of this study showed that the achievement scores of the online group were significantly higher than the other two groups, followed by the achievement scores of the videotape and workbook group, then the traditional group with lowest achievement scores. The analysis of data obtained from a satisfaction questionnaire showed that there was no significant difference between the levels of satisfaction of the three groups, although the level of the online group satisfaction was higher than the other two groups. The scholars investigated the correlation between academic performance of students and satisfaction. The result indicated that there was no correlation between these variables. In contrast to the above study, the present study did not set out to compare traditional and distance education but to examine the relationship between e-learning and academic performance of distance e-learners.

El-Deghaidy and Nouby (2008) conducted research to investigate the effectiveness of blended e-learning cooperative method as compared to face-to-face lectures on the achievement and attitudes of pre-service teaching programme students who took a science teaching methods course at the school of education at Suez Canal University in Egypt. The study sample was chosen randomly from pre-service teaching students in their third year. The sample comprised 26, of whom 12 biology students constituted the control group, while the remaining 14 chemistry and physics students constituted the experimental group. The experimental group was exposed to the course through a website designed based on the ADDIE model (analysis, design, development, implementation and evaluation) by the researchers using the FrontPage software program. The control group was exposed to the same course through the traditional method of teaching. Post-test achievement and attitude scale was utilised to examine the differences between the two groups in terms of achievement and the attitude. The result of the study showed significant differences between the two groups in favour of the experimental group.

Lim (2002) compared the level of learning and learning application of three groups of undergraduate students who took a course in human resource development at Midwestern University. The three groups were taught the course by three different strategies (classroom, WBI

and satellite-based instruction). Eight students were instructed using WBI, six students by satellite-based instruction and five students through normal classroom instruction. A five-point Likert scale was utilised to survey the level of learning and learning application. The outcomes demonstrated a high perceived level of learning in all of the three groups where the mean score was 4.04 and the mean score of the three groups in terms of the frequently applied learning was 3.89. With respect to the differences between the three groups in terms of the two dependent variables, the outcomes demonstrated that there were no significant differences between them in terms of perceived level of learning and application.

Kekkonen-Moneta and Moneta (2002) compared the effectiveness of e-learning and face-to-face lectures on students' learning outcomes involving a course of introductory computing at the Hong Kong University of Science and Technology. The study compared three groups, one lecture group and two online groups. The lecture group involved 105 students. One online group involved 180 students, while the other featured 129 students. The students' learning outcomes were tested through midterm and final examinations. The mean scores of learning outcomes regarding factual learning were higher in the traditional group compared to e-learning groups, and yet the difference was not significant. The mean scores of learning outcomes regarding applied-conceptual learning were significantly higher in the traditional group in the midterm exam though significantly lower in the final exam compared to online groups. This led the researchers to conclude that the online format could be deemed as effective as the traditional format regarding the students' learning outcomes. This study is a survey research which focuses on the academic performance of distance e-learners who are fully on e-learning, unlike the above study that concentrated on distance e-learners that engaged in both lecture and online groups.

Johnson et al. (2000) researched the adequacy of an online course on the learning results of undergraduate students who took the instructional design course for human resource development experts at Midwestern University as compared to a face-to-face course. Nineteen students were involved in each group. The results of this study indicated that face-to-face group satisfaction was significantly more positive regarding instructor and course quality, course interaction and support. There were no distinctions in the levels of fulfilment among the group regarding course structure, while the fulfilment of the online group with respect to department backing was significantly more positive. With respect to the learning results variables, the outcomes showed that the mean of the

education packages designed by the face-to-face group was higher than the online group, but not significant. The course graduates were for the most part equivalent for both groups. The analysis of the self-assessment instrument indicated that the face-to-face group was significantly more comfortable in the following tasks: preparing a learner analysis, preparing a content analysis, writing goal statements and writing terminal objectives. The online group was essentially more pleasant in distinguishing the different ISD models. The general results demonstrated that the level of fulfilment of the face-to-face group appeared to be slightly more positive than that of the online group, while there was no difference between both groups as far as learning results were concerned.

Carswell et al. (2000) compared the impact of e-learning techniques and traditional strategy on the learning results and experience of undergraduate students who undertook a fundamentals of computing course at the Open University in the UK. The study sample comprised 132 students, 59 students in the Internet study group, and 73 students in the conventional study group. Continuous assessment was utilised to analyse the learning results of both groups. The students' experiences of both groups were compared through various tools including the distribution of a questionnaire at the beginning and the end of the course, learning style questionnaire, tutorial, and marked assignments. The outcomes of the study showed that there was no significant difference in the learning outcomes between the two groups. The utilisation of an online technique expands learning background and Internet experience more than traditional methods.

Alsete and Beutell (2004) reported a significant positive relationship between undergraduate GPA and grades obtained in online courses. Bearden, Robinson and Deis (2002) found that students with lower GPAs did not perform as well as traditional on-campus students with the same GPA in a dental hygiene nutrition course.

There are many studies comparing the academic performance of distance learning students to the academic performance of students under a traditional on-campus environment (Bernard et al., 2004). Bernard et al. (2004) observed that this kind of comparative research has kept on expanding despite the fact that there are conspicuous voices inside the field that have expressed that there has been sufficient similar research on distance learning. Bernard et al. (2004) argued that comparative research is useful because distance learning is growing at an exceptional rate. Researchers have compared the academic performance of distance learning students to that of traditional on-campus

students in healthcare education (Beadern, Robinson, & Deis, 2002; Duffy, Gilbert, Kennedy, & Kwong, 2002; Jedlicka, Brown, Bunch, & Jaffe, 2002). Some researchers (Beadern, Robinson, & Deis, 2002; Jedlicka et al., 2002) reported that there was no significant difference in test scores between distance learning students and traditional on-campus students. Gallagher, Dobrosielski-Vergona, Wingard and Williams (2005) and Duffy et al. (2002) demonstrated that distance learning students outperformed their on-campus counterparts on academic evaluations. The researcher observed that the above authors failed to report in their academic comparisons, whether the factors that influence academic performance of traditional on-campus students also influence the academic performance of distance learners. This is a research gap that the present study set out to fill.

Naidr, Adla, Janda, Feberová and Hladiková (2004) found that health information administration students that were enrolled in a medical informatics course via distance learning retained as much of the material as students in traditional classrooms. Gallagher et al. (2005) found that the retention rates for dental hygiene students were higher for those in web-based courses as compared to those in traditional courses. The academic performance, retention rates, student perceptions, faculty perceptions, and various educational technologies have all been studied in distance healthcare education. Bearden et al. (2002) compared dental hygiene students enrolled in an online nutrition course to those that had received the nutrition course on-campus. The researchers compared the two groups by examining the distance and on-campus students' scores on nutrition questions on the National Board Dental Hygiene Examination (NBDHE). Bearden et al. found that there was no significant difference in the nutrition NBDHE questions between the two groups.

Collins and Pascarella (2003) conducted research that compared three groups of students enrolled in a firefighting tactics and strategy course. They utilised an experimental and quasi-experimental design to investigate whether students enrolled in a two-way interactive course would perform as well as students in the traditional on-campus face-to-face course. They also compared students that had self-selected the telecourse. The researchers found that the self-selected telecourse group performed better than the two randomised groups. The randomised telecourse and on-campus group participants performed equally on both the pre-test and post-test. Collins and Pascarella concluded that researchers that attempt to compare self-chosen distance learners to their on-campus counterparts may have distorted their findings due to the significant differences in the

groups with which they began. This group of self-chosen learners scored two standard deviations above the randomised groups on the pre-test; they had more postsecondary credits, and previous fire science credits. More of the self-chosen learners were trained as emergency medical professionals and more were certified firefighters. These variables led to a self-selected group with more experience and knowledge than the two randomly formed groups.

Bernard et al. (2004) reported that those students in distance education had slightly higher overall achievement than those in customary classrooms. They found that achievement was higher for those students in an asynchronous learning environment instead of those in an asynchronous learning environment. Students in a synchronous distance setting preferred traditional classroom instruction more than those students in an asynchronous setting. The retention rate was lower in the asynchronous setting as opposed to the synchronous distance education setting (Bernard et al., 2004). Allen et al. (2004) carried out a meta-analysis of more than 500 manuscripts. They showed comparable results to at similar finding by Bernard et al. (2004), that students in distance education courses performed slightly better than those in on-campus courses. In contrast to the Bernard et al. (2004) discoveries, Allen et al. (2004) found that there was no difference in student performance between the synchronous and asynchronous learning situations. Oye et al. (2012) found that students in higher educational institutions engaged in e-learning performed better than those in face-to-face courses. Holley (2002) found that students who participated in online/e-learning scored higher grades than students who studied using the traditional approach. Lumadi (2013) concluded that e-learning has a significant influence on the performance of students, as student teachers taught using e-learning reliably performed better than student-teachers taught using the customary technique.

Healthcare education was identified as one content variable in a meta-analysis performed by Zhao, Lei, Yan, Lai and Tan (2005). This meta-analysis was performed on 51 journal articles and the authors concentrated their examination on past distance education studies to investigate how different variables of the distance education research influenced learning outcomes reported in the research. The variables that were determined by the authors to have a possible influence on the outcomes of distance education studies were the publication year, instructor as an author, instructor involvement, status of the instructor, teacher training for teaching distance education courses, content area, instructional level of the student, interaction type between students and teacher and

the media used. In summary, the researchers found that there was no distinction in outcomes between distance and face-to-face instruction. Olmsted (2002) concentrated his study conducted in the USA on five consecutive classes of dental hygiene students to determine how they performed on the national board examinations. A total of 115 distance students were compared to 105 conventional on-campus students. The researcher found there was no critical distinction in scores on the national board examination, core curriculum courses and final GPAs between the two groups of students. The researcher also found that there was a strong correlation for both distance learning and on-campus students between GPA scores and national board examination scores.

The majority of the above studies were carried out in advanced countries that have sophisticated technology and where the usage of ICT for educational purposes has been in existence for a long time. But the present study was carried out in Nigeria, where technology is in its infancy. Specifically, the study is interested in determining the influence of e-learning on the academic performance of distance e-learners at NOUN. Also, this study differs from the above studies because the study is not comparing the academic performance of distance learners with on-campus students but critically analyses the effect of e-learning on academic performance of distance e-learners.

It is pertinent, therefore, to have a clear understanding of what determines academic performance of distance e-learners. It is on this ground that this study intends to focus on the influence of these factors on academic performance of distance e-learners.

2.10 Students' ICT Literacy Level and Academic Performance

Oladunjoye et al. (2014) viewed computer literacy as the amount of computer knowledge required and the length of computer usage. According to Adeyinka and Mutala (2008) computer literacy can be viewed as some basic skills in using the computer, for example, to save and open a file, use a word processing program, and send and receive e-mail. These researchers conducted their studies on a computer literacy among undergraduate students in Nigerian universities and gender differences in computer literacy among undergraduate students at the University of Botswana. The present study was intended to determine the computer literacy levels of distance e-learners in a Nigerian university by considering their level competency in using educational software such as

word processing, spreadsheet, presentation etc. This will be computed against their academic performance to determine the influence.

Hall (2005) identified four classes of computer users as emergent users, the progressive users, the high users and the dependent users at the University of Newcastle. He described the emergent users as those who have access to computers at home and at work; they have access to and know how to use word processing, e-mail, web, and how to download information to compact discs. The progressive users are those who are prepared to learn everything necessary about computers. They invest their energy and cash to take in more about the innovation. The high users are the individuals who are well versed in computer technology; they know how it works and how it can be controlled. The dependent users, on the other hand, are the individuals who do not know anything about computers and are not making moves to learn. They rely on upon the individuals who know much about computers whenever they have something to do on the computer. Do the student's computer literacy levels influence the academic performance of distance e-learners? What effect do the classes of computer users have on academic performance of distance e-learners? The present study will provide answers to these questions and also determine how best the student's ICT literacy level predicts academic performance of a distance e-learner.

Previous studies (Angrist & Lavy, 2002; Rouse & Krueger, 2004) on the impact of classroom computer use on student achievement have reported no impact or negative impact of using computers for instructional purpose on learning outcomes of mathematics and reading. On the other hand, Fuchs and Woessmann, (2004) found positive relationships between computers use and learners' academic performance.

A number of researchers (Alavi et al., 2002; Lee et al., 2001; Marks, Sibley, & Arbaugh, 2005) reported that students' prior knowledge with online instruction had significant effects on their current distance education background: students who had online courses before have a tendency to be more skilled at dealing with their Internet learning process and hence performed better than their counterparts who were new to online instruction.

Some studies (Cheung & Kan, 2002; Dupin-Bryant, 2004) identified earlier web learning background as a pointer for predicting success of graduating and non-graduating students in distance education programs (Cheung & Kan, 2002, Dupin-Bryant, 2004).

Arbaugh (2008) reported that prior web learning knowledge is one of the most grounded indicators of learner fulfilment. There are studies that support this finding, demonstrating that experienced online learners are more likely to rate their online program as best or fulfilling (Artino, 2007; Lim & Morris, 2009; Martínez-Caro, 2011).

Eskil et al. (2010) argued that when students have prior information about computer technologies, they can be more effective in their studies. They concluded that direct and indirect effects of ICT usage at school should be considered. Sosin, et al. (2004) conducted a large-scale study involving 3986 students from 15 universities in the USA. The purpose of the study was twofold: the first was to examine the performance of students whose courses incorporated technology and the second was to investigate the time a teacher needed to spend on creating a technology-based course. She reported there were positive results to support the inclusion of technology in economics education since she found student learning to have improved significantly. She concluded that course preparation time had also improved for teachers depending on how they managed their time and what use they made of technology. This study was done in the USA where technology integration in education has been in place for decades, while but the present study will be conducted in Nigeria where technology integration in education is newly emerging.

House (2010) conducted studies on the impact of computer use on student achievement by using multiple regression analysis on a sample of 13-year-olds from the Trends in International Mathematics and Science Study (TIMSS) 2003 to study the effect of computer activity on science achievement for American (n = 8,093) and Japanese (n = 4,540) students. The outcome suggested that not all computer activities improve academic achievement. He reported in the US sample, that using a computer to write reports for school significantly enhanced science achievement whereas using a computer to process and analyse data had no effect on students' achievement. He additionally reported cross-country contrasts in the impact of computer use on achievement. The utilisation of the computer to search for knowledge and information about science significantly affected science achievement of Japanese students, yet had no impact on American students. Carrillo et al. (2010) conducted a comparative study of the impact of ICTs utilisation on mathematics and language by assessing a public program of computer-aided instruction. They found that this program positively affected mathematics test scores but it did not influence dialect

test scores or language test scores. Different studies, conversely, have found that ICT usage contributed to higher science scores but with negative impact on mathematics (Antonijevic, 2007).

Gil-Flores (2009) conducted a comparative study by comparing math and language scores and analyse the differential impact at home and at school. He found a positive outcome of ICT usage on academic achievement in both cases.

In Iran, Mohagheghzadeh et al. (2014) reported that there was immediate and statistically significant relationship between ICT and academic performance of medical and dental students at Shiraz University of Medical sciences. Similar to the above study, the present study further examined the influence of ICT on the academic achievement of distance e-learners based on their faculty of study or course of study. Andreoli (2014) found that there was a significant relationship between the learners' academic performance and their computer education, that is, the more noteworthy the computer proficiency, the better the scores obtained by these students in the distance learning course. Kim and Chang (2010) focused on the Mathematics achievement gap between students originating from Hispanic and Asian students at the Virginia Polytechnic Institute and State University who frequently used a computer for mathematics. This could have been because the students have a computer background and probably had access to ICT facilities. They found that home computer use diminished the gap in mathematics achievement. One of the reasons could that the students were faced with many challenges at home. Contrary to this study, Aypay (2010) found that there was no significant relationship between students' ICT usage and academic achievement, taking into account the consequences of PISA 2006 in Turkey.

Coates et al. (2004) examined three matched pairs of face-to-face and online principles of economics courses taught at three different institutions. The students' score in the TUCE given at the end of the term was used as the measure of learning outcomes. After taking into account selection bias and differences, student characteristics, they reported that the average TUCE scores are almost 15% higher for the face-to-face format than for the online format. Anstine and Skidmore (2005) surveyed two matched pairs of on-campus and online courses, one in statistics, and the other in managerial economics. They reported that after taking into account student characteristics and selection bias, students in the online format of the statistics class exam scored 14.1% less than in the traditional format, whereas, for the managerial economics class, the test scores within both formats were not significantly different.

Terry, Lewer and Macy (2003) investigated 240 students in a programme offering courses in the three formats of online, on-campus, and hybrid. Using a standard regression model where the final exam score is the dependent variable and student characteristics are the independent variables, they reported that actual exam scores for students in the online courses were significantly less than those of students in the on-campus and in the hybrid formats. However, with the comparison of exam scores between students in the hybrid and students in the on-campus classes there was no significant difference.

Brown and Liedholm (2002) surveyed students in a matched pair of online and face-to-face principles of economics courses taught by the same teacher. They reported that exam scores, after taking into account differences in student characteristics, were approximately 6% higher for the on-campus format than for the online format. They attribute the relatively better performance in the on-campus classes to the benefit of in-person teacher-student interactions, and attribute the relatively poor performance of the students in the online class to the lack of self-discipline necessary for successful independent learning in the online environment.

In the Netherlands, Leuven et al. (2004) concluded that there is no evidence for a relationship between increased educational use of ICT and students' performance. In fact, they find a consistently negative and marginally significant relationship between ICT use and some student achievement measures.

Machin et al. (2006) investigated whether changes in ICT investment had any causal impact on changes in educational outcomes in English schools over the period from 1999 to 2003 at University College London. They used an Instrumental Variable (IV) approach to control for endogeneity of ICT use. The authors found evidence for a positive causal impact of ICT investment on educational performance in primary schools.

In India, Banerjee et al. (2007) reported that Indian students who are usually skilled in instructional games and software for mathematics scored significantly higher in mathematics. They outlined two groups that received the programme (or not), and collected student test scores twice, before and after the programme. They regressed the difference in test score between before and after the experiment on the scores before the experiment and the 18 dummy variables, which is a binary specification of whether the school received a programme or not. Thereby, they observed how

many students in the treatment school improved their mathematics score, relative to what would have been expected based on the pre-test score, compared to the control group. Consequently, Computer-Assisted Learning (CAL) has a solid impact, with a standard deviation of 0.35 and 0.47 in the first and second year, individually. In the USA, Dynarski, et al. (2007) carried out a study to assess the utilisation of programming items in the classroom. Items to be utilised as a part of the trial were chosen based on voluntary support. Participating schools and regions were focused on those with low student achievement and a large proportion of poverty. According to their report, the effectiveness of an educational software program in the treatment group, which were randomly assigned, was partly observed in the first and fourth grade; the impacts were probably connected with school qualities. The above research is an experimental research while the present is survey research. The above findings may be influenced by the fact that they were conducted in developed countries where ICT literacy is part of the universities' curriculum. What is the situation in a developing country like Nigeria? In Nigeria, Aitokhuehi and Ojogho (2014) showed that computer-literate students perform better than the non-computer literate; computer-literate female students perform better than male students who are also computer literate; computer-literate students who are not addicted to the use of computer facilities perform better than those who are addicted; computer-literate students in co-educational secondary schools perform slightly better than those in single sex schools. This study was conducted in a Nigerian secondary school and this may explain the fact that computer facilities were made available for convenient and easy learning process and enabled them to practise and access the internet on a daily basis in search of information that could enhance their academic performance.

Osunade, Ojo and Ahisu (2009) showed a significant difference in academic performance between those who had Internet access and those without it in Nigeria. This could suggest that internet access in an e-learning setting is a key determinant of academic performance of students.

In South Africa, Barlow-Jones and Westhuizen (2012) revealed that the computer-literate students performed significantly better during the first semester compared to the computer-illiterate students. The computer-illiterate students indicated that the lack of computer experience influenced their ability to pass computer-related subjects. This study is similar to the present study which will determine if students' prior ICT experience influences their academic performance within the same African country.

Rouse and Krueger (2004) presented the result of a randomised experiment with Fast ForWord (FFW) programs that are intended to enhance dialect and reading skills at Princeton University. Students in an urban school district in which scores of students were beneath normal for the state were arbitrarily chosen to take an interest in FFW. They regressed four predictors that measure various types of objective that were expected to be achieved, with the programme finding that the computerised instruction is helpful in improving some aspects of students' language skills. The programmes fail to develop these skills to broader types of ability such as language acquisition or actual reading skills. Barrow et al. (2007) upheld the positive role of the computerised instruction for Mathematics at the University of Chicago. Students randomly assigned to computer-aided instruction scored higher than those in control groups. They engaged an empirical model like that utilised by Rouse and Krueger (2004). Academic outcomes measured by test scores are regressed on a binary variable, a vector of student characteristics and dummy variables, and the binary variable is regressed with instrumental variables. Lei and Zhao (2007) in their study done in USA; performed a study on a sample of 130 students from a middle school in to examine the impact of the amount and nature of computer use on academic achievement. Their analysis of variance results demonstrated that both quantity and quantity are significant indicators of academic achievement.

Kim and Chang (2010), in their study done in the USA, expressed that computer use for mathematics was connected with diminishing the achievement gap among various differing foundations. Notten and Kraaykamp (2009) stated that science performance was positively affected if there was a positive correlation between a climate of reading and a computer being available at home in the Netherlands.

Also in the Netherlands, Pelgrum and Plomp (2002) discovered results that differentiated those of OECD (2005) by utilising information from the 1999 TIMSS. They group students as *high ICT users* (most frequent users) or *low ICT users* (never or once-in-a-while). High ICT users had lower achievement scores compared to low ICT users in all 26 participating countries[1]. In Canada, the score differential represented approximately 1.5 years of achievement growth. They concluded that the indicators of the available ICT infrastructure differ between countries to another as well

[1] Belgium-French, Bulgaria, Canada, Hong Kong, Taiwan, Cyprus, Czech Republic, Denmark, Finland, France, Hungary, Iceland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, New Zealand, Norway, Russian Federation, Singapore, Slovenia, Slovak Republic, South Africa and Thailand.

as school levels. This study provides answers to the question whether high ICT users' performance surpasses the low ICT user under an e-learning setting. The above study was carried out in the Netherlands but 26 countries participated in the study, while the present study was carried out in Nigeria. The present study investigates if the level of student ICT literacy determines the academic performance of distance e-learners under an e-learning setting.

Wittwer and Senkbeil (2008) investigated PISA 2003 information to determine whether or not home computer accessibility was connected with German arithmetic education, after considering the impact of additional determinants of school performance (like SES, gender, immigrant status, cognitive abilities, reading and watching television). A class definition was used to investigate how students differed in their ICT use at home. Students were grouped into four classes: (a) *smart users*, who had high interest and confidence in using computers, and used them for a variety of applications; (b) *rational users*, who used the computer frequently for school-related learning activities, but not for playing games or communicating with other people; (c) *recreational users*, who only used the computer for playing games, watching movies, or listening to music; and (d) *indifferent users*, who had low enthusiasm for utilising computers and occasionally used them. The scholars found that there was a slightly positive effect on problem solving and mathematics literacy for students in the smart user and rational user group, using multilevel modelling.

Wittwer and Senkbeil (2008) inferred that students' computer-related behaviour at home marginally predicted mathematics performance in Germany. Wittwer and Senkbeil (2008) additionally reported that there were differences in achievement if high-confidence ICT users (whom they termed "smart users") acquired the skills on their own, since they were engaged in problem-solving activities, as opposed to those who acquired skills with the help of others. The above study was done in Germany, a country with high rate of Internet access, and widespread and affordable broadband access, while the current study was done in Nigeria, a developing country with a challenge of implementing ICT. Likethe above study, the present study will investigate if ICT smart users performed better than other users in an e-learning setting and investigate the influence of each class of ICT user as classified above on the academic performance of distance e-learners.

This study determines the ICT literacy level of distance e-learners in the following packages: word processing, spreadsheet, databases, presentation, Internet Explorer and e-mail. The ICT literacy

level is rated as high, moderate, little and none and analysed with previous semester academic performance to determine the significance.

The researcher observed that the effect of technology on students' academic performances have been the focus of an extensive literature over the last two decades, but there is a limited study on the influence students' ICT literacy level on the academic performance of distance e-learners especially in a Nigerian context. The researcher also observed that studies on the impact of students' ICT literacy on their academic performance were mostly conducted outside Nigerian context and those that were carried out in Nigeria focused on regular universities students. This study is meant to fill the identified gap.

Based on this, this study is interested in determining if students' ICT literacy level is a key determinant of academic performance as constructed in hypothesis H_{01}. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.11 Frequency of Engagement with ICT and Academic Performance

At the University of Alberta, Canada, Parsons and Taylor (2011) noted that students learn best when they are completely occupied with the learning process; thus engagement is a vital element in successful implementation of e-learning. Student engagement in China is defined, according to Kong et al. (2003), as students' psychological investment in an effort coordinated towards learning, understanding or mastering the knowledge, skills, or crafts that academic work is planned to advance.

In the USA, Akin (2009) suggested that student engagement is a term extensively used to refer to the degree to which students are actively involved in significant educational experiences and activities. He noticed that student engagement is portrayed as participation in educationally effective practices, both inside and outside the classroom, which yields a positive result. In Australia, according to Errey and Wood (2011), the two factors (a) active and collaborative learning, and (b) inspiring educational experiences are extremely pertinent to student engagement.

In the USA, Ray (2004) stated that learning happens when teaching techniques encourage students to become actively engaged, have opportunities for interaction with others, are presented with challenging circumstances or questions, use their critical thinking skills and are surrounded by a

nurturing learning environment. In Florida in the USA Carle et al. (2009) and Angell (2009) noted that technology has expanded student engagement and academic performance by upgrading students' knowledge. Noeth &Vokov (2004) highlighted that learning results rely on upon precisely how technology is utilised as a part of practice, and learning happens when learners are effectively engaged. The researcher observed from the studies above that there are widespread student engagement concepts in public universities in the USA, Australia, China, but discussion of these concepts has just begun in some parts of the world like Nigeria. Studies that deal directly with influence of student engagement on academic performance in Nigerian public universities are limited. This study perhaps will give a better idea on student engagement in a Nigerian university and fill the gap in research studies. Does frequent engagement with technology influence academic performance of distance learners? This is the focus of the present study.

In the USA, Carney et al. (2006) found that engagement positively correlates with student performance. The Carney et al. conclusion was supported by a number of empirical studies. Davies and Graff (2005) found that online engagement had no statistically significant impact on examination performance at the University of Glamorgan in the UK. The above studies are in conformity with the present study, which aimed to determine if the frequency of engagement with ICT has statistically significant impact on academic performance of distant e-learners. In Europe, Kubiatko and Vlckova (2010) noted that the amount of time spent utilising a computer had a positive and strong relation with scientific knowledge. They concluded that students who used ICT tools for educational purposes scored higher than their counterparts who did not use ICT tools for educational process. This is similar to the current study which will determine if most frequent ICT users will perform higher than zero ICT users. This study was conducted in a European country which has recorded success in ICT tools integration in teaching and learning, but the current study will be done in Nigerian where ICT usage in educational process is in its infancy. Krentler and Willis-Flurry (2005) used a sample of 445 first-year students recruited from Southwestern State University in the US and used analysis of variance to demonstrate that there was a positive association between the frequency of computer use for course-related work and achievement. One of the reasons for this may be that computer use is considered a necessity for educational purposes in the USA. The present study will be done in Nigeria where computer use for educational purposes is relatively new.

In the USA, Kim and Chang (2010) focused on the mathematics achievement gap between students originating from various racial and ethnic backgrounds. They discovered home computer use reduced the gap in Mathematics achievement. In Turkey, Aypay (2010) found that there was no significant relationship between students' use of ICT and academic achievement based on the results of PISA 2006. Aypay (2010) indicated that neither very frequent nor very little use of ICT improved student performance in PISA 2006. The above studies attempted to explain in general the relationship between the level of engagement with ICT and academic performance of students under the traditional mode of learning. The present study is different because it examined the relationship between distance e-learners' frequency of engagement with ICT and their academic performance under an e-learning setting.

The previous studies (Chang & Kim, 2009; Notten & Kraaykamp, 2009; Güven & Kosa 2008; Li et al. 2012; Luu & Freeman, 2011; Kubiatko & Vlckova, 2010; Spiezia 2010; Demir & Kiliç, 2009) reported that computer availability and use had positive effects on students' achievement. One of the reasons might be because these studies were conducted in developed countries were ICT usage for educational purposes has been in place for years.

The present study examines the distance e-learners' frequency of engagement with ICT, and this will be correlated to their previous semester results to determine if frequency of engagement with ICT influences academic performance of distance e-learners as proposed in hypothesis H_8.

The literature reviewed above has clearly shown that all the studies were conducted in developed countries but the present study will be carried out in developing in Nigeria. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

The researcher observed that although there are many research studies in the literature reviewed above, there is limited research on the influence of students' frequency of engagement with ICT on academic performance, most especially the distance e-learners especially in a Nigerian context. This study is intended to fill this research gap.

2.12 Learning Styles and Academic Performance

Learning styles were earlier seen as methods of learning. Today, however, learning styles are likened to the favoured sense through which one gets the information, whether it is visual, auditory

or kinaesthetic. Cooze and Barbour (2007) suggested that it might be profitable to consider various learning styles when creating online courses at Memorial University of Newfoundland and Sacred Heart University. They recommended that course design be flexible enough to reach a variety of learning styles. The focus must be shifted to developing quality learning for the online setting and the designing instruction which will foster and enhance learning for each student regardless of their individual differences and irrespective of the learning environment. Learning styles are distinctive for every student, and learning can be enhanced by matching one's teaching with students' preferred learning mode at Randolph-Macon College (Riener & Willingham, 2010). In the USA, Riener and Willingham (2010) contended that students vary in their capacities, interests and background information, but not in their learning styles. College educators need to consider prior knowledge and background information because student learning style preferences may or may not impact the learning environment. Riener and Willingham proposed that school teachers ought to consider learning styles in the classroom by presenting information in the most appropriate manner for the content and for the students' level of prior knowledge, ability and interests. In Taiwan, Shaw (2012) found that diverse learning styles were related. He focused on the relationships among learning styles, participation types, and learning performance for programming language learning supported by an online forum. He used Kolb's learning style definitions of accommodator, assimilator, converger and diverger. He concluded that programming language learning, supported with online forums and students' active participation, increases students' academic performance. This study was similar to the current one, but the current study considered learning styles such as auditory, kinaesthetic, visual and reading and was conducted in a different context. Romanelli, Bird and Ryan (2009), at University of Kentucky, remarked that the association between learning styles and academic performance is a controversial issue that requires further investigation. This present study is intended to further investigate this by engaging the controversy in different context and suggest a result to show whether there is a relationship between learning styles and academic performance of learners, specifically the distance e-learners in Nigeria.

Hall and Mosely (2005) and Cassidy (2004) noted that learning style is one of the components that assume a vital part in influencing academic performance. Ahmed (2012) found that matching students' learning style helped to enhance the performance of Saudi EFL learners in writing skills. One of the reasons may be that it is impossible to take all of learning preferences into account but

teachers' skills in matching and diversifying learners' style preferences is essential to effective teaching and learning. Abu Sharbain, Tan and Jahaish (2010) investigated the relationship between the learning style preferences and academic performance of third-year English majors at Al-Aqsa University in Gaza. They found that there was a significant correlation between academic performance and auditory style, but there was no significant correlation between performance and visual and kinaesthetic styles. The reason may be that the students were exposed to audio materials in their English lessons and this gave auditory learners an advantage over others. The present study is similar to the above study because it intends to find out the correlation between learning styles and academic performance of distance e-learners in a Nigerian university.

In contrast to this study, Abu Sharbain et al.'s studies focused on conventional university students, but this present research focuses on distance e-learners' learning style and its influence on their academic performance. In the UK, Tight (2007) revealed that college students learning English performed equally well on vocabulary tests in respect of perceptual learning style preferences. In the USA, Sparks (2006) reported that learning styles are not the variables explaining and predicting achievement. For this reason, this study determined in the Nigerian context if learning style is a good predictor of academic performance of distance e-learners.

Soghra et al. (2013) carried out a study on the relationship between learning styles and the academic performance of students who attend an English class to learn English as a second language in Iran. An arbitrarily selected group of 488 high school students (248 male and 240 female) were involved in the study. They were requested to fill out the Kolb's learning styles inventory to identify four basic learning types: accommodating, diverging, assimilating and converging. Academic performance was evaluated by an achievement test in the English language. They found that there existed a significant relationship between the different learning styles and the performance on an English test, and the performance resulted differently in four groups with different preferred learning styles. They found that learning styles can be considered as a good predictor of any second language, academic performance, and it should be taken into account to enhance students' performances specifically in learning and teaching the second language, and showed that individual differences in learning styles play an important role in this domain. In contrast to the above study, the present one investigated the relationship between learning styles and the academic performance of distance learners taking various courses at NOUN and cut across

all schools in the university. Unlike the above study, it was not limited to a particular subject area but extended to all. Is learning style a good predictor of academic performance of distance e-learners? This is also the interest of this study and the study suggests a precise answer to the question.

Renou (2008) conducted a study at Universidad de Puerto Rico, Mayagüez on perceptual learning style and achievement in a university-level foreign language course and found that there was no significant difference between the predominant learning style groups and course grades. She found that whether one is a visual, auditory or kinaesthetic learner has no significant bearing on achievement in school as measured by grades. Reyneri et al. (2003) found out in their study conducted in the USA that both achieving and underachieving middle school children have the same learning styles. These findings are contrary to the results of a study conducted by Kia, Alipour and Ghaderi (2009). They found out that students with visual learning styles in Payame Noor University in Iran had the best academic performance. This could suggest that because the lecturing method or teacher method is the dominant mode of teaching in Iran and visual learners learn best by listening. Another reason may be that in all schools in Iran, the instructor of a course is the only person that is active in class. All students are simple listeners. This way of education makes lack of creativity in students. On the other hand, teachers have high expectations from students, which makes them harder working than American students.

Liegle and Janicki (2006) at Georgia State University researched the impact of learning styles on the Internet mode needs of online learners and found out that students as explorers provided a higher number of visits to linked web pages, while onlookers had a tendency to be more passive. Popescu (2010) studied relationships between web-based educational systems and learning styles and found that accommodator has the advantage over others in the learning process at University of Craiova. In Taiwan, Wang et al. (2006) concentrated on the impacts of formative assessment and learning style on student performances in a web-based learning environment. The findings showed that both learning style and formative assessment strategy were significant factors influencing student achievement in a web-based learning environment.

Sun et al. (2008) utilised Kolb's inventory to examine learning outcomes related to various learning styles in a virtual science laboratory for elementary school students. Students who used the online virtual lab were not significantly different from students of different learning styles.

Kolb's LSI was utilised as a part of other Internet learning research studies in online learning research studies to measure learners' preferences and learning styles (Dringus & Terrell, 2000; Federico, 2000; Fahy & Ally, 2005; Miller, 2005; Liegle & Janicki, 2006; Wang et al., 2006; Lu et al., 2007). In contrast to the above study, the present study uses Visual, Aural, Read/Write and Kinaesthetic (VARK) sensory modalities to investigate the learning styles of the distance e-learners and their influence on academic performance.

Ahmad and Suaini (2010) investigated learning styles of Bachelor of Education degree part-time students in Universiti Teknologi Malaysia (UTM) using the Grasha-Riechmann learning style scale and found that collaborative and competitive learning styles were the overwhelming learning styles among the students. Kumar et al.'s (2004) study included 65 students at Midwestern University and found that students preferred the participant, collaborative and dependent learning styles. Hamidah et al. (2009) reported that female learners were more inclined towards the collaborative, participant, dependent and competitive learning styles.

They concluded from their findings that there was a significant difference between learning styles and the academic performance but the researcher observed that they failed to report whether it has a strong correlation or predictive power for academic performance of distance e-learners or not. This study investigates that further. Although students have been performing well with their different learning styles under the traditional mode of learning, not much can be said about e-learning. This study aims to find out the effect of learning styles on academic performance of distance learners with the intervention of e-learning and to show whether learning has significant effect on distance e-learners' academic performance.

There has been a growing body of research investigating the effect of learning styles on academic performance of students. The researcher, however, observed that the effect on distance e-learners' academic performance has not been investigated extensively, especially in the Nigerian context. The literature reviewed above clearly showed that most of the studies above were carried out outside Nigerian context. This study attempts to fill the gap in distance learners' learning styles research by investigating the influence of learning styles on distance e-learners' academic performance in Nigeria. The category of learning styles of distance e-learners investigated in this study were learning by listening, learning by seeing, learning by experimenting/feeling and learning by reading/writing, and explored their relationship with their academic performance.

The above studies led the researcher to determine if learning styles of distance e-learners influence their academic performance as constructed in hypothesis H_{010}. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

According to Bernier (2009), at University of Florida, there are several different ways to define learning styles but this study will utilise the learning styles associated with the VARK.

2.12.1 VARK

The acronym VARK stands for Visual, Aural, Read/Write and Kinaesthetic sensory modalities that are used for learning information. VARK is a questionnaire that provides users with a profile of their learning preferences. These preferences are about the ways that they want to take in and give out information (Bernier, 2009).

2.12.2 The VARK Categories

Fleming and Mills (1992) as quoted by Bernier (2009) suggested four categories that seemed to reflect the experiences of the students and teachers.

2.12.3 Visual Learners

Researchers such as Walsh (2011), Pritchard (2009) and Sarasin (2006) explained that visual learners learn best through seeing, and prefer information to be presented visually in the form of pictures, posters, maps, diagrams, film etc. The lecture method does not work well for them. They get nothing from merely hearing information. They prefer to sit in the front of the classroom, take notes, use lists to organise their thoughts and observe teacher's body language and facial expressions to fully understand. They like to be left alone when reading or studying because they are easily distracted by noise. They have a neat appearance and likewise their handwriting is neat. These categories of learners like colours and show interest in the world around them. This study will further determine if a correlation exists between the variables under investigation and academic performance of visual distance e-learners.

2.12.4 Auditory Learners

Researchers such as Walsh (2011), Pritchard (2009) and Sarasin (2006) explained that these learners prefer to collect and confirm information via listening. Some of these students learn best when the teacher explains orally, others when participating in verbal communication activities.

The classroom activities they like to participate in are discussion, debates, role play and problem solving. They read and talk to themselves aloud, discuss ideas with others and recite information over and over to better realise the learning material. They benefit from formal lectures, repetition, questions and sequential presentation. The majority of auditory learners are talkative, conceptual, perceptual, reflective and memory-oriented. This study further determined if correlations exist between the variables under investigation and academic performance of auditory distance e-learners.

2.12.4.1 Reading/Writing Learners

According to Bernier (2009), these categories of learners have a preference for information that is displayed as words. Many academics have a strong preference for this modality. This preference emphasises text-based input and output reading and writing in all its forms. People who prefer this modality are often addicted to PowerPoint, the Internet, lists, filofaxes, dictionaries, thesauri, quotations and words. This study further determined if correlations existed between the variables under investigation and academic performance of reading/writing distance e-learners.

2.12.4.2 Kinaesthetic Learners

Researchers such as Walsh (2011), Pritchard (2009) and Sarasin (2006) explained that these categories of learners are the movers of the educational world. They learn best when actively engaged in doing or touching something. They need to walk around or stand up while working. They enjoy physical activities, field trips, manipulating objects and hands-on experiences. All kinaesthetic learners need to interact with learning materials and resources. They like to think out issues, ideas and problems while they exercise. They would rather go for a run or walk if something is bothering them than sit at home. The thought of sitting in a lecture listening to someone else talk is extremely demanding to them. This study further determined if correlations existed between the variables under investigation and academic performance of kinaesthetic distance e-learners.

2.13 Socioeconomic Status and Academic Performance

According to Keltner (2008), SES is an economic and sociologically connected aggregate measure of a person's work experience and of an individual's or family's economic and social position in connection to others. Nuthana and Yenagi (2009) investigated the reasons for poor academic performance among university undergraduates in India. These factors were identified as

intellectual ability, poor study habits, achievement motivation, lack of vocational goals, low self-concept, low socioeconomic status of the family and poor family structure.

In Kenya, Okioga (2013) revealed that the student's socioeconomic background affected student academic performance since education assumes a major role in skill sets for acquiring jobs, in addition to particular qualities that stratify individuals with higher and lower social economic status. It is noteworthy that although these studies were conducted in Asian and Africa countries, they reported similar findings. One of the reasons may be that these studies were on conventional traditional students who are dependent on their parents' socio-economic status.

Many researchers have viewed poor academic achievement as either a problem associated with school-related factors such as school location, quality of teacher and learning environment (Ekeh, 2011; Asikhia, 2010; Uwaifor, 2008), or a problem associated with home background such as family types, family size, socioeconomic status of parents and parenting styles (Ekeh, 2011). Many of studies revealed that distance learners belong to lower income groups (Rao 2010; Rao, 2008; Islam, 2011), while other studies revealed that socioeconomic status of distance learners was positive and higher than conventional university students (Mehta, 2011; Garg 2011; Alana et. al, 2002). The above studies were conducted in South Asia. The reason may be that distance learners are working class and their overall socioeconomic status reflect the income from their personal income or from members of their family such as husband and wife, but the reverse is the case of conventional university students who mostly depend on their parents. In Tripura, Raychaudhuri et al., (2010), found that the students' academic performance depends on a number of socioeconomic factors like students' attendance in the class, family income, mother's and father's education, teacher-student ratio, presence of trained teachers in school, sex of the student and distance of schools. Hijaz and Naqvi (2006) who focused on the private colleges in Pakistan reported that there was a negative relationship between the family income and students' performance. Caro (2009) found that the relationship between family socioeconomic status and academic achievement is cordial.

In this study, the socioeconomic status characteristics and academic performance predictors studied were home background, parent's education and parent's income.

2.13.1.1 Home Background and Academic performance

One important predictor of student performance and completion rate is the student's educational background (Colorado & Eberle, 2012). Home background has been of remarkable important in determining the performance of children in schools worldwide because academic performance is usually a result of motivation that children get from the people they interact with in their initial stages of life (Kamau, 2013). Poor parental care, combined with gross socioeconomic deprivation, usually results in poor academic performance of the child. Good parenting, together with stable economic and home background, have been found to improve academic performance of children (Basil, 2007). In Jordan, Hassan (2009) found in her longitudinal study that there was a positive relationship between the students' grades and their parents' income. In Nigeria, Abdu-Raheem (2015) reported that there was a significantly relationship between background of parents and students' academic performance.

Rouse and Barrow (2006) conducted a study in the US and they revealed that years of schooling completed and educational achievement of students, changed broadly by family backgrounds. Rouse and Barrow (2006) revealed that students originating from advantaged families outperformed than their counterparts from the disadvantaged families.

Adesoji (2008) and Umanah and Wonu (2010) reported that home background of students was a significant indicator of their academic performance in schools in Nigeria. Home background of students remained an essential indicator that constantly affected their academic achievement either positively or negatively (Ajila & Olutola, 2007). In Nigeria Akanle (2007) and Akomolafe (2011) reported that family type of students influenced their academic chances significantly. Asikhia (2010) contended that the family educational background and socioeconomic status assumed significant parts in the learning process of a child. She stressed further that the child's performance, whether positive or negative, could be attributed to the type of family a child had. In Nigeria, Ushie, Owolabi and Emeka (2012) confirmed that SES and educational background assume a vital part in children's educational attainment and social integration. In Nigeria, Uwaifo (2008) contended that the family background of a child influences his response to life circumstances and his level of performance. Is home background a significant predictor of academic performance of distance e-learners in the same context?

Woessmann (2004) stated in his study that family background has solid and comparable impacts in both Europe and the USA. He evaluated the model utilising a QR (Quantify Rational) approach where he concluded that there was weak evidence of variety in the family background impact. Polasek & Kolcic (2006) concluded in his study on academic performance and scientific involvement of final-year medical students originating from urban and rural backgrounds at Zagreb University Medical School. He found that students from urban backgrounds had significantly better academic and research indicators than those from rural and remote backgrounds. According to Egunsola (2014), home locations have high correlation and significant influence on students' academic performance in agricultural science among the respondents of this study in Nigeria. Ogbemudia and Aiasa (2013) reported that physical and psychological conditions of the home environment affected children academically in Nigeria. It is noteworthy that the above studies reported similar findings despite differences in cultural background, educational system or learning environment, history and languages.

As can be seen from the above, it has been established by various researchers, particularly from Nigeria, that home background influenced academic achievements of on-campus students but there is little or no research on the influence of home background on academic performance of distance e-learners. This study fills the research gap.

It is on this ground that this study is also interested in determining if home background is a key factor of academic performance of distance e-learners as constructed in hypothesis H_5. The results of the finding will reveal outcomes in the Nigerian setting (Chapter 6).

2.13.1.2 Parent Education and Academic Performance

According to Owoeye (2008), parents with higher educational level could serve as a motivation to children's intellectual potential, which could result to better performance in school in Nigeria.

The European Union Monitoring Report (2013) reported that students with moderately educated parents will on average perform significantly better in assessment of science courses, comprehension and arithmetical ability than students with less educated parents. Students from a well-read family received proper caring in terms of provision of educational materials. This has led to improvement in their academic performance but the reverse is the case with an illiterate

family; the ability to supervise the children's exercise books is absent, hence their children's low academic performance in school.

Educated parents have a library at home, loaded with books, reference books and other educational books and educational audiovisual tapes. At the point when children make use of these materials, it will increase their understanding. Chen (2009) posited that parental education was the key determinant of student's achievement at University of Wollongong. According to Ersado (2005), educational level of household members was influential particularly on children and it determined their access to schooling in the USA. The notion was widely accepted as the most consistent determinant of child education. Parental level of education was connected with expanded access to education (Ersado, 2005; Grant & Hallman, 2006). Parental education and retention in school have been connected by numerous researchers. Dubow et al. (2009) commented that parents' education was connected to the child's developing academic success and achievement-oriented attitudes at the University of Michigan. According to Kamau (2013) in Nairobi, the impact of the level of education of parents on the academic performance of their children was obvious in all nations. Pamela and Kean (2010) reported that children of highly educated parents performed significantly better than students of less educated parents. Kamar (2008) found that parents of moderate to high income and educational background held beliefs and expectations that were closer than those of low-income families to the actual performance of their children. Low-income families instead had high expectations and performance beliefs that did not correlate well with their children's actual school performance. In contrast to the above studies, Pitan (2015) reported in her study conducted in Nigeria that distance learners' academic achievement was not significantly influenced by parental education. This may suggest that the success in distance education depends on their determination to excel and may be because the previous studies concentrate on conventional university students while her study focused on distance e-learners.

Graetz (2009) reported that high parental education means better occupations with higher financial status. In Sweden, Gustafsson et al. (2011) reported that parents' attitudes towards reading and the importance they attached to study serve as good examples for their wards to perform well in school; all these are resultant impacts of parental education background. In Nigeria, Akinsanya et al. (2011) revealed that students enriched with high parental occupational backgrounds enjoy much

parental backing for academic work, such as good nutrition and provision of essential academic materials. Is this applicable to distance e-learners to the same context?

Gottfried et al. (2004) found that both mothers' education and family wage were indicators of the physical environment and learning encounters in the home, yet that mothers' education alone was predictive of parental warmth. Smith et al. (2007) found that the association of family income and parents' education with young people's academic achievement was reinforced by the home environment. In Nigeria, Ogunshola and Adewale (2012) found the parental educational qualification and wellbeing statuses of students had a statistically significant impact on the academic performance. Hill et al. (2004) contended that socioeconomic status of parents did not only affect academic performance, but also made it possible for children from a low SES background to compete well their counterparts from a high SES background under the same academic environment. In Spain, Diaz (2004) found that personality, family and academic variables of parents influence low academic achievement in secondary schools. Huang (2007) found that there was a correlation between parents' education level and children's motivation and achievement at senior secondary school level. Hansen and Masterkaasa (2006) discovered that students who originated in a farm household in Norway showed the lowest educational attainment while those who originated in an academic household performed best. In Pakistan, Farooq et al. (2011) examined different features influencing the educational attainment of students. They investigated the consequence of parent's education, occupation and socioeconomic status on the excellence of a student's educational attainment. They used ANOVA and T-test to study the outcomes of various features on student's achievements and they found that the socioeconomic status and parent's education have highly significant impact on students' academic performance and achievement in English and mathematics. This may suggest that highly educated parents give maximum support to their children and this reflects in their academic performance.

According to Nannyonjo (2007), in his study done in Uganda, students from well-read parents with university degrees performed significantly better than students with illiterate parents. Students whose fathers were university graduates might expect to score higher than their counterparts with middle educated parents or illiterate parents. Musgrave (2000) and Grissmer (2003) reported that parents' level of education was the most critical variable influencing students' academic achievement. According to Grissmer (2003), parents' level of education is the most

critical variable influencing students' academic achievement. Song and Hattie (2004) agreed that families from different socioeconomic groups create diverse learning environments that affect the child's academic achievement. Educational background of the parents was found to be an influential variable on their children's education.

In South Africa, Singh, Mbokodi and Msila (2004) performed an exploratory study on the impacts of parental participation on the educational achievement of children. They found that parental backing in provision of a good learning environment, physical facilities and spiritual health is vital to the success of the learner. This study was done in a sub-Saharan country and it is similar to the present study which will be conducted in another sub-Saharan country but with a different focus. Several studies conducted at Michigan State University by Lezotte (2010) showed that home background was one of the key factors of effective schooling. As indicated by Lezotte (2010) in an effective schools' model, home-school relations is a general term used to describe a myriad of activities, projects, and programs that bring parents, businesses and other stakeholders together to support student learning and schools. Krashen (2005) concluded that students at the University of Southern California whose parents were educated scored higher on standardised tests than those whose parents were not educated. Educated parents can better communicate with regard to school activities, exercises and the information being taught at school.

It is interesting to note that the majority of the researchers above from different parts of the world reported similar findings that parent education plays a significant role in their academic performance in respect of the difference in learning environments, technology development, educational levels and regions.

In addition, all the studies cited above from both developed and developing countries, with exception of Pitan (2015), supported the view that parent education influences the academic performance of students in a conventional school with no reference to distance education. It is on these grounds that this study intended to further investigate the influence of parent education on academic performance of distance e-learners, as expressed in hypothesis H_6, in order to fill the existing research gap. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.13.1.3 Family Income and Academic Performance

Family income has been recognised as positively affecting student determination and academic performance. The rationale behind this was that undergraduates from lower-income families needed to work more than students from higher-income families. More hours devoted to work were equated with fewer hours committed to class work. Individuals who received government financial aid typically had to negotiate a complex process for receiving it. Financial resources were one of the most often cited factors determining adults' persistence and success in higher education (Community College Survey of Student Engagement Report, 2008). Walpole (2003) found that students from low SES families were less occupied with academic work since they worked more and concentrated on academic work less than students from high-income families.

Nam and Huang (2009) found that family income and liquid assets significantly affected school participation and the graduation rate at the university of Buffalo. Stinebrickner and Stinebrickner (2003) remarked that students from high-income families had an 18% higher likelihood of effectively finishing more than six semesters than students from low-income families. Reardon (2013) reported similar findings.

Akhtar (2012) in international Islamic university predicted the SES factors that were affecting the student's learning achievement in Pakistan and questionnaires were filled by their parents. She used the sample of secondary school students enrolled in four districts of Rawalpindi Division and a linear regression model to predict the impact of the recognised factors of SES on students' achievement. She concluded that mother's education, income and basis used to travel to school had a positive effect on achievement. This could suggest that mothers' involvement or support in education play a significant role in academic performance of their children. Dahl and Lochner (2012) investigated the impact of family income on children's attainments. They used a fixed effect instrumental variables (FEIV) strategy to calculate the influence of income on children's academic performance and concluded that income has a significant influence on children' academic performance. Mayer (2002) observed the impact of parent's income on children's outcomes in different ways. The researcher used simple analyses to check the relationship between parent's income and children's outcomes and further investigated the effect of family organisation and parent's education on young people's outcomes. He found that parents' income related to all the

outcomes of children. McGivney (2004) reported that students with significant financial difficulties tended to have low retention or accomplishment.

Considine and Zappala (2002) observed that children originating from low-income families showed a bad attitude towards academic performance, low education level, low degree of consistency, issues in school conduct and more trouble in their studies and generally showed a negative state of mind towards studies and school. The findings of Considine and Zappala are reinforced by Eamon (2005). According to him, students from a low SES tend to show low performance in studies and obtained low scores as compared to the other students. In Nigeria, Ankale (2007) found parental wage in his work to be a reliable predictor of academic and vocational successes of secondary and junior secondary school students. As indicated by his investigation, parental income cannot be sufficient to sustain the academic and personal social life of the student in semi-rural school areas. This can influence the psychological balance or homeostatic balance in the classroom, which causes low focus, low perception, frustration, sickness and emotional disability in academic performance of the students and can likewise prompt dropping out or withdrawal. He concluded that lack of essential needs may lead to poor academic performance.

Egunsola (2014) noted the parental income was related to student's academic performance, economic status of parents had moderate but significant correlation with students' academic performance. This may suggest that students depend on their parents' income for survival.

The researcher observed that few studies have been done on the influence of socioeconomic status on academic performance of distance e-learners. A large portion of the studies referred to above, concentrated on the influence of socioeconomic status on academic performance of primary, secondary and post-secondary school students with no reference to the distance learners under an e-learning setting. The present study intends to examine the influence of socioeconomic status on academic performance of distance learners with intervention e-learning. This missing link emphasises the need for the present study in order to fill the missing gap.

2.14 Socio-Demographics Characteristics and Academic Performance

Socio-demographic characteristics have been examined by scholars as indicators for academic achievement. According to Russell (2006), if certain student attributes really affect academic

accomplishment in distance learning situations then these indicators could be utilised when directing students whether to attempt or enlist for programmes in the distance learning environment. Some studies uncovered that there was significant relationship between learner's characteristics and academic achievement (Bowa, 2011; Oladejo, 2010). The researchers Casanova, García-Linares, de la Torre and de la Villa Carpi (2005), Ray (2010) and O'Sullivan (2009) identified socio-demographic factors used to explain academic performance of students. In this research, the socio-demographics characteristics that will be examined as indicators of academic performance are age, marital status and gender.

2.14.1 Age and Academic Performance

Age played a significant role in respect to education, such as entry age of students to a school, and age could be regarded as an indicator of student achievement (Abubakar & Oguguo, 2011). Russell (2006) reported that age as an academic performance indicator has been investigated in healthcare education. Wang and Newlin (2002) found that age was a not strong predictor of distance learners' academic performance in the USA. Alhajraf and Alasfour (2014) revealed in their study carried out in Kuwait that students' age was significantly related to business students' academic performance. This may suggest that their academic performance has to do with maturity or ability to handle independent learning. The above was done in country with an educational system similar to that of Nigeria but the current study is being conducted on students running distance learning programming.

Guney (2009) found that there was a positive relationship between age of students and their GPA at the University of Hull. Amuda et al. (2016) reported that age was not a significant predictor of academic performance of students. One of the objectives of the study was to determine as significant predictor of academic performance in the North-Eastern States, Nigeria. They concluded that whether students were young or old did not seem to tell on their academic performance. In contrast, Amro et al. (2015) found that age was a predictor of academic performance of students under traditional methods in algebra courses at a college in south Texas but in online courses age was not a predictor of students' academic performance. This could be a result of a difference in space or educational background of the countries where the studies conducted. For the online, this could also be that age does not play a significant role in academic performance but self-determination does. Alstete and Beutell (2004) found a significant positive

relationship between students' ages and grades received in online courses offered in a Master's in Business Administration programme in the USA. One possible reason that may be advanced for this is that MBA programmes are undertaken by mature students or professionals who are determined to succeed. The findings from the above studies on the relationship between socio-demographic characteristics, age and academic performance were inconclusive. Despite the fact that the above studies were carried out in Kuwait and the USA, the researcher has built on the above study in order to add to the current literature.

Is age a powerful predictor of academic of distance e-learners in Nigeria? This was one focus of this study in order to fill the research gap. This study is also interested to determine if age influences academic performance of distance e-learners as constructed in hypothesis H_2. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.14.2 Marital Status and Academic Performance

Oladejo et al. (2010) found in their research conducted in Nigeria that marital status was a predictor of academic performance. Al-Mutairi (2010) reported that married students at the Arab Open University outperformed their unmarried counterparts, and concluded that marital status plays a significant role in determining students' performance. In the United Arab Emirates, Thomas, Raynor and Al-Marzooqi (2012) reported that marital status predicted undergraduate academic achievement. When age was controlled, married students were found to be older than their unmarried counterparts and age or maturity could be an important determinant of students' success. One of the reasons could be that marriage is attached to a lot responsibilities and burdens that could hinder academic performance. It could also be that the drop-out rate is higher among married students. In contrast to the above studies, Wang and Newlin (2002) and Ergul (2004) reported a negative correlation between marital status of distance learners and their academic performance in the USA and Turkey. This could be because the study was performed in a virtual classroom, a synchronous online learning environment with online meetings, chat, forums, whiteboards, desktop sharing, document sharing and other online features and the ability to work on these determines their academic performance. This may also suggest that one's commitment, belief, confidence and self-efficacy may tend to predict one's academic performance. The present study is similar to the above study but it will concentrate on Nigerian context. As indicated by Owino (2013), marital status contributed significantly to distance learners' academic performance.

He revealed that marital status was a major determinant on one's choice of method of study as it was found that married people, who naturally had a family to attend to other than school activities, generally constituted the individuals who chose the e-learning method of study.

Thomas, Raynor and Al-Marzooqi (2012) reported married undergraduates performed better than their unmarried classmates. They reported that marital status and gender are predictors of undergraduate academic performance. Thomas et al. (2012) study was conducted in Arab countries, specifically in the Gulf region, but the present study was carried out in the South West region of Nigeria. Bowa (2011) reported there was no significant relationship between marital status and academic performance of the distance learners in university of Nairobi. Is marital status a good predictor of academic performance of distance e-learners in a Nigerian university?

It is worth noting that the above studies that were conducted on distance learners and contrasting findings were reported, despite the fact they were conducted in both developed and developing countries. It is on this ground that the researcher concluded that the above reviewed literature has not shown clearly whether marital status predicts academic performance of distance e-learners and the researcher also observed that there are no studies on this in the Nigerian context. This study addressed this research gap.

This study was also keen to determine if marital status is a key factor of academic performance of distance e-learners as postulated in hypothesis H_4. The results of the findings will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.14.3 Gender and Academic Performance

Gender has been viewed as a determinant of academic achievement in the distance learning environment. The relationship between gender and the academic achievement of students has been discussed for a considerable length of time (Eitle, 2005). A gap between the achievement of males and females has been found, with females having superior performance over males in certain instances (Chambers & Schreiber, 2004). Wang and Newlin (2002) and Ergul (2004) found that gender was not powerful predictor of web students' academic performance in the United of America. This study tested the predictive level of gender of distance e-learners in terms of academic performance.

These studies done in Iran, the USA, Spain and Turkey (Habibollah et al., 2009; Lim & Morris, 2009; Martínez-Caro, 2011; Tello, 2007; Yukselturk & Bulut, 2007) indicated that gender has no significant effect on students' online learning performance. This may suggest that the success of students depend on their ability to adjust faster and comfortably in an online learning environment. Interestingly, these studies were done in those countries that had online learning systems in place for a long period and where students are believed to be comfortable with an online learning environment. However, the current study will be done in Nigeria where online learning was introduced recently.

However, there exist contrasting findings in this respect, which the researcher will discuss below. Alstete and Beutell (2004) conducted a study on gender in relationship to academic achievement in distance undergraduate and graduate business management courses in the USA. They found that gender was not significantly related to academic performance of undergraduate and graduate distance learners. They additionally found that gender was significantly related to overall course performance, since females outperformed their male partners in the distance learning courses studied. As opposed to Alstete and Beutell's study, the present study was not restricted to undergraduate and postgraduate students of business management courses but it cut across all courses offering at both undergraduate and graduates at NOUN.

In the USA, Barakzai and Fraser (2005) investigated the relationship between gender and academic performance in 290 students enrolled in advanced healthcare practitioner courses at three universities. The researchers found that the female group scored higher than the male group, and also found no significant difference between men and women in terms of academic performance. Hedjazi and Omidi (2008) found that among undergraduate agricultural students at the University of Tehran in Iran, female students significantly outperformed their male counterparts. Harb and El-Shaarawi (2007) found that female students studying in the college of business and economics at UAE University performed significantly better than their male counterparts. Agu and Hamad (2000) and Smith (2004) contended that the academic performance of females who have many commitments at home is normally very low while those with very little home commitment normally excel.

In the USA, Fairfield-Sonn, et al. (2009) examined the academic performance of MBA students as measured by their GPA at graduation. They investigated the relationship between academic

performance and gender, and between academic performance in the MBA program and undergraduate GPA. They established that gender and undergraduate GPA have a significant impact on the academic performance measured by the GPA of the MBA graduates. By examining a variety of traditional attributes and the potential influence of GMAT Waivers on graduation GPA because there was some thought that students who waived this test might have lower graduation GPAs than those who took the examination.

In the France, González-Gómez et al. (2012) found that female students have a tendency to make the most of their Internet learning experience more than their male counterparts and report higher perceived achievement with the online learning programs.

Does gender predict academic performance of distance e-learners as reported above? This was one interest of the present study. Despite the numerous studies on the influence of socio-demographic characteristics on academic performance of learners, little is known about published studies on the academic performance of distance e-learners in developing countries like a Nigeria. This study intended to determine if socio-demographic characteristics influenced academic performance of distance e-learners in Nigeria.

As can be seen from above, there is an extensive literature on impact of gender on academic performance of students in an online learning environment in the developed world but none from Africa, especially Nigeria. This is related to the fact that online learning has been existence in developed countries for a long time due to their advancement in technology usage. However, these scholars did not to agree that gender influences academic achievement of students in an online learning environment. This has led the researcher to hypothesise that gender will influence academic performance of distance e-learners in an e-learning environment. The results of the of the study will show what the outcome was in a Nigerian setting (Chapter 6).

2.15 Previous Qualification and Academic Performance

Wambugu and Emeke (2013) commented that it is normal practice that the nature of graduates is measured utilising academic performance in Nigeria. According to them, one predictor of a quality student is the entry qualification. Wambugu and Emeke (2013) reported that there was a significant correlation between entry qualification and academic performance in chemistry and biology,

though in physics there was no direct relationship. Acato (2006) contended that admission points, which are a reflection of past performance, are reflected in later academic performance.

Mutonga (2011) found that there was a relationship between student's academic performance and their previous qualification. Alias and Zain (2006), Zezekwa and Mudavanhu (2011) revealed that there was a positive relationship between previous qualification and academic achievement in Tun Hussein Onn University College of Technology, Malaysia, and Bindura University of Science Education. Students with higher entry qualifications often perform better than those with low entry qualifications. In the USA, Moore and Kearsley (2005) reported that there was no correlation between student entry characteristics and academic performance for graduate students but it appeared that student entry qualifications have an impact on academic performance of undergraduate students. Does previous qualification predict the academic performance of distance e-learners as reported for conventional students? In Nigeria, Okunnuga et al. (2013) reported that some significant differences were seen as demonstrating that the higher the entry qualification, the better the quality of students and their performance on their programs. Lizzio, Wilson and Simons (2002) found that a higher entry qualification score is not an indication of better academic performance in a course of study in Griffith University in Australia. Adeyemi (2009) studied the mode of entry as a predictor of success in final year bachelor's degree examination in Nigeria at the University of Ado Ekiti in Ekiti State and Adekunle Ajasin University in Ondo State. Adeyemi's study was conducted in a conventional university in Nigeria, unlike the present study. Is entry qualification a predictor of academic performance in a course of study of students under an e-learning setting?

In Nigeria, Afolabi (2005) examined the entry qualification as a predictor of college students' performance in micro-teaching and found that there was a low relationship between entry qualification and performance in academic courses. The study population consisted of all the 1,810 final-year students in the two universities offering education courses. Out of this population, 760 students with CGPAs of 3.50 and more in the 2007/2008 academic year in the two universities were chosen for the study. The instrument used was an inventory while the data collected were analysed using percentages, correlation matrix and multiple regressions. The result revealed that the pre-degree mode of entry is the best predictor of success in the final year Bachelor of Education degree in the universities. Apantaku (2003) conducted a comparative study on the performance of

university students admitted through pre-degree and University Matriculation Examination (UME) programmes at the University of Agriculture, Abeokuta, Ogun State. The primary goal of the study was to learn if there was any relationship between mode of admission (pre-degree or UME) and academic performance of university students at their first year (100 level). The sample of the study comprised 516 first-year students who gained admission through pre-degree programme and 244 students that gained admission through UME. They were selected from all the first-year students of the College of Natural Science at the university for three sessions (1997–2000). Correlation design was used as the research design while the Pearson Product Moment statistic was used for data analysis. The outcome of the study indicated that students who were admitted through pre-degree performed better than those admitted through UME.

Okpilike (2011) researched the mode of admission of education undergraduates and their academic performance in a Nigerian university, using the students' scores in the two semesters of the 2006/2007 academic session. A representative stratified random sample comprising 600 first-year education undergraduates was used. This number was comprised 300 participants were admitted on their successful completion of the pre-degree programme and another 300 who were admitted through the Joint Admission and Matriculation Examination. Data collected were the students' scores in both education courses and teaching subjects in the first year's two semesters of the 2006/2007 academic session. The data collected were subjected to an independent samples T-test analysis. Results showed that education undergraduates who were admitted through the pre-degree programme performed better than their counterparts who were admitted through the Joint Admission and Matriculation Examination in all courses combined in education at a 0.05 level of confidence. It was concluded that most UME candidates, unlike their pre-degree counterparts, are not good material for degree programmes. Almost all the studies above revealed that entry qualification was a determinant factor for academic performance of students. This may because entry qualification is a major requirement during the admission process. Is this applicable to distance e-learners in a Nigerian context? From the literature reviewed above, although the majority of the studies were done in Nigerian universities but concentrated on traditional students, the researcher observed that little research has been conducted on the influence of previous qualifications/entry qualifications on academic performance of distance e-learners in Nigeria. The present study focused on this, in order to fill the research gap. The previous qualifications for this study are Senior School Certificate (SSCE), National Diploma (ND), Nigeria Certificate in

Education (NCE), Higher National Diploma (HND) and bachelor degrees. This study was also aimed at determining if previous or entry qualification is a major determinant of academic performance of distance e-learners as constructed in hypothesis H_9. The results of the study will show what the outcome was in a Nigerian setting (Chapter 6).

2.16 Interactive Learning

Interaction is defined from various perspectives, within different contexts, based on the participants involved and the level of their engagement (Woo & Reeves, 2007; Bernard et al., 2009). With the development of technology, distance and online education provides a wide range of interactive learning opportunities (Donnelly, 2010; Bernard et al., 2009; Woo and Reeves, 2007; Bouhnik and Marcus, 2006). According to Allan (2008) and Phillips (2005), e-learning is an interactive learning that allows the learner to interact with the content, with colleagues and the instructor, whether synchronously, through such tools as chat rooms, shared whiteboards and video conferencing or asynchronously, through e-mail and group news. Thread discussions and discussion forums also provide interactivity. This is the main feature of e-learning which can be defined as electronic interaction between the learner and instructor, learner and learner and learner and content. The purpose of this research was to find out the influence of the interaction or discussion forum on academic performance of distance e-learners in Nigeria. According to DFES (2002), interactive learning is accomplished through maintaining a balance between direction, command, presentation, explanation, illustration, questions, discussion, exploration, confirmation, profound thinking, evaluation and summarising.

Moore & Kearsley (2005) stated that the success of distance education programs depends on the extent to which the learners are provided with appropriate structure and the appropriate quantity and quality of interaction between instructor and learner.

Interaction has been observed to be a basic component for the general achievement and adequacy of distance education and e-learning (Rovai, 2002; Neo, 2003; Sher, 2009). Alstete and Beutell (2004) showed that the active participation and involvement of students using e-learning is positively and significantly related to overall course performance for MBA students. Wanstreet, (2006) remarked that interaction (student-student or student-instructor) can be regarded as the heart of the learning background in both the regular and Internet learning environment. Shih,

Martínez-Molina and Muñoz (2008) conducted an in-depth study on the role played by facilitators in e-learning and concluded that instructors can improve effectiveness of e-learning by providing constructive and prompt feedback to the students. Numerous researchers have considered interaction as the most vital part of any learning environment (Woo & Reeves, 2007), and essential in interactions in both traditional (Tirri & Kuusisto, 2013) and distance and online educational settings (Anderson 2003; Woo & Reeves 2007; Bernard et al. 2009; Lou et al. 2006; Muirhead & Juwah 2005). Researchers such as Anderson (2003), Bernard et al. (2004), Arbaugh and Benbunan-Fich (2007) viewed interaction as the key part of distance and web learning. Is interaction a major determinant of academic performance of distance e-learners in a Nigerian setting?

According to Muijs and Reynolds (2010), the US studies from the 1980s highlighted the following as the features of interactive learning:

- The utilisation of inquiries to update what has been learnt before towards the beginning of the lesson and summing up what has been learnt towards the end of the lesson;
- Creating an atmosphere where learners are urged to answer questions;
- The incorporation of key and unusual questions, open-ended inquiries and procedure-related inquiries;
- Assessing learners' answers and offering clear input, particularly when the learner appears to be reluctant;
- Making learners intrigued by rethinking or separating questions on the options for which there are wrong or no answers;
- Allowing the learner adequate time to reply; and
- Having off-base inquiries replied to by different learners as opposed to the instructor.

Garrison and Anderson (2003) mentioned that that all types of learning happen as interactions between instructors, learners and content. They recommended six sorts of interaction, of which the three most imperative are learner-instructor, learner-learner, and learner-content.

These three vital types of interaction in e-learning are considered in this current study.

2.16.1 Learner-Content Interaction

The learners' interaction with the content, through website links, e-libraries and laboratories, and the influence on their academic performance was one focus of the present study. In Turkey, Nesliha and Mustapha (2016) found that learner-content interaction has positive effect on achievement and the success of distance education. According to them, this was determined by the structure and the quantity and quality of interaction between instructor and learner. In the USA, Ramos and Yudko (2008) applied a stepwise multiple regression analysis to explore whether the count of page hits, discussion posts and/or discussion reads (as proxies of student-content and student-student/instructor interactions) could predict learning outcomes.

Analysing trace data collected by LMSs from two online courses, Ramos and Yudko (2008) revealed that the count of page hits (the frequency in which each student viewed the content pages at the class site) as the only and dependable indicator of academic success. This finding has resulted in the conclusion that student-content interaction was crucial in predicting learning outcomes. The final regression model in the above study showed that the best predictors of students' final grades were the count of forum postings, the count of messages sent and the count of assessments completed.

Morris et al. (2005) used a multiple regression analysis to examine whether online learning activities of students can predict learning success in the USA. Their investigation demonstrated that the count of discussion posts viewed, the time spent on viewing discussion posts, and the frequency of interaction with content were the most important predictors of students' final grades. Agudo-Peregrina et al. (2014), in their study done in Spain, suggested a framework for the investigation of the impacts of the interaction types measured through the use of trace data on academic performance in both online and mixed learning courses. In the USA, Alstete and Beutell (2004) found that the strongest predictor of student performance in online classes was discussion board usage. This finding was supported by the way that the quantity of student sessions emphatically and essentially identified with general course performance. The literature above showed that these studies were conducted in developed countries, mainly the USA, where ICT is more mainstream, which enable the students to have access to ICT facilities in order to participate in online discussion and engage with course contents online. Will similar results surface in a developing country like Nigeria, where technology development and ICT use is relatively new? It

is on this ground that the present study attempts to determine if learner-content-interaction affect academic performance of distance e-learners. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.16.2 Learner-Learner Interaction

In Saudi Arabia, Almosa (2002) described learner-learner interactions in e-learning as a process of differentiating similar interactions in traditional learning where individual learning was supported. He demonstrated that group learning had positive results and helped learners' social skills, as well as enabling them to complete tasks which were important for the establishment of acknowledged learning communities. Interactive environments replaced direct human interaction. The relevance of this to the academic achievement of learners was one concern of this study. In London, it was discovered imperative that ICT utilisation in education gives proper consideration regarding each available form of interactivity (Garrison & Anderson, 2003). Tirri and Kuusisto (2013) noted in their study done in Finland that learning happens when a student interacts with different students or with a situation, paying little respect to a subject area, instructional design or the innovation in place as a part of the learning process. Gutierrez et al. (2007) reported in their study conducted at the University of the Philippines-Diliman that the learners' interaction with their companions gives more noticeable benefits to the achievement of learning outcomes. It is interesting to note that these studies were conducted in both developed and developing countries with different cultural backgrounds, but with similar findings. The reason could be that in an online discussion forum, students were privileged to exchange knowledge and ideas with their peers, instructors, faculty members and engage with the learning environment. Is this applicable to distance e-learners that interact on i-learning or Internet learning discussion forums where they interact with their colleagues, course content and facilitator? This study suggested answers to this question and made a finding.

The above literature clearly showed that these studies were conducted outside the Nigerian context but the present study was keen to determine if learner-learner interaction is a key factor in academic performance, as postulated in hypothesis H_{14}. The results of the finding revealed what the outcome was in a Nigerian setting (Chapter 6).

2.16.3 Learner-Instructor Interaction

Picciano (2002) noticed that online learning requires modification with respect to students and instructors for effective communication and cooperation to happen. Picciano's study searched for associations between student interaction and participation, and online courses, yet did not discover a statistically significant relationship. In Finland, Hargreaves et al. (2010) recommended that viable interactive teaching, which is recognised by consistent mutual interaction between the teacher and the learner, involves the exchange of thoughts and not conventional methods of dictation, response and feedback which results from a teacher's questions. Muijs and Reynolds (2010) in their study conducted in Australia distinguished interactive learning in terms of the nature and efficacy of the interaction between the teacher and the students. They recommended that interaction empowers the instructor to affirm that the learner comprehends the content that has been taught. It helps the students to practise and master target skills and obviously highlights the way they think. It additionally helps the instructor to offer focused learning support. Many studies conducted at the State University of New York, the University of Central Florida and the University of Nebraska (Diedrich, 2010; Nugent, 2009; Knoell, 2012) revealed that students-teacher interactions are significant to students' academic performance. Agudo-Peregrina et al. (2014) found that academic performance mostly depended on student-instructor and student-student interactions in internet learning settings at Universidad Politechnica de Madrid in Spain. Zhao, et al. (2005) reported in their meta-analytic research on distance education conducted in the United States, that of all the available forms of interaction in e-learning the most significant one was the student-teacher interaction. Miyazoe and Anderson (2010) in their study conducted at the Universities of Tokyo and Taipei found that the learner-instructor interaction was the most effective in distance learning situation.

All the studies reviewed above were conducted mostly in advanced countries and they all reported that student-teacher interaction influenced academic performance in either traditional or distance education. The reason may be that the mode of teaching in advanced countries encourages teacher and students' interaction and probably discourages a teacher-dominated approach, which in turn reflects in their academic performance. It is pertinent therefore to determine if learner-instructor-interaction affect academic performance of distance e-learners in Nigeria as a developing country, as postulated in hypothesis H_1. The results of the finding will reveal what the outcome was in the Nigerian setting (Chapter 6).

Under conventional methods of learning and before the incorporation of ICT into teaching and learning, many studies have reported that interaction between students and teachers has influenced their academic performance. The present study therefore examined the influence of interaction between student and instructor, student and content, student and student on academic performance of distance e-learners. Marks et al. (2005) investigated the significance of student-student, student-instructor and student-content interaction types as predictors of perceived learning and satisfaction with an online course at the University of Wisconsin. They included perceived advantages of online courses, students' personal characteristics and experience with online learning environments as variables in the structural equation modelling analysis. Their findings revealed that student-instructor interactions were the strongest predictors of perceived learning. Interactions among students were also positively associated with perceived learning, but the strength of the association was much lower than in the case of student-instructor interactions. Only certain student-content interactions (i.e., individual and group projects) were significantly associated with perceived learning and students' satisfaction (Marks et al., 2005). Marks et al.'s study was carried on outside Nigeria and with on-campus students but the present study was carried out in Nigeria to investigate the influence of student-student, student-instructor and student-content interaction on academic performance of distance e-learners. The present study is also in invariance with Mark et al.'s study because interaction as predictors of academic performance is the interest of study.

In the Turkey, Nesliha and Mustapha (2016) considered interaction as central to the educational experience and they claimed it should be the primary focus in the study of learning outcomes in online classes.

Interaction has been found to be a critical element for the overall success and effectiveness of distance education and e-learning (Neo, 2003; Rovai, 2002; Sher, 2009). Alstete and Beutell (2004) indicated that active participation and involvement of students using e-learning was positively and significantly related to overall course performance for MBA students. Their study was limited to MBA students but the present study covered both undergraduates and postgraduate students. The interaction (student-student or student-instructor) can be regarded as the heart of the learning experience in both the traditional and online learning environment (Wanstreet, 2006).

Algahtani (2011) reported that there was a statistically significant correlation (at 0.01 level) between learning interaction through e-learning and academic performance of distance learners.

This indicated that the items in each dimension are internally homogeneous and all the correlations are statistically significant at 0.01, indicating a strong and positive relationship between the dimensions and the scale. Many studies reported that student-to-student and student-to-instructor interactions are important elements in the design and successful implementation of online learning courses.

Alstete and Beutell (2004) found that discussion board usage was the most effective determinant of student performance in online classes. This finding was supported by the fact that the number of student sessions was positively and significantly related to overall course performance. Holley (2002) found that university students taking part in an entirely online course scored higher grades than students who studied in regular learning settings. Interactions are viewed as one of the most significant indicators of academic success in a distance and online instruction (Donnelly, 2010; Muirhead & Juwah, 2005). There was no precise answer to which type of interaction was more effective in certain educational situations (Miyazoe & Anderson, 2010). The researcher is of the opinion that this study provides the precise answer to the type of interaction that is more powerful in distance learning in an e-learning setting. Agudo-Peregrina et al. (2014) noted that academic performance mostly depended on student-instructor and student-student interactions in Internet learning settings. This study will further reveal the predictive power of the three important types of interaction discussed above on academic performance of distance learners under an e-learning setting in the Nigerian context.

2.16.4 Work Experiences

Work experiences of part-time students are typically viewed as continually enriching and contributing to their learning process. At Iowa State University, Ibrahim et al. (2011) argued that part-time students could concurrently relate their work experience to their academic learning. Therefore they could constructively apply their job knowledge and skills to their learning, or vice versa. This advantage could reinforce their academic understanding as well as enhance their academic performance as recommended by Rogers (2002:26):

> [T]he development of intelligence seems to be dependent more on the amount of educational experience one has received and on the subsequent use of learning skills in one's occupations than on any basic learning ability inherited or developed when young.

In the UK, Gracia and Jenkins (2003) conducted a study in the second and final year students of an accounting degree considered gender, prior year performance and students' application to study and their relationship to student performance. They found that students who have work experience performed significantly better than students who go straight from the second to the final year. This may be because the experiences they had at work were relevant to their studies. Will similar findings surface in a Nigerian setting with different environment cultural background and system of education? The outcome will show the situation in a Nigerian setting (Chapter 6).

Most adults indicate that job-related reasons led to their participation in education (Desjardins et al., 2006; UNESCO, 2009). Dreher and Ryan (2000) suggested that having work experience not related to the studies may not be beneficial to students' academic achievement. In the model of Adult Learners' College Outcome, Ibrahim et al. (2011) also emphasised the potential role of prior experiences in affecting the academic outcomes of adult students. The model included prior experiences and personal biographies such as external factors that influence four other variables: psycho-social and value orientation; adult cognition; life-world environment; and connecting classroom. Adult cognition, life-world environment and connecting classroom directly affected the college outcome. This model clearly demonstrated that adults' prior experiences influence their classroom learning and academic success. Ibrahim et al. (2011) revealed that work experience predicts students' academic success at polytechnic institutions in Malaysia. The above study was conducted in Malaysia while the present was conducted in Nigeria. Does distance learner's work experience predict his or her academic performance under e-learning setting?

Many studies (Andemariam et al,2015; Callender, 2008; Curtis, 2007; Curtis & Shani 2002; Humphery 2006; Hunt, King 2002; Lincoln, & Walker 2004; Metcalf 2003) reported that student employment had a negative effect on their academic performance. Cheng (2004), Nonis and Hudson (2006) and Wang et al. (2010) reported neither positive nor negative effects of work; part-time student employment had no impact on GPA. The findings in respect of the effect of college students working on GPA are inconclusive. In a study done at the University of Ohio, Kalenkoski and Pabilonia (2008) demonstrated positive effects of students working. They found that college students working less than 20 hours a week had an average GPA of 3.13 while students who did not work had an average GPA of 3.04. This suggests that college students who work one to 20 hours per week do slightly better, on average, than those who do not work at all. Hunt, Lincoln

and Walker (2004) revealed that non-working students obtained a significantly higher GPA than working students. These studies reported contrasting findings and one of the reasons may be that students were able to coordinate their studies with a schedule of work while others were not.

The literature above clearly showed that studies were done in advanced countries where systems of education accommodate work and study, but the present study will concentrate on distance e-learners who operate on a flexible mode of study.

The researcher noted that little was researched on the influence of work experience on academic performance of distance e-learners. The study is set to fill the identified gap. Does the student with work experience perform better under an e-learning setting than their counterpart with less experience?

The above studies have led the researcher to hypothesise whether work experience is a major determinant of academic performance of distance e-learners as constructed in (H_{11} and H_{15}). The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.16.5 Previous Academic Performance and Academic Performance

Numerous studies have shown that previous academic performance is one of the predictors of academic performance of students in higher institutions. It is a common belief that a higher achiever in one educational level will always be higher achiever at another higher educational level. Researchers from the USA, Hong Kong and Spain (Alstete & Buetell, 2004; Cheung & Kan, 2002; Diaz, 2002) reported that previous academic performance was positively correlated with college students' performance online. Cheung and Kan (2002), Dupin-Bryant (2004) and Morris et al. (2005) reported that students with good academic records will probably effectively finish their online courses or programmes. The higher the grade in secondary schools, the higher the possibility of securing admission into Nigerian universities, Colleges of Education and Polytechnics. Randall and Engelhard (2010) noted that grades are important to determine class placement, scholarships and college admissions. Wolfe and Johnson (1995) as quoted by Luo et al (2014) found in their study that 19% of the variance in college GPA can be predicted by high-school GPA. Hoffman and Lowitzki (2005), Schwartz & Washington (2002) and Mattson (2007) reported that high-school GPA was a successful positive predictor of success of at-risk students. Sulaiman and Mohezar (2006) reported in their study that undergraduate GPA was the most

important predictor of final graduate academic performance in a Masters of Business Administration (MBA) program. Brookshire and Palocsay (2005) conducted a study on factors that impact academic performance of students in an undergraduate management science course. They reported that previous academic performance (GPA) had the strongest correlation as compared to mathematics SAT, calculus grade, and statistics with academic performance.

Lizzio, Wilson and Simons (2002) conducted a study to investigate the impact of Tertiary Entrance (TE) score in the students' years 11 and 12 of their secondary education on academic outcomes at the University of Griffith, Australia. A sample of 64 students was drawn from the Faculty of Business Studies. Findings demonstrated that TE score was positively, though weakly ($\rho = .39$), associated with a high GPA score measured on a scale of 1 (low) to 7 (high). The weak relationship was an indication that previous performance was not a determinant of present performance, presumably because of intellectual improvement, which is connected with maturity. Olle-Momoh (u.d.) researched the relationship between students' entrance scores and academic achievement at the Kwara State College of Education, Ilorin found that no measurably critical relationship between the students' entrance scores and their cumulative academic achievement in Science and Mathematics courses (r -0.08, $p > 0.01$). He deduced that the academic performance of the students at the university depends on their experiences affected by the school instructional environment, which ought to rouse learners for compelling learning. Adedeji (2001, Zezekwa (2011) contended that the B. Ed (Science) conventional students who were admitted into the University of Nairobi with high mean grades (C+ and above) at KCSE level are liable to perform higher than the distance learners whose entry qualification was lower than C+. Bore, Munro and Powis (2009) and Barr (2010) reported that entry into academic programmes in most tertiary education institutions is ordinarily based on the academic achievement of the students. Martha (2009) demonstrated that previous performance influences future academic achievement in Uganda.

Alstete's and Beutell (2004) and Cheung and Kan (2002) found that there was a significant positive correlation between undergraduate GPA and academic performance in the distance learning Masters level management courses. Contrary to the above studies, the present study was not constrained to management and human resource management courses and it was carried out in a Nigerian context. As seen from the literature above, all the studies were done in developed countries (Australia, the USA, Spain etc.) and developing countries (Nigeria, Uganda, Kenya) and

interestingly none of the researchers reported contrasting findings. This might suggest that previous academic performance of students is a key factor to their present academic performance in respect of whether the country is developed or not. It can be concluded that these studies are aligned with the above belief. The present study is similar to the above study but it will concentrate on distance e-learners in a Nigerian university.

It is for this reason that the current study was intended to find out if previous academic performance is a key determinant of academic performance of distance e-learners as constructed in hypothesis H_{16}, and to determine if previous academic performance is a predictor of academic performance of distance e-learners in a Nigerian university. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.16.6 Family Size and Academic Performance

Family size means the total number of parents and their children in a family.

Bowa (2011) conducted a study on the relationship between learner characteristics and academic performance of distance learners in the case of the external degree programme of the University of Nairobi. The major objective of his research was to find out the extent to which learner characteristics affect academic performance of learners in the Bachelor of Education (Arts) external degree programme of the University of Nairobi. He reported a weak, negative correlation between family size and semester examination grades with large family size associated with low semester examination grades. The current study is similar to the above because it is also centred on distance learners in an African country. Uwaifo (2008) reported that family structure negatively and significantly affected academic achievement of students. He further explained that there was a significant difference between the academic performance of students from single parent families and students from two-parent families. The reason could be that life in a single-parent family can be harmful and children raised in such family structure often suffer some emotional problems such as lack of warmth, love and disciplinary problems, which may hamper their academic performance. In addition, children raised in two-parent family structure are often stable emotionally and they suffer less emotional problems thereby making them less anxious in the pursuit of their academic work.

In Nigeria, Ushie, Owolabi and Emeka (2012) and Abdu-Raheem (2015) found that there was a significant relationship between family size and academic performance of students but concentrated on students from regular universities. In contrast, the present study will concentrate on distance e-learners. In Kenya, Ogweno et al. (2014) reported a low positive correlation between family size and students' performance in agriculture. This implies that the larger the family size, the lower the performance of students in agriculture. The above study is similar to the current study but it will not be limited to a discipline and will be conducted in another African country, Nigeria, to determine if similar finding will surface.

As it can be seen from the above literature, these studies were conducted in African countries and were focused on students' performance in traditional universities but the current study will also determine if family size is a key determinant of academic performance of distance e-learners in Nigerian context, as postulated in hypothesis H_{17}. Is family size a predictor of academic performance of distance e-learners? This was one focus of the current study. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.16.7 Hours Spent on the Internet and a Computer for Studies per Day and Academic Performance

In the UK, Rodgers (2008) found that the effect of time spent online was significant and positive, such that one extra hour of e-learning participation was found to increase the module mark by approximately one percent. Coldwell, Craig, Paterson and Mustard (2008) in their study conducted in Australia reported similarly that time spent online matters for achieving a better grade, while controlling for gender, age and ethnic origin. In Nigeria, Osunade, Ojo and Ahisu (2009) found a significant difference in academic performance between those who had Internet access and those without. Despite the fact that previous studies above were conducted in different countries although concentrated on conventional universities students but they reported a similar finding. For this reason, this study will attempt to determine whether hours spent on the Internet influence distance e-learners in a Nigerian University.

However, there exist contrasting findings in this respect, which the researcher will discuss below.

In a study done in the UK, Davies and Graff (2005) found that the amount of time spent online had no statistically significant impact on examination performance. Ponzo (2010), Bielefeld

(2006), OECD (2010), Biagi and Loi (2013) and Papanastasiou (2006) found negative correlations between computer use for educational purposes and students' academic performance. These researchers conducted a similar study in developed countries such as Canada, Italy, USA but the current study will determine if similar will surface in Nigeria as a developing country. Similarly, in a study done in the USA, Jackson, Eye, Witt, Zhao and Fitzgerald (2011) found that greater Internet use was linked with better reading skills, particularly for youth initially low in reading skills. Lee et al. (2009) in South Korea conducted a study to determine the influence of computer use on academic performance of secondary school students. They used a national database to analyze how students' school behaviour as evaluated by English and math instructors and standardized test scores of math and reading were related to computer use for school activities and students in secondary schools. They controlled socioeconomic status (SES), home computer access, parental involvement, and students' academic expectation variables, the students who used a computer for one hour per day showed more positive school behaviours and higher reading and math test scores. They found that students who used the computer 1 hour per day for both school work and other than school activities had significantly better reading and math test scores. It implies that computer use of one hour per day was a predictor of success in mathematics and English. This is similar to the current study, although it was conducted in South Korea and in secondary schools, but the current study will be done in Nigeria and concentrate on distance e-learners. Nigeria, according to www.itnewsafrica.com (as at 2016) was the second in terms of Internet usage in Africa. What effect does this have on academic performance of Nigerian students? This is one of the interests of this study.

In a study done in the USA, Lim and Morris (2009) reported there was no significant relationship between study time and learning outcomes among 60 participants in a blended learning setting. The participants were separated into three categories based on time spent in learning ("less than 1 hour", "from 1 to 2 hours", and "more than 2 hours"). Their learning outcomes were based on course results and perception of learning outcomes. They found that there was no significant difference in the students' learning outcomes between the three categories. The present study which conducted in an Africa country, Nigeria, is similar to the above study although the participants in an e-learning setting will be involved and they will be categorised into 5 groups (0-2, 3-5, 6-8, 9-12 and more than 12 hours).

As seen from the above literature, some scholars did not agree that hours spent on the Internet influence academic performance but to a small extent.

These studies have led the researcher to hypothesise that hours spent on the Internet influence academic performance of distance e-learners as postulated in hypothesis H_{18}. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.16.8 Social Media and Academic Performance

Helou and Rahim (2014) in a study carried out in Malaysia, viewed online social networks as virtual communities which allow people to connect and interact with each other on a particular subject or spend time together online. In Malaysia, Yunus et al. (2012) indicated that students gained more vocabulary and improved their writing skills because of their participation on social networks such as Facebook and Twitter.

Asad, Mamun and Clement (2012) reported in his study conducted in Bangladesh that social networking sites had influence on the lifestyle of students and teachers with the positive effects outweighing the negative. Their findings confirmed that students can formulate group discussions in order to exchange their ideas, communicate to their teachers and appeal to their friends about assignments. Teachers share course-related materials with their students, enable research work, create student groups to collaborate on projects and communicate with their colleagues from other universities. Mehmood and Tawir (2013), in research conducted in Oman, remarked that the use of technologies such as social media networks and the Internet is one of the most important factors that can influence educational performance of students positively or negatively. Despite the fact that the above studies were done in different countries such as Bangladesh, Malaysia and Oman, outside Nigerian context, similar findings surfaced. This might suggest that use of social media for educational purposes influences academic performance of students in respective of their nation. Will similar findings surface in Nigerian context? Is there significant correlation between time spent on social medial such as Facebook by distance e-learners and their academic performance? This is the focus of the current study. Furthermore, the above literature from Europe and Ethiopia supported that the hours spent on social media for educational purposes leads to high academic performance.

Interestingly, the present study was conducted in Nigeria, a country, according to www.itnewsafrica.com (as at 2016) considered to be the second largest country in Africa in terms of Facebook use. What impact this has on academic performance of students in a Nigerian university is one interest of this study.

However, there were some contrasting findings that reported that hours spent on social media and high academic performances were not related. Some of these findings will be discussed below.

Many studies, such as Kirschner and Karpinski (2010), conducted in Europe, have reported a negative impact that social network participation has on students' academic performance. According to them, Facebook users reported lower mean GPAs and also reported spending fewer hours per week studying on average than Facebook nonusers. A majority of students claimed to use Facebook accounts at least once day. Negussie and Ketema (2014) conducted a study in Ethiopia and indicated that there was no significant relationship between time spent on social networks such as Facebook and students' GPA. Gupta (2016) conducted a research on impact of social media on the performance of students. This research is more significant because distance learning is totally dependent on social networking technologies. The study revealed that a majority of the students access various social media tools for information sharing and personal interaction. The academic performance of the students was independent of the use of Facebook as a social media tool for educational purposes. The reason may be that the students used social media for other purposes than educational purposes, which could serve as a distraction to their learning and which in turn hamper their academic performance. The above findings clearly showed that the impact of social media on academic performance does not depend on the level of advancement in terms of technology or huge internet connectivity.

The above studies led the researcher to inquire if hours spent on social media influence academic performance of distance e-learners as postulated in hypothesis H_{19}. The results of the finding will reveal what the outcome was in a Nigerian setting (Chapter 6).

2.17 Conclusion

It is evident from the literature reviewed above that these factors influence or determine academic performance of students: students' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning

styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day and hours spent on a computer for studies per day. Although there have been some studies on the determinants of students' academic performance in Nigeria there is limited research on the influence of these factors on academic performance of distance e-learners. Majority of the studies cited above were focused on factors influencing academic performance of traditional (on-campus) students and those that focused on distance learners were conducted outside the Nigerian context. It is pertinent, therefore, to have a clear understanding of what determines academic performance of distance e-learners. It is on this ground that this study focused on the influence of these factors on academic performance of distance e-learners.

The next chapter discusses the 3P Model that was combined with these variables to form a suitable conceptual framework for this study.

3. CONCEPTUAL FRAMEWORK AND THEORY

3.1 Introduction

A conceptual framework is an organised set of ideas or theories concerning the way a particular event works or is connected to its components. According to Maxwell (2005) and Robson (2011), a conceptual framework is the system of concepts, assumptions, predictions, thoughts and theories that underpin and advise the study under investigation. It is an important part of research design. The conceptual framework enables researchers to commence the study with certain basic presumptions emerging from their hypothetical point of view (Mertens, 2005). Jabareen (2009) defined conceptual framework as the set of connections of interwoven ideas that collectively provide a broad understanding of a happening. A conceptual framework is the system of interconnected ideas that connect the key parts of the research design that reacts to the qualitative questions in research paradigms and are products of qualitative processes of theorisation (Jabareen, 2009).

The following variables were extracted from the literature review: distance e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day and hours spent on a computer for studies per day. These variables were then considered as independent variables that could affect academic performance. Academic performance was considered as the dependent variable in this study. The variables together with 3P Model of teaching and learning as shown in Figure 3.1 below form the conceptual framework.

3.2 Model of Teaching and Learning

In 1989, Biggs proposed a theoretical framework to analyse the interactions of the variables in the three stages of learning which he referred to as the 3P model (Tang, 2009). According to Chan (2011), the model was developed initially by Dunkin and Biddle (1974). This illustrated learning in the classroom with multi-components integrated system with a combination of presage, process and product. The three components are (1) prior learning environment and student characteristics (presage), (2) approach to learning (process) and (3) the learning outcomes (product). Personal and situational factors (presage) were proposed in the model to influence a student to use a particular

approach to learning (process) which affects the learning outcomes (product) (Chan, 2011). The 3P model suggested that motives of students for learning and procedures for learning are combined to reveal learning approaches.

According to Hein (2014), Biggs (1993) delineated a 3P model (presage, process and product factors), built on the systems theory, which gives a general idea of the diverse components within an educational environment and the likely interaction among them. There is a difference between presage elements, process elements and product elements inside the model. There is a linear movement from presage to process to product but in the process each element can intermingle with the other to achieve stability, as shown in Figure 3.1. The 3P model proposed by Biggs (1999) explained why students learn in a different way and how students' approach to teaching is related to quality of learning and outcome. The model integrates teaching-, student- and process-based approaches to learning. According to the 3P model, learning is seen as a progression from presage (learning context) through process (learning acts) to products (learning achievement). According to Barros et al. (2013), they presented a systemic version of the students' approaches to learning, through the 3P model. Within this model, results may influence the approaches to tasks, and these may influence the context of education and the factors more directly related to students. According to Barros et al. (2013), the main differentiating factor of learning results is not cognitive ability but the use of different study processes depending on strategies towards learning. These approaches can be regarded as surface, deep and strategic or high performance. The superficial approach concerns an attitude based on the bare minimum when encountering the learning process; the student is not concerned with understanding it or developing it. This approach can be referred to as reproductive and marked by extrinsic motivation and fear of failure. The deep approach is learning which involves content to be learnt through vigorous tasks. Due to this, high-level cognition abilities are adopted, for example, analyses, comparisons, syntheses and confrontations, and even the cultural and cognitive repertoire is used, helping these students to reach a transforming and creative level. The strategic or high-performance approach is based on the intention of getting the maximum efficiency through the intrinsic motivations of the subject. Biggs et al. (2001) refer to this phenomenon as the 3P model of teaching and learning where student factors and the teaching context influence the process in which students engage during the learning activity and the products of their efforts. The two-headed arrows between each of the elements of the model indicate that each element influences and is influenced by each of the other elements. It

is very important to note that the 3P model is dependent not only on the student's tendency and academic abilities, but it depends also upon the design of the learning activity to encourage students to take deeper approaches to their learning. It is important to note that the 3P model has a feedback method to inform the instructor and students of changes that might have to be made to achieve desirable learning outcomes in any given educational process. The 3P model replaced a closed system that can illustrate educational processes in any nation with students from related or diverse cultural, language, and educational backgrounds. It can represent a teaching technique which retains the current or existing situation. It can also portray an approach to teaching that improves and advances in response to the learning needs of a different student group. According to Biggs and Tang (2007), students can take either a surface or a deep approach to a learning task.

The theoretical conception of 3P model of learning approaches differs from other theorists in its two components: how students approach a learning task, and reason for the approach (motive). Learning approaches are formed by combining different motives that are connected with the different procedure. The 3P model proposes two major learning approaches – surface and deep.

3.3 Presage Stage

According to Bonsaksen, Tore, Ted, Hua, Kenneth (2017), the presage factors are linked to the background of students (socio-demographic factors) and readiness for better understanding. Also, presage comprises the situational context where learning occurs, which includes the specific area of specialisation and its traditions, the constantly adopted teaching and evaluation forms, and the time spent engaging with the appropriate time tasks. In summary, the presage stages are those factors that form the context and background for the learning experience. Presage factors are divided into student and institutional or teacher contexts. Presage factors exist prior to actual engagement in learning and comprise both teaching and student presage factors. These two sets of presage factors interact. Student presage factors are the first stage of presage factors. This concentrates on the learning-related characteristics, for example abilities, prior knowledge, motivation, personality, learning styles, and stabilised learning approaches. Teaching presage factors is the second stage of presage factor. The presage variables integrate factors in place before learning takes place.

According to Tang (2009), in the process of learning the learners are not "empty-handed". They must have come to the classroom or lecture room with prior experiences, aptitudes, preferred learning styles, personalities and conceptions of learning. Gibbs (2010) stated that presage is referred to as a personal or situational variable before the learning occurs (learning environment, personality). Hein (2014) remarked that student characteristics are moderately steady and they comprise prior knowledge, values, expectations and abilities relating to achievement, approaches to learning, motivation, study skills, work habits, perceived self-efficacy, social and cultural factors. According to (Hein, 2014), this concentrates on teacher behaviour or attitude and the role of the learning environment which includes course structure, curriculum content, teaching methods or style, assessment techniques and resource materials.

Hein (2014) viewed the learning environment as the socially mediated beliefs of an individual regarding the opportunities to learn and the extent to which the social and physical milieu challenges learning. It is the totality of both internal and external circumstances and influences surrounding and affecting a person's learning. Learning environments are personal, but the environment is dictated by actions of others in the social setting and characteristics of the culture in which learning is situated. Learning environments are constrained by past actions, and what naturally happened and what has happened in the past can shape expectations of students with regard to what should happen.

For the purpose of this study, the following factors were considered as part of the presage stage: socio-demographic factors (age, gender, marital status), socioeconomic factors (family income, home background), hours spent on the Internet, social media, previous academic performance, learning style, previous qualification and work experience.

3.4 Process Stages

The process factors concentrated on learning activities which involve the real activities that happen in the lecture room. In the process stage the model begins with the interaction of student factors and learning setting or environment. This interaction regulates students' perceptions, and the perceptions drive the methods chosen to managing the teaching task. Gibbs (2010) viewed learning approach as the ability to engage students with feedback quality. He further noted that presage and

process variables are affected by external conditions which may influence student learning outcome or performance.

According to Hein, (2014) process stages are a result of student and teaching context interactions. Litwinska (2006) described learning activities as an activity organised by an individual with the purpose of improving his or her knowledge, competence and skills. The process factors include the way students handle precise learning assignments, which can be divided into deep approach, surface approach and achieving approach (Hein, 2014).

3.5 Student Approaches to Learning

Zikhali (2013) stated that Marton and Saljo (1976) and Biggs (1987) were the founders of research in the student approaches to learning. According to Zikhali (2013), the following scholars, Kember and Leung (1998), Trigwell, Prosser and Waterhouse (1999), Biggs et al. (2001) and Duff (2004), contributed significantly to understanding student approaches to learning (SAL). The research on SAL was focused on the effort of educational psychologists (Zikhali, 2013) which gave birth to the acknowledgment of two different categories of students. The first group is at the stage after understanding of the materials used for learning, while the second group is at the stage after reproduction of the materials used for learning. Duff (2004) stated that research in student approaches to learning has advanced and intend to comprehend and elucidate the causal relationship between student learning, learning strategies and their academic performance. According to Zikhali (2013) learning approaches are connected to the individual student and the learning environment which the student was exposed to, which implies that an approach to learning is an individual student-specific event. Neuman, (2011) explained that a positivist paradigm of educational research was adopted in the process of searching for a causal relationship between student approaches to learning and student outcome. The main focus of SAL is on students' approach, their purpose for learning and the variables that affect that strategy and motive (Duff, 2004; Phan & Deo, 2007). These can be achieved by establishing:

a) The approach students selected during a learning task.
b) The rationale, reason or justification for learning: whether it is to succeed in an evaluation, increase knowledge or to acquire a particular skill in order to accomplish a task. These scholars specialising in student learning, Biggs (1987), Ramsden (1991), Biggs and Tang (2007),

Entwistle and Tait (1990) as cited by Zikhali (2013) have identified three dominant study approaches by the students to explain the constructs of SAL. These constructs are deep learning, surface learning and strategic or achievement learning. These three approaches to learning are briefly discussed below.

3.5.1 Surface Approach

The major aim of this approach is to achieve qualifications at minimum permissible standard. The surface approach is to replicate prerequisites by means of rote learning. The surface approach is the opposite of the deep approach where a student–teacher relationship takes place in a traditional way, and the student assumes a passive role (Hein, 2014). A student who does not want to take risks opts for the surface approach. Hein, 2014) argued that surface approaches can never lead to understanding; they are necessary and sufficient condition for poor quality learning. The surface approach is an approach to learning where the student is mostly concerned with doing little work to complete the requirements of the learning task. This approach is determined by the use of low-level cognitive strategies such as rote memorisation of facts, when higher level strategies such as synthesis of disparate ideas are required for the task (Biggs & Tang, 2007). The surface approach could be suitable in response to evaluation arrangements by the higher institution.

The following are characteristics of the surface approach as identified by Goel (2009) and Kyndt et al (2011).

a) Learning is superficial.
b) Learning is incoherent.
c) Learning's meaning and material being learnt are disjointed.
d) Emphasis is on the learning outcome rather than on learning.

3.5.2 Deep approach

This is an approach to learning where the student uses suitable and meaningful cognitive strategies to understand, extend and apply their knowledge (Biggs, Kember & Leung, 2001). The deep approach is interested in the subject and its related areas. The deep approach aims to understand what is to be learnt through interrelating thoughts and broad reading. The deep approach aligns with constructivist theory, which enables the student to find and construct knowledge by themselves (Barros et al., 2013). Barros et al. (2013) recognised that the deep approach to learning

is linked with higher quality learning outcomes. Biggs and Tang (2011) suggested that students who engaged in the deep approach were motivated to search for and make meaning of their learning. Students who embraced deep approaches to learning showed an intention, from an intrinsic inquisitiveness or from a determination to do well, to engage in a meaningful task, view things from a different viewpoint and try to integrate and manufacture information to making learning theoretically structured. Biggs and Tang (2007) noted that deep approaches to learning are characterised by the appropriate use of high-level cognitive skills for tasks that require them. Students in the deep approach hunt for understanding of ideas in context and apply their learning to other concepts. They actively consider their own questions and seek answers related to the idea. In summary, students in a deep approach to their learning are doing the things required of critical thinkers. It was argued based on theory that students by means of the deep approach are regularly high achievers in their academic performance and nurture thoughts of great satisfaction (Chan, 2011). Lizzio et al. (2002) reported a positive relationship between the deep approach and GPAs among commerce students while there was no relationship among science and humanities students. A number of studies (Lizzio et al., 2002; Trigwell et al., 2013) stated that students decided to select the surface approach rather than the deep approach due to a different factor like intense workloads, and a didactic teaching and learning environment. Choy, O'Grady and Rotgans (2012) reported that students' approach to learning was a weak predictor of academic performance. Diseth, Pallesen, Brunborg and Larsen (2010) showed that learning approach was an independent predictor of test performance. Salamonson et al. (2013) found that surface and deep approaches to learning were important predictors of academic performance.

3.5.3 Achievement Approach

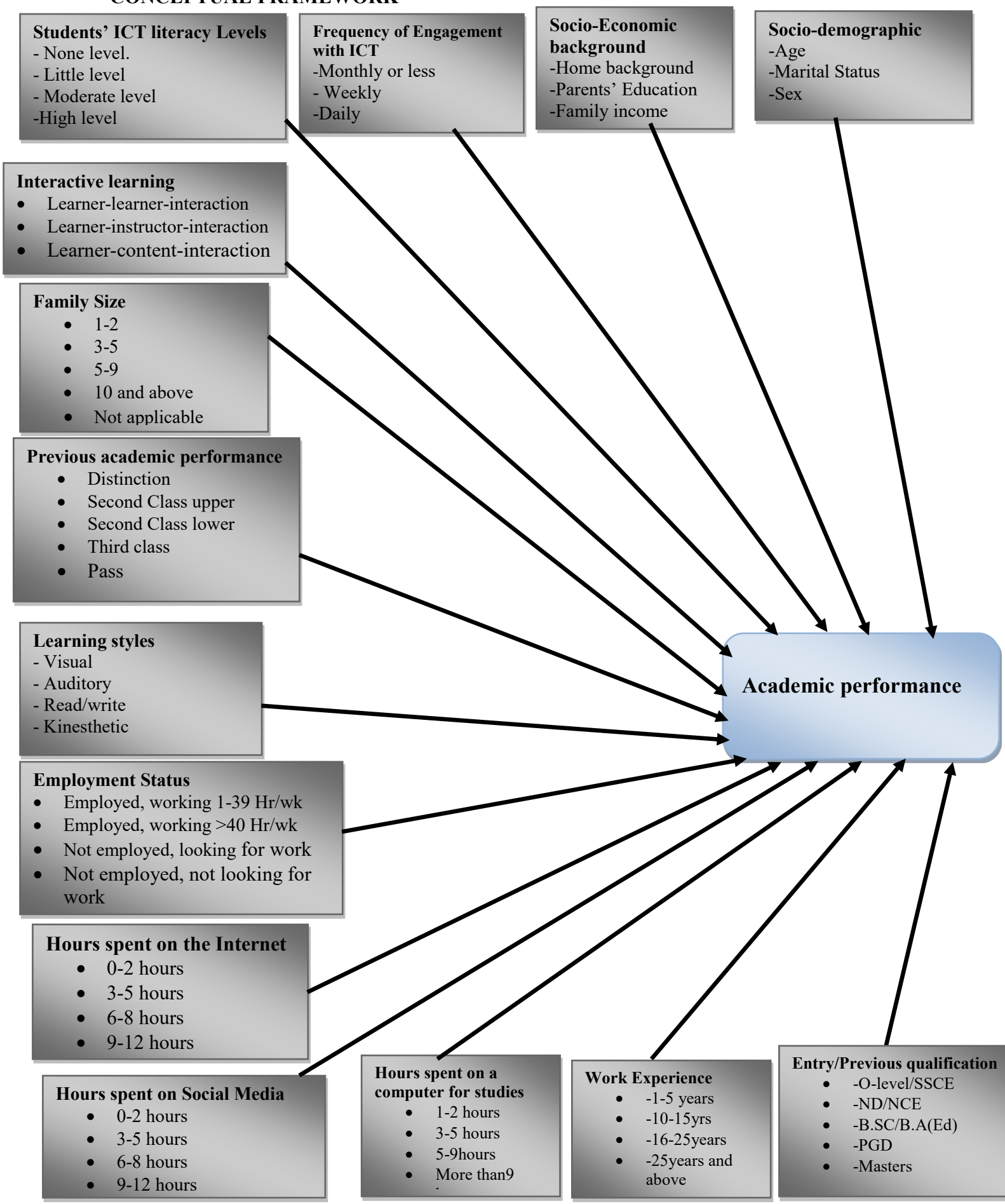
The motive of the achievement approach is to attain maximum grades and ego satisfaction. The achievement approach is exceedingly structured and planned to attain high marks by being an exemplary student in areas like punctuality and doing readings. The achievement approach is more concentrated on achieving high marks through assiduousness and well-structured study methods (Barros et al., 2013). In this study the following were considered as part of the process stage: electronic communication, collaboration, discussion forum, e-learning engagement, student interaction, submission of Tutored Marked Assignment (TMA), writing e-exams, pen-on-paper exams and checking of results online.

3.6 Product Factors

The last construct in the model, product, describes the outcomes achieved in the learning process. According to Gibbs (2010), this stage is referred to as learning outcomes, that is, academic performance and employability. The product factors were recognised as students' learning outcomes which can be described quantitatively (how much was learnt), qualitatively (how well it was learn), or both quantitatively and qualitatively. The learning outcome, which is also known as student achievement, is the product and reflects what we want the student to do (Jamieson, 2015). Product indicates the level of understanding and performance that students are expected to achieve because of engaging in the teaching and learning experience (Biggs & Tang, 2011). The anticipated learning outcomes are vital to Biggs' 3P model and the problems students encounter in achieving these outcomes through the teaching and learning process provide direction on how the learning environment, or teaching-learning activities, may be adapted to better meet student needs. In terms of learning outcomes, assessment is needed which gauges where students are in terms of their level of understanding or competence in the concept or skills in question. Course grade is a generally used variable to determine student achievement in an educational environment (Jamieson, 2015). Bonsaksen et al. (2017) stated that learning outcomes could be a result of various factors such as learning environment, students' predispositions, study efforts, cultural factors and approaches towards studying.

For this study, academic performance was considered as learning outcome or products.

CONCEPTUAL FRAMEWORK



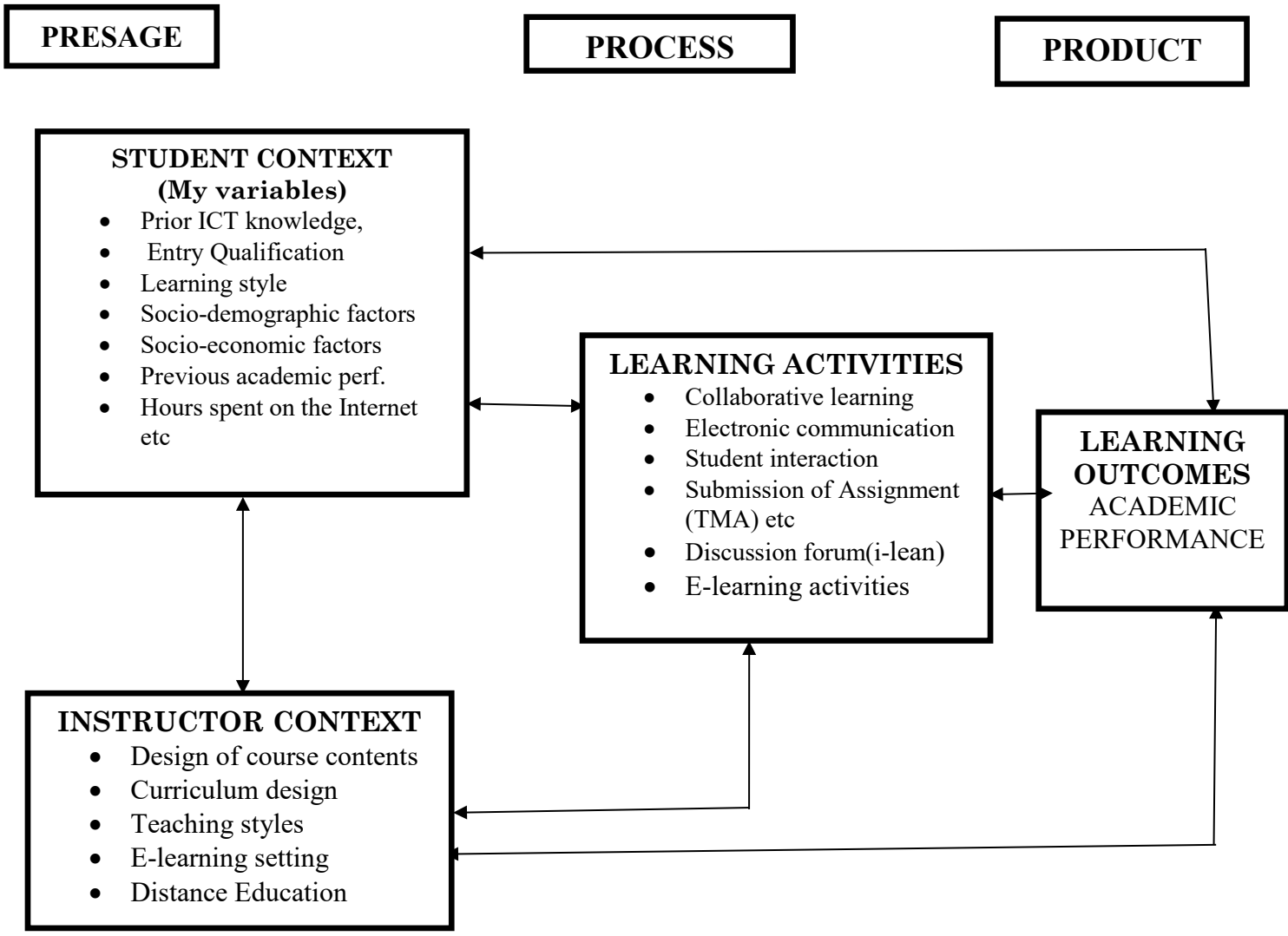


Figure 3.1: 3P Model of teaching and learning adapted from Biggs (1999)

3.7 Conclusion

After extensive review of the literature and reading of theories and models in information systems that relate to teaching and learning, it was felt that the 3P models together with the variables identified would form an appropriate conceptual framework for this study. This was implemented and evidence is found in the results and discussion chapters. In the next chapter, the research methodology is discussed.

4. RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the research methodology used in order to achieve the objectives of the study. Kumar (2010) defines research methodology as the methods and procedures embraced by a researcher to conduct a study in line with their desired aims and stated research objectives. This was also supported by Collis and Hussey (2009) who described research methodology as the overall approach to the entire process of the research study.

Based on the above explanation, the methods and procedures adopted by the researcher to conduct this study are explained in detail under the following subheadings: Research design, Target Population, Sampling Procedures and Sample Size, Data Collection Instruments and Procedure, Reliability of the Instruments, Validity of the Instruments and Data process and Data Analysis Techniques.

4.2 Research Design

Research design provides the basic guiding principle for carrying out research. Specifically, a research design provides useful, accurate information that will answer the stated research questions or hypotheses (Hair et al., 2007). The present study adopted largely a quantitative approach which was descriptive and predictive/inferential in nature. To achieve this, Spearman's Correlation coefficients as well as ordinal regression were used to analyse the data.

The results from the bivariate analysis indicated that the dataset for this research was not normally distributed; therefore, the nonparametric Spearman's rank order correlation test was used to identify relationship between the independent variables and dependent variable instead of Pearson correlation analysis. One-way analysis of variance (ANOVA) was applied in analysing the differences between the mean scores of three or more groups in this study and the level of significance was set at $p < 0.05$ based on previous studies. The mean scores and the standard deviation were calculated under the hypothesis testing. The ANOVA result was used to further support the correlation result and thereby indicate whether the variables under investigation affected academic performance of distance e-learners or not. The Games-Howell and Tukey HD Post-hoc Test were carried out in order to identify the direction of the differences between three

groups or more. The Games-Howell and Tukey HD Post-hoc Test were chosen based on whether the Test of Homogeneity of Variances was violated or not. In order to determine the predictors of academic performance of distance e-learners, ordinal regression was used because the dependent variable which was the outcome variable was categorised. The ordinal regression is explained in detail in Chapter 7.

As explained by Woodwell (2013), descriptive research offers answers to sensible questions in order to make a decision on current events. In that capacity, descriptive research often involves utilising statistics to outline the nature and shape of the data and the distribution of the measured data. In this study, the research design was said to be descriptive because descriptive statistics (such as average scores, mean scores and Spearman's correlation) were used. Creswell (2012) explained that the process of analysing data based on a sample can be facilitated by inferential statistics by drawing conclusions from a given population. In this study, inferential statistics were used to test the hypotheses and the ordinal regression model was used to determine the best predictor of academic performance of distance e-learners.

In order to facilitate triangulation, qualitative data was also collected and analysed. Creswell and Vicki (2011) noted that triangulation is a qualitative validation technique in which the researcher builds evidence for a code or theme from several sources or individuals. The qualitative data was used to get an in-depth understanding of the statistical results (Cresswell, 2012): in other words, why the participants responded in the way they did. The study therefore could be considered as a mixed-methods research approach, although the qualitative aspect was limited. Maxwell (2012) described research method as an approach that gives a context within which appropriate techniques and methods can be adopted and developed to achieve the overall purpose of the study. Cresswell (2013) remarked that the major assumption of mixed-methods research is that both the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone. He argued further that mixed method consists of two stages: the first is where the researcher collects quantitative data, followed by results analysis, and thereafter the results are used in building the second, qualitative, stage. The results of preliminary quantitative data analysis assist the researcher to determine purposively the participants to select for the qualitative stage. It also assists the researcher to decide the questions that will be suitable for any interviews to follow. According to Cresswell (2013), the mixture of

strengths of one approach compensates for the shortcomings of the other method. Mixed-methods research assists in giving response to research questions which are difficult for only quantitative or qualitative methods as in the case of research question 3 of this study. For the purpose of this study, the qualitative method was adopted to complement the quantitative as it was used to elicit information of a personal character and allowed the participants to freely express ideas on issues which were not addressed in the questionnaire items. The researcher is of the opinion that both methods are suitable for this study and supplement each other by applying appropriate and sufficient data to address the problem stated in the research questions and hypotheses. The quantitative data was analysed using SPSS statistical software, reporting both descriptive and inferential statistics. The qualitative data (focus group interviews) was analysed through coding after transcriptions. Interpretations then were grouped into emergent themes.

4.3 Target Population

Gray (2014) defined population as the totality of people, organisations, objects or occurrences from which a sample is drawn. McMillan and Schumacher (2010) remarked that population can be referred to as the whole group of individuals from which a sample is drawn and to which results can be generalised. The South-West geopolitical zone of Nigeria was the focus of this study. The population was the total number of distance e-learners in different faculties and different years of studies in all the study centres in NOUN in the geopolitical zone. This geopolitical zone is made up of six states – Lagos, Ekiti, Oyo, Osun, Ondo and Ogun, with 9 different study centres. NOUN is one of the federal universities in Nigeria located at the University village,Jabi, Abuja. It has many branches (study centres) spread across the nation. At least each state has one study centre located in the state capital.It was difficult for the researcher to manage the target population due to constraints such as money, time and practical issues. Because of this, the target population was downsized to a manageable four study centres. Therefore, the study was made up of all the distance e-learners in Osun State study cente (Osogbo city), Ondo State study centre (Akure city), Ekiti State study centre (Ado Ekiti city) and Oyo State study centre (Ibadan city) with a population of 15,223. A sample was chosen by the researcher as explained below because it was not possible to concentrate on the entire population.

4.4 Sampling Technique and Sample Size

Sampling technique is the procedure used in extracting a suitable sample size from a population (Hair et al., 2007; Saunders, Lewis & Thornhill, 2007). The current study applied convenience sampling for the quantitative part, while purposive sampling was used for the qualitative part, owing to the restriction of resources and limited time. The reason for adopting convenience sampling for the quantitative part of the study was that it is the easiest way to contact participants and collect information within a short period of time (Saunders, Lewis, & Thornhill, 2009). The researcher employed non-probability convenience sampling. In this type of sampling, each member of the chosen population does not have the same chance of being selected as part of the sample**.** The university where the research was conducted operates on flexible mode of study which does not mandate the students to come to campus regularly. Due to this, the researcher went as far as many computer centres, cyber cafés, places of worship and individual offices in order to distribute questionnaires to the participants. Purposive sampling approach is a type of non-probability sampling in which the researcher selects the sample based on certain conditions (Babbie, 2011). Purposive sampling was used by the researcher with the purpose of ensuring that the senior students or experienced students participated in the interview (Leedy & Ormrod 2013). A sample of 10 participants for each group of focus group interviews was purposively selected from those that participated in the questionnaire and those who had volunteered to participate in the interview.

Sample size can be defined as the number of samples used by the research and which can represent the entire population (Yin, 2009). Sample size is an important consideration for the researcher because the overall findings gathered from the primary data are dependent upon it and any inaccuracy associated with it can lead to misleading findings (Saunders, Lewis & Thornhill, 2007). It is necessary that the researcher selects a sufficiently large sample to achieve the objective of generalisation of findings. It is obvious that it is impossible to consult all the people in a target population in the process of collecting data for a quantitative study. Due to this, it is therefore necessary to select from the whole population. Since the population was 15223 which is beyond 5000, the sample size for this study was 1,025, which is in line with recommendations by Leedy and Ormrod (2005) as explained below.

Gay and Airasian (as cited in Leedy & Ormrod, 2005:25) suggested the following procedures when selecting a sample size:

- For small populations (with fewer than 100 people), there is little point in sampling, therefore, one should survey the entire population.
- If the population size is around 500, one should sample at least 50% of the population.
- If the population size is around 1,500, then one should sample at least 20% of the population.
- Beyond a certain point (at about 5,000 or more), one should sample at least 400 of the population.

4.5 Data Collection Instruments and Procedure

The researcher made use of both primary and secondary data for the present study. Jamal (2007) stated that primary data is the data which the researcher personally collected from the field, while secondary data is the data obtained from previously published documents. According to Kinyua (2014) secondary data consists of existent information, collected by researchers for different purposes, from external sources such as documentation, archival records, magazines and the Internet. In this study, secondary data was collected from both published and unpublished theses, journal articles and the Internet. The primary data for this study was obtained through face-to-face interaction with the participants using a paper-based survey. The permission and assistance of the study centre directors was sought by the researcher in order to distribute the questionnaires to the students in their study centres. Permission to conduct research at the designated study centres was sought from relevant authorities of the university in addition to the letter of introduction given to the researcher by his supervisor for ease of data collection and adequate recognition. The participants were selected randomly using purposive and convenience sampling methods from various places in South-Western Nigeria (university campuses, computer centres, cyber cafés, places of worship and individual offices). The researcher employed the service of research assistants who are the staff and students of the university where the research was conducted.

The current study focuses on the effect of e-learning on academic performance of distance e-learners. The questionnaire was adapted in order to collect the necessary data on the effect of e-learning on academic performance among distance e-learners in the South-Western geopolitical zone of Nigeria. The questionnaires enabled the researcher to reach a large population scattered

over an extensive geographical area (Babbie, 2011). Participants were given room to ask questions to clarify research items and were requested to answer every item in the questionnaire as truthfully as possible. The questionnaires were left for those who were unable to complete them in the presence of the researchers and were instructed to submit them to the research assistants in their study centre.

The participants were contacted through research assistants to find out if they were interested in participating in the research. The purpose of the research was explained to the participants with the assurance of anonymity and guarantee of no personal information in the survey questionnaire will be made public. Thereafter it was found that the participants showed willingness to participate in filling out the survey questions (questionnaire) and participate in the focus group interview.

4.6 Data Collection Tools

Questionnaire: The present study used a questionnaire with open-ended questions. The researcher used a questionnaire because it helps to generate quantifiable and standardised data ready for statistical analysis, which made the processing of responses easier (Mugenda, 2008; Panneerselvam, 2008). According to Saunders et al. (2012), the questionnaire allows the participants to read and answer similar questions connected to the topic under investigation, thereby ensuring consistency in the data collection. The questionnaire for this study was adapted from Aboderin (2011), Algahtani (2011), Martha (2009) and Owino (2013) in order to meet the needs of this research. One thousand and four hundred (1400) copies of questionnaire were distributed, the researcher was able to retrieve 1,050 responses. Twenty-five questionnaires were considered to be spoilt because they were partially completed, illegible or contained contradictory entries. At the end of the exercise, the researcher used data from 1,025 questionnaires for data analysis. The response rate was 73% which is more than the required, taken into account that some percentages were not usable. Saunders et al. (2007) remarked that a 100% response rate is unrealistic and the sample needs to be large to ensure enough response for the mandatory margin of error. The sample size is almost 7% (6.8%) of the population.This sample size sufficiently satisfied Leedy and Ormrod's (2005) requirements based on the above explanation.

The questionnaire was divided into eight sections: section A (demographic data), section B (socioeconomic status), section C (academic performance of distance e-learners), section D

(students' engagement with ICT), section E (students' ICT Literacy), section F (learning style), section G (interactive learning) and section H (socioeconomic status perception). The questionnaire had 25 questions in all. These questions were constructed to measure the variables of interest. In constructing these questions, a Likert scale was developed to assess these variables. The following points provide a description of the measurement scales.

Academic performance: Ten items were incorporated in the questionnaire to determine academic performance. The scale that was used in this item was an interval scale. The participants were asked to indicate their academic performance for each of their courses taken over one semester. This was based on a 6-point Likert scale (A = distinction, B = good, C = credit, D = pass, E = poor and F = fail). Thereafter, the researcher arrived at an overall academic performance (ACADPERF) by determining their average performance based on actual results. This involved the summation of each course result (C1–C10) divided by NC where NC is the number of courses taken by each student in the semester under consideration. This was done because not all the students took all the 10 courses per semester.

Frequency of engagement with ICT: Ten items were incorporated in the questionnaire to determine level of engagement with ICT. The scale that was used in this item was an interval scale. The participants were asked to rate on a 4-point Likert scale their level of engagement with ICT respect to the statements, with 1 = never, 2 = occasionally, 3 = frequently and 4 = most frequently. All 10 items under frequency of engagement with ICT (Appendix A) were aggregated into index FREQICT.

Students' ICT literacy level: Six items were incorporated in the questionnaire to measure students' ICT literacy level. The scale that was used in this item was an interval scale. The participants were asked to rate on a 4-point Likert scale their students' ICT literacy level respect to the statements, with 1 = none, 2 = little, 3 = moderate and 4 = high. All six items under students' ICT literacy were aggregated (Appendix A) into Index ICTLTR.

Learner-content interaction: Fifteen items were incorporated in the questionnaire to determine learner-content interaction. The scale that was used in this item was an interval scale. The participants were asked to rate on a 4-point Likert scale their level of agreement with respect to

the statements, with 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree. All 15 items under learner-content interaction (Appendix A) were aggregated into Index LCI

Learner-instructor interaction: Seven items were incorporated in the questionnaire to determine learner-instructor interaction. The scale that was used in this item was an interval scale. The participants were asked to rate on a 4-point Likert scale their level of agreement respect to the statements, with 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree. All seven items on learner-instructor interaction (Appendix A) were aggregated into Index LII.

Learner-learner interaction: Seven items were incorporated in the questionnaire to determine learner-learner interaction. The scale that was used in this item was an interval scale. The participants were asked to rate on a 4-point Likert scale their level of agreement with respect to the statements, with 1 = strongly disagree; 2 =disagree; 3 = agree; and 4 = strongly agree. All the seven items on learner-learner interaction (Appendix A) were aggregated into Index LLI.

Family income: Four items were incorporated in the questionnaire to determine family income of distance e-learners. The scale that was used in this item was an interval scale. The participants were asked to indicate their parent's income based on: 1 = unemployed or no income; 2 = low; 3 = middle; and 4 = high; where high represented an income of N1,000,000 and above, middle an income of between N500,000 and N1,000,000, low an income of below N500,000.[2] All the four items on family income (Appendix A) were aggregated into FAMILYINC.

Focus group interviews: For the qualitative part of the study, focus group interviews were conducted. After the collection of the data obtained from the questionnaire, focus group interviews were arranged to obtain more information pertaining to those factors which affect distance e-learners' academic performance in a Nigerian university. The researcher randomly chose students who participated in the answering of the questionnaire for the focus group interview in order to clarify points raised from the questionnaire.

Focus group interviews are a type of qualitative data collection instrument in which the researcher gives the participants a question to discuss (Alzahrani, 2015). According to Alzahrani (2015), focus groups have been widely used in e-learning research, particularly those linked to improving

[2] At the time of writing, 1 Nigerian Naira = USD0.0028, or ZAR0.038.

the quality of e-learning. Bichsel (2013) published an article on e-learning titled "The State of E-Learning in Higher Education: An Eye toward Growth and Increased Access" which applied focus group analysis for data collection. In the same vein, O'Driscoll et al. (2010) conducted a study for the University of Surrey examining how the university could use e-learning to improve the learning experience of non-traditional students. Flick (2014) remarked that focus group interviews provide a foundation for interpreting statistically significant findings from a parallel qualitative study.

This study adopted the six stages of conducting focus group interviews as identified by Onwuegbuzie et al. (2009).

1. Stage 1: Question formation – The questions that were used in the questionnaire survey were used to form the focus group interview questions. The researcher with the guidance of his supervisor prepared a set of nine questions which were used for each focus group. The researcher asked other relevant question to extract more details.
2. Stage 2: Group preparation – This stage commenced with identification of the likely participants for the focus groups. The researcher did this by contacting his research assistants in all the four centres of NOUN used for the study to identify potential participants and also invited them to participate in the focus group interview. With the assistance of research assistants, the researcher was able to obtain the details of the participants that were useful for this study, especially those who participated in the administration of the questionnaire. In all, the researcher arranged for 12 focus groups, each containing five to 10 participants (Onwuegbuzie, 2009).
3. Stage 3: Data collection – The researcher audio-recorded each session with the permission of the participants.
4. Stage 4: Data preparation – A laptop computer was used both for audio recording the conversation as well as for preparation of transcription. In addition to that, the researcher used a smartphone for audio recording. The phone was used to ensure that the complete focus group was recorded and also to verify the recording for the purpose of transcription.
5. Stages 5 & 6: Data analysis and interpretation – In all, several hours of audio recording was obtained. This was transcribed and then analysed. The data analysis was arranged under themes.

4.7 Reliability

The reliability of a scale indicates how free it is from random error. Test-retest reliability (also referred to as “temporal stability”) and internal consistency are the two regularly used indicators of a scale's reliability. The test-retest reliability of a scale is assessed by administering it to the same people on two different occasions, and calculating the correlation between the two scores obtained. High test-retest correlations indicate a more reliable scale. The researcher must take the nature of the construct that the scale is measuring into consideration when considering this type of reliability. A scale designed to measure current mood states is not likely to remain stable over a period of a few weeks. The test-retest reliability of a mood scale, therefore, is likely to be low. One would, however, hope that measures of stable personality characteristics would stay much the same, showing quite high test-retest correlations.

Internal consistency is the second aspect of reliability that can be assessed. This is the degree to which the items that make up the scale are all measuring the same underlying attribute (i.e. the extent to which the items “hang together”). Internal consistency can be measured in a number of ways. The most commonly used statistic is Cronbach's coefficient Alpha (available using SPSS). This statistic provides an indication of the average correlation among all of the items that make up the scale. Values range from 0 to 1, with higher values indicating greater reliability. While different levels of reliability are required, depending on the nature and purpose of the scale, Pallant (2016) recommended a minimum level 0.7.

In this study, the researcher used internal consistency as the indicator of scale reliability. The scale reliability and Cronbach Alpha coefficients validating the internal consistency reliability of the effect of e-learning on academic performance of distance e-learners were performed. The reliability was determined by computing the Cronbach’s Alpha coefficient for each construct’s items in the instrument as shown below which indicated that the questionnaire tool was highly reliable. The researcher felt there was no need for further reliability test (test-retest or pilot study) apart from using Cronbach’s Alpha since the questionnaire was adapted from previous studies (Aboderin, 2011; Algahtani, 2011; Martha, 2009 & Owino, 2013).

The Cronbach’s Alpha for each variable was calculated by the researcher in order to establish reliability and consistency of the scale. Also, this was done to ensure all the items were measured

in the same underlying construct (Pallant, 2016). Table 4.1 shows the Cronbach's Alpha coefficients reliability benchmarks.

Table 4.1: Cronbach's Alpha Coefficients Reliability Benchmarks.

Alpha Coefficient Range	Strength of Association
<0.6	Poor
0.6 to <0.7	Moderate
0.7 < to 0.8	Good
0.8 to <0.9	Very Good
>=0.9	Excellent

Source: Developed by the researcher for this research

Variable	Number of Items	Reliability
Academic performance	10	0.745
Freq of engagement with ICT	10	0.850
Students' ICT Literacy level	7	0.859
Learner -content-Instruction	15	0.920
Learner- learner- Instruction	7	0.915
Learner-instructor- Instruction	7	0.902
Socioeconomic perception	8	0.753
Parent/Family Income	2	0.806

Source: Developed by the researcher for this research

In the case of the socioeconomic perception, initially the total items in the group was 14 but it was reduced to eight in order to meet up with Alpha value of 0.7 as shown above after running Cronbach's Alpha test using the reliability command in SPSS.

4.8 Validity of the Instruments

The validity of a scale refers to the degree to which it measures what it is supposed to measure. Unfortunately, there is no one clear-cut indicator of a scale's validity. The validation of a scale involves the collection of empirical evidence concerning its use.

Validity can be viewed as the degree to which the instrument measures what it is believed to measure according to the researcher's subjective assessment (Nachmias & Nachmias, 2007). The research instruments in the quantitative part of this study include academic results of students from the first year to the fourth year. The researcher ensured validity of the academic results used by ensuring the results were collected directly from the IT office or Internet café of the study centre where the participants were students during the data collection.

Validity in qualitative research is associated with the authentic nature of the findings of the study and the conclusions drawn from that piece of work (Bryman, 2012). In relation to data generation processes, the researcher spent six months in the field (January to June 2016) in order to generate some rich, thick descriptive data based on the research design. This enables the researcher to understand the participants' views and their contexts. The data generation process and the researcher's prolonged engagement in the field enabled him to develop an adequate understanding of participants' contexts and helped to establish relationships of trust with the participants. The researcher went as far as visiting the participants in their various offices, places of worship, Internet cyber cafés and so on, based on appointments and their convenience.

The researcher documented each research procedure and provided an in-depth methodological description in order to confirm the integrity of the study. The researcher reflected his position through engagement in the field as an insider in the process of data generation as he was involved in conversations with participants and undertook observations of events and activities. In this study, both quantitative and qualitative methods were used to ensure triangulation of data. Dahlberg and McCaig (2010) remarked that triangulation data collection approach is the accepted method of ensuring validity.

In this current study, the researcher ensured the validity of the questionnaire through these processes:

Face validity refers to whether panels of judges or experts on the topic agree that the statements do relate to what they are supposed to measure. If agreement is obtained, then the instrument has face validity. The validation of a scale involves the collection of empirical evidence concerning its use. In this study, researcher's supervisor and the Ethical Clearance Committee concurred that the items in the questionnaire focused on (i) independent variables under investigation and (ii) the dependent variable – the distance e-learners' academic performances. Because of this, the items were found appropriate to measure the intended variable and therefore concluded that it had face validity.

Content validity refers to the adequacy with which a measure or scale has sampled from the intended universe or domain of content (the literature). Davies and Hughes (2014) stated that content validity is the extent to which the elements within a measuring instrument are relevant and representative of the construct that they will be used to measure. In the current study, the content of the instrument (questionnaire) was considered valid because it was adapted from previous studies.

In addition to the above, the researcher considered the following steps in order to ensure the validity and reliability of the qualitative part of the study as suggested by these researchers: Creswell and Clark (2011), Liamputtong (2013) and Struwig and Stead (2013).

- He must be aware the entire time of the possibility of researcher bias.
- He must use a tape recorder to tape interviews and transcribed the interviews verbatim.
- He must use triangulation in order to test for consistency in both quantitative and qualitative stages.
- He must be completely involved in the qualitative stage and established a trusting relationship with the participants.
- He must talk to a lot of participants about the study and the result to ensure the accuracy, trustworthiness and credibility.
- He must use lengthy data collection time for the study.
- He must use another academic to look at the analysis of the data.
- He must reanalyse parts of the unprocessed data collected during the qualitative stage in order to determine the reliability of the results from the first analysis.

- He must frequently reflect on the data collected to ascertain its reliability.

4.9 Data Capturing and Variable Coding

After the collection of questionnaires from the participants with the assistance of research assistants in all the study centres covered, the data was coded and captured by the researcher using SPSS. SPSS software requires all data to be in coded form. Therefore, data was coded before capturing.

Table 4.2 gives the details of the measures and codes for the variables under investigation in this study.

Table 4.2: Definition of Variables Used in the Study

Dependent Variable	**Definitions**
Distance e-learners' academic performance	A= 6 B=5 C= 4 D= 3 E= 2 F= 1
Independent Variables	**Definitions**
Frequency of engagement with ICT	i. Most frequently=4 ii. Frequently =3 iii. Occasionally =2 iv. Never =1
Student ICT literacy	i. High = 4 ii. Moderate =3 iii. Little =2 iv. None =1
Socio-demographic status	**1. Sex(Gender)** i. Male = 1

Independent Variables	Definitions
	ii. Female = 2 **2. Age** i. 17 below =1 ii. 18-20 =2 iii. 21-29 =3 iv. 30-39 =4 v. 40-49 =5 vi. 50-59 =6 vii. 60 and above=7 **3. Marital Status** i. Married =1 ii. widowed= 2 iii. Divorced =3 iv. Separated=4 v. Never married=5
Socioeconomic status	**Home background** i. Rural=1 ii. Semi-urban iii. Urban=3 **iv. Parents' Education** v. O-level/SSCE =1 vi. ND/NCE =2 vii. B.Sc./B.A./B.Ed=3 viii. PGD =4 ix. Masters =5 x. PhD = 6 xi. Vacant =0 **Recoded to** i. Illiterate(0)

Independent Variables	Definitions
	ii. Fairly educated (1&2) iii. Moderately (3&4) iv. Well educated (5&6) **Family income** i. No income = 1 ii. Low = 2 iii. Middle =3 iv. High =4
Employment	i. Working 1-39 hours =1 ii. Working 40 hours and above=2 iii. Looking for work =3 iv. Not looking for work=4 v. Retired=5 vi. Disabled=6 vii. vii. Vacant =0
Children	i. Yes=2 ii. No=1 iii. Not applicable=0
Many children/family size	i. 1-2=1 ii. 3-5=2 iii. 5-9=3 iv. 10 and above= 4 v. Not applicable=5
Work experience	**i.** 1-9 years =1 ii. 10-15 years =2 iii. 16 -25 years =3 iv. 25 years and above=4

Independent Variables	Definitions
Previous/entry qualification	i. O-level /SSCE =1 ii. ND/NCE =2 iii. B.Sc./B.A./B.Ed. =3 iv. PGD =4 v. Master's =5
Parent qualification	i. O level/SSCE =1 ii. ND/NCE =2 iii. B.Sc./B.A./B.Ed. =3 iv. PGD =4 v. Masters =5 vi. PhD =6
Faculty of study	i. Agriculture Science =1 ii. Arts and Social Sciences =2 iii. Education =3 iv. Health Science =4 v. Law =5 vi. Management Sciences =6 vii. Science & Technology =7
Year of study	i. Year 1=1 ii. Year 2=2 iii. Year 3=3 iv. Year 4=4 v. Year 5 =5 **Note**: Year 5 was considered in this study because the university has only one program which takes five years and that is the bachelor of laws; the rest go up to four years.

Independent Variables	Definitions
Course of study/degree to be awarded	i. B.A. =1 ii. B.Sc.=2 iii. B.A. /B.Ed./B.Sc.Ed. =3 iv. PGD =4 v. Masters =5 vi. PhD =6
Previous academic performance	i. Distinction/Upper Credit/First Class =6 ii. Credit/ Upper Credit/Second Class upper=5 iii. Merit/Lower credit/ Second Class Lower =4 iv. Third Class =3 v. Pass =2 vi. Vacant=1
Hours spent on the Internet per day	i. 0-2 hours=1 ii. 3-5 hours =2 iii. 6-8 hours =3 iv. 9-12 hours =5 v. More than 12 hours =5
Hours spent on social network per day	i. 0-2 hours=1 ii. 3-5 hours =2 iii. 6-8 hours =3 iv. 9-12 hours =5 v. More than 12 hours =5
Hours spent on a computer per day	i. 0-2 hours=1 ii. 3-5 hours =2 iii. 6-8 hours =3 iv. 9-12 hours =5 v. More than 12 hours =5
Learning style	i. Learning by listening (Auditory) =1 ii. Learning by seeing (Visual)=2

Independent Variables	Definitions
	iii. Learning by experimenting and feeling (Kinesthetic) =3 iv. Learning by reading/writing (Read/Write)=4
Interactive learning	**i. Learner- content- interaction** SA - Strongly Agree =4 A – Agree =3 D – Disagree =2 SD - Strongly Disagree =1 **ii. Learner-instructor-interaction** SA - Strongly Agree =4 A – Agree =3 D – Disagree =2 SD - Strongly Disagree =1 **iii. Learner-learner-interaction** SA - Strongly Agree =4 A – Agree =3 D – Disagree =2 SD - Strongly Disagree =1
Socioeconomic perception	SA - Strongly Agree =4 A – Agree =3 D – Disagree =2 SD - Strongly Disagree =1 **Revised for negative statement** SA - Strongly Agree =1 A – Agree =2 D – Disagree =3 SD - Strongly Disagree =4

4.10 Data Processing and Data Analysis Techniques

Prior to data analysis, the researcher checked data for errors. This was done by looking for values that fell outside the range of possible values for a variable. After some errors were identified, they were corrected immediately in the data file (Pallant, 2016). According to Pallant (2016), data analysis is the process that begins once data has been checked and freed of any errors. Data analysis is a process of inspecting, cleaning, transforming, and modelling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making (Jansen, 2010 and Pallant (2016). Data processing is a procedure that includes questionnaire checking, data editing, coding, transcribing and cleaning before the analysis can be done. Questionnaire checking is a process of discovering, correcting and resolving an identified error or problem that may occur in the questionnaire. The questionnaires are cross checked, redesigned separately to guarantee no errors, and accepted by the supervisor to guarantee the questions asked were of high quality, appropriate, and comprehensible by participants. Data editing is conducted to ensure that the accuracy of the data is high. Missing data is rejected while noticeably distinct data is being taken out to guarantee consistency and avoid unwanted result outcome.

The qualitative and the quantitative results were analysed individually in this study. The researcher used quantitative results to plan the qualitative follow up. According to Cresswell, (2013), the important area is that the quantitative results cannot only inform the sampling procedure but they can also point towards the types of qualitative questions to ask participants in the second phase. To analyse the mixed method research the sequential explanatory design was used which involves the collection and analysis of quantitative data. Priority is given to the quantitative data, and the findings are integrated during the interpretation phase of the study (Cresswell, 2013). Data analysis for this study consisted of both qualitative and quantitative methods. The data from the completed questionnaires were analysed by the researcher using SPSS statistical package 17. The researcher transcribed the recorded data and analysed focus group interviews. After the focus group interviews, the audio tapes were transcribed and important points raised by participants in response to each topic were noted. Based on the important points raised, patterns were noted and data were categorised and discussed appropriately. Qualitative data from the focus group interviews that

matched the survey were incorporated. The researcher noted patterns emerging from the data and findings were interpreted. The researcher used the themes that emerged from the qualitative part of the study to support the quantitative results and the new themes that emerged were also noted and explained in detail under research question three. The Cronbach Alpha Coefficient was applied to the main survey in order to determine the validity and the reliability of the instruments used.

4.11 Ethical Considerations

Bartlett (2009) stated that ethics should be a central consideration for all the researchers in education and also remarked that research conducted without care and consideration might lead to potential harmful effects for those participating in the research.

According to Gray (2014) ethical considerations can be classified into the following four major parts:

- Avoiding harm to participants;
- Ensuring informed consent of participants;
- Respecting the privacy of participants; and
- Avoiding the use of deception.

Silverman (2013) noted that ethical considerations include the right of the participants to withdraw from the research at any stage; protection of the participants; obtaining a consent form; and causing no harm. All universities have research ethnics committees that issue approval to research proposals after the submission of relevant documents (Fowler, 2014; Silverman, 2013). Based on this, the researcher submitted an application form with relevant documents to the ethnical committee of the University of KwaZulu-Natal. The researcher outlined in the application, the type of research that was going to be carried out, the research methods and data collection instruments that were to be used. The application form explained how ethical issues concerning participants were to be addressed. An ethical clearance certificate was issued to the researcher after meeting the ethical requirements of the University of KwaZulu-Natal. Data collection began immediately after the ethical clearance certificate was issued. The researcher explained the ethical considerations to the participants and they agreed to be included in the research (Flick, 2014; Hammersley & Traianou, 2012). The participants were informed at the beginning of the research

that they were participating voluntarily and that they had the right to withdraw from the study without any penalty. The consent forms were issued to the participants to specify whether they wanted to participate in the research or not. In this study, the researcher ensured that the data remained confidential and the participants were assured that their anonymity would be maintained unless otherwise agreed. The principles and ethical issues associated with data collection, analysis and interpretation were closely followed with a view to strengthening the outcome of the study. The researcher and the research assistants were ethical in all the stages of the research.

4.12 Conclusion

This chapter presented the methodology used by the study, as guided by the research objectives.

There was a detailed explanation of the rationale for the choice of quantitative and qualitative approach (mixed method), the methods of data collection, ethical considerations, the data analysis, and data validity and reliability. The next chapter focuses on the analysis and presentation of the results of research question one.

5. RESULTS OF RESEARCH QUESTION ONE

5.1 Research Question One

This question investigated what correlations exist between distant e-learners' academic performance and their ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day and hours spent on a computer for studies per day.

5.1.1 Spearman's Correlation

Morgan et al. (2012) stated that Spearman's correlation Rho is based on ranking the score rather than using the actual raw scores. According to him, Spearman's correlation is expressed as a coefficient, r (or Rho), which indicates the strength of the association and relationship between two variables. Spearman's correlation coefficient is a statistical measure of the strength of a monotonic relationship between two variables. Spearman's Rho produces a rank order correlation coefficient that is similar to the Pearson's correlation coefficient test. The Spearman's correlation test examines the degree to which individuals or cases with high rankings on one variable were observed to have similar rankings on another variable. Correlation designs are procedures in quantitative research in which researcher measures the degree of association (or relation) between two or more variables using the statistical procedure of correlation analysis (Creswell, 2008). The researcher used the correlation statistical test to describe and measure the degree of association (or relationship) between two or more variables or sets of scores. The nature of the current study required a nonparametric correlation analysis such as Spearman's correlations because the scores for academic performance were ranked. The nonparametric Spearman correlation Rho was adopted to determine the strength of the relationships between the two variables. The researcher also used Spearman's correlation instead of Pearson's product-moment correlation Rho because the variables in this study are ordinal and the assumptions necessary for conducting Pearson' product-moment correlation are violated.

To answer research question one, a Spearman's correlation coefficient test was conducted to determine if correlations existed between distance e-learners' ICT literacy levels, socio-

demographic characteristics, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and their academic performance.

5.1.2 Students' ICT Literacy Levels and Their Academic Performance

Table 5.1: Spearman's Correlation Coefficient on Students' ICT Literacy

			ACADPERF	ICTLITC
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.188**
		Sig. (2-tailed)	.	.000
	ICTLITC	Correlation Coefficient	.188**	1.000
		Sig. (2-tailed)	.000	.

**. Correlation is significant at the 0.01 level (2-tailed).

a. Listwise N = 1025

The relationship between students' ICT literacy level (ICTLITC) and academic performance (ACADPERF), yielded a significant correlation of 0.188 (r = 0.188, p = .000, N = 1025) as shown in Table 5.1. This indicated that a positive correlation does exists between students' ICT literacy level (ICTLITC) and their academic performance (ACADPERF), although the strength of the correlation was weak. This was an interesting result since it correlates with Rakap (2010) who found moderate positive correlation between computer skills and academic performance of students.

5.1.3 Socio-Demographic Characteristics.

For this study, the following socio-demographic characteristics were examined:

a) Age

b) Gender

c) Marital Status.

Table 5.2: Spearman's Correlation on Socio-demographic Variables

			ACADPERF	Age	Gender	Marital status
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	-.064*	-.008	.104**
		Sig. (2-tailed)	.	.040	.796	.001
	Age	Correlation Coefficient	-.064*	1.000	.096**	-.646**
		Sig. (2-tailed)	.040	.	.002	.000
	Gender	Correlation Coefficient	-.008	.096**	1.000	.033
		Sig. (2-tailed)	.796	.002	.	.291
	Marital status	Correlation Coefficient	.104**	-.646**	.033	1.000
		Sig. (2-tailed)	.001	.000	.291	.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

a. Listwise N = 1025

The researcher then conducted the Spearman's correlation coefficient test on each variable to establish if correlation existed.

Regarding **age**, Table 5.2 illustrates that the Spearman's Rho correlation coefficient r = -0.064 computed for age and academic performance (ACADPERF) was negative with significance or p-value = 0.040, which is greater than Alpha = 0.01 but less than Alpha = 0.05. The Spearman's Rho correlation coefficient of -0.064, p = 0.040, N = 1025, as shown in Table 5.2, indicated that there was a correlation between age and their academic performance (ACADPERF), which was statistically significant at 0.05 level of significance, but the strength of the correlation was weak.

Interestingly this result is aligned with the study by Bowa (2011) who showed that there was a weak negative correlation between the students' age and academic performance in a study conducted in Kenya.

Regarding **gender**, Table 5.2 illustrates that the Spearman's Rho correlation coefficient r = −.008 computed for gender and academic performance (ACADPERF) was negative with non-significance or p-value = .796 which is greater than Alpha = 0.01 and greater than even Alpha = 0.05. This implies that no correlation exists between gender and academic performance (ACADPERF).

This result is aligned with previous studies (Lim & Morris, 2009; Martínez-Caro, 2011; Bowa, 2011; Yukselturk & Bulut, 2007) which found that gender has no critical effect on academic performance of online students.

Regarding **marital status**, Table 5.2 illustrates that the Spearman's Rho correlation coefficient $r = 0.104^{**}$ computed for marital status and academic performance (ACADPERF) was positive with significance or p-value = 0.001 which is equal to Alpha=0.01 but less than Alpha = 0.05.

The relationship between marital status and academic performance (ACADPERF), yielded a significant correlation of 0.104 (r = 0.104, p = .001, N = 1025) as shown in Table 5.2. This indicated that a positive correlation does exists between marital status and academic performance (ACADPERF) of distance e-learners although the strength of the correlation was weak.

It is worth noting that this result agrees with previous studies (Oladejo, et. al., 2010; Owino, 2013; Thomas et al., 2012) which found that marital status significantly influences academic performance of students.

5.1.4 Socioeconomic Status

For this study, the following variables were examined under socioeconomic status:

a) Home background.
b) Parent education: Parent Qualification was recoded to different variables (parent education). O level/SSCE and ND/NCE were recoded as 1 (fairly educated parents), B.Sc./B.A./B.Ed. and

PGD were recorded as 2 (moderately educated parents), Master's/M.Sc. and PhD were recorded as 3 (well-educated parents) while none (illiterate) was recoded as 0.

c) PARENTINC/family income**.**

The researcher then conducted the Spearman's correlation coefficient test on each of them to establish if correlation existed.

Table 5.3: Spearman's Correlation on Socioeconomic Status Variables

			ACADPERF	Home background	Parent Edu	Family INC
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.053	.028	.046
		Sig. (2-tailed)	.	.088	.364	.143
	Home background	Correlation Coefficient	.053	1.000	.064*	.058
		Sig. (2-tailed)	.088	.	.039	.064
	PARENTEDU	Correlation Coefficient	.028	.064*	1.000	.057
		Sig. (2-tailed)	.364	.039	.	.069
	PARENTINC	Correlation Coefficient	.046	.058	.057	1.000
		Sig. (2-tailed)	.143	.064	.069	.

*. Correlation is significant at the 0.05 level (2-tailed).

a. Listwise N = 1025

Regarding **home background**, Table 5.3 illustrates that the Spearman's Rho correlation coefficient r =.053 computed for home background and academic performance (ACADPERF) was positive with significance or p-value = 0.088 which is greater than Alpha = 0.01 or Alpha = 0.05.

This implies that no significant correlation exists between home background and academic performance (ACADPERF). Interestingly, this result is different when compared to the studies by Abdu-Raheem (2015), Ushie, Owolabi and Emeka (2012) and Asikhia (2010) who found that there was a significant relationship between home background and academic performance of students.

For **parent education,** Table 5.3 illustrates that the Spearman's Rho correlation coefficient r = .028 computed for parent education and academic performance (ACADPERF) was positive with significance or p-value = .364 which is greater than Alpha = 0.01 or Alpha = 0.05.

This implies that no significant correlation exists between parent education and academic performance (ACADPERF).

Interestingly, this result is different from previous studies conducted by Chen (2009), Kamau (2013), Graetz (2009) and Pamela and Kean (2010) which found that there was a significant relationship between parents' education and academic performance of students and background of the students. The reason could be that the above studies were conducted on traditional on-campus students but a contrary finding surfaced under an e-learning setting (distance e-learners).

For **family income,** Table 5.3 illustrates that the Spearman's Rho correlation coefficient r = .046 computed for family income and academic performance (ACADPERF) was positive with significance or p-value =0.143 which is greater than Alpha = 0.01 or Alpha = 0.05. This implies that no significant correlation exists between family income and academic performance (ACADPERF). It is interesting to note that this result is different from the study conducted by Farooq et al. (2011) and the reason may be because this was conducted in an Asian country or that a majority of the distance e-learners are self-sponsored.

5.1.5 Frequency of Engagement with ICT.

Table 5.4: Spearman's Correlation Coefficient on Frequency of Engagement with ICT.

			ACADPERF	FREQICT
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.198**
		Sig. (2-tailed)	.	.000
	FREQICT	Correlation Coefficient	.198**	1.000
		Sig. (2-tailed)	.000	.

**. Correlation is significant at the 0.01 level (2-tailed).

a. Listwise N = 1025

Table 5.4 illustrates that the Spearman's Rho positive correlation coefficient r = .198 computed for frequency of engagement with ICT (FREICT) and academic performance (ACADPERF) was positive with significance of p-value = 0.000 which is less than Alpha = 0.01 or even Alpha = 0.05.

The relationship between frequency of engagement with ICT and academic performance (ACADPERF), yielded a significant correlation of 0.198 (r = 0.198, p = .000, N = 1025) as shown in Table 5.4. This indicated that a positive correlation does exists between frequency of engagement with ICT and academic performance (ACADPERF) of distance e-learners although the strength of the correlation was weak. It is notable that this result is aligned with another study by (Anil and Ozer, 2012) who found a positive correlation between frequent computer use and academic achievement despite the study having been carried out in a developed country.

5.1.6 Previous Qualifications.

Table 5.5: Spearman's Correlation Coefficient on Previous Qualifications

			ACADPERF	Previous Qualification
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.038
		Sig. (2-tailed)	.	.225
	Previous Qualification	Correlation Coefficient	.038	1.000
		Sig. (2-tailed)	.225	.

a. Listwise N = 1025

Table 5.5 illustrates that the Spearman's Rho positive correlation coefficient r = .038 computed for previous qualifications and academic performance (ACADPERF) was positive with significance or p-value = .225 which is greater than Alpha = 0.01 or greater than Alpha = 0.05. This implies that no significant correlation exists between previous qualifications and academic performance (ACADPERF). Interestingly, this result is different when compared to the studies conducted by Wambugu and Emeke (2012) and Mutonga (2011) who reported that there was a significant correlation between entry qualification and academic performance of on-campus students. And the reason may be that their study focused on traditional on-campus students while the present study focused on distance e-learners.

5.1.7 Learning Styles

Table 5.6: Spearman's Correlation Coefficient on Previous Qualifications

			ACADPERF	Learning style
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	-.010
		Sig. (2-tailed)	.	.744
	Learning style	Correlation Coefficient	-.010	1.000
		Sig. (2-tailed)	.744	.

a. Listwise N = 1025

Table 5.6 illustrates that the Spearman's Rho positive correlation coefficient r = -.010 computed for learning styles and academic performance (ACADPERF) was negative with significance or p-value = .744 which is greater than Alpha = 0.01 or greater than Alpha = 0.05. This implies that no significant correlation exists between learning style and academic performance (ACADPERF).

This result is different when compared to the study by Soghra et al. (2013) who reported that there was a significant relationship between learning style preferences and academic performance of students and the reason could be that this study was conducted in a developed country.

5.1.8 E-Interactive learning

The following types of interaction were examined in this study:

1. Learner-Content Interaction (LCI)
2. Learner-Instructor Interaction (LII)
3. Learner-Learner Interaction (LLI)

Table 5.7: Spearman's Correlation Coefficient on Interactive Learning

			ACADPERF	LCI	LII	LLI
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.050	.017	.066*
		Sig. (2-tailed)	.	.110	.581	.034
		N	1025	1025	1025	1025
	LCI	Correlation Coefficient	.050	1.000	.452**	.412**
		Sig. (2-tailed)	.110	.	.000	.000
		N	1025	1025	1025	1025
	LII	Correlation Coefficient	.017	.452**	1.000	.554**
		Sig. (2-tailed)	.581	.000	.	.000
		N	1025	1025	1025	1025
	LLI	Correlation Coefficient	.066*	.412**	.554**	1.000
		Sig. (2-tailed)	.034	.000	.000	.
		N	1025	1025	1025	1025

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The researcher then conducted Spearman's correlation coefficient test on each of them to establish if correlation exists.

For **learner-content interaction (LCI),** Table 5.7 illustrates that the Spearman's Rho correlation coefficient r = .050 computed for learner-content interaction and academic performance (ACADPERF) was positive with significance or p-value = .110 which is greater than Alpha = 0.01

or Alpha = 0.05. This implies that no correlation exists between LCI and academic performance (ACADPERF).

It is interesting to note that this result is contrary to the study by Nesliha and Mustapha (2016) who found that there was a significant relationship between LCI and academic performance and the reason may be that this was carried out outside developing countries.

Table 5.7 further revealed that a positive correlation does exist between LCI and academic performance (ACADPERF) of female distance e-learners although the strength of the correlation was weak. But no significant correlation exists between LCI and academic performance (ACADPERF) of male distance e-learners.

It is worthy of note that this result is in disagreement with the study carried out in a developed country by Nesliha and Mustapha (2016) who found that there was no statistically significant difference between the interaction and academic performance of male and female students and the reason may be due to the background of the students.

For **learner-instructor interaction (LII),** Table 5.7 illustrated that the Spearman's Rho correlation coefficient r =.017 computed for learner-instructor-interaction and academic performance (ACADPERF) was positive with significance or p-value = .581 which is greater than Alpha = 0.01 but less than Alpha = 0.05. This implies that no correlation exists between LII and academic performance (ACADPERF).

This is an interesting result since it is different when compared to the study by Diedrich (2010) and Knoell (2012) who found that there was a significant relationship between LII and academic performance of students. This reason could that their studies were conducted in a developed country and because of the geographical location of the students.

Table 5.7 further revealed that a positive correlation does exist between LII and academic performance (ACADPERF) of female distance e-learners, although the strength of the correlation was weak. But no significant correlation exists between LII and academic performance (ACADPERF) of male distance e-learners.

This result was consistent with another study by Coldwell, Craig, Paterson and Mustard (2008) who found that students who participated more frequently in discussion forums obtained significantly higher grades. It is interesting to find out that although the above study was conducted in Australia, a developed country, a similar finding surfaced in a developing country like Nigeria.

For **learner-learner interaction (LLI),** Table 5.7 illustrates that the Spearman's Rho correlation coefficient r = .066 computed for learner-learner interaction and academic performance (ACADPERF) was positive with significance or p-value = .034 which is greater than Alpha = 0.01 but less than Alpha = 0.05, This implies that a positive correlation exists between LLI and academic performance (ACADPERF) although the strength of the correlation was weak. It is noteworthy that this result is aligned with the study carried by Rugendo (2014) in Kenya, a developing country like Nigeria, which reported that LLI influenced academic performance of distance learners.

Table 5.7 further reveals that a positive correlation does exists between LLI and academic performance (ACADPERF) of female distance e-learners although the strength of the correlation was weak. But no significant correlation exists between learner-learner interaction and academic performance (ACADPERF) of male distance e-learners.

Interestingly, this result was quite consistent with another study by Coldwell et al., (2008) and Kunhi Mohamed (2012) who reported female students were more actively engaged in online discussions and outperformed than their male counterparts in online courses despite the fact that the study was carried out in Australia.

Table 5.8: Spearman's Correlation Coefficient on E-Interactive Learning by Splitting Based on Gender

Gender				ACADPERF	LCI	LII	LLI
Spearman's Rho	Female	ACADPERF	Correlation Coefficient	1.000	.121**	.108*	.105*
			Sig. (2-tailed)	.	.009	.018	.023
			N	474	474	474	474
		LCI	Correlation Coefficient	.121**	1.000	.484**	.401**
			Sig. (2-tailed)	.009	.	.000	.000
			N	474	474	474	474
		LII	Correlation Coefficient	.108*	.484**	1.000	.569**
			Sig. (2-tailed)	.018	.000	.	.000
			N	474	474	474	474
		LLI	Correlation Coefficient	.105*	.401**	.569**	1.000
			Sig. (2-tailed)	.023	.000	.000	.
			N	474	474	474	474
	Male	ACADPERF	Correlation Coefficient	1.000	-.013	-.067	.034
			Sig. (2-tailed)	.	.756	.114	.430
			N	551	551	551	551
		LCI	Correlation Coefficient	-.013	1.000	.421**	.418**
			Sig. (2-tailed)	.756	.	.000	.000
			N	551	551	551	551
		LII	Correlation Coefficient	-.067	.421**	1.000	.536**
			Sig. (2-tailed)	.114	.000	.	.000
			N	551	551	551	551
		LLI	Correlation Coefficient	.034	.418**	.536**	1.000
			Sig. (2-tailed)	.430	.000	.000	.
			N	551	551	551	551

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5.9: Summary of ANOVA by Splitting Learner-Content Interaction Based on Gender

Gender		Sum of Squares	df	Mean Square	F	Sig.
Female	Between Groups	5.427	4	1.357	3.251	.012
	Within Groups	195.737	469	.417		
	Total	201.165	473			
Male	Between Groups	.082	4	.020	.051	.995
	Within Groups	218.539	546	.400		
	Total	218.621	550			

Table 5.10: Summary of ANOVA by Splitting Learner-Instructor- Interaction Based on Gender

Gender		Sum of Squares	df	Mean Square	F	Sig.
Female	Between Groups	4.631	4	1.158	2.763	.027
	Within Groups	196.534	469	.419		
	Total	201.165	473			
Male	Between Groups	1.580	4	.395	.994	.410
	Within Groups	217.041	546	.398		
	Total	218.621	550			

Table 5.11: Summary of ANOVA by Splitting Learner-Learner- Interaction Based on Gender

Gender		Sum of Squares	df	Mean Square	F	Sig.
Female	Between Groups	3.525	4	.881	2.091	.081
	Within Groups	197.639	469	.421		
	Total	201.165	473			
Male	Between Groups	.788	4	.197	.494	.741
	Within Groups	217.833	546	.399		
	Total	218.621	550			

5.1.9 Work Experience.

Table 5.12: Spearman's Correlation Coefficient on Work Experience

			ACADPERF	Work Experience
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.001
		Sig. (2-tailed)	.	.965
		N	1025	1025
	Work experience	Correlation Coefficient	.001	1.000
		Sig. (2-tailed)	.965	.
		N	1025	1025

Table 5.12 illustrates that the Spearman's Rho correlation coefficient r =.001 computed for work experience and academic performance (ACADPERF) was positive with significance or p-

value = .965 is greater than Alpha = 0.01 or Alpha = 0.05. This implies no correlation exists between work experience and academic performance (ACADPERF).

Surprisingly, this result is different from the study conducted by Ibrahim et al. (2011) in a developed country like Nigeria and revealed that work experience was a predictor of academic success of students. This may due to the background of the students and the relevance of the experience to their study.

5.1.10 Employment Status

Table 5.12 illustrates that the Spearman's Rho's correlation coefficient r = 0.80 computed for employment and academic performance (ACADPERF) was positive with significance or p-value = 0.011 which is greater than Alpha = 0.01 but less than Alpha = 0.05. The Spearman's Rho correlation coefficient of 0.080, p = 0.011, N = 1025, as shown in Table 5.12, indicated that there was a correlation between employment and academic performance (ACADPERF) of distance e-learners, which was statistically significant at 0.05 level of significance, however, the strength of the correlation was weak. Surprisingly, the result is aligned with other studies (Curtis, 2007 and Callender, 2008) carried out outside the Nigerian context which found that students' employment had negative effect on their academic performance.

5.1.11 Family Size

The relationship between family size and academic performance (ACADPERF), yielded a significant correlation of -0.102 (r = -0.102, p = .001, N = 1025) as shown in Table 5.12. This implies that a negative correlation does exists between family size and academic performance (ACADPERF) of distance e-learners although the strength of the correlation was weak. This is an interesting result since it ties up with another study (Bowa, 2011; Ogweno et al., 2014) who found that there was a negative correlation between family size and academic performance of students.

5.1.12 Previous Academic Performance

The relationship between previous academic performance and academic performance (ACADPERF), yielded a significant correlation of 0.110 (r = 0.110, p = .000, N = 1025) as shown in Table 5.12. This implies that a positive correlation does exists between previous academic performance and academic performance (ACADPERF) of distance e-learners although the

strength of the correlation was weak. It is interesting that this result correlates with previous studies conducted in a developed country by Alstete and Buetell (2004) and Cheung and Kan (2002) who reported there was a positive correlation between previous academic performance and college students' performance online.

5.1.13 Hours Spent on the Internet per Day

The relationship between hours spent on the Internet per day and academic performance (ACADPERF), yielded a significant correlation of 0.101 ($r = 0.101$, $p = .001$, $N = 1025$) as shown in Table 5.13. This implies that a positive correlation does exists between hours spent on the Internet per day and academic performance (ACADPERF) of distance e-learners although the strength of the correlation was weak.

It is noteworthy that this result correlates with a similar study conducted in Nigeria but concentrated on conventional students by Osunade, Ojo and Ahisu (2009) and found there was a significant difference in academic performance between those who had Internet access and those without it for educational purposes.

5.1.14 Hours Spent on Social Media per Day

The relationship between hours spent on social media per day and academic performance (ACADPERF), yielded a significant correlation of 0.085 ($r = 0.085$, $p = .006$, $N = 1025$) as shown in Table 5.13. This implies that a positive correlation exists between hours spent on social media per day and academic performance (ACADPERF) of distance e-learners, although the strength of the correlation was weak.

This result may warrant further research since it is different when compared to the study by Negussie and Ketema (2014), who found that there was no significant relationship between times spent on social media with students' GPA.

5.1.15 Hours Spent on Computer for Studies per Day

Table 5.13 illustrates that the Spearman's Rho positive correlation coefficient $r = .032$ computed for hours spent on a computer for studies per day and academic performance (ACADPERF) was positive with significance or p-value = .307 which is greater than Alpha = 0.01 or greater than

Alpha = 0.05. This implies that no significant correlation exists between hours spent on a computer for studies per day and academic performance (ACADPERF) of distance e-learners.

Interestingly, this result correlates with a study conducted by Gil-Flores (2009) who found there was no correlation between academic performance and computer use for educational purposes.

Table 5.13: Spearman's Correlation for Other Variables

			ACADPERF	Intconperday	Family Size	PrevAcadper	Employment	ComputerStd	SoicialInetperday
Spearman's Rho	ACADPERF	Correlation Coefficient	1.000	.101**	-.102**	.110**	.080*	.032	.085**
		Sig. (2-tailed)	.	.001	.001	.000	.011	.307	.006
		N	1025	1025	1025	1025	1025	1025	1025

5.2 Further Findings Based on Splitting of Data

The above results revealed that 10 variables were found to have significant correlation for academic performance of distance e-learners. The researcher went further to determine if correlation existed between these 10 variables and academic performance by splitting data into:

1. Faculty of study; and
2. Learning styles.

The splitting of data was done because some disciplines are highly theoretical, depending on what the discipline entails. Also, learning styles of distance e-learners were used because the knowledge of learning styles can help improve instructional planning and implementation and ultimately bring about improvement in student learning (Wang et al., 2006). The knowledge of learning styles enables instructors to be more flexible in the ways they present instruction and design courses and learning objects (Mestre, 2010). It is essential, therefore, to determine the best learning style that

has the strongest impact on academic performance of distance e-learners based on the variables under investigation.

5.2.1 Splitting by Faculty of Study

For the distance e-learners in the faculty of Agriculture as shown in Table 5.14, a positive correlation exists between frequency of engagement with ICT and academic performance of distance e-learners in faculty of Agriculture. It is noteworthy that frequency of engagement with ICT was found to be the only variable that has significant relationship with academic performance of distance e-learners at 5% level of significance.

For the distance e-learners in the faculty of Art and Social Sciences as shown in Table 5.14, frequency of engagement with ICT, students' ICT literacy level, previous academic performance and LLI were the variables where positive significant correlations were found to exist with academic performance of distance e-learners at 5% level of significance.

For the distance e-learners in the faculty of Education as shown in Table 5.14, frequency of engagement with ICT and students' ICT literacy level were the only variables where positive significant correlations were found to exist with academic performance of distance e-learners, at a 5% level of significance.

For the distance e-learners in the faculty of Health Science, as shown in Table 5.14, frequency of engagement with ICT, students' ICT literacy level, hours spent on the Internet per day and hours spent on social media per day were the variables where positive significant correlations were found to exist, with academic performance of distance e-learners at a 5% level of significance.

For the distance e-learners in Faculty of Law as shown in Table 5.14, none of these 10 variables was found to have a significant relationship with academic performance of distance e-learners at 5% level of significance.

For the distance e-learners in the faculty of Management Science as shown in Table 5.14, none of these 10 variables was found to have significant relationship with academic performance of distance e-learners at a 5% level of significance.

For the distance e-learners in the faculty of Science and Technology as shown in Table 5.14**,** the variable frequency of engagement with ICT, students' ICT literacy level and hours spent on the Internet per day were the only variables where positive significant correlations were found to exist with academic performance of distance e-learners at 5% level of significance.

Table 5.14: Correlation Table Based on Splitting by Faculty of Study

Spearman's Rho	**Agriculture**	**Arts and Social Science**	**Education**	**Health Science**	**Law**	**Management Science**	**Science & Technology**
Marital Status Correlation coefficient	.112	.083	.137	.200	-.057	.105	.025
Sig. (2-tailed)	.557	.235	.111	.122	.713	.089	.674
N	30	208	137	61	44	265	280
Age Correlation coefficient	.021	-.115	-.049	.002	-.190	-.039	.003
Sig. (2-tailed)	.913	.097	.568	.991	.217	.522	.965
N	30	208	137	61	44	265	280
LLI Correlation coefficient	-.169	.155*	.107	.158	-.100	.013	.026
Sig. (2-tailed)	.372	.026	.213	.224	.518	.827	.669
N	30	208	137	61	44	265	280
Family size Correlation coefficient	-.264	-.035	-.157	-.087	-.044	-.073	-.053
Sig. (2-tailed)	.158	.615	.066	.503	.775	.238	.374
N	30	208	137	61	44	265	280
FREQICT Correlation coefficient	.376*	.325**	.228**	.408**	.210	.043	.145*
Sig. (2-tailed)	.040	.000	.007	.001	.172	.487	.015

N	30	208	137	61	44	265	280
ICT LITC Correlation coefficient	.228	.194**	.198*	.402**	.201	.072	.219**
Sig. (2-tailed)	.225	.005	.020	.001	.192	.244	.000
N	30	208	137	61	44	265	280
PrevAcad Correlation coefficient	.304	.153*	.013	.091	.256	.105	.100
Sig. (2-tailed)	.102	.027	.884	.484	.094	.089	.094
N	30	208	137	61	44	265	280
Intconperday Correlation coefficient	.198	-.063	.056	.331**	.227	.058	.136*
Sig. (2-tailed)	.294	.362	.514	.009	.138	.344	.023
N	30	208	137	61	44	265	280
Soicialnetperday Correlation coefficient	.339	-.047	.130	.405**	.104	.040	.039
Sig. (2-tailed)	.067	.499	.131	.001	.502	.515	.520
N	30	208	137	61	44	265	280
Employment Correlation coefficient	.234	.078	.105	.238	.112	.016	.053
Sig. (2-tailed)	.214	.264	.220	.065	.467	.795	.377
N	30	208	137	61	44	265	280

5.2.2 Conclusion

The above result revealed that frequency of engagement with ICT, students' ICT literacy and hours spent on the Internet per day have the highest impact on academic performance of students in the discipline of Health Science than other disciplines. It also revealed that none of these variables influences academic performance of students in the Faculty of Law and Management Science.

5.2.3 Splitting by Learning Styles

For **auditory distance e-learners**, LLI, frequency of engagement with ICT, students' ICT literacy level and hours spent on the Internet per day were the variables where positive significant correlations were found to exist with academic performance of distance e-learners at a 5% level of significance (See Table 5.15).

For **visual distance e-learners**, age, marital status, frequency of engagement with ICT, students' ICT literacy level, family size, previous academic performance and hours spent on the Internet per day were the variables where significant correlations were found to exist with academic performance of distance e-learners at a 5% level of significance (See Table 5.15). The table revealed that a positive correlation existed between marital status, frequency of engagement with ICT, students' ICT literacy level, family size, previous academic performance and hours spent on the Internet per day and academic performance, but a negative correlation exists between age, family size and academic performance.

For **kinaesthetic distance e-learners**, learner-learner interaction was the only variable where positive significant correlations were found to exist with academic performance of distance e-learners at 5% level of significance (See Table 5.15).

For **reading/writing distance e-learners**, frequency of engagement with ICT, students' ICT literacy level, family size, previous academic performance and hours spent on the Internet per day were the variables where significant correlations were found to exist with academic performance of distance e-learners at a 5% level of significance (see Table 5.15). A positive significant correlation exists between the above variables (except family size) and academic performance.

Table 5.15: Correlation Table Based on Splitting by Learning Styles

Spearman's Rho	Auditory LS	Visual LS	Kinesthetic LS	Reading/ Writing LS
Marital Status Correlation coefficient	.129	.291**	-.085	.066
Sig. (2-tailed)	.110	.000	.568	.086
N	155	144	47	679
Age Correlation coefficient	-.128	-.174*	.154	-.035
Sig. (2-tailed)	.111	.037	.301	.360
N	155	144	47	679
LLI Correlation coefficient	.175*	.091	.327*	.018
Sig. (2-tailed)	.030	.276	.025	.645
N	155	144	47	679
Family size Correlation coefficient	-.105	-.288**	.196	-.077*
Sig. (2-tailed)	.192	.000	.188	.046
N	155	144	47	679
FREQICT Correlation coefficient	.317**	.448**	.059	.119**
Sig. (2-tailed)	.000	.000	.693	.002
N	155	144	47	679
ICT LITC Correlation coefficient	.271**	.412**	.267	.118**
Sig. (2-tailed)	.001	.000	.070	.002
N	155	144	47	679
PrevAcad Correlation coefficient	.015	.203*	.159	.101**
Sig. (2-tailed)	.849	.014	.285	.008
N	155	144	47	679
Intconperday Correlation coefficient	-.180*	.363**	.210	.097*
Sig. (2-tailed)	.025	.000	.157	.012
N	155	144	47	679
Soicialnetperday Correlation coefficient	-.157	.342**	.173	.076*
Sig. (2-tailed)	.051	.000	.245	.047
N	155	144	47	679
Employment Correlation coefficient	.157	.126	.044	.052
Sig. (2-tailed)	.051	.131	.770	.173

N	155	144	47	679

5.2.4 Conclusion

It can be concluded that the variables under investigation have the highest impact on academic performance of visual distance e-learners than other learning styles.

5.3 Research Hypotheses

The following null hypotheses were designed for the study:

H_{01}:– Distance e-learners' (students') ICT literacy level does not affect academic performance of distance e-learners.

H_{02}:– Distance e-learners' (students') age does not affect academic performance of distance e-learners.

H_{03}:– Gender does not affect academic performance of distance e-learners.

H_{04}:– Marital status does not affect academic performance of distance e-learners.

H_{05}:– Home background does not affect academic performance of distance e-learners.

H_{06}:– Parents' education does not affect academic performance of distance e-learners.

H_{07}:– Family income does not affect academic performance of distance e-learners.

H_{08}:–. Frequency of engagement with ICT does not affect academic achievement of distance e-learners.

H_{09}:–. Previous qualification does not affect academic performance of distance e-learners.

H_{010}:– Learning style does not affect academic performance of distance e-learners.

H_{011}:– Work experience does not affect academic performance of distance e-learners.

H_{012}:– Learner-content-interaction does not affect academic performance of distance e-learners.

H_{013}:– Learner-instructor interaction does not affect academic performance of distance e-learners.

H_{014}:– Learner-learner interaction does not affect academic performance of distance e-learners.

H_{015}:– Employment status does not affect academic performance of distance e-learners.

H_{016}:– Previous academic performance does not affect academic performance of distance e-learners.

H_{017} – Family size does not affect academic performance of distance e-learners.

H_{018}:– Hours spent on the Internet per day does not affect academic performance of distance e-

learners.

H_{019}:– Hours spent on social media per day does not affect academic performance of distance e-learners.

H_{020}:– Hours spent on a computer for studies per day does not affect academic performance of distance e-learners.

5.4 Testing of Hypotheses

This study employed an independent T-test and one-way ANOVA. According to Pallant (2016), an independent sample T-test is employed to compare mean scores when there are only two different groups of respondents or conditions, to suggest if there is a statistically significant difference in their mean scores. This is applicable to hypothesis three in this study. According to him, an ANOVA test is used in hypothesis testing to compare mean scores when there are more than two groups or populations. This is also applicable to all the hypotheses except hypothesis three. A one-way ANOVA statistical test compares group variance and within-group variance to determine if a real difference exists, with a Post-hoc test that identifies where significance difference exists between these groups. The magnitude of the effect size is important when one is conducting both an independent T-test and an ANOVA test. This is explained below.

5.4.1 ANOVA Effect Size

Pallant (2016) explained that effect size is calculated to provide an indication of the magnitude of differences between groups in both the T-test and ANOVA, to ensure the difference in mean scores has not occurred by chance. According to Okunola (2015), the eta squared and Cohen's d are the most commonly adopted effect size formulas and benchmarks. According to him, the Cohen's d effect size procedures were adopted to interpret values of effect size (Cohen, 1988). Table 5.16 shows the Cohen's d effect size guidelines.

Table 5.16: Cohen's D Effect Size Guidelines

Value	Effect Size
0.01 to < 0.06	Small
0.06 to < 0.14	Medium
0.14 and above	Large

According to Okunola (2015), in a T-test, the effect size of the statistical difference in the two groups' mean scores is calculated using the eta squared formula: t2 / t2 + (df). In ANOVA, the effect size of the statistical difference in the groups' mean score is calculated using the eta formula: the sum of the squares (between groups)/the total sum of the squares.

5.4.2 Levene's Test for the Equality and Homogeneity of Variances

Okunola (2015) explained that in a T-test, the result of Levene's test for the equality of variances needs to be checked to determine the spread of group data, as well as whether data are identical. If the sig. value for Levene's test is larger than 0.05, it shows that the group data tends to be close to the mean and the assumption of variance is made. As a result of this, the data in the first line of the T-test table, which is referred to equal variances assumed will be used (Pallant, 2016). If the result of Levene's test is less than 0.05, it reveals that the group data tend to spread out around the mean. Due to this, data in the second line of the T-test table which is referred to as sequel variances need will be used to interpret the T-test result.

Morgan et al. (2012) explained that in an ANOVA test, if the sig. value for Levene's test is larger than 0.05, its assumption of the homogeneity of variance has not been violated. As a result, the Tukey HD post-hoc test is adopted for the multiple comparisons of the group to determine the statistically significant difference in the mean scores between each pair of groups. If the sig. value for Levene's test is less than 0.05, then its assumption of homogeneity of variance has been violated and the Games-Howell Post-hoc test should be adopted. This rule is strictly followed in the current study.

5.4.3 Hypothesis on Distance E-Learners' ICT Literacy level

H_1: Distance e-learners' ICT Literacy level (high, moderate, little and none) affects academic performance.

H_{01} (Null hypothesis):- Distance e-learners' ICT literacy level does not affect academic performance of distance e-learners.

Table 5.17: Descriptive for Academic Performance of Distance E-Learners Based on ICT Literacy Levels

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	63	4.540	.6915	.0871	4.366	4.714	2.0	6.0
Little	236	4.712	.6601	.0430	4.627	4.797	3.0	6.0
Moderate	532	4.852	.6095	.0264	4.800	4.903	3.0	6.0
High	194	5.015	.6232	.0447	4.927	5.104	4.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.18: Test for Homogeneity of Variances for ICT Literacy Level

Levene Statistic	df1	df2	Sig.
1.987	18	1006	.008

Table 5.19: ANOVA Summary for ICT Literacy Level

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.521	3	5.174	13.066	.000
Within Groups	404.280	1021	.396		
Total	**419.801**	**1024**			

Table 5.20: Post-Hoc Tests for Multiple Comparisons for ICT Literacy Level

(I) ICTLTR	(J) ICTLTR	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	Little	-.1722	.0971	.293	-.426	.082
	Moderate	-.3118*	.0910	.005	-.551	-.073
	High	-.4758*	.0979	.000	-.732	-.220
Little	None	.1722	.0971	.293	-.082	.426
	Moderate	-.1396*	.0504	.030	-.270	-.010
	High	-.3036*	.0620	.000	-.464	-.144
Moderate	None	.3118*	.0910	.005	.073	.551
	Little	.1396*	.0504	.030	.010	.270
	High	-.1640*	.0520	.009	-.298	-.030
High	None	.4758*	.0979	.000	.220	.732
	Little	.3036*	.0620	.000	.144	.464
	Moderate	.1640*	.0520	.009	.030	.298

Results: An ANOVA test was conducted to explore the difference between none, little, moderate and high level of students' ICT literacy level regarding their academic performance. The participants were divided into four categories according to their level of ICT literacy (none, little, moderate and high). The assumption of homogeneity of variances was tested using Levene's test and violated it as the sig. value was .008. The ANOVA was significant, $F(1025) = 13.066$, $p = 0.000$. With this result, there was significant evidence to reject the null hypothesis and conclude that students' ICT literacy level does affect their academic performance. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.04.

The Games-Howell post-hoc tests indicated that the mean score for the high ICT literacy level (M = 5.015, SD = .6232) was significantly different from that for the moderate ICT literacy level (M = 4.852, SD = .6095), p = 0.009, little ICT literacy level: (M = 4.712, SD = .6601), p = 0.000 and none ICT literacy level: (M = 4.540, SD = .6915), p = 0.000. There was no significant difference in the mean scores between little ICT literacy and none ICT literacy. The result does support the view that ICT literacy does influence distance learners' academic performance, but, more so with students who have a high level of ICT literacy.

5.4.4 Hypothesis on Distance E-Learners' Age

H_2: Distance e-learners' age (17 or younger, 18-20, 30-39, 40-49 and 50-59) affects academic performance.

H_{02} (null hypothesis): Distance e-learners' age does not affect academic performance.

Table 5.21: Descriptive for Academic Performance of Distance E-Learners Based on Age Groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
17 or younger	6	4.833	.7528	.3073	4.043	5.623	4.0	6.0
18-20	156	4.859	.6471	.0518	4.757	4.961	3.0	6.0
21-29	499	4.866	.6045	.0271	4.813	4.919	3.0	6.0
30-39	257	4.798	.6599	.0412	4.717	4.879	3.0	6.0
40-49	94	4.734	.7210	.0744	4.586	4.882	2.0	6.0
50-59	13	4.538	.7763	.2153	4.069	5.008	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.22: Test of Homogeneity of Variances for Age groups

Levene Statistic	df1	df2	Sig.
3.463	5	1019	.004

Table 5.23: ANOVA Summary Result for Age Groups

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	3.006	5	.601	1.470	.197
Within Groups	416.795	1019	.409		
Total	**419.801**	**1024**			

Table 5.24: Post-Hoc Tests for Multiple Comparisons for Age Groups

(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
17 or younger	18-20	-.0256	.2661	.923	-.548	.496
	21-29	-.0324	.2627	.902	-.548	.483
	30-39	.0357	.2641	.893	-.483	.554
	40-49	.0993	.2693	.712	-.429	.628
	50-59	.2949	.3156	.350	-.325	.914
18-20	17 or younger	.0256	.2661	.923	-.496	.548
	21-29	-.0068	.0587	.908	-.122	.108
	30-39	.0613	.0649	.345	-.066	.189
	40-49	.1249	.0835	.135	-.039	.289
	50-59	.3205	.1846	.083	-.042	.683
21-29	17 or younger	.0324	.2627	.902	-.483	.548
	18-20	.0068	.0587	.908	-.108	.122
	30-39	.0681	.0491	.166	-.028	.164
	40-49	.1317	.0719	.067	-.009	.273
	50-59	.3273	.1797	.069	-.025	.680
30-39	17 or younger	-.0357	.2641	.893	-.554	.483
	18-20	-.0613	.0649	.345	-.189	.066
	21-29	-.0681	.0491	.166	-.164	.028
	40-49	.0636	.0771	.409	-.088	.215
	50-59	.2592	.1818	.154	-.098	.616
40-49	17 or younger	-.0993	.2693	.712	-.628	.429
	18-20	-.1249	.0835	.135	-.289	.039
	21-29	-.1317	.0719	.067	-.273	.009
	30-39	-.0636	.0771	.409	-.215	.088
	50-59	.1956	.1892	.302	-.176	.567
50-59	17 or younger	-.2949	.3156	.350	-.914	.325
	18-20	-.3205	.1846	.083	-.683	.042
	21-29	-.3273	.1797	.069	-.680	.025
	30-39	-.2592	.1818	.154	-.616	.098
	40-49	-.1956	.1892	.302	-.567	.176

Results: A one-way ANOVA was used to explore distance e-learners' age group with their academic performance. The participants were divided into six age groups ((17 or younger, 18-20, 21-29, 30-39, 40-49 and 50-59). The assumption of homogeneity of variances was tested using Levene's test and violated it as the sig. value was .004. The ANOVA was not significant, F (1025) = 1.470, p = .197. Thus, there was a significant evidence to accept the null hypothesis and conclude that age does not influence academic performance of distance e-learners. Although statistical significance was not reached, the actual difference in the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.007.

The Games-Howell post-hoc tests were used because the assumption of homogeneity of variances was violated since the p-value is less than 0.05, as explained above.

The Games-Howell post-hoc tests showed that the six age groups were not significantly different. Age group 20-29 scored the highest mean while age group 17 or younger scored the lowest. Age group 20-29 (M = 5.015, SD = .6232), did not differ significantly from either 17 or younger (M =4.833, SD =.7528), or 18-20(M = .0068, SD = .0587) or 30-39 (M =4.852, SD = .6095) or 40-49: (M = 4.712, SD = .6601) or 50-59: (M = 4.540, SD = .6915).

5.4.5 Hypothesis on Gender of Distance E-Learners.

H_3: Gender (male/female) affects academic performance of distance e-learners.

H_{03} (Null hypothesis): Gender (male/female) does not affect academic performance of distance e-learners.

Table 5.25: Group Statistics for Academic Performance of Distance E-Learners Based on Gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean
ACADPERF	Female	474	4.835	.6521	.0300
	Male	551	4.828	.6305	.0269

Table 5.26: Independent Samples Test for Academic Performance of Distance E-Learners Based on Gender

		Statistics								
		Levene's Test for Equality of Variances		T-test for Equality of Means						
									95% Confidence Interval of the Difference	
Dependent variables		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ACADPERF	Equal variances assumed	.145	.704	.196	1023	.845	.0079	.0401	-.0709	.0866
	Equal variances not assumed			.195	989.348	.845	.0079	.0402	-.0711	.0868

T-test result: An independent sample T-test was conducted to compare the mean scores for male and female. There was no significant difference in the two groups of users' scores: t (1023) = 0.196, p = 0.845, two-tailed for the male students (M = 4.828, SD = .6305) and the female users (M = 4.828, SD = .6305). Therefore, there was significant evidence to accept the null hypothesis and conclude that gender does not affect academic performance of distance e-learners. The magnitude of difference in the means is (mean difference = .0079, 95% CI: -.0709 to 0.0866). The eta squared statistic (0.0008) indicates a very small effect.

5.4.6 Hypothesis on Marital Status of Distance e-learners

H_4: Distance e-learners' marital status (married, widowed, divorced, separated and never married) affects academic performance.

H_{04} (Null hypothesis): - Distance e-learners' marital status (married, widowed, divorced, separated and never married) does not affect academic performance.

Table 5.27: Descriptives for academic performance of distance e-learners based on marital status

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Nil	12	4.917	.5149	.1486	4.589	5.244	4.0	6.0
Married	364	4.728	.6430	.0337	4.662	4.794	2.0	6.0
widowed	4	4.750	.5000	.2500	3.954	5.546	4.0	5.0
divorced	8	5.375	.5175	.1830	4.942	5.808	5.0	6.0
separated	14	4.929	.7300	.1951	4.507	5.350	4.0	6.0
Never married	623	4.881	.6330	.0254	4.831	4.931	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.28: Test of Homogeneity of Variances for Marital Status

Levene Statistic	df1	df2	Sig.
2.280	5	1019	.045

Table 5.29: ANOVA Summary for Marital Status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.046	5	1.609	3.983	.001
Within Groups	411.755	1019	.404		
Total	**419.801**	**1024**			

Table 5.30: Post-Hoc Tests for Multiple Comparisons for Marital Status

(I) Marital status	(J) Marital status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Nil	Married	.1886	.1524	.811	-.322	.699
	Widowed	.1667	.2909	.989	-1.044	1.377
	Divorced	-.4583	.2358	.415	-1.224	.307
	Separated	-.0119	.2453	1.000	-.772	.749
	Never married	.0354	.1508	1.000	-.474	.545
Married	Nil	-.1886	.1524	.811	-.699	.322
	Widowed	-.0220	.2523	1.000	-1.419	1.375
	Divorced	-.6470	.1861	.068	-1.339	.045
	Separated	-.2005	.1980	.906	-.851	.450
	Never married	-.1532*	.0422	.004	-.274	-.033
Widowed	Nil	-.1667	.2909	.989	-1.377	1.044
	Married	.0220	.2523	1.000	-1.375	1.419
	Divorced	-.6250	.3098	.423	-1.838	.588
	Separated	-.1786	.3171	.991	-1.373	1.016
	Never married	-.1312	.2513	.991	-1.538	1.276
Divorced	Nil	.4583	.2358	.415	-.307	1.224
	Married	.6470	.1861	.068	-.045	1.339
	Widowed	.6250	.3098	.423	-.588	1.838
	Separated	.4464	.2675	.567	-.399	1.292
	never married	.4938	.1847	.192	-.199	1.186
Separated	Nil	.0119	.2453	1.000	-.749	.772
	Married	.2005	.1980	.906	-.450	.851
	Widowed	.1786	.3171	.991	-1.016	1.373
	Divorced	-.4464	.2675	.567	-1.292	.399
	never married	.0474	.1968	1.000	-.602	.697
Never married	Nil	-.0354	.1508	1.000	-.545	.474
	Married	.1532*	.0422	.004	.033	.274
	Widowed	.1312	.2513	.991	-1.276	1.538
	Divorced	-.4938	.1847	.192	-1.186	.199
	Separated	-.0474	.1968	1.000	-.697	.602

*. The mean difference is significant at the 0.05 level.

Results: A one-way analysis of variance was conducted to explore the difference between married, widowed, divorced, separated and never married distance e-learners regarding their academic performance. The respondents were divided into five groups according to their marital status (married, widowed, divorced, separated and never married). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was .045. The ANOVA was significant: F (1025) = 3.983, p = 0.001. Thus, there was a significant evidence to reject the null hypothesis and conclude that there was significant statistically difference between marital status and distance e-learners in academic performance. It implies that marital status affects distance e-learners' academic performance. Despite reaching statistical significance, actual difference in the mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0.02.

The post-hoc tests conducted using Games-Howell because the homogeneity was violated showed that the unmarried group (M = 4.881, SD = .6330) and married group (M = 4.728, SD=.6430) was significantly different at p = 0.004. The mean difference between the unmarried and married group was 0.1532. This means that unmarried learners scored significantly higher than the married distance e-learners.

5.4.7 Hypothesis on Distance E-Learners' Home background

H_5: Distance e-learners' home background (rural, urban, semi-urban) affects academic performance.

H_{05} (Null hypothesis): - Distance e-learners' home background (rural, urban, semi-urban) does not affect academic performance.

Table 5.31: Descriptives for Academic Performance of Distance E-Learners Based On Home Background

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Nil	30	4.867	.5713	.1043	4.653	5.080	4.0	6.0
Rural	322	4.786	.6562	.0366	4.714	4.858	2.0	6.0
Urban	514	4.829	.6320	.0279	4.774	4.884	3.0	6.0
Semi-urban	159	4.925	.6419	.0509	4.824	5.025	3.0	6.0
Total	1025	4.831	.6403	.0200	4.792	4.870	2.0	6.0

Table 5.32: Test of Homogeneity of Variances: Home Background

Levene Statistic	df1	df2	Sig.
1.368	3	1021	.251

Table 5.33: ANOVA Summary for Home Background

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.092	3	.697	1.704	.164
Within Groups	417.709	1021	.409		
Total	419.801	1024			

Table 5.34: Post-Hoc Tests for Multiple Comparisons for Home Background

(I) Home background	(J) Home background	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Nil	Rural	.0810	.1221	.911	-.233	.395
	Urban	.0379	.1201	.989	-.271	.347
	Semi-urban	-.0579	.1273	.969	-.385	.270
Rural	Nil	-.0810	.1221	.911	-.395	.233
	Urban	-.0431	.0455	.779	-.160	.074
	Semi-urban	-.1388*	.0620	.114	-.298	.021
Urban	Nil	-.0379	.1201	.989	-.347	.271
	Rural	.0431	.0455	.779	-.074	.160
	Semi-urban	-.0957	.0580	.351	-.245	.054
Semi-urban	Nil	.0579	.1273	.969	-.270	.385
	Rural	.1388*	.0620	.114	-.021	.298
	Urban	.0957	.0580	.351	-.054	.245

Results: A one-way analysis of variance was conducted to explore the difference between rural, urban and semi-urban background regarding their academic performance. The respondents were divided into three groups according to their home background (rural, urban and semi-urban). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig.

value was 0.251. The ANOVA was significant: F (1025) = 1.704, p = 0.164. There is an evidence to accept the null hypothesis and conclude that home background does not affect academic performance of distance e-learners. Surprisingly, the result showed that there was a significant difference between semi-urban and rural background. Although statistical significance was not reached for all, the actual difference in the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.005.

The post-hoc tests conducted revealed that the semi-urban group (M = 4.925, SD = .6419) and rural group (M = 4.786, SD = .6562) was differ significantly at p = 0.025. The mean difference between them was 0.1388. This means that semi-urban group scored higher than the rural and urban group. There was also a slightly smaller higher score between urban and rural with mean difference of .0431.

5.4.8 Hypothesis on Parents' Education of Distance E-Learners

H_6: Distance e-learners' parents' education (well-educated, moderately educated, fairly educated and illiterate) affects academic performance.

H_{06} (Null hypothesis): - Distance e-learners' parents' education (well-educated, moderately educated, fairly educated and illiterate) does not affect academic performance.

Table 5.35: Descriptives for Academic Performance of Distance E-Learners Based on Parents' Education

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Illiterate	47	4.809	.6801	.0992	4.609	5.008	3.0	6.0
Fairly	608	4.819	.6289	.0255	4.769	4.869	2.0	6.0
Moderately	250	4.820	.6613	.0418	4.738	4.902	3.0	6.0
Well educated	119	4.916	.6322	.0580	4.801	5.031	4.0	6.0
Total	1024	4.830	.6396	.0200	4.791	4.869	2.0	6.0

Table 5.36: Test of Homogeneity of Variances for Parents' Education

Levene Statistic	df1	df2	Sig.
.847	3	1020	.468

Table 5.37: ANOVA Summary for Parents' Education

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.999	3	.333	.813	.487
Within Groups	417.435	1020	.409		
Total	418.434	1023			

Table 5.38: Post-Hoc Tests for Multiple Comparisons for Parent Education

(I) PARENT EDU	(J) PARENTEDU	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Illiterate	Fairly	-.0106	.0969	1.000	-.260	.239
	Moderately	-.0115	.1017	.999	-.273	.250
	Well educated	-.1075	.1102	.764	-.391	.176
Fairly	Illiterate	.0106	.0969	1.000	-.239	.260
	Moderately	-.0009	.0481	1.000	-.125	.123
	Well educated	-.0969	.0641	.431	-.262	.068
Moderately	Illiterate	.0115	.1017	.999	-.250	.273
	Fairly	.0009	.0481	1.000	-.123	.125
	Well educated	-.0960	.0712	.533	-.279	.087
Well educated	Illiterate	.1075	.1102	.764	-.176	.391
	Fairly	.0969	.0641	.431	-.068	.262
	Moderately	.0960	.0712	.533	-.087	.279

Results: A one-way analysis of variance was conducted to explore the difference between well-educated, moderately educated and fairly educated parents regarding distance e-learners' academic performance. The respondents were divided into four groups according to their parents'

educational level (well-educated people: respondents with a doctorate or master's degree; moderately educated people: respondents with a bachelor's degree or a HND or postgraduate diploma and fairly educated people: respondents with a National Diploma, NCE and Secondary school certificate).

The homogeneity of variances assumption was conducted using Levene's test and the sig. value at 0.468 was not violated. Because of this, a Tukey HD post-hoc test was used to find the mean difference there among the groups. The ANOVA was not significant: F (1025) = .813, p = 0.487. Therefore, there is an evidence to accept the null hypothesis and conclude that parent education does not affect distance e-learners' academic performance. Although statistical significance was not reached, the actual difference in the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.002.

The result further review that there was no significant difference between the mean scores of well –educated parents (M=4.916, SD=.6322) and illiterate parents (M=4.809, SD=.6801) with mean difference of 0.1075.

5.4.9 Hypothesis on Distance E-learners' Family income

H_7: Distance e-learners' Family income (high, middle, low and unemployed) affects Academic performance.

H_{07} (Null hypothesis): - Family income does not affect academic performance of distance e-learners.

Table 5.39: Descriptives for Academic Performance of Distance E-Learners Based on Family Income

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Unemployed	212	4.797	.6468	.0444	4.710	4.885	3.0	6.0
Low	309	4.819	.6881	.0391	4.742	4.896	2.0	6.0
Middle	312	4.830	.6054	.0343	4.763	4.898	3.0	6.0
High	192	4.891	.6084	.0439	4.804	4.977	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.40: Test of Homogeneity of Variances family income

Levene Statistic	df1	df2	Sig.
3.500	3	1021	.015

Table 5.41: ANOVA Summary for family income

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.972	3	.324	.790	.500
Within Groups	418.829	1021	.410		
Total	**419.801**	**1024**			

Table 5.42: Tukey HD Post-hoc Tests for Multiple Comparisons for Family Income

(I) PARENTINC	(J) PARENTINC	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Unemployed	Low	-.0216	.0592	.983	-.174	.131
	Middle	-.0330	.0561	.936	-.178	.112
	High	-.0935	.0625	.441	-.255	.068
Low	Unemployed	.0216	.0592	.983	-.131	.174
	Middle	-.0114	.0520	.996	-.145	.123
	High	-.0719	.0588	.614	-.224	.080
Middle	Unemployed	.0330	.0561	.936	-.112	.178
	Low	.0114	.0520	.996	-.123	.145
	High	-.0605	.0557	.698	-.204	.083
High	Unemployed	.0935	.0625	.441	-.068	.255
	Low	.0719	.0588	.614	-.080	.224
	Middle	.0605	.0557	.698	-.083	.204

Results: A one-way analysis of variance was conducted to explore the difference between family income (high, middle, low and unemployed) regarding distance e-learners' academic performance. The respondents were divided into four groups according to their family income (high, middle, low and none/unemployed).

The homogeneity of variances assumption was conducted using Levene's test and the sig. value at .015 was violated. Because of this, a Tukey HD post-hoc test was used to find the mean difference there among the groups. The ANOVA was not significant: F (1025) = .790, p = 0.500. Therefore, there is an evidence to accept the null hypothesis and conclude that family income does not affect distance e-learners' academic performance. Although statistical significance was not reached, the actual difference in the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.002.

The Tukey HD post-hoc test indicated that there was no significant difference between the mean scores of High family income (M=4.891, SD=.6084) and Low family income (M=4.819, SD=.6881) at sig. value at .698 and High family (M=4.891, SD=.6084) was not differ significantly with Unemployed (M=4.797, SD=.6468) at sig. value at .441.

5.4.10 Hypothesis on Frequency of Engagement with ICT.

H_8: Distance e-learners' frequency of engagement with ICT (never, occasionally, frequently and most frequently) affects Academic performance.

H_{08} (Null hypothesis): - Frequency of engagement with ICT does not affect academic performance of distance e-learners.

Table 5.43: Descriptives for Academic Performance of Distance E-Learners Based on Frequency of Engagement with ICT

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	24	4.667	.8165	.1667	4.322	5.011	3.0	6.0
Occasionally	332	4.684	.6545	.0359	4.613	4.754	2.0	6.0
Frequently	542	4.871	.6185	.0266	4.819	4.923	3.0	6.0
Most Frequently	127	5.079	.5579	.0495	4.981	5.177	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.44: Test of Homogeneity of Variances for Frequency of Engagement with ICT

Levene Statistic	df1	df2	Sig.
11.709	3	1021	.000

Table 5.45: ANOVA Summary for Frequency of Engagement with ICT

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.503	3	5.501	13.927	.000
Within Groups	403.298	1021	.395		
Total	**419.801**	**1024**			

Table 5.46: Post-Hoc Tests for Multiple Comparisons for Frequency of Engagement with ICT

(I) FREQICT	(J) FREQICT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	Occasionally	-.0171	.1705	1.000	-.486	.452
	Frequently	-.2042	.1688	.627	-.669	.261
	Most Frequently	-.4121*	.1739	.107	-.888	.063
Occasionally	None	.0171	.1705	1.000	-.452	.486
	Frequently	-.1871*	.0447	.000	-.302	-.072
	Most Frequently	-.3950*	.0612	.000	-.553	-.237
Frequently	None	.2042	.1688	.627	-.261	.669
	Occasionally	.1871*	.0447	.000	.072	.302
	Most Frequently	-.2079*	.0562	.002	-.353	-.062
Most Frequently	None	.4121	.1739	.107	-.063	.888
	Occasionally	.3950*	.0612	.000	.237	.553
	Frequently	.2079*	.0562	.002	.062	.353

*. The mean difference is significant at the 0.05 level.

Results: A one-way analysis of variance test was conducted to explore the mean difference between frequency of engagement with ICT and academic performance of distance e-learners. The respondents were categorised into four levels based on their engagement level (level of engagement with ICT: none users; occasional users; frequent users; and most frequent user). The

homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.000.

The ANOVA was significant: F (1025) = 13.927, p = .000. Therefore, there is significant evidence to reject the null hypothesis and conclude that frequency of engagement with ICT affects academic performance of distance e-learners. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.04.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.000. The Games-Howell post-hoc tests indicated that the mean score for the occasional users (M = 4.684, SD = .6545) was significantly different from that for the frequent users (M = 4.871, SD .6185) and most frequent users (M = 5.079, SD = .5579) at p = 0.00. The most frequent users (M = 5.079, SD = .5579) was significantly different from that for the frequent users (M = 4.871, SD .6185) at p=0.002, also there was a significantly different between most frequent users (M = 5.079, SD = .5579) and none users (M = 4.667, SD = .8165) at p=0.034 having the highest mean difference of 0.4121. It therefore means the higher the level of engagement with ICT, the higher the academic performance.

5.4.11 Hypothesis on Distance E-Learners' Entry Qualification

H_9: Distance e-learners' entry/previous qualification (O-level/SSCE, ND/NCE, B.Sc./B.A./B.Ed., PGD, and Master's/M.Sc.) affects academic performance.

H_{09} (Null hypothesis): - Distance e-learners' entry/previous qualifications do not affect academic performance.

Table 5.47: Descriptives for Academic Performance of Distance E-Learners Based on Entry/Previous Qualification

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
O-level/SSCE	569	4.805	.6243	.0262	4.754	4.856	3.0	6.0
ND/NCE	215	4.888	.6314	.0431	4.803	4.973	3.0	6.0
B.Sc./B.A./B.Ed.	214	4.827	.6804	.0465	4.735	4.919	2.0	6.0
PGD	11	4.909	.9439	.2846	4.275	5.543	3.0	6.0
Masters/M.Sc.	16	5.000	.5164	.1291	4.725	5.275	4.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.48: Test of Homogeneity of Variances for Entry Qualifications

Levene Statistic	df1	df2	Sig.
2.586	4	1020	.036

Table 5.49: ANOVA Summary for Entry Qualifications

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.622	4	.405	.989	.412
Within Groups	418.179	1020	.410		
Total	419.801	1024			

Table 5.50: Post-hoc tests for Multiple Comparisons for Entry Qualifications

(I) Previous Qualification	(J) Previous Qualification	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
O-level/SSCE	ND/NCE	-.0835	.0513	.480	-.224	.057
	B.Sc./B.A./B.Ed.	-.0222	.0513	.993	-.162	.118
	PGD	-.1042	.1949	.984	-.637	.428
	Masters/M.Sc.	-.1951	.1623	.750	-.639	.248
ND/NCE	O-level/SSCE	.0835	.0513	.480	-.057	.224
	B.Sc./B.A./B.Ed.	.0613	.0618	.859	-.108	.230
	PGD	-.0207	.1979	1.000	-.562	.520
	Masters/M.Sc.	-.1116	.1659	.962	-.565	.342
B.Sc./B.A./B.Ed.	O-level/SSCE	.0222	.0513	.993	-.118	.162
	ND/NCE	-.0613	.0618	.859	-.230	.108
	PGD	-.0820	.1980	.994	-.623	.459
	Masters/M.Sc.	-.1729	.1660	.836	-.626	.281
PGD	O-level/SSCE	.1042	.1949	.984	-.428	.637
	ND/NCE	.0207	.1979	1.000	-.520	.562
	B.Sc./B.A./B.Ed.	.0820	.1980	.994	-.459	.623
	Masters/M.Sc.	-.0909	.2508	.996	-.776	.594
Masters/M.Sc.	O-level/SSCE	.1951	.1623	.750	-.248	.639
	ND/NCE	.1116	.1659	.962	-.342	.565
	B.Sc./B.A./B.Ed.	.1729	.1660	.836	-.281	.626
	PGD	.0909	.2508	.996	-.594	.776

Results: A one-way analysis of variance test was conducted to explore the mean difference between entry qualification and academic performance of distance e-learners. The respondents were categorised into five groups based on their entry qualifications (entry qualifications: O-level/SSCE; ND/NCE; B.Sc./B.A./B.Ed. PGD and Master's/M.Sc.). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.036.

The ANOVA was not significant: F (1025) = .989, p = .412. Therefore, there is an evidence to accept the null hypothesis and conclude that entry qualifications do not affect distance e-learners' academic performance. Although statistical significance was not reached, the actual difference in

the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.004.

The Games-Howell post-hoc tests indicated that there was no significant difference between the mean scores of Masters/M.Sc. group (M=5.000, SD=.5164) and O-level/SSCE group (M=4.805, SD=.6243) at sign\. Value at .750 and Masters/M.Sc. group (M=5.000, SD=.5164) is not differ significantly with ND/NCE (M=4.797, SD=.6468) at sig. value at .962. The result further revealed that there was no significance difference between B.Sc./B.A./B.Ed. and O-level/SSCE group (M=4.827, SD=.6804) at sig. value at .993.

5.4.12 Hypothesis on Learning Styles.

H_{10}: Distance e-learners' learning style (visual, auditory, read/write and kinaesthetic) affects academic performance.

H_{010} (Null hypothesis): - Learning style does not affect academic performance of distance e-learners.

Table 5.51: Descriptives for Academic Performance of Distance E-Learners Based on Learning Styles

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Nil	6	5.000	.6325	.2582	4.336	5.664	4.0	6.0
LSAuditory	155	4.852	.6220	.0500	4.753	4.950	3.0	6.0
LSVisual	142	4.796	.6999	.0587	4.680	4.912	3.0	6.0
LSKinesthetic	46	4.978	.7146	.1054	4.766	5.190	4.0	6.0
LSRead/Write	676	4.822	.6262	.0241	4.775	4.870	2.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.52: Test of Homogeneity of Variances for Learning Styles

Levene Statistic	df1	df2	Sig.
1.548	4	1020	.186

Table 5.53: ANOVA Summary for Learning Styles

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.460	4	.365	.890	.469
Within Groups	418.341	1020	.410		
Total	**419.801**	**1024**			

Table 5.54: Post-Hoc Tests for Multiple Comparisons for Learning Styles

(I) Learning style	(J) Learning style	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Nil	LSAuditory	.1484	.2665	.981	-.580	.877
	LSVisual	.2042	.2669	.941	-.525	.934
	LSKinesthetic	.0217	.2780	1.000	-.738	.781
	LSRead/Write	.1775	.2626	.962	-.540	.895
LSAuditory	Nil	-.1484	.2665	.981	-.877	.580
	LSVisual	.0558	.0744	.944	-.147	.259
	LSKinesthetic	-.1266	.1075	.764	-.420	.167
	LSRead/Write	.0291	.0570	.986	-.127	.185
LSVisual	Nil	-.2042	.2669	.941	-.934	.525
	LSAuditory	-.0558	.0744	.944	-.259	.147
	LSKinesthetic	-.1825	.1086	.447	-.479	.114
	LSRead/Write	-.0267	.0591	.991	-.188	.135
LSKinesthetic	Nil	-.0217	.2780	1.000	-.781	.738
	LSAuditory	.1266	.1075	.764	-.167	.420
	LSVisual	.1825	.1086	.447	-.114	.479
	LSRead/Write	.1558	.0976	.500	-.111	.422
LSRead/Write	Nil	-.1775	.2626	.962	-.895	.540
	LSAuditory	-.0291	.0570	.986	-.185	.127
	LSVisual	.0267	.0591	.991	-.135	.188
	LSKinesthetic	-.1558	.0976	.500	-.422	.111

Results: A one-way analysis of variance test was conducted to explore the mean difference between learning styles and academic performance of distance e-learners. The respondents were categorised into four categories based on their learning styles (Visual, Auditory, Read/write and Kinaesthetic). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was .186.

The ANOVA was not significant: F (1025) =.890, p=.469. Therefore, there is an evidence to accept the null hypothesis and conclude that learning styles (Visual, Auditory, Read/write and Kinaesthetic) does not affect distance e-learners' academic performance. The homogeneity of variances assumption was conducted using Levene's test and the sig. value at 0.468 was not violated. Although statistical significance was not reached, the actual difference in the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.003.

Because of this, a Tukey HD post-hoc test was used to find the mean difference among the groups. Therefore, there is an evidence to reject the alternative hypothesis and conclude that there is no statistically significant difference between visual, auditory, read/write and kinaesthetic learning styles regarding distance e-learners' academic performance. The result further review that there is no significant difference between the mean scores of kinaesthetic (m=4.978, SD=.7146) and read (m=4.822, SD=.6262) with mean difference of 0.1558 at p=0.500 and kinaesthetic (m=4.978, SD=.7146) was not differ significantly from auditory (M=4.852, SD=.6220) with mean difference of 0.1266 at p=0.764.

5.4.13 Hypothesis on Work Experience

H_{11}: Distance e-learners' work experience (1-9 years; 10-15 years; 16-25 years; and 25 years and above) affects academic performance.

H_{011} (Null hypothesis): - Work experience does not affect academic performance of distance e-learners.

Table 5.55: Descriptive on Academic Performance of Distance E-Learners Based on Work Experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Nil	15	4.933	.4577	.1182	4.680	5.187	4.0	6.0
1-9 years	389	4.846	.6274	.0318	4.783	4.908	3.0	6.0
10-15 years	174	4.753	.6644	.0504	4.653	4.852	3.0	6.0
16-25 years	27	4.630	.7917	.1524	4.316	4.943	2.0	6.0
25 years and above	18	5.056	.9984	.2353	4.559	5.552	3.0	6.0
No experience	402	4.851	.6137	.0306	4.791	4.911	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.56: Test of Homogeneity of Variances for Work Experience

Levene Statistic	df1	df2	Sig.
4.244	5	1019	.001

Table 5.57: ANOVA Summary for Work Experience

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.463	5	.693	1.695	.133
Within Groups	416.338	1019	.409		
Total	**419.801**	**1024**			

Table 5.58: Games-Howell Post-Hoc Tests for Multiple Comparisons for Work Experience

(I) Work experience	(J) Work experience	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Nil	1-9 years	.0876	.1224	.977	-.306	.482
	10-15 years	.1805	.1285	.724	-.224	.585
	16-25 years	.3037	.1928	.619	-.273	.881
	25 years and above	-.1222	.2633	.997	-.934	.690
	No experience	.0826	.1221	.982	-.311	.476
1-9 years	Nil	-.0876	.1224	.977	-.482	.306
	10-15 years	.0929	.0596	.626	-.078	.264
	16-25 years	.2161	.1556	.733	-.259	.691
	25 years and above	-.2098	.2375	.946	-.966	.547
	No experience	-.0050	.0441	1.000	-.131	.121
10-15 years	Nil	-.1805	.1285	.724	-.585	.224
	1-9 years	-.0929	.0596	.626	-.264	.078
	16-25 years	.1232	.1605	.971	-.363	.609
	25 years and above	-.3027	.2406	.803	-1.065	.459
	No experience	-.0979	.0589	.559	-.267	.071
16-25 years	Nil	-.3037	.1928	.619	-.881	.273
	1-9 years	-.2161	.1556	.733	-.691	.259
	10-15 years	-.1232	.1605	.971	-.609	.363
	25 years and above	-.4259	.2803	.655	-1.277	.425
	No experience	-.2211	.1554	.713	-.696	.254
25 years and above	Nil	.1222	.2633	.997	-.690	.934
	1-9 years	.2098	.2375	.946	-.547	.966
	10-15 years	.3027	.2406	.803	-.459	1.065
	16-25 years	.4259	.2803	.655	-.425	1.277
	No experience	.2048	.2373	.950	-.551	.961
No experience	Nil	-.0826	.1221	.982	-.476	.311
	1-9 years	.0050	.0441	1.000	-.121	.131
	10-15 years	.0979	.0589	.559	-.071	.267
	16-25 years	.2211	.1554	.713	-.254	.696
	25 years and above	-.2048	.2373	.950	-.961	.551

Results: A one-way ANOVA test was conducted to explore the mean difference between work experience and academic performance of distance e-learners. The respondents were categorised into four group based on their work experience (work experience: 1-9 years; 10-15 years; 16-25 years; and 25 years and above). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.001.

The ANOVA was not significant: F (1025) =1.695, p = .133. Therefore, there was significant evidence to accept the null hypothesis and conclude that there was no statistically significant difference between work experience and the academic performance of distance e-learners. It implies that work experience does not affect academic performance of distance e-learners. The actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.008.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.001. The Games-Howell post-hoc tests indicated that the mean score for the 25 years and above (M = 5.056, SD = .6137) was not significantly different from that for 16-25 years (M = 4.630, SD =.7917) from that for 10-15 years (M = 4.753, SD =.6644) and 1-years (M = 4.846, SD = .6274) at p= .655, .803 and .946 respectively. Those with 25 years and above scored slightly higher than others but not significantly so.

5.4.14 Hypothesis on Learner-Content Interaction

H_{12}: Learner-content interaction (strongly agree; agree; disagree; and strongly agree) affects academic performance.

H_{012} (Null hypothesis):- Learner-content interaction does not affect academic performance of distance e-learners.

Table 5.59: Descriptive on Academic Performance of Distance E-Learners Based on Learner-Content Interaction

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	8	4.875	.3536	.1250	4.579	5.171	4.0	5.0
SD	9	4.444	1.3333	.4444	3.420	5.469	2.0	6.0
D	41	4.683	.6870	.1073	4.466	4.900	3.0	6.0
A	687	4.830	.6309	.0241	4.782	4.877	3.0	6.0
SA	280	4.868	.6282	.0375	4.794	4.942	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.60: Test of Homogeneity of Variances for Learner-Content Interaction

Levene Statistic	df1	df2	Sig.
6.271	4	1020	.000

Table 5.61: ANOVA Summary for Learner-Content Interaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.641	4	.660	1.614	.168
Within Groups	417.160	1020	.409		
Total	**419.801**	**1024**			

Table 5.62: Games-Howell Post-hoc Tests for Multiple Comparisons for Learner-Content Interaction

(I) LCI	(J) LCI	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	SD	.4306	.4617	.877	-1.113	1.974
	D	.1921	.1647	.770	-.303	.687
	A	.0453	.1273	.996	-.401	.492
	SA	.0071	.1305	1.000	-.440	.454
SD	None	-.4306	.4617	.877	-1.974	1.113
	D	-.2385	.4572	.983	-1.778	1.301
	A	-.3852	.4451	.902	-1.921	1.150
	SA	-.4234	.4460	.870	-1.959	1.112
D	None	-.1921	.1647	.770	-.687	.303
	SD	.2385	.4572	.983	-1.301	1.778
	A	-.1468	.1100	.671	-.459	.166
	SA	-.1849	.1137	.488	-.507	.137
A	None	-.0453	.1273	.996	-.492	.401
	SD	.3852	.4451	.902	-1.150	1.921
	D	.1468	.1100	.671	-.166	.459
	SA	-.0382	.0446	.913	-.160	.084
SA	None	-.0071	.1305	1.000	-.454	.440
	SD	.4234	.4460	.870	-1.112	1.959
	D	.1849	.1137	.488	-.137	.507
	A	.0382	.0446	.913	-.084	.160

Results: A one-way analysis of variance test was conducted to explore the mean difference between LCI and academic performance of distance e-learners. The responses were categorised

into four (strongly agree, agree, disagree and strongly disagree). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.000.

The ANOVA was not significant: F (1025) = 1.614, p = .168. Therefore, there was significant evidence to accept the null hypothesis and conclude that there was no statistically significant difference between learner-content-interaction and the academic performance of distance e-learners. It implies that LCI does not affect academic performance of distance e-learners. The actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.01.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.000. The Games-Howell post-hoc tests indicated that the mean score for the Strongly Agree (M = 4.868, SD = .6282) was not significantly different from that for Agree (M = 4.830, SD =.6309) from that for Disagree (M = 4.683, SD =.6870) from that for Strongly Disagree (M = 4.444, SD = 1.3333) and none (M = 4.875, SD =.3536) at p= .913, .488, .870 and 1.000 respectively.

5.4.15 Hypothesis on Learner-Instructor Interaction

H_{13}: Learner-instructor-interaction (strongly agree; agree; disagree; and strongly disagree) affects academic performance.

H_{013} (Null hypothesis): - Learner-instructor interaction does not affect academic performance of distance e-learners.

Table 5.63: Descriptive on Academic Performance of Distance E-Learners Based on Learner-Instructor Interaction

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	11	4.909	.3015	.0909	4.707	5.112	4.0	5.0
SD	32	4.938	.9136	.1615	4.608	5.267	2.0	6.0
D	238	4.807	.6723	.0436	4.721	4.893	3.0	6.0
A	550	4.818	.6123	.0261	4.767	4.869	3.0	6.0
SA	194	4.876	.6399	.0459	4.786	4.967	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.64: Test of Homogeneity of Variances for Learner-Instructor Interaction

Levene Statistic	df1	df2	Sig.
3.396	4	1020	.009

Table 5.65: ANOVA Summary for Learner-Instructor Interaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.059	4	.265	.645	.631
Within Groups	418.742	1020	.411		
Total	**419.801**	**1024**			

Table 5.66: Games-Howell Post-hoc Tests for Multiple Comparisons for Learner-Instructor Interaction

(I) LLI	(J) LLI	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	1.0	-.0284	.1853	1.000	-.557	.500
	2.0	.1024	.1008	.844	-.209	.413
	3.0	.0909	.0946	.867	-.212	.394
	4.0	.0328	.1019	.997	-.280	.346
SD	None	.0284	.1853	1.000	-.500	.557
	2.0	.1308	.1673	.934	-.350	.611
	3.0	.1193	.1636	.948	-.353	.591
	4.0	.0612	.1679	.996	-.421	.543
D	None	-.1024	.1008	.844	-.413	.209
	1.0	-.1308	.1673	.934	-.611	.350
	3.0	-.0115	.0508	.999	-.151	.128
	4.0	-.0696	.0633	.807	-.243	.104
A	None	-.0909	.0946	.867	-.394	.212
	1.0	-.1193	.1636	.948	-.591	.353
	2.0	.0115	.0508	.999	-.128	.151
	4.0	-.0581	.0528	.807	-.203	.087
SA	None	-.0328	.1019	.997	-.346	.280
	1.0	-.0612	.1679	.996	-.543	.421
	2.0	.0696	.0633	.807	-.104	.243
	3.0	.0581	.0528	.807	-.087	.203

Results: A one-way analysis of variance test was conducted to explore the mean difference between LII and academic performance of distance e-learners. Their responses were categorised into four (strongly agree, agree, disagree and strongly disagree). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.009.

The ANOVA was not significant: F (1025) =.645, p = .631. Therefore, there was significant evidence to accept the null hypothesis and conclude that there was no statistically significant difference between learner-instructor-interaction and the academic performance of distance e-learners. It implies that LII does not affect academic performance of distance e-learners. The actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.003.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.009. The Games-Howell post-hoc tests indicated that the mean score for the strongly agree (M = 4.876, SD = .6399) was not significantly different from that for agree (M = 4.818, SD =.6123) from that for disagree (M = 4.807, SD =.6723) from that for strongly disagree (M = 4.938, SD = .9136) and vacant (M = 4.909, SD =.3015) at p= .807, .807, 0.996 and 0.996 respectively.

5.4.16 Hypothesis on Learner-Learner Interaction

H_{14}: Learner-learner interaction (strongly agree; agree; disagree; and strongly disagree) affects academic performance.

H_{014} (Null hypothesis): - Learner-learner interaction does not affect academic performance of distance e-learners.

Table 5.67: Descriptive on Academic Performance of Distance E-Learners Based on Learner-Learner Interaction

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	14	5.000	.3922	.1048	4.774	5.226	4.0	6.0
SD	22	4.773	.9223	.1966	4.364	5.182	2.0	6.0
D	207	4.768	.6642	.0462	4.677	4.859	3.0	6.0
A	590	4.820	.6262	.0258	4.770	4.871	3.0	6.0
SD	191	4.932	.6246	.0452	4.843	5.021	3.0	6.0
Total	**1024**	**4.832**	**.6401**	**.0200**	**4.793**	**4.871**	**2.0**	**6.0**

Table 5.68: Test of Homogeneity of Variances for Learner-Learner Interaction

Levene Statistic	df1	df2	Sig.
5.408	4	1019	.000

Table 5.69: ANOVA results for Learner-Learner Interaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.305	4	.826	2.025	.089
Within Groups	415.804	1019	.408		
Total	**419.109**	**1023**			

Table 5.70: Games-Howell Post-hoc tests for Multiple Comparisons for Learner-Learner Interaction

(I) LII	(J) LII	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	1.0	.2273	.2228	.844	-.418	.873
	2.0	.2319	.1145	.293	-.114	.577
	3.0	.1797	.1080	.483	-.155	.514
	4.0	.0681	.1142	.974	-.277	.413
SD	.0	-.2273	.2228	.844	-.873	.418
	2.0	.0046	.2020	1.000	-.592	.601
	3.0	-.0476	.1983	.999	-.637	.541
	4.0	-.1592	.2018	.931	-.755	.437
D	.0	-.2319	.1145	.293	-.577	.114
	1.0	-.0046	.2020	1.000	-.601	.592
	3.0	-.0522	.0529	.861	-.197	.093
	4.0	-.1638	.0646	.085	-.341	.013
A	.0	-.1797	.1080	.483	-.514	.155
	1.0	.0476	.1983	.999	-.541	.637
	2.0	.0522	.0529	.861	-.093	.197
	4.0	-.1116	.0520	.204	-.254	.031
SA	.0	-.0681	.1142	.974	-.413	.277
	1.0	.1592	.2018	.931	-.437	.755
	2.0	.1638	.0646	.085	-.013	.341
	3.0	.1116	.0520	.204	-.031	.254

Results: A one-way analysis of variance test was conducted to explore the mean difference between learner-learner-interaction and academic performance of distance e-learners. Their responses were categorised into four (Strongly Agree-SA, Agree-A, Disagree-D and Strongly Disagree). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.000.

The ANOVA was not significant: F (1025) =2.025, p = .089. Therefore, there was significant evidence to accept the null hypothesis and conclude that there was no statistically significant difference between learner-learner-interaction and the academic performance of distance e-learners. It implies that learner-learner interaction does not affect academic performance of distance e-learners. The actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.008.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.000. The Games-Howell post-hoc tests indicated that the mean score for the strongly agree (M = 4.932, SD = .6246) was not significantly different from that for agree (M = 4.820, SD =.6262) from that for disagree (M = 4.768, SD =.6642) from that for strongly disagree (M = 4.773, SD = .9223) and None (M = 5.000, SD =.3922) at p= .974, .931, 0.85 and 0.204 respectively.

5.4.17 Hypothesis on Employment Status

H_{15}: Employment status does affect academic performance of distance e-learners.

H_{015} (Null hypothesis): - Employment status does not affect academic performance of distance e-learners.

Table 5.71: Descriptive on Academic Performance of Distance E-Learners Based on Employment Status

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Nil	15	4.600	.7368	.1902	4.192	5.008	3.0	6.0
Employed, working 1-39 hours per week	224	4.754	.6405	.0428	4.670	4.839	3.0	6.0
Employed, working 40 or more hours per week	220	4.832	.6716	.0453	4.743	4.921	2.0	6.0
Not employed, looking for work	380	4.858	.6128	.0314	4.796	4.920	3.0	6.0
Not employed, not looking for work	179	4.877	.6417	.0480	4.782	4.972	3.0	6.0
Retired	5	5.200	.8367	.3742	4.161	6.239	4.0	6.0
Disabled, not able to work	2	5.000	.0000	.0000	5.000	5.000	5.0	5.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.72: Test of Homogeneity of Variances for Employment Status

Levene Statistic	df1	df2	Sig.
2.021	6	1018	.060

Table 5.73: ANOVA Summary for Employment Status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.506	6	.584	1.429	.200
Within Groups	416.295	1018	.409		
Total	**419.801**	**1024**			

Table 5.74: Tukey HD Post-hoc Tests for Multiple Comparisons for Employment Status

(I) Employment	(J) Employment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Nil	Employed, working 1-39 hours per week	-.1545	.1706	.972	-.658	.349
	Employed, working 40 or more hours per week	-.2318	.1706	.824	-.736	.272
	Not employed, looking for work	-.2579	.1683	.725	-.755	.239
	Not employed, not looking for work	-.2771	.1719	.675	-.785	.231
	Retired	-.6000	.3302	.537	-1.576	.376
	Disabled, not able to work	-.4000	.4814	.982	-1.822	1.022
Employed, working 1-39 hours per week	Nil	.1545	.1706	.972	-.349	.658
	Employed, working 40 or more hours per week	-.0774	.0607	.864	-.257	.102
	Not employed, looking for work	-.1034	.0539	.467	-.263	.056
	Not employed, not looking for work	-.1226	.0641	.472	-.312	.067
	Retired	-.4455	.2892	.720	-1.300	.409
	Disabled, not able to work	-.2455	.4542	.998	-1.587	1.096

Employed, working 40 or more hours per week	Nil	.2318	.1706	.824	-.272	.736
	Employed, working 1-39 hours per week	.0774	.0607	.864	-.102	.257
	Not employed, looking for work	-.0261	.0542	.999	-.186	.134
	Not employed, not looking for work	-.0453	.0644	.992	-.235	.145
	Retired	-.3682	.2892	.864	-1.223	.486
	Disabled, not able to work	-.1682	.4542	1.000	-1.510	1.174
Not employed, looking for work	Nil	.2579	.1683	.725	-.239	.755
	Employed, working 1-39 hours per week	.1034	.0539	.467	-.056	.263
	Employed, working 40 or more hours per week	.0261	.0542	.999	-.134	.186
	Not employed, not looking for work	-.0192	.0580	1.000	-.190	.152
	Retired	-.3421	.2879	.899	-1.193	.508
	Disabled, not able to work	-.1421	.4534	1.000	-1.481	1.197
Not employed, NOT looking for work	Nil	.2771	.1719	.675	-.231	.785
	Employed, working 1-39 hours per week	.1226	.0641	.472	-.067	.312
	Employed, working 40 or more hours per week	.0453	.0644	.992	-.145	.235
	Not employed, looking for work	.0192	.0580	1.000	-.152	.190
	Retired	-.3229	.2900	.924	-1.179	.534
	Disabled, not able to work	-.1229	.4547	1.000	-1.466	1.220
Retired	Nil	.6000	.3302	.537	-.376	1.576
	Employed, working 1-39 hours per week	.4455	.2892	.720	-.409	1.300
	Employed, working 40 or more hours per week	.3682	.2892	.864	-.486	1.223
	Not employed, looking for work	.3421	.2879	.899	-.508	1.193
	Not employed, not looking for work	.3229	.2900	.924	-.534	1.179
	Disabled, not able to work	.2000	.5350	1.000	-1.381	1.781

Disabled, not able to work	Nil	.4000	.4814	.982	-1.022	1.822
	Employed, working 1-39 hours per week	.2455	.4542	.998	-1.096	1.587
	Employed, working 40 or more hours per week	.1682	.4542	1.000	-1.174	1.510
	Not employed, looking for work	.1421	.4534	1.000	-1.197	1.481
	Not employed, not looking for work	.1229	.4547	1.000	-1.220	1.466
	Retired	-.2000	.5350	1.000	-1.781	1.381

Results: A one-way analysis of variance was conducted to explore the mean difference between employment status and distance e-learners' academic performance. The respondents were divided into six groups according to their employment status (employed: working 1-39 hours per week; employed: working 40 or more hours per week: not employed: looking for work; not employed: not looking for work; retired, disabled, not able to work).

The homogeneity of variances assumption was conducted using Levene's test and the sig. value at 0.060 was not violated. Because of this, a Tukey HD post-hoc test was used to find the mean difference there among the groups. The ANOVA was not significant: F (1025) = 1.429 p = 0.200. Therefore, there was an evidence to accept the null hypothesis and conclude that employment status does not affect distance e-learners' academic performance. Although statistical significance was not reached, the actual difference in the mean scores between groups was quite small. The effect size, calculated using eta squared, was 0.008.

The Tukey HD post-hoc test was used because homogeneity of variances assumption was not violated at 0.060. The result indicated that the mean score for the employed, working 1-39 hours per week (M = 4.754, SD = .6405) was not significantly different from that for employed, working 1-40 hours per week (M = 4.832, SD =.6716) from that for not employed, looking for work (M = 4.858, SD =.6128) from that for not employed, not looking for work (M = 4.877, SD = .6417) from that for retired (M = 5.200, SD =.8367) and disabled, not able to work (M = 5.000, SD =.0000) at p= .864, .467, 0.472,.720 and 0.998 respectively.

5.4.18 Hypothesis on Previous Academic Performance

H_{16}: Distance e-learners' previous academic performance affects academic performance.

H_{016} (null hypothesis): - Distance e-learners' previous academic performance does not affect their academic performance.

Table 5.75: Descriptive on Academic Performance of Distance E-Learners Based on Previous Academic Performance

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Distinction/Upper Credit/ First Class	152	5.099	.6383	.0518	4.996	5.201	4.0	6.0
Credit/ Upper Credit/ Second Class upper	415	4.800	.6107	.0300	4.741	4.859	3.0	6.0
Merit/Lower credit/ Second Class Lower	182	4.758	.6190	.0459	4.668	4.849	3.0	6.0
Third Class	20	4.550	.8256	.1846	4.164	4.936	2.0	6.0
Pass	15	4.400	.6325	.1633	4.050	4.750	4.0	6.0
Nil	241	4.822	.6433	.0414	4.740	4.903	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.76: Test of Homogeneity of Variances for Previous Academic Performance

Levene Statistic	df1	df2	Sig.
.872	5	1019	.499

Table 5.77: ANOVA Summary for Previous Academic Performance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.641	5	3.328	8.412	.000
Within Groups	403.160	1019	.396		
Total	**419.801**	**1024**			

Table 5.78: Tukey HSD Post-hoc tests for Multiple Comparisons for Previous Academic Performance

(I) PrevAcadper	(J) PrevAcadper	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Distinction/Upper credit/First class	Credit/ Upper Credit/Second Class upper	.2987*	.0596	.000	.128	.469
	Merit/Lower credit/ Second Class Lower	.3404*	.0691	.000	.143	.538
	Third Class	.5487*	.1496	.004	.122	.976
	Pass	.6987*	.1702	.001	.213	1.185
	Nil	.2771*	.0652	.000	.091	.463
Credit/ Upper Credit/Second Class upper	Distinction/Upper credit/First Class	-.2987*	.0596	.000	-.469	-.128
	Merit/Lower credit/ Second Class Lower	.0418	.0559	.976	-.118	.201
	Third Class	.2500	.1440	.508	-.161	.661
	Pass	.4000	.1653	.150	-.072	.872
	Nil	-.0216	.0509	.998	-.167	.124

Merit/Lower credit/ Second Class Lower	Distinction/Upper credit/First Class	-.3404*	.0691	.000	-.538	-.143
	Credit/ Upper Credit/Second Class upper	-.0418	.0559	.976	-.201	.118
	Third Class	.2082	.1482	.724	-.215	.631
	Pass	.3582	.1690	.278	-.124	.841
	Nil	-.0633	.0618	.909	-.240	.113
Third Class	Distinction/Upper credit/First class	-.5487*	.1496	.004	-.976	-.122
	Credit/ Upper Credit/Second Class upper	-.2500	.1440	.508	-.661	.161
	Merit/Lower credit/ Second Class Lower	-.2082	.1482	.724	-.631	.215
	Pass	.1500	.2148	.982	-.463	.763
	Nil	-.2716	.1464	.431	-.689	.146
Pass	Distinction/Upper credit/First Class	-.6987*	.1702	.001	-1.185	-.213
	Credit/ Upper Credit/Second Class upper	-.4000	.1653	.150	-.872	.072
	Merit/Lower credit/ Second Class Lower	-.3582	.1690	.278	-.841	.124
	Third Class	-.1500	.2148	.982	-.763	.463
	Nil	-.4216	.1674	.120	-.899	.056
Nil	Distinction/Upper Credit/First Class	-.2771*	.0652	.000	-.463	-.091
	Credit/ Upper Credit/Second Class upper	.0216	.0509	.998	-.124	.167
	Merit/Lower credit/ Second Class Lower	.0633	.0618	.909	-.113	.240
	Third Class	.2716	.1464	.431	-.146	.689
	Pass	.4216	.1674	.120	-.056	.899

*. The mean difference is significant at the 0.05 level.

Results: A one-way analysis of variance test was conducted to explore the difference between previous performance or grade (distinction, second class upper, second class lower, third class, pass and none) academic performance of distance e-learners. The respondents were divided into six groups according to their previous performance or grade (distinction, second class upper, second class lower, third class, pass and none).

The assumption of homogeneity of variances was tested using Levene's test and not violated as the sig. value was 0. 499. The ANOVA was significant: F (1025) =8.412, p = 0.000. Therefore, there was significant evidence to reject the null hypothesis and conclude that statistically previous performance affects academic performance of distance e-learners. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.04.

The Tukey HSD post-hoc tests indicated that the mean score for the distinction group (M = 5.099, SD = .6383) was significantly different from that for the second class upper group (M = 4.800, SD = 0.6107), the Second Class Lower group (M = 4.758, SD = .6190), third class group (M = 0.4550, SD = .8256), pass group (M = 4.400, SD = .6325) and none – those without grade (M = 4.822, SD = .6433) p = 0.000, 0.001 and 0.004 respectively. It therefore means that distinction candidates scored the highest among the group.

5.4.19 Hypothesis on Family Size

H_{17}: Family size affects academic performance of distance e-learners.

H_{017} (null hypothesis): Family size does not affect academic performance of distance e-learners.

Table 5.79: Descriptive on Academic Performance of Distance E-Learners Based on Family Size

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Not app	664	4.878	.6227	.0242	4.831	4.925	3.0	6.0
1-2	207	4.768	.6029	.0419	4.686	4.851	3.0	6.0
3-5	137	4.672	.7082	.0605	4.552	4.791	2.0	6.0
5-9	12	5.417	.7930	.2289	4.913	5.920	4.0	6.0
10 and above	5	4.200	.4472	.2000	3.645	4.755	4.0	5.0
Total	1025	4.831	.6403	.0200	4.792	4.870	2.0	6.0

Table 5.80: Test of Homogeneity of Variances for Family Size

Levene Statistic	df1	df2	Sig.
4.742	4	1020	.001

Table 5.81: ANOVA Summary for Family Size

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.877	4	2.969	7.424	.000
Within Groups	407.924	1020	.400		
Total	**419.801**	**1024**			

Table 5.82: Games-Howell Post-hoc Test for Multiple Comparisons for Family Size

(I) FamilySize 1	(J) FamilySize 1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Not appl	1-2	.1099	.0484	.157	-.023	.243
	3-5	.2065*	.0652	.015	.027	.386
	5-9	-.5387	.2302	.202	-1.280	.203
	10 and above	.6780	.2015	.114	-.204	1.560
1-2	Not appl	-.1099	.0484	.157	-.243	.023
	3-5	.0966	.0736	.684	-.106	.299
	5-9	-.6486	.2327	.099	-1.393	.096
	10 and above	.5681	.2043	.186	-.302	1.439
3-5	Not appl	-.2065*	.0652	.015	-.386	-.027
	1-2	-.0966	.0736	.684	-.299	.106
	5-9	-.7451	.2368	.051	-1.494	.004
	10 and above	.4715	.2090	.298	-.384	1.327
5-9	Not appl	.5387	.2302	.202	-.203	1.280
	1-2	.6486	.2327	.099	-.096	1.393
	3-5	.7451	.2368	.051	-.004	1.494
	10 and above	1.2167*	.3040	.011	.261	2.172
10& above	Not appl	-.6780	.2015	.114	-1.560	.204
	1-2	-.5681	.2043	.186	-1.439	.302
	3-5	-.4715	.2090	.298	-1.327	.384
	5-9	-1.2167*	.3040	.011	-2.172	-.261

*. The mean difference is significant at the 0.05 level.

Results: A one-way analysis of variance test was conducted to explore the mean difference between family size and academic performance of distance e-learners. The respondents were categorised into five groups based on their family size (family size: not applicable; 1-2; 3-5; 5-9 and 10 and above). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.001.

The ANOVA was significant: F (1025) = 7.424, p = .000. Therefore, there is significant evidence to reject the null hypothesis and conclude that family size affects academic performance of distance e-learners. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.03.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.001. The Games-Howell post-hoc tests indicated that the mean score for the Not applicable-those without child or children (M = 4.878, SD = .6227) was significantly different from that for those 3-5 children (M = 4.672, SD = .7082) at p=0.15. It therefore means the higher the family size, the lower the academic performance. Also, there was a significantly different between those with 5-9 children (M = 5.417, SD = .7930) and those that have 10 and above children (M = 4.200, SD = .4472) at p=0.011.

5.4.20 Hypothesis on Hours Spent on the Internet per Day

H_{18}: Hours spent on the Internet per day affect academic performance of distance e-learners.

H_{018} (null hypothesis): Hours spent on the Internet per day do not affect academic performance of distance e-learners.

Table 5.83: Descriptive on Academic Performance of Distance E-Learners Based on Hours Spent on the Internet per Day

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	3	4.667	.5774	.3333	3.232	6.101	4.0	5.0
0-2 hours	338	4.734	.6628	.0361	4.663	4.805	2.0	6.0
3-5 hours	286	4.878	.6289	.0372	4.804	4.951	3.0	6.0
6-8 hours	123	4.821	.5731	.0517	4.719	4.923	4.0	6.0
9-12 hours	103	4.893	.6555	.0646	4.765	5.021	3.0	6.0
More than 12 hours	172	4.919	.6346	.0484	4.823	5.014	3.0	6.0
Total	1025	4.831	.6403	.0200	4.792	4.870	2.0	6.0

Table 5.84: Test of Homogeneity of Variances for Hours Spent on the Internet per Day

Levene Statistic	df1	df2	Sig.
2.443	5	1019	.033

Table 5.85: ANOVA Summary for Hours Spent on the Internet per Day

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.631	5	1.126	2.771	.017
Within Groups	414.170	1019	.406		
Total	**419.801**	**1024**			

Table 5.86: Games-Howell Post-Hoc-Hoc Test for Multiple Comparisons for Hours Spent on the Internet per Day

(I) Intconperday	(J) Intconperday	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	0-2 hours	-.0671	.3353	1.000	-2.776	2.641
	3-5 hours	-.2110	.3354	.977	-2.916	2.494
	6-8 hours	-.1545	.3373	.994	-2.806	2.498
	9-12 hours	-.2265	.3395	.971	-2.821	2.368
	More than 12 hours	-.2519	.3368	.956	-2.917	2.413
0-2 hours	None	.0671	.3353	1.000	-2.641	2.776
	3-5 hours	-.1439	.0518	.062	-.292	.004
	6-8 hours	-.0874	.0630	.735	-.268	.094
	9-12 hours	-.1595	.0740	.264	-.373	.054
	More than 12 hours	-.1849*	.0603	.028	-.358	-.012
3-5 hours	None	.2110	.3354	.977	-2.494	2.916
	0-2 hours	.1439	.0518	.062	-.004	.292
	6-8 hours	.0565	.0637	.949	-.126	.239
	9-12 hours	-.0156	.0745	1.000	-.230	.199
	More than 12 hours	-.0410	.0610	.985	-.216	.134
6-8 hours	None	.1545	.3373	.994	-2.498	2.806
	0-2 hours	.0874	.0630	.735	-.094	.268
	3-5 hours	-.0565	.0637	.949	-.239	.126
	9-12 hours	-.0721	.0827	.953	-.310	.166
	More than 12 hours	-.0975	.0708	.741	-.301	.106
9-12 hours	None	.2265	.3395	.971	-2.368	2.821
	0-2 hours	.1595	.0740	.264	-.054	.373
	3-5 hours	.0156	.0745	1.000	-.199	.230
	6-8 hours	.0721	.0827	.953	-.166	.310
	More than 12 hours	-.0254	.0807	1.000	-.258	.207
More than 12hr	None	.2519	.3368	.956	-2.413	2.917
	0-2 hours	.1849*	.0603	.028	.012	.358
	3-5 hours	.0410	.0610	.985	-.134	.216
	6-8 hours	.0975	.0708	.741	-.106	.301
	9-12 hours	.0254	.0807	1.000	-.207	.258

*. The mean difference is significant at the 0.05 level.

Results: A one-way analysis of variance test was conducted to explore the mean difference between hours spent on the Internet per day and academic performance of distance e-learners. The

respondents were categorised into six groups based on their hours spent on the Internet per day (none, 0-2 hours, 3-5 hours, 6-8 hours and 9-12 hours). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.033.

The ANOVA was significant: $F\ (1025) = 2.771,\ p = .017$. Therefore, there was significant evidence to reject the null hypothesis and conclude that hour spent on the Internet per day affects academic performance of distance e-learners. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.01.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.033. The Games-Howell post-hoc tests indicated that the mean score for More than 12 hours ($M = 4.919,\ SD = .6346$) was significantly different from that for 0-2 hours ($M = 4.734,\ SD = .6628$) at $p = 0.028$. Although significant different was not found in other groups but it is obvious that the distance e-learners who spent more than 12 hours per day scored slightly higher than the rest of the group.

5.4.21 Hypothesis on Hours spent on Social Media per Day

H_{19}: Hours spent on social media per day affects academic performance of distance e-learners.
H_{019} (null hypothesis): Hours spent on social media per day do not affect academic performance of distance e-learners.

Table 5.87: Descriptive on Academic Performance of Distance E-Learners Based on Hours Spent on Social Media per Day

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	5	4.400	.5477	.2449	3.720	5.080	4.0	5.0
0-2 hours	381	4.759	.6763	.0346	4.690	4.827	2.0	6.0
3-5 hours	280	4.868	.6451	.0386	4.792	4.944	3.0	6.0
6-8 hours	141	4.872	.5714	.0481	4.777	4.967	4.0	6.0
9-12 hours	79	4.937	.5150	.0579	4.821	5.052	4.0	6.0
More than 12 hours	139	4.871	.6464	.0548	4.762	4.979	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.88: Test of Homogeneity of Variances for Hours Spent on Social Media per Day

Levene Statistic	df1	df2	Sig.
5.435	5	1019	.000

Table 5.89: ANOVA Summary for Hours Spent on Social Media per Day

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.651	5	.930	2.283	.045
Within Groups	415.150	1019	.407		
Total	**419.801**	**1024**			

Table 5.90: Games-Howell Post-hoc Hoc Test for Multiple Comparisons for Hours Spent on Social Media per Day

(I) Soicialnetperday	(J) Soicialnetperday	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	0-2 hours	-.3585	.2474	.707	-1.508	.791
	3-5 hours	-.4679	.2480	.507	-1.614	.678
	6-8 hours	-.4723	.2496	.503	-1.611	.666
	9-12 hours	-.5367	.2517	.405	-1.667	.593
	More than 12 hours	-.4705	.2510	.509	-1.603	.662
0-2 hours	None	.3585	.2474	.707	-.791	1.508
	3-5 hours	-.1093	.0518	.284	-.258	.039
	6-8 hours	-.1138	.0593	.392	-.284	.056
	9-12 hours	-.1782	.0675	.095	-.373	.017
	More than 12 hours	-.1120	.0649	.516	-.298	.074
3-5 hours	None	.4679	.2480	.507	-.678	1.614
	0-2 hours	.1093	.0518	.284	-.039	.258
	6-8 hours	-.0045	.0617	1.000	-.181	.172
	9-12 hours	-.0689	.0696	.921	-.270	.132
	More than 12 hours	-.0026	.0670	1.000	-.195	.190
6-8 hours	None	.4723	.2496	.503	-.666	1.611
	0-2 hours	.1138	.0593	.392	-.056	.284
	3-5 hours	.0045	.0617	1.000	-.172	.181
	9-12 hours	-.0644	.0753	.957	-.281	.153
	More than 12 hours	.0018	.0729	1.000	-.208	.211
9-12 hours	None	.5367	.2517	.405	-.593	1.667
	0-2 hours	.1782	.0675	.095	-.017	.373
	3-5 hours	.0689	.0696	.921	-.132	.270
	6-8 hours	.0644	.0753	.957	-.153	.281
	More than 12 hours	.0662	.0798	.962	-.163	.296
More than 12 hours	None	.4705	.2510	.509	-.662	1.603
	0-2 hours	.1120	.0649	.516	-.074	.298
	3-5 hours	.0026	.0670	1.000	-.190	.195
	6-8 hours	-.0018	.0729	1.000	-.211	.208
	9-12 hours	-.0662	.0798	.962	-.296	.163

Results: A one-way analysis of variance test was conducted to explore the mean difference between hours spent on social media per day and academic performance of distance e-learners. The respondents were categorised into six groups based on their hours spent on social media per day (none, 0-2 hours, 3-5 hours, 6-8 hours and 9-12 hours). The homogeneity of variances assumption was tested using Levene's test and violated it as the sig. value was 0.000.

The ANOVA was significant: $F\ (1025) = 2.283$, $p = .045$. Therefore, there was significant evidence to reject the null hypothesis and conclude that hours spent on social media per day affect academic performance of distance e-learners. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.01.

The Games-Howell post-hoc was used because homogeneity of variances assumption was violated at 0.000. The Games-Howell post-hoc tests indicated that the mean score for the More than 12 hrs ($M = 4.871$, $SD = .6464$) was not significantly different from that for none ($M = 4.400$, $SD = .5477$), from that for 0-2 hrs ($M = 4.759$, $SD = .6763$) from that for 3-5 hrs ($M = 4.868$, $SD = .6451$), from that for 6-8 hrs ($M = 4.872$, $SD = .5714$) and from that for 9-12 hrs ($M = 4.937$, $SD = .5150$) at $p = .509$, .516, .962 and 1.000 respectively.

5.4.22 Hypothesis on Hours Spent on a Computer for Studies per Day

H_{20}: Hours spent on a computer for studies per day affects academic performance of distance e-learners.

H_{020} (null hypothesis):- Hours spent on a computer for studies per day does not affect academic performance of distance e-learners.

Table 5.91: Descriptive on Academic Performance of Distance E-Learners Based on Hours Spent on a Computer for Studies per Day

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
None	21	4.286	.5606	.1223	4.031	4.541	4.0	6.0
1-2 hours	440	4.850	.6718	.0320	4.787	4.913	2.0	6.0
3-5 hours	322	4.823	.5983	.0333	4.757	4.889	3.0	6.0
5-9 hours	138	4.862	.5819	.0495	4.764	4.960	4.0	6.0
More than 9 hours	104	4.846	.6794	.0666	4.714	4.978	3.0	6.0
Total	**1025**	**4.831**	**.6403**	**.0200**	**4.792**	**4.870**	**2.0**	**6.0**

Table 5.92: Test of Homogeneity of Variances for Hours Spent on a Computer for Studies per Day

Levene Statistic	df1	df2	Sig.
1.135	4	1020	.338

Table 5.93: ANOVA Summary for Hours Spent on a Computer for Studies per Day.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.583	4	1.646	4.062	.003
Within Groups	413.218	1020	.405		
Total	**419.801**	**1024**			

Table 5.94: Tukey HSD Post-Hoc hoc Test for Multiple Comparisons for Hours Spent on a Computer for Studies per Day

(I) ComputerStd	(J) ComputerStd	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
None	1-2 hours	-.5643*	.1422	.001	-.953	-.176
	3-5 hours	-.5373*	.1434	.002	-.929	-.146
	5-9 hours	-.5766*	.1491	.001	-.984	-.169
	Moret than 9 hours	-.5604*	.1523	.002	-.977	-.144
1-2hrs	None	.5643*	.1422	.001	.176	.953
	3-5 hours	.0270	.0467	.978	-.101	.155
	5-9 hrs	-.0123	.0621	1.000	-.182	.157
	More than 9 hours	.0038	.0694	1.000	-.186	.193
3-5hrs	None	.5373*	.1434	.002	.146	.929
	1-2 hours	-.0270	.0467	.978	-.155	.101
	5-9 hours	-.0393	.0648	.974	-.216	.138
	More than 9 hours	-.0232	.0718	.998	-.219	.173
5-9hrs	None	.5766*	.1491	.001	.169	.984
	1-2 hours	.0123	.0621	1.000	-.157	.182
	3-5 hours	.0393	.0648	.974	-.138	.216
	More than 9 hours	.0162	.0826	1.000	-.210	.242
Morethan9hrs	None	.5604*	.1523	.002	.144	.977
	1-2 hours	-.0038	.0694	1.000	-.193	.186
	3-5 hours	.0232	.0718	.998	-.173	.219
	5-9 hours	-.0162	.0826	1.000	-.242	.210

*. The mean difference is significant at the 0.05 level.

Results: A one-way analysis of variance was conducted to explore the mean difference between hours spent on a computer for studies per day and distance e-learners' academic performance. The respondents were divided into five groups according to hours spent on a computer for studies per day (None, 1-2 hours, 3-5 hours, 5-9 hours and More than 9 hours).

The homogeneity of variances assumption was conducted using Levene's test and the sig. value at 0.338 was not violated. As a result of this, a Tukey HD post-hoc test was used to find the mean difference there among the groups. The ANOVA was significant: $F\ (1025) = 4.062$ $p = 0.03$. Therefore, there was an evidence to reject the null hypothesis and conclude that hours spent on a computer for studies per day does affect distance e-learners' academic performance. Despite reaching statistical significance, actual difference in the mean scores between the groups was small. The effect size, calculated using eta squared, was 0.02.

The Tukey HD post-hoc test was used because homogeneity of variances assumption was not violated at 0.338. The result indicated that the mean score for none –those who are not using computer for studies ($M = 4.286$, $SD = .5606$) was significantly different from those using computer studies between 1-2 hours per day ($M = 4.850$, $SD = .6718$) at $p=0.001$. There was significant different in mean score between none – those who are not using computer for ($M = 4.286$, $SD = .5606$) and those who use computer for studies between 3-5 hours per day ($M = 4.823$, $SD = .5983$) at $p=0.002$, there was significant different in mean score between none – those who are not using computer for studies ($M = 4.286$, $SD = .5606$) and those who use computer for studies for 5-9 hours per day ($M = 4.862$, $SD = .5819$) at $p = 0.001$. Also significant different was found between none – those who are not using computer for studies ($M = 4.286$, $SD = .5606$) and those who use computer for studies for more than 9 hours per day ($M = 4.846$, $SD = .6794$) at $p=0.002$. It implies those that are not using computer for studies scored the least mark among the groups.

5.5 Conclusion

The purpose of this chapter was to analyse and present the results in light of research question one. Research question one was to analyse if correlation exists between distant e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and their academic performance. In order to achieve this objective, a survey-based questionnaire was used to collect data from 1025 participants from NOUN, South Western geo-political zone. The survey data was analysed using the SPSS 17.0. After exposing all the variables to both Spearman's correlation and

post-hoc tests, the results revealed that students' ICT literacy levels, frequency of engagement with ICT, marital status, previous academic performance, family size, hours spent on the Internet per day, hours spent on social media per day and hours spent on a computer for studies per day significantly influencing academic performance while age, gender, previous qualifications, learning styles, work experience, learner-content-interaction,learner-instructor-interaction,learner-learner-interaction, family, home background, parent education and employment did not influencing academic performance. The discussion of the results follows in the next chapter. In the next chapter, Chapter 6, the discussions of research question one are presented in detail.

6. DISCUSSION OF RESEARCH QUESTION ONE

6.1 Introduction

This chapter includes a discussion of the results that were presented in the previous chapter. The discussion attempts to provide some answers to the research question and hypotheses presented in Chapter 1. The present study adds supplementary information to the existing body of literature on factors affecting academic performance of distance e-learners by yielding the statistical correlations with literature examined and data collected.

6.2 Research Question One

What correlations exist between distant e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and their academic performance?

6.3 Students' ICT Literacy Levels and Academic Performance.

The results did show that there is some relationship between ICT literacy level of distance e-learners and their academic performance. As stated in Chapter 3, ICT literacy levels were measured on a scale of high, moderate, little and never. The relationship between ICT literacy level ($r = .188$) and their academic performance is significant at $p=.000$, is shown in Table 5.1Table 5.1.

The results highlighted show that there was a weak correlation between students' ICT literacy level (ICTLITC) and their academic performance (ACADPERF). This may be because it is crucial that distance e-learners gain some basic computer literacy skills (word processing, spreadsheet, database, presentation, e-mail and Internet) to enable them to submit TMA, interact among colleagues and facilitators and write electronic/online exams. Adequate ICT skills are essential to the success of distance e-learners' collaborative learning. Collaborative learning is also one of the themes that emerged from the qualitative results as one variable that determines academic performance of distance e-learners (see Chapter 8). According to Pallant (2016), the interpretation of strength of correlation depends on the research that has been conducted in the particular topic areas. The result will be impressive if it predicted a higher percentage than the results of other

researchers in the particular topic area. Based on the above argument, the present result is impressive comparing with that of Lee (2008) who found that the overall relationship between computer competency and academic success yielded a correlation $r = .095$, $p > .01$. The present result is also impressive when comparing with that of Welsh (2007) who found that there was a low positive relationship between computer skills ($r = .101$, $p = .002$) and course completion of distance learners, which was statistically significant. However, this study is in disagreement with Aypay (2010) who found that there was no significant relationship between students' use of ICT and academic achievement based on the results of PISA 2006. The result of this study is also not in line with Zhu et al. (2009), Al-Fadhli (2008), Sun et al. (2008) and Azizi (2014) who pointed out that students' computer skills competency had no significant effect on students' performance or there was no significant positive relationship between Internet competency and academic achievement of Science students in Bachelor Level.

Consistent with this study was Sosin et al. (2004) who indicated that ICT use had a low positive effect on student performance. They argued that some ICT skills emphatically related to performance while others most certainly did not. This study is in agreement with Mohagheghzadeh et al. (2014) who found there was a statistically significant relationship between ICT and the academic performance of medical and dental students at Shiraz University of Medical sciences. This study is also in agreement with Rakap (2010) who found a moderate positive correlation between computer skills and students' success. The results of this study are also consistent with Osunade, Ojo and Ahisu (2009) and Barlow-Jones & Westhuizen (2013) who revealed a significant difference in academic performance between those who had Internet access or were computer literate and those without Internet access and/or computer illiterate students. Seeing that this aspect of the study was quite consistent with other studies, one would want to believe that this further supports the finding that ICT literacy level does play a role in influencing academic performance. It is interesting to find out that although other studies were conducted in a developed country a similar finding surfaces in a developing country like Nigeria.

Both the qualitative and the quantitative strands of this study have shown that ICT literacy level does influence academic performance of distance e-learners. The quantitative strand showed that those who have a lower ICT literacy level found it difficult to cope under an e-learning setting. This quantitative analysis was supported by the following responses from the qualitative part of the study:

Being average student, this really affected me because there are some things that I can't do on my own without consulting computer guru. Had it been that I'm expert I wouldn't seek the assistance of guru.

It really affects my academic work because any assignment I want to do, I will search the Internet or Google it.

If I have acquired the knowledge of ICT that I don't have before. I believe that I will perform better in my examination.

Everybody has to be ICT literate in respect of your course of study.

When I was newly admitted into this university, I was a novice, I don't know how to operate computer at all. I consulted my colleagues and they taught me the steps and procedure to follow during examination. From there, I acquired a perfect knowledge. The first examination was poorly affected but I was able to perform excellently in my second exam.

Table 5.19 under hypothesis one revealed that the ANOVA was significant at $F(1025) = 13.066$, $p = 0.000$. This implies that distance e-learners' ICT literacy level affects their academic performance. The post-hoc test, Table 5.20, revealed that the high ICT literacy level group was significantly different from the moderate ICT literacy level group, the little ICT literacy level group and the none ICT literacy level group. The post-hoc test as shown in Table 5.20 further revealed that the more the students are advancing in ICT literacy levels, the higher their academic performance.

The above result is further supported by the 3P Model since students' ICT literacy level is part of their activities prior to entering university (presage factors), course curriculum, course materials or contents under an e-learning setting (institutional factor), engagement with e-learning activities through collaboration, submission of TMA, interaction among colleagues and facilitators and write electronic online exams (learning activities or process), and the learning outcome which is the academic performance (products). Both the quantitative and qualitative results showed that a deep approach to learning influences academic performance of students. Those who have High ICT literacy level (deep learning approach) performed higher than those with little ICT literacy level (surface learning approach). See Table 5.17 and Table 5.20).

6.4 Socio-Demographic Characteristics

6.4.1 Age and Academic performance

It is a common belief that distance education is meant or designed for adults and working-class people that were not privileged to attend regular universities due to home and work commitments. The results of this study contradict the belief because it revealed that majority of the distance e-learners are less than 40 years old (see Table 5.21). This may be so because of high demand for admission into Nigerian conventional universities which makes it difficult for the universities to accommodate all prospective students. As a result of this, they switch to a distance learning program in order to obtain the degree which they were unable to obtain in conventional universities because of lack of space. The result of this study showed that a very weak correlation exists between age of distance e-learners and their academic performance, and the correlation was statistically significant. This may be that age plays a negligible role in academic performance of distance e-learners. The result in Table 5.21 revealed that the distance e-learners within the ages of 21 to 29 had the highest scores in the age groups but not significantly so. This implies that older distance e-learners tend to perform more poorly in their academic work than their younger counterparts. This may be due to the fact that the older distance e-learners have many commitments at home and in their places of work. Also, the younger distance e-learners have more basic ICT literacy skills than their older counterparts. Consistent with this study was Bowa (2011) who showed that there was a weak negative correlation between the two variables ($r = -0.23$, $n = 202$, $p < 0.001$), with higher age associated with lower semester examination grades. Consistent with this study, Alstete and Beutell (2004) found a significant positive relationship between students' ages and grades received in online courses offered in a Master's in Business Administration program. Wang and Newlin (2002) found that age was not a large indicator of distance learners' academic performance.

Table 5.23 under hypothesis 2 revealed the ANOVA was not significant at $F (1025) = 1.470$, $p = .197$ and there was no statistically significant difference between age group and academic performance of distance e-learners. Therefore, the researcher concludes that age does not really affect academic performance of distance e-learners.

6.4.2 Gender and Academic Performance

Recently many studies (Rugendo, 2014; Alstete & Beutell; 2004; Harb & El-Shaarawi, 2007) have looked at gender and technology as well as gender and academic performance. There is a belief that females are less technologically savvy (Li & Kirkup, 2007; Kaino, 2008; Dhindsa & Shahrizal-Emran, 2011), but the results in this study showed female distance e-learners scored slightly higher than their male counterparts under an e-learning setting but the result was not statistically significant (see Table 5.2). This may be because the female distance e-learners are more determined to perform better than their male counterparts. The results in this study also showed that was no statistically significant correlation between gender and academic performance of distance e-learners. This may be because gender does not play an important role in academic performance of distance e-learners. Academic performance may depend on how much effort students put on their studies but might not necessary depend on gender. This finding is consistent with Rugendo (2014) who reported there was no influence of gender on academic performance of distance learners. This study is in consistent with Lim and Morris (2009), Martínez-Caro (2011), Bowa (2011) and Yukselturk and Bulut (2007) indicated that gender has no critical effect on students' online learning performance. This study is in support of Cheung and Kan (2002) who reported that women outperformed men in the distance learning environment and speculated that it could have been a result of the fact that women put more effort into the course than the men did. The result of this study is in conformity with Barakzai and Fraser (2005) who investigated the relationship between gender and academic performance in 290 students enrolled in advanced healthcare practitioner courses at three universities. The researchers found that the female group scored higher than the male group, and they also found there is no significantly difference between men and women in term of academic performance. The difference between this study and that of Barakzai and Fraser is that the present study was conducted in Nigeria while Barakzai and Fraser conducted their study outside Nigeria. It is worthy of note that this aspect of the study was consistent with other studies, and one would want to believe that this further supports the finding that gender does not play a role in influencing academic performance. It is interesting to find out that although other studies were conducted in developed countries a similar finding surfaced in a developing country like Nigeria.

The result in Table 5.26 under hypothesis 3 also revealed that there was no significant difference in scores for males ($M = 7.49$, $SD = 1.853$) and females ($M = 4.828$, $SD = .6305$), $t\ (1025) =$

0.196, p = 0.845 and supported the above result. The researcher concludes that gender does not affect academic performance of distance e-learners.

6.4.3 Marital status and Academic Performance

Many studies (Oladejo, et. al, 2010; Owino, 2013; Thomas et al., 2012) have revealed that marital status plays a significant role in academic performance of students in both traditional and distance learning. Interestingly, the results of this study showed that a positive correlation does exist between marital status and academic performance (ACADPERF) of distance e-learners although the strength of the correlation was weak. This may be so because marital status plays an important role in academic performance of the distance learners. Married distance e-learners may also be affected because it may be extremely difficult to successfully combine their studies with their family, work and social lives. This study is in agreement with Oladejo, et. al. (2010), Owino (2013) and Thomas et al. (2012), who found that marital status significantly influenced academic performance of students. This study is in contradiction to Bowa (2011) who found no significant relationship between marital status and academic performance of the distance learners. Table 5.29 under hypothesis 4 revealed that ANOVA was significant at F (1025) = 3.983, p = 0.001. The post-hoc tests showed that the unmarried group (M=4.881, SD=.6330) and married group (M=4.728, SD=.6430) was significantly different at p= 0.004. The mean difference between the unmarried and married group was 0.1532. This implies that unmarried students outperformed their married distance e-learner counterparts. We can therefore conclude that marital status affects academic performance of distance e-learners.

This study is in contrast with Al-Mutairi (2010) who reported that married students outperforming their unmarried counterparts. This could be as result of the family challenges and other commitments faced by married distance e-learners which served as a distraction unlike their unmarried counterparts. This quantitative analysis was supported by the following responses from the qualitative part of the study:

> *I'm a working person and I have kids. Is what I hear I remember? I don't have time to read and for my academic.*
>
> *My first-year result was very good but I perform woefully in my second year because it wasn't easy combining work and marriage with study.*

The same as above as I'm trying to combine work and family issues the study is not easy. There is no time to gather information or download course materials while on duty. Assume there are no challenges of family issue and others, if one is a novice, he will improve while moving from one year to another.

I don't have much time because of my job and my family but I desire to be, at least I pick my phone every day to browse, to get information regularly and go on the net to get information. But I'm not that frequent.

This is in line with Thomas, Raynor and Al-Marzooqi (2012) who reported that married undergraduates performed better than their unmarried classmates. This study is in support of Owino (2013) who reported that marital status contributed significantly to distance learners' academic performance.

The above result is further supported by the 3P Model since marital status is part of student context, course curriculum, course or course contents under an e-learning setting (institutional factor), engagement with e-learning activities through collaboration, engagement with e-learning activities through collaboration, submission of TMA, interaction among colleagues and facilitators and writing electronic/online exams (learning activities or process), and the learning outcome, which is the academic performance (products). The quantitative results showed that unmarried distance e-learners scored higher than their married counterparts. Unmarried distance e-learners can be referred to as deep learners while married distance e-learners can be referred to as surface learners (see Table 5.30).

6.5 Socioeconomic Status

6.5.1 Home Background and Academic performance

Many studies (Asikhia, 2010; Owolabi & Emeka, 2012; Abdu-Raheem, 2015; Egunsola, 2014; Adesoji, 2008) revealed that home or educational background affect academic performance of on-campus students. However, the results of this study showed that there was no statistically significant correlation between home background and academic performance of distance e-learners. This may be because home background has little or no role to play in their academic performance but they have to be self-motivated and be determined to excel irrespective of their backgrounds. This study is in disagreement with the findings of these researchers (Abdu-Raheem, 2015; Ajila and Olutola, 2007; Ushie, Owolabi and Emeka, 2012; Asikhia, 2010 & Adell, 2002) who found a significant relationship between home background and academic performance. It is

interesting to note here, that the above studies were conducted with on-campus students, while a contrary finding surfaced under an e-learning setting.

This study is in agreement with Pitan (2015) and Ojokheta (2010) who found that parental background does not have significant influence on the distance learner's achievement. Table 5.31 under hypothesis 6, revealed that there was a significant difference between distance e-learners from a semi-urban and those from a rural background. This may be because those from a semi-urban background are more determined than those from a rural one. The ANOVA result in Table 5.33 was not significant: $F\ (1025) = 1.704$, $p = 0.165$. There was evidence to accept the null hypothesis and conclude that there was no statistically significant difference between rural, urban and semi-urban background regarding their academic performance. The researcher concludes that home background of distance e-learners does not affect their academic performance.

This quantitative analysis was supported by the following responses from qualitative part of the study:

> *I came from rural area and my parents are poor. I choose within myself to be educated. That is why when I got the job and came to Open University to study under e-learning and my background doesn't contribute to my performance. I'm also not influence by my parent education.*
>
> *My background and my academic performance are different things that didn't affect each other.*
>
> *No, I don't believe that environment influence academic performance the reason is that my parents are not educated. They didn't even know how to write zero but if you know what you are doing environment, background and parent education doesn't influence academic performance.*
>
> *I think parent background and education have nothing with academic performance. A lot of parents are not educated but they want their children to be educated. They want them to be greater than them, to reach the top of their career. They are some parents that are not educated but their children are performing, they are to provide the necessary things.*

6.5.2 Parent Education and Academic Performance

Many studies (Pamela & Kean, 2010; Kamar, 2008; Chen, 2009) revealed that parent education significantly influenced academic performance of on-campus students. In contrast to the above studies, the results of this study showed that there was no significant correlation between parent education and academic performance (ACADPERF) of distance e-learners as shown in Table 5.35.

This may be because parent education does not play an important role in distance e-learners' academic performance but they are determined to be successful irrespective of their parents' education. The result in Table 5.35 from hypothesis 6, revealed that distance e-learners from well-educated parents scored slightly higher than their counterpart but not significant. This may be because parent education plays a little role in the academic performance of distance e-learners but is not a predictor of academic performance of distance e-learners. This revelation contradicted previous studies (Chen, 2009; Kamau, 2013; Graetz, 2009; Pamela & Kean 2010; Kamau, 2013) who indicated that a significant relationship existed between parents' education and their academic performance. It is interesting note here that above studies were conducted with on-campus students, while a contrary finding surfaced under an e-learning setting. However, this study is in agreement with Pitan (2015) who found that parental education does not have significant influence on the distance learner's performance.

Table 5.37 supported the above findings and revealed that the ANOVA result was not significant at $F\ (1025) = .813$, $p = 0.487$. Therefore, we can conclude that their parent education does not affect distance e-learners' academic performance.

This quantitative analysis was supported by the following responses from qualitative part of the study:

> *A lot of parents are not educated but they want their children to be educated. They want them to be greater than them, to reach the top of their career.*
>
> *I came from rural area and my parents are poor. I choose within myself to be educated. That is why when I got the job and came to Open University to study under e-learning and my background doesn't contribute to my performance. I'm not influence by my parent education.*
>
> *Yes, if my Dad is not that educated he doesn't know much about education. You know I'm a female child and you know in those days female child don't go to school they end up in it kitchen. But my own parents are not like that. They believe woman can equally do what man can do.*
>
> *I think parent background and education has nothing to do with academic performance. They are some parents that are not educated but their children are performing, they are to provide the necessary things. Whatever you can get your laptop to facilitate your study.*
>
> *If my parents are much educated, infact, I must have graduated and gone far in education.*

No, I don't believe that environment influence academic performance the reason is that my parents are not educated. They didn't even know how to write zero but if you know what you are doing in your environment, background and parent education doesn't influence academic performance.

A lot of parents are not educated but they want their children to be educated. They want them to be greater than them, to reach the top of their career.

6.5.3 Family Income and Academic Performance

A majority of studies (Farooq et al. 2011; Nam & Huang, 2009; Dahl & Lochner, 2005; Egunsola, 2014) revealed that there was a significant relationship between family income and academic performance. However, the results of this study showed that there was no correlation between family income and academic performance (ACADPERF) as in shown in Table 5.39. This may be because majority of the distance e-learners are self-sponsored and independent of their parent's income. This study is not inconsistent with almost all the literature reviewed (see section 2.13.2) which found that there was a significant relationship between family income and academic performance. It is worthy of note that the above studies were conducted with on-campus students, while a contrary finding surfaced under an e-learning setting.

Table 5.39 revealed that distance e-learners from high income scored slightly higher than the rest but was not significant. This may because family income plays a small but not significant role in the academic performance of distance e-learners. Table 5.41 under hypothesis 7 revealed that the ANOVA was not significant at $F(1025) = .790$, $p = 0.500$. Therefore, there was evidence to accept the null hypothesis and conclude that there was no statistically significant difference between family income (high, middle, low and none/unemployed) and distance e-learners' academic performance. This implies that family income does not affect academic performance of distance e-learners.

6.6 Frequency of Engagement of ICT and Academic Performance

Interestingly the results did show that there is some relationship between frequency of engagement with ICT of distant e-learners and their academic performance. As stated in Chapter 3, frequency of engagement with ICT was measured on a scale of most frequent, frequent, occasionally and none. The relationship between frequency of engagement with ICT (FREQICT) and academic

performance (ACADPERF) was positive with significance or p-value = 0.000 as show in Table 5.43.

The result highlighted shows that there was a weak correlation between frequency of engagement with ICT and academic performance (ACADPERF). This may be because frequency of engagement with ICT plays a significant role in the academic performance of distance e-learners as a result of frequency of technology use. This may suggest that without engaging frequently with ICT, distance e-learners cannot participate actively under an e-learning setting. This result of this study is similar to that of Sosin et al. (2004), despite the difference in the location of the study, who found weak correlation and significant positive effect on student performance as a result of ICT use. This study is in contrast to that of Harman and Sato (2011), Jacobsen and Forste (2011) and Wentworth and Middleton (2014) who reported that frequency of cell phone use or frequency of technology use was negatively correlated with GPA.

According to Pallant (2016), the interpretation of strength of correlation depends on the research that has been conducted in a particular topic area. The result will be impressive if it predicted higher percentage than the results of other researchers in a particular topic area. Based on this, the researcher concluded that the present result is impressive because it is higher than that of Sun and Bradley (2010) who reported that the school computer use frequency grouping factor accounted for 2.4% of the variance of student academic achievement, whereas in the present study, frequency of engagement of ICT accounted for 4% of the variance of distance academic performance. According to them, the effects size indicated a weak relationship between the type of school computer use frequencies and academic achievement. The school computer use frequency grouping factor accounted for 2.4% of the variance of student academic achievement whereas in the present study, frequency of engagement of ICT accounted for 4%. This result is in contrary with Aypay (2010) who indicated that neither very frequent nor very little use of ICT improved student performance in PISA 2006. This study is in accordance with Anil and Ozer (2012) who found a positive correlation between frequent computer use and academic achievement. This study is in agreement with Katz and Macklin (2007) who reported that many students in Purdue University believed that frequent use of ICT had influenced their ICT skills, which eventually impacted on their academic achievement. This is consistent with the previous studies (Chang & Kim 2010; Notten & Kraaykamp 2009; Güven & Kosa 2008; Luu & Freeman 2011; Kubiatko &

Vlckova 2010; Spiezia 2010; Demir & Kiliç 2009) who reported that computer availability and use had positive effects on students' achievement. Seeing that this aspect of the study was consistent with other studies, one would want to believe that this further supports the finding that frequency of engagement with ICT does play a role in influencing academic performance. It is interesting to find that although other studies were conducted in developed countries, a similar finding surfaced in a developing country like Nigeria.

Table 5.45 under hypothesis 8 revealed that the ANOVA was significant at F (1025) =13.927, p = .000. Therefore, we can conclude that the higher the level of engagement with ICT, the higher the academic performance. The post-hoc test results under hypothesis 8 as shown in Table 5.46 revealed that there was a significant difference between most frequent user, moderate user, little users and none user. It therefore implies that most frequent user outperformed than the rest users. This result is supported by Wittwer and Senkbeil (2008) who found that there were differences in achievement if high-confidence ICT users (which they termed smart users) acquired the skills on their own, since they were engaged in problem-solving activities, as opposed to those who acquired skills with the help of others.

The quantitative analysis was supported by the following responses from qualitative part of the study:

> *My level of engagement with ICT improves me due to the program. I'm running in Open University, everything is in system and helps to know everything about computer. This ICT influence me in my study. It helps me to go deep.*
>
> *I use computer frequently. Yes, if I want to read or do anything, I'm away online 24/7 and that has helped me in my academic performance.*
>
> *Most frequently, in fact every second. When my phone is off, I feel uncomfortable. Since yesterday I don't have data on my set, is like something is missing. I don't know the word I can use but I say every second.*
>
> *Yes, when you are frequently with ICT, it helps you to solve ICT problems faster than people who don't have the knowledge.*
>
> *My frequent usage of computer, make it very easy for me to study online. It contributes to my academic performance.*
>
> *Had it been that I'm frequent, my present performance will be better.*

As I said early on, that I'm not really frequent but the little I know about it really influence my academic performance. Assuming that I'm frequent or most frequent my performance will be better.

The above result is further supported by the 3P Model since students' prior ICT knowledge is part of their activities prior to the time learning take place (student context), course curriculum, course materials or contents under an e-learning setting (institutional factor), engagement with ICT (learning activities or process) and the learning outcome, which is the academic performance (products). The results above highlighted the influence of student context (prior ICT knowledge) and learning activities (ICT engagement) on final learning outcome (students' academic performance). Both quantitative and qualitative results showed that deep learning approach influence academic performance of students, that is, most frequent users (deeper learners) scored higher than none or occasionally users (surface learners) (see Table 5.43 and Table 5.45

6.7 Previous/Entry Qualifications and Academic Performance

Conventional wisdom recommends that candidates with higher certificates at the point of entrance to the university are expected to perform higher than their counterparts with lower certificates. It is interesting to report that the results of this study established this wisdom. The results revealed that those admitted with a Masters qualification scored higher than those with lesser qualifications, although statistical significant was not established (See Table 5.47). This may be because a higher entry qualification plays a role in academic performance. However, the result showed that no correlation exists between entry qualification and academic performance of distance e-learners (see Table 5.47). This may be because a majority of the participants were admitted with lesser qualifications. Table 5.47 shows that more than half of the participants were admitted with high school certificates. This may also be because a majority of the participants do not possess entry qualifications related to computer or ICT use before they were admitted. This study contradicts Wambugu and Emeke (2012), Mutonga (2011), Adedeji (2001), Alias and Zain (2006), Zezekwa and Mudavanhu (2011), Lloyd and Thomas (2009), Bore, Munro and Powis (2009) and Barr (2010) who found that there was a significant correlation between entry qualification and academic performance of on-campus students. The findings of this current study are consistent with Moore and Kearsley (2005) and Olle-Momoh (u.d) who reported no statistically significant correlation between previous qualifications and academic performance of distance learners. Table 5.49 under hypothesis 9 supported the above findings and further revealed that the ANOVA result was not

significant at F (1025) =.989, p=.412. Therefore, the researcher concludes that that entry qualifications do not affect distance e-learners' academic performance.

This quantitative analysis was supported by the following responses from qualitative part of the study:

> *No correlation, then I read Accounting but now Mass communication. It was calculation and calculation but now reading and reading.*
>
> *My former school was traditional while the present is e-learning. There is no relationship. So, my previous qualification doesn't influence my present performance.*
>
> *Before I was admitted, I don't know how operate computer in former school where I have my ND talk less of searching for materials online but now I can operate computer, search for Internet, submit my TMA and do other things without being assisted. I can do e-exams on my own, submit my TMA and get course materials online. This is to tell you there is no link between my previous qualification and my present academic performance.*
>
> *The method is quite different because the old traditional method cannot be compared with the new. We are now in new age, the computer is everywhere even if you want to get employ you will use computer or you want to do any whatever.*
>
> *Therefore previous qualification has nothing to do with my present academic performance except for admission.*

6.8 Learning Styles and Academic Performance

Previous studies on learning style and academic performance of students are extensive but seem to be controversial. Some studies (Schulz, 2001; Byrne & Lyons, 2001 and Al-Hebaishi, 2012) revealed there was no significant relationship between learning style preferences and academic performance, while other studies (Thomas, Ratcliffe, Woodbury & Jarman, 2002; Wang et al., 2006; Soghra et al., 2013) revealed there was a significant relationship between learning style preferences and academic performance. The result of this study added to the literature that there was that there was no statistically significant correlation between learning styles and academic performance of distance e-learners. This may be so because having individual preferred learning style did not make an impact on academic performance of distance e-learners. Table 5.51 revealed that majority of participants indicated they preferred reading/writing but was not significant. This implies that distance e-learners' preferred learning style does not affect their academic performance.

Table 5.51 under hypothesis 10 further revealed that the ANOVA was not significant at F (1025) = .890, p = .469. Therefore, the researcher concludes that learning styles do not affect academic performance of distance e-learner. This study is also in consistent with Sparks (2006).

6.9 Learner-Content Interaction and Academic Performance

Previous studies (Nesliha & Mustapha, 2016; Ramos & Yudko, 2008) revealed that LCI plays a significant role in academic performance of distance or online students. However, this study showed there was no correlation between LCI and academic performance (ACADPERF) of distance e-learners as shown in Table 5.8. This may be because the interaction between distance e-learners and their course contents online do not play a significant role in academic performance of distance e-learners. This may also be because the amount of interaction that learners have with the content does not reflect in their academic performance.

Table 5.61 under hypothesis 12 revealed that the ANOVA was not significant at F (1025) = 1.614, p = .168. Table 5.61 also revealed there were no statistically significant differences between group means as determined by one-way ANOVA (F (1025) =1.614, p = .168)). Therefore, we can conclude that LCI does not affect academic performance of distance e-learners.

This result of the current study is in disagreement with Bernard, Abrami, Borokhovski, Wade, Tamim, Surkes and Bethel, (2009) who reported that learner-content interaction has a greater influence on learning outcomes in asynchronous settings. The result of the present study is in agreement with Picciano (2002) who did not find a statistically significant relationship between student interaction and participation in an online course.

6.10 Learner-Instructor Interaction and Academic Performance

Many studies (Diedrich, 2010; Nugent, 2009; Knoell, 2012) revealed that student-teacher interactions are significant to students' academic performance. However, the result of this study showed that no correlation exists between learner-instructor interaction and academic performance of distance e-learners as shown in Table 5.63 This may be because LII is not efficient enough to bring about effective learning that the learners need.

Table 5.65 under hypothesis 13 revealed that the ANOVA was not significant at F (1025) = 0.645, p = .631. Table 5.65 also revealed there were no statistically significant differences among group means as determined by one-way ANOVA (F (1025) =0.645, p = .631. Therefore, the researcher concludes that LII does not affect academic performance of distance e-learners.

This study is not in line with Agudo-Peregrina et al. (2014) who recommended that academic performance mostly depended on student-instructor and student-student interactions in Internet learning settings. This study is also in disagreement with Zhao, et al. (2005) who concluded in their meta-analytic research that of all the available forms of interaction in e-learning the most significant one is the student-teacher interaction. This study is also in contrast to Miyazoe and Anderson (2010) who revealed that the LII type of interaction is the most effective in distance learning situation.

6.11 Learner-Learner Interaction and Academic Performance

Many studies (Kolloff, 2011; Swan, 2002; Beaudoin, 2001; Roblyer & Ekhaml, 2000) have shown that LLI has positive impact or influence on academic performance of students. Interestingly, the results of this study showed that positive correlation exists between LLI and academic performance of distance e-learners although the strength of the correlation was very weak, as shown in Table 5.67. This may be because the online discussion forums among the learners play a role on the academic performance of distance e-learners. The role may be negligible because of the very weak correlation.

This study is in agreement with Rugendo (2014) who found that learner-to-learner interaction influenced academic performance of distance learners. This study is in line with Agudo-Peregrina et al. (2014) who reported that academic performance mostly depends student-student interactions in Internet learning settings. This study is also in agreement with Algahtani (2011) who found

there was a statistically significant correlation (at 0.01 level) in learning interaction through e-learning and academic performance of distance learners.

Table 5.69 under hypothesis 14 revealed that the ANOVA was not significant at F (1025) = 2.025, p = .089.

Table 5.69 also revealed there were no statistically significant differences among group means as determined by one-way ANOVA (F (1025) =2.025, p = .089)). Therefore, the researcher concludes that learner-learner-interaction does not affect academic performance of distance e-learners. Although Table 5.67 reveals that there was a correlation, it was very weak and that does not really affect academic performance.

In summary, when the overall sample was considered, LLI was the only factor that was significant, with very small weak correlation out of the three types of interactions discussed in this study.

However, when the sample was split into male and female, all the three types of interactions were significant for female distance e-learners but none was significant for male distance e-learner as explained (see Table 5.67).

There was a statistically significant correlation (r= .121**p=0.009) between learner-content-interaction and female distance e-learners' academic performance (see Table 5.67). This implies that a positive correlation does exists between LCI and academic performance (ACADPERF) of female distance e-learners although the strength of the correlation was weak. This may be because female distance e-learners are more actively engaged with course contents online than their male counterparts. It may also be that female distance e-learners improve productivity through LCI than their male counterparts. This may because the female learners prefer to discuss their course contents with their colleagues while the male counterparts prefer to learn on their own. The results of the study are in disagreement with Nesliha and Mustapha (2016) who reported that there was no statistically significant difference between the interaction and achievement means of the male and female students. The result also revealed there was a statistically significant correlation (r=.108*, p=0.018) between LII and female distance e-learners' academic performance (see Table 5.67).

This may be because female distance e-learners built a productive relationship with the instructor under an e-learning setting. This may also suggest that the female distance e-learners communicate and enjoy contacting their instructors online than their male counterparts. This finding was in line with a study by Coldwell, Craig, Paterson and Mustard (2008) who suggested that students who participated more frequently in discussion forums earned significantly higher grades. However, this result was in contrast with a study by Davies and Graff (2005) who found students who interacted more actively in the "blackboard" access did not achieve higher grades. The result revealed further that there was a statistically significant correlation ($r = .105^{*}$, $p = 0.023$) between LLI and female distance e-learners' academic performance (see Table 5.67). This implies that a positive correlation does exists between LLI and academic performance (ACADPERF) of female distance e-learners, although the strength of the correlation was weak. This may suggest that female distance e-learners prefer to interact with their colleagues on the discussion forum and build a productive relationship with their colleagues but their male counterparts prefer to learn on their own. This may also suggests that female distance learners with similar goals and objectives study together, which resulted in better academic performance because this brought about better understanding of course materials. This study is in consistent with Price (2006), Coldwell et al. (2008) and KunhiMohamed (2012) who reported female students were more actively engaged in online discussions and outperformed than their male counterparts in online courses. This finding is in contrast to Hoskins and van Hooff (2005) and Fink (2007) who found males to be more actively engaged in online discussions by comparison to females.

The ANOVA result further supported the above findings by revealing significant effect on female distance e-learners academic performance (see Table 5.67It was revealed that the ANOVA result was significant at $p < 0.05$ for LCI and LLI but not significant for LLI. Therefore, the researcher concludes that learner-content interaction and learner-instructor-interaction affect academic performance of female distance e-learners while LLI partially affects academic performance of female distance e-learners.

6.12 Work Experience and Academic Performance

It is a common belief that most of what people know and understand was learnt through experience, most people learnt through previous jobs, past experience, internships, and relationships with other people. However, the result of this study showed that students with 25 years and above work

experience scored slightly higher than those with lesser experiences but not significant (see Table 5.12). This may be because of their exposure, long years of experience, life experiences from their work, family social roles, and probably because of prior ICT skills. The result of the Spearman's Rho correlation revealed that no significant correlation exists between work experience and academic performance of distance e-learners. This may be so because work experience does not play a predicting role in academic performance of distance e-learners. The results of this study are in disagreement with Ibrahim et al. (2011) who revealed that experience predicts students' academic success at polytechnic institutions in Malaysia.

The qualitative part of this study clearly shows that ICT work experience influence of academic performance of distance e-learners. Those who had ICT experience in their place of work or former place of work commented they were able to cope and perform better than their counterparts under e-learning setting. Table 5.73 under hypothesis 11 revealed that the ANOVA was not significant at F (1.695), p = .133, and this implies that work experience does not affect academic performance. Contrary to the above result, the qualitative part of this study clearly shows that ICT work experience influences academic performance of distance e-learners. Those who had ICT experience in their place of work or former place of work commented that they were able to cope and perform better than their counterparts under an e-learning setting.

The following responses from qualitative part of the study:

> *Like where I worked before in accounting firm, we exposed to computer come here now make it easier. This has really contributed to my academic performance.*
>
> *Most of the thing in the company where I was working I did them on the system. I have ICT work experience. This has really influence my academic performance.*
>
> *Yes, my working experience has really influence my performance in this university because of my ICT background/experience and I was able to cope and excel under e- learning setting.*
>
> *I was able to perform because of ICT work experience. I have gone for different trainings on ICT. Assuming I don't know have knowledge of ICT, it will have affected my academic negatively.*
>
> *There is a correlation between ICT work experience and academic performance. My mates called me" guru" in the class but that is the result of my work experience. I have pre-knowledge of computer both theory and practical before I gained admission.*

6.13 Employment Status and Academic Performance

It is a general belief that students who are employed while studying will be distracted by work commitments. However, the results of this study showed that that there was a positive correlation between employment and academic performance (ACADPERF) of distance e-learners, which was statistically significant at 0.05 level of significance, but the strength of the correlation was weak, as shown in Table 5.71. This may be so because employment status plays a negligible role in academic performance of distance e-learners. This may also be because the mode of study under an e-learning setting is flexible and students learn at their own pace. However, Table 5.71 reveals that those who were not working scored slightly higher than their counterparts that were working, but the mean score was not significantly different. Table 5.73 revealed that the ANOVA was not significant: $F\ (1025) = 1.429\ p = 0.200$. The Tukey HD post-hoc test indicated that employed ($M = 4.754$, $SD = .6405$), working 1–39 hours per week did not differ significantly either from or among the group: Employed, working 1–40 hours per week ($M = 4.832$, $SD = .6716$), not employed, looking for work ($M = 4.858$, $SD = .6128$), not looking for work ($M = 4.877$, $SD = .6417$), retired ($M = 5.200$, $SD = .8367$) and disabled, not able to work ($M = 5.000$, $SD = .0000$) (see Table 5.74). The researcher therefore concludes that employment status does not affect academic performance of distance e-learners. The results of this study are in line with King (2002), Humphery (2006), Hunt, Lincoln and Walker (2004), Curtis and Shani (2002), Metcalf (2003), Curtis (2007) and Callender (2008) who reported that student employment had negative effect on their academic performance. It is worthy of note that although majority of these studies were conducted outside a Nigerian context, a similar finding surfaces in a Nigerian context.

6.14 Previous Academic Performance and Academic Performance

It is a common belief that a higher achiever in one educational level will always be a higher achiever in another higher educational level. The higher the grade in secondary schools, the higher the possibility of securing admission into Nigerian universities, colleges of education and polytechnics. The results of this study showed that there was a relationship between previous academic performance and academic performance (ACADPERF) of distance e-learners. As stated in Chapter 4, previous academic performance was measured on a scale of distinction, second class upper, second class lower, third class, pass and none. The relationship between previous academic performance ($r = .0.110$) and their academic performance is significant at $p = .000$, as shown in

Table 5.13. The results highlighted show that there was a weak correlation between distance e-learners' previous academic performance and their academic performance. This may be because higher achievers will always be higher achievers irrespective of their level of education. This suggests that the results of this study affirm the above belief.

Shuttleworth (2009) remarked that the basic assumption is that a high school pupil with a high GPA will achieve high grades at university. This study is consistent with that of Alstete and Buetell (2004), Cheung and Kan (2002) and Diaz (2002) who reported that previous academic performance was positively correlated with college students' performance online. This study is also in agreement with Hoffman and Lowitzki (2005), Schwartz and Washington (2002) and Mattson (2007) who reported that high school GPA was a successful positive predictor of success of at-risk students. Seeing that this aspect of the study was quite consistent with other studies, one would want to believe that this further supports the finding that previous academic performance does play a role in influencing academic performance. It is interesting to find out that although the majority of these studies were conducted in developed countries, a similar finding surfaces in a developing country like Nigeria.

Table 5.77 under hypothesis 16 revealed that the ANOVA was significant at $F(1025) = 8.412$, $p = 0.000$. The Tukey HSD post-hoc tests also indicated that the mean score for the distinction group ($M = 5.099$, $SD = .6383$) was significantly different from second class upper group ($M = 4.800$, $SD = 0.6107$), from second class lower group ($M = 4.758$, $SD = .6190$), from third class group ($M = 0.4550$, $SD = .8256$), from pass group ($M = 4.400$, $SD = .6325$) and from none group – those without grade ($M = 4.822$, $SD = .6433$) $p = 0.000$, 0.001 and 0.004 respectively. Therefore, the researcher concludes that higher the previous grade or previous academic performance, the higher the academic performance.

The above result is in line with 3P Model since previous academic performance is part of their activities prior to entering university (students' context-presage factors), course curriculum, course materials or contents under an e-learning setting (institutional factor-presage factor), all learning activities under an e-learning setting (learning activities or process) and the learning outcome which is the academic performance (products).

Those who were admitted with higher grade such as distinction (deep learner) performed higher than those with lower grade (surface learners) (see
Table 5.75 and Table 5.78).

6.15 Family Size and Academic Performance

Recent studies (Bowa, 2011; 2010; Ogweno et al., 2014) have revealed that there was negative correlation between family size and academic performance of students in both traditional and distance learning. The results of this study showed that a negative correlation does exist between family size and academic performance (ACADPERF) of distance e-learners, although the strength of the correlation was weak. It implies the lower the family size (number of children), the higher the academic performance of distance e-learners. This may be because distance e-learners with a smaller family will have more time to concentrate on their studies without distraction, unlike their counterpart with a larger family size, who will have many commitments outside their studies. This study is inconsistent with Bowa (2011) who reported a weak, negative correlation between family size and semester examination grades of distance learners. This study is in agreement with Ogweno et al. (2014) who found that students coming from a smaller family had a higher mean score as compared to students coming from larger family.

Table 5.81 under hypothesis 17 revealed that the ANOVA was significant at F (1025) = 7.424, p = .000, and we conclude that family size affects academic performance of distance e-learners. Table 5.79 revealed that those without any child (M = 4.878, SD = .6227) was significantly different from those with 3–5 children (M = 4.672, SD = .7082) at p = 0.15. Therefore, it can be concluded that the higher the family size, the lower the academic performance. Also, there was a significantly different between those with 5–9 children (M = 5.417, SD = .7930) and those that have 10 and above children (M = 4.200, SD SD = .7930) at p=0.011 but the result may not be significant because of the sample size of 5 and 12.

This quantitative analysis was supported by the following responses from the qualitative part of the study:

> *I'm a working person and I have kids. Is what I hear I remember? I don't have time to read and for my academic.*
>
> *My first-year result was very good but I perform woefully in my second year because it wasn't easy combining work and marriage with study.*

The same as above as I'm trying to combine work and family issues the study is not easy. There is no time to gather information or download course materials while on duty.

Assume there are no challenges of family issue and others, if one is a novice, he will improve while moving from one year to another.

The above result is in line with 3P Model since family size is part of activities before learning started (student context-presage factors), course curriculum, course materials or contents under an e-learning setting (institutional factor), e-learning activities (learning activities or process) and learning outcome are indicators for academic performance (products). Both quantitative and qualitative results showed that those with low family size have full concentration on their studies and perform better than those with higher family size because of family issues or commitments. Those with low family size can be likened to deeper learners while those with higher family size can be likened to surface learners (See Table 5.79 and Table 5.82).

6.16 Hours Spent on the Internet per Day and Academic Performance

Researchers such as Kheirkhah, Juibary and Gouran (2010), Wanajak (2011), Frangos, Frangos and Kiohos (2010) showed that students' addiction to the Internet resulted in failure in academic performance. However, the results of this study showed there was a relationship between hours spent on the Internet per day and academic performance (ACADPERF) as shown in Table 5.13. This implies that a positive correlation does exists between hours spent on the Internet per day and academic performance (ACADPERF) of distance e-learners although the strength of the correlation was weak. This may be because distance e-learners regularly use the Internet for educational purposes and it plays an important role for them to actively participate in discussion forums. This may also be because under an e-learning setting, the Internet is a knowledge tool which they cannot do without. This study is consistent with Rodgers (2008) who found that the effect of time spent online was significant and positive, such that one extra hour of e-learning participation is found to increase the module mark by approximately one percent. Consistent with the current study, Coldwell, Craig, Paterson, and Mustard (2008) reported that time spent online matters for achieving a better grade for learners. This study is in disagreement with YangKim (2009) who showed there was no statistically significant correlation between Internet use and academic achievement.

Table 5.85 under hypothesis 18 revealed that the ANOVA was significant at F (1025) = 2.771, p = .017, and we conclude that hours spent on the Internet per day affects academic performance of distance e-learners. Table 5.83 and Table 5.86 indicated that the mean score for the more than 12 hours group (M = 4.919, SD = .6346) was significantly different from that for the 0–2 hours group (M = 4.734, SD = .6628) at p = 0.028.

The researcher concludes that those who spent many hours on the Internet scored higher than those who spent few hours on the Internet per day. This is supported by Osunade, Ojo & Ahisu (2009) who found a significant difference in academic performance between those who had Internet access and those without. This quantitative analysis was supported by the following responses from qualitative part of the study:

> *We download our course materials/contents from the Internet and that have assisted me to improve on my academic performance.*
>
> *I'm away online, 24/7 and that has helped in my academic performance. I'm a data management student, anything about our course we always go online. And this has really help me to perform well at the end of the semester and shown in my result.*
>
> *I got a lot of information and development day by day through the Internet, ICT and this has reflected in my performance.*
>
> *Had it been that I don't know how to access Internet my performance will be lower.*
>
> *You know as for me by going to Internet everyday to get new, educational material/advices, it affect my educational performance.*

The above result is in line with the 3P Model since hours spent on the Internet per day is part of students' context (presage factors), download of course material, communication with colleagues, submission of assignment, reading online (learning activities or process) and learning outcome is the academic performance (products). Both quantitative and qualitative results showed that those who spent longer time on the Internet per day perform higher than those who spent less time. Those who spent more than 12 hours per day on the Internet per day (deep learners) scored higher than those who spent 0–2 hours on the Internet per day (surface learners) (see Table 5.83 and Table 5.86).

6.17 Hours Spent on Social Network per Day and Academic Performance

It is a common belief that social media or networks serve as a distraction to students' academic engagement. Interestingly, the result of this study showed that there was a significant correlation of 0.085 ($r = 0.085$, $p = .006$, $N = 1025$) between hours spent on social networks per day and academic performance (ACADPERF) as shown in Table 5.87. This implies that a positive correlation does exist between hours spent on social networks per day and academic performance (ACADPERF) of distance e-learners, although the strength of the correlation was weak. This may be because distance learning is completely dependent on social networking technologies. This may suggest that students are using social media for educational purpose like chatting with colleagues on assignment issues.

This study is in disagreement with Kirschner and Karpinski (2010) who found that there was a significant negative relationship between Facebook use and academic performance. The current study is also not in line with Negussie and Ketema (2014) who indicated that there was no significant relationship between times spent on social networks such as Facebook with students' GPA. Table 5.89 under hypothesis 19 revealed that the ANOVA was significant at $F(1025) = 2.283$, $p = .045$.

The researcher concludes that hours spent on social media per day affect academic performance of distance e-learners.

This quantitative analysis was supported by the following responses from qualitative part of the study:

> *I learn every day. I visit social media, Facebook, Twitter every day to get information you don't have the knowledge before.*
>
> *Through this, I visit it every day to gain more knowledge. My focus on social media is for educational purpose.*
>
> *Through this, I visit social media everyday to gain more knowledge. My focus on social media is for educational purpose.*
>
> *In NOUN, we created a blog like a mini website; we have social activities on the blog. You pull your question out even for your lecturers, we have lecturers, counsellors and they on it in form of interaction*

Social media do influence my performance because through it, we are duly inform of the latest information go on. The interaction on social media is not only for social activities but for educational purpose.

The above result is in line with 3P Model since hours spent on social media per day are part of students' context (presage factors), interaction on social media to exchange ideas, chatting and messaging with instructors and fellow students on social media (learning activities or process) and learning outcome is the academic performance (products). Both quantitative and qualitative results showed that those who spent longer hours spent on social media per day perform higher than those who spent lesser hours. Those who spent longer hours on social media per day can be likened to deeper learners while those who spent fewer hours can be likened to surface learners.

6.18 Hours Spent on a Computer for Studies per Day and Academic Performance

Previous studies (Torres-Díaz, 2016, Wittwer and Senkbeil, 2008 and Hunley et al., 2005) revealed there was no relationship between academic performance and computer use for educational purposes. The results of this study show that no significant correlation exists between hours spent on a computer for studies per day and academic performance (ACADPERF) of distance e-learners. This may be because a majority of the students spent few hours on computer studies per day. However, Table 5.91 under hypothesis 20 reveals that the ANOVA was significant at $F(1025) = 4.062$, $p = .003$. This may be because those students who used a computer for educational purposes did benefit academically, irrespective of the hours spent, compared to those who did not use a computer for educational purposes.

The result of the Tukey HD post-hoc test indicated that the mean score for the none group – those who are not using a computer for studies ($M = 4.286$, $SD = .5606$) was significantly different from those using a computer for studies between 1 and 2 hours per day ($M = 4.850$, $SD = .6718$) at $p=0.001$. There was significant different in mean score between none –t hose who are not using computer ($M = 4.286$, $SD = .5606$) and those who use computer for studies between 3 and 5 hours per day ($M = 4.823$, $SD = .5983$) at $p=0.002$, there was significant difference in mean score between none ($M = 4.286$, $SD = .5606$) and those who use a computer for studies for 5-9 hours per day ($M = 4.862$, $SD = .5819$) at $p=0.001$(See Table 5.91 and Table 5.94). Therefore, the researcher concluded that hours spent on a computer for studies affected academic performance. This study is in consistent with Lee et al. (2009) who found in their study that students who were utilising

computer 1 hour per day had better maths scores. This study is in disagreement with Ponzo (2010), Bielefeld (2006), OECD (2010), Biagi and Loi, (2013) and Papanastasiou (2006) who found that there was a negative correlation between computer use for educational purposes and students' academic performance.

The above result is in line with the 3P Model, since hours spent on a computer for studies per day are part of students' context (presage factors), course contents, curriculum design, assessment procedure (teacher context), reading or learning with computer, online activities such as downloading of course material on PC (learning activities or process) and learning outcome in academic performance (products). The quantitative results showed that there was a significant effect on those who used a computer for studies, unlike those who did not. Those who use computer for studies (deeper learners) perform higher than zero users (surface learners) (See Table 5.91 and Table 5.94).

6.19 Splitting of Data Based on Faculty of Study and Learning Style

When the data was split based on faculty of study; it is interesting to know that none of the 10 significant variables were significant to Law and Management Science distance e-learners. This may be because the variables captured above were not the variables that influence their academic performance. As a result of this, there is a need to further research on factors influencing academic performance of distance e-learners in the faculties of Law and Management Science.

As shown in Table 5.14 for those in the faculty of Agriculture, frequency of engagement with ICT is the only variable where correlation exists between it and academic performance. This may be because frequency of engagement with ICT plays a vital role in the academic performance of distance e-learners in the faculty of Agriculture and there may be other important variables outside the variables under investigation. The qualitative part of the study may reveal those variables and this will be treated in Chapter 8. This implies that the higher the frequency of engagement with ICT of the distance e-learners in the faculty of Agriculture, the higher is his or her academic performance.

Table 5.14 revealed that for those in the faculty of Art and Social Science, frequency of engagement with ICT, students' ICT literacy level, previous academic performance and LLI were the variables where positive significant correlations were found to exist with academic

performance of distance e-learners at a 5% level of significance. This may be because these variables play an important role in academic performance of distance e-learners in faculty of Art and Social Science and probably predict their academic performance. It implies that as these variables increase, so also their academic performance increases.

Table 5.14 revealed that for those in the faculty of Education, frequency of engagement with ICT and students' ICT literacy level were the only variables where positive significant correlations were found to exist with academic performance of distance e-learners at 5% level of significance. This could suggest these variables play an important role in their academic performance and there may be other important variables outside the variables under investigation. The qualitative part of the study may likely reveal those variables and this will be treated in Chapter 8.

Table 5.14 revealed that for those in the faculty of Health Science, frequency of engagement with ICT, students' ICT literacy level, hours spent on the Internet per day and hours spent on social media per day were the variables where positive significant correlations were found to exist with academic performance of distance e-learners at a 5% level of significance. It implies that the higher these variables, the higher the academic performance of Health Science students. It is interesting to note here that the faculty of Health Science recorded the highest correlation on the variables compared to other faculties. They have more impact on their academic performance compare to others. This may be so because Health Science distance e-learners constantly engaged with ICT, Internet and social media for their academic requirements than the other faculties. This may also because they are more actively involved in discussion forums. Unfortunately, this result cannot be generalised because of the small sample size of 61.

For those in the faculty of Science and Technology as shown in Table 5.14**,** frequency of engagement with ICT, students' ICT literacy level and hours spent on the Internet per day were the only three variables where positive significant correlations were found to exist with academic performance of distance e-learners at a 5% level of significance. This may be because they play an important role in their academic performance. One would have expected the Faculty of Science and Technology to record the highest correlation in the area of ICT engagement, students' ICT literacy levels and hours spent on the Internet because this is the faculty where we have students studying computer science, but the reverse was the case. This may be because the academic

performance of distance e-learners does not depend on the course of study or area of specialisation. This was supported by qualitative study part of the study as quoted below:

> *The academic performance doesn't depend on your course of study but determination to excel. I don't agree that students in computer science will perform better than those of us in Law or other disciplines under e-learning setting. Even if you are not computer literate but you can determine to be one.*
>
> *The course of study does not determine the academic performance of students under e-learning setting. What determine my performance is the interest and the knowledge of ICT.*
>
> *Course of study has nothing to do with academic performance of students under e-learning setting but determination and interest do.*
>
> *The course of study does not determine the academic performance of students under e-learning setting. What determine my performance are the interest and the knowledge of ICT.*

Furthermore, when the data was split based on learning style, as one will be expected under frequency of engagement with ICT and students' ICT literacy level, visual, which has to do with seeing, has the highest correlation (See Table 5.15). This was followed by auditory, which has to do with listening, followed by reading/writing, which has to do with reading text or course materials on a computer and the least should be kinaesthetic, which has to do with doing. Visual learners require ICT skills in order to organise learning to suit their learning style and to actively participate in discussion forums with their instructors and colleagues. Auditory learners learn by listening to the VCD that contains their course contents which was given to them by the university at the beginning of each semester. Reading and writing learners learn by taking in information displayed as words. They learn best by learning materials that are primarily text-based. Kinaesthetic learners learn best through a hands-on approach. This result is in keeping with the psychology behind it.

It is worth noting that visual e-learners recorded highest variation in all the variables as shown in Table 5.15. This may because the variables under investigation are the major variables that play a significant role in academic performance of visual e-learners. This may also be because some of these variables are strong predictors of academic performance of visual distance e-learners. It can be seen from the table that out of 10 significant variables, eight of them were significant for visual e-learners.

6.20 Conclusion

This chapter discussed the results of research question one, the quantitative data collected using the questionnaire. The results were supported by the qualitative part of the study. After testing all the variables with both Spearman's correlation and post-hoc tests, the researcher therefore concluded that students' ICT literacy level, frequency of engagement with ICT, marital status, previous academic performance, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and family size do affect academic performance of distance e-learners. In addition to the above, researcher also concluded that socioeconomic status, gender, previous qualification, LCI, LII, learning style, work experience, age, employment, and LLI do not affect academic performance of distance e-learners. The 3P model of teaching and learning was used to further explain the above results, especially those that were found to have effect on academic performance. Chapter 7 presents the results of research question two.

7. RESULTS OF RESEARCH QUESTION TWO

Research question two: What is the best predictor of academic performance of distance e-learners?

7.1 Introduction

One of the objectives of this research was to develop a predictive model that is able to identify the factors that influence academic performance of distant e-learners. In order to determine the best predictor, the researcher adopted ordinal regression analysis because it is appropriate to use when the dependent variables are categorised variables with at least three options and are ordinally scaled. According to Çokluk (2010), the categories must be coded in an ordered way, from low to high in the ordinal regression analysis. Ordinal logistic regression (OLR) is used to predict an ordinal dependent variable with one or more independent variables. O'Connell (2006) remarked that OLR uses highest likelihood estimation to envisage the likelihood of an exact class of outcome in the dependent variable.

Hoffmann (2004) observed that OLR should be used when developing models to predict ordinal variables. Garson (2012) and Levy (2006) explained that OLR adopted categorical independent variables to predict the likelihood of the percent of variance in the dependent variable. In this study, the OLR model used the independent variables students' ICT literacy level, socio-demographic characteristics, frequency of engagement with ICT, socioeconomic status, interactive learning, learning styles, student entry/previous qualification, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and work experience to predict the probability of the ordinal dependent variable, namely academic performance of distance e-learners.

As indicated by SPSS (2002), the SPSS Ordinal Regression Procedure, or PLUM (Polytomous Universal Model), is an extension of the general linear model to ordinal categorical data. SPSS Ordinal Regression Procedure has five link functions as well as scaling parameters. As noted by Norusis (2008), ordinal regression is a special case of generalised linear models in which the logit function is used to establish the relationship between independent variables and the ordinal dependent variable. Chen and Hughes (2004) stated that ordinal regression analysis has two major link functions, logit link and the complementary log-log (cloglog) links which are used to design

a particular model. There is no clear strategy to differentiate the choice of using different link functions. According to Chen and Hughes (2004), the logit link is widely suitable for analysing the ordered categorical data evenly circulated among all categories. The cloglog link may be used to analyse the ordered categorical data when higher categories are more preferable. For the purpose of this study, the logit link functions were used but if the analysis failed to yield significant models or failed to meet the parallel lines assumption, the complementary log-log link was run to check whether it yields enhanced outcomes.

7.2 Parameter Estimates

The parameter estimates summarise the effect of each predictor variable. The signs of the coefficients for both covariates and factor levels enable the researcher to have accurate and deep understanding of the impacts of the predictors on the model. In the case of covariates, positive and negative coefficients indicate a positive (inverse) relationship between the outcomes of predictors. In the case of covariates factors level, a factor level with a greater coefficient reveals a greater chance of being in one of the higher cumulative outcome categories. Factor level's effective relative to the reference determines the sign of a coefficient based upon that category. For the purpose of this study, covariate is applied as explained above.

7.3 Goodness-of-Fit

Goodness-of-fit Pearson is widely used in statistics to determine the degree of the relationship between the linear related variables. Deviance is a likelihood ratio test used under full maximum likelihood. The deviance can be regarded as a measure of lack of fit between model and data. In general, the larger the deviance, the poorer the fit to the data. The deviance is usually compared to deviances from other models fitted to the same data. The difference between the deviances D0 and D1 has a large-sample chi-square distribution with degrees of freedom equal to the difference in the number of parameters estimated. The null hypothesis states that the observed data are consistent with the fitted model. The null hypothesis is accepted and one concludes that the observed data were consistent with the estimated values in the fitted model since the p was insignificant, $p=1.00 > 0.05$.

7.4 Model Fitting

The model fitting information table gives the -2log likelihood (-2LL as above) values for the baseline and the final model, and SPSS performs a chi-square to test the difference between the -2LL for the two models. The significant chi-square statistic ($p \leq 0.005$) shows that the final model gives a significant improvement over the baseline intercept-only model. This shows that the model gives better predictions than if one just guessed based on the marginal probabilities for the outcome categories.

7.5 Test of Parallel Lines

This is commonly referred to as the test of parallel lines because the null hypothesis states that the slope coefficients in the model are the same across response categories and lines of the same slope are parallel. Applying the parallel lines test tests if the regression coefficients are not significantly different across levels of the response variable. Since the ordered logit model estimates one equation over all levels of the response variable, the test for proportional odds tests whether our one-equation model is valid. The assumption is not violated if this test returns a finding of non-significance, meaning there is no significant difference between the models where the regression lines are constrained to be parallel for each level of the ordinal dependent compared to the model where the regression lines are allowed to be estimated without a parallelism constraint. In Table 7.1, the non-significant value shows that the assumption of parallel lines is met.

7.6 Pseudo-R-Square

Pseudo R^2 methods are used to estimate the coefficient of determination. There are three types of pseudo R^2 known as: (1) Cox and Snell; (2) Nagelkerke; and (3) McFadden. The model with the largest R^2 statistics is best according to this measure. As noted by Field (2009), the Cox and Snell pseudo R^2 value was difficult to interpret, and the Nagelkerke value was considered and this value revealed that the percentage of the dependent variable was explained by the independent variables. Silva and Abreu (2010) argued that the name pseudo was because these coefficients look like R-squared in the sense that they were on a similar scale, ranging from 0 to 1 with higher values indicating better model fit. The pseudo R-square is calculated depending upon the likelihood ratio. The Cox and Snell's coefficient is an attempt to imitate the interpretation of multiple R-square based on the log likelihood of the final model versus the log likelihood for the baseline model, but

its maximum value can be (and usually is) less than 1.0, making it difficult to interpret. The Nagelkerke's coefficient is a modification of Cox and Snell undertaken to ensure that the result is between 0 and 1. This is achieved because the Nagelkerke's R^2 divides Cox and Snell's by its maximum in order to achieve a measure that ranges from 0 to 1. Nagelkerke's R^2 is normally higher than the Cox and Snell measure. Silva and Abreu (2010) also remarked that McFadden's coefficient is a less common pseudo R^2 variant, based on log likelihood kernels for the full versus the intercept-only model. In this study, the value of Nagelkerke was considered.

The model for this study involves ACADPERF (Academic Performance) as the dependent variable and the independent variables (explanatory) are students' ICT literacy level (ICTLITC), socio-demographic status (age, gender and marital Status), frequency of engagement with ICT (FREQICT), socioeconomic status (parent education, home background, family income), interactive learning (LLI, LII, and LCI), learning styles, student entry/previous qualification, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and work experience. The dependent variable academic performance of distance e-learners was measured on ordinal scale; as a result of this, ordinal regression was chosen as a better choice over other options. The researcher used OLR because the assumptions of multiple linear regressions were not met. OLR does not support the linearity assumption in the relationship between independent variables and dependent variable, unlike MLR. SPSS PLUM (Ordinal regression analysis) procedure was performed to determine the prediction of academic performance of distance e-learners.

The current study followed a systematic procedure for designing, evaluating and interpreting an ordinal regression model as explained by Chen and Hughes (2004), Iyare (2016) and Elamir Sadeq (2010). According to them, the following are the guidelines for building, evaluating, and interpreting the ordinal regression model.

1. The potential explanatory variables must be examined to determine if they should be included in the model.
2. The outcome variable (dependent variable) was coded or labeled as ordered, ranked, and categorical values.

3. The complete and the reduced models along with the logit link and the complementary log-log (cloglog) link were used to generate the candidate models. The complete model contained all the explanatory variables while the reduced model included a subset of the predetermined explanatory variables.
4. The best model was chosen among all models based on the model fitting statistics, the accuracy of the classification results, the validity of the model assumption, and the principle of parsimony. Based on the principle of parsimony, the reduced models should be considered as the ideal models if the above screening criteria are met. Larasati et al. (2011) parsimony means that a model does not need to include some variables if, by excluding those variable from the model, the existing independent variables will be sufficient to explain the outcome variables. According to Larasati et al. (2011), the minimum number of independent variables in the model is a critical decision in building a regression model. They further stated that as a rule of thumb, the recommended minimum ratio of the number of independent variables to the sample size is 1:10. Therefore, the number of independent variables could be determined by dividing the number of valid responses/questionnaires by 10.

In accordance with the above procedure, the following regression models were constructed by entering all the explanatory (independent) variables under investigation in this study into the model which is called a complete model, according to Chen and Hughes (2004). Thereafter, those that were significant in the complete model were entered into another model called the reduced model, using both logit link and the complementary log-log (cloglog) link to determine the best model. The best model was because the model assumptions were met or parallel lines assumptions were not violated.

After a critical and a thorough study of the models below, it is obvious to conclude that the only model and the best model that does not violated all the assumptions of ordinal regression as explained earlier is the complete model using logit function as shown in Table 7.2, Table 7.3, Table 7.4 and Table 7.5. All other models violated the assumptions of ordinal regression in one way or the other.

Table 7.1: The Summary of Best Model

	Model of Fitting	**Goodness-of-fit**	**Test of Parallel Lines**
✓ Complete model (*Logit function)*	Not violated See Table 7.3 P<0.05	Not violated See Table 7.4 P>0.05	Not violated See Table 7.6 P>0.05
Reduced model (*Logit function*)	Not violated See Table 7.8 P<0.05	Violated See Table 7.9 P<0.05	Not violated See Table 7.11 P>0.05
Complete model (*Complementary Log-log)*	Not violated See Table 7.13 P<0.05	Not violated See Table 7.14 P>0.05	Violated See Table 7.16 P<0.05
Reduced model (*Complementary Log-log)*	Not violated See Table 7.18 P<0.05	Violated See Table 7.19 P<0.05	Violated See Table 7.21 P<0.05

Source: Developed by the researcher for this study

Henceforth, the study will concentrate on the best model which is the complete model using logit function (Table 7.1).

Table 7.2: Parameter Estimates on Explanatory Variables Associated with Academic Performance of Distance E-Learners Based on Complete Model Using Logit Link

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[ACADPERF = 2.0]	-4.257	1.198	12.629	1	.000	-6.605	-1.909
	[ACADPERF = 3.0]	-1.752	.720	5.917	1	.015	-3.163	-.340
	[ACADPERF = 4.0]	1.843	.671	7.541	1	.006	.527	3.158
	[ACADPERF = 5.0]	5.011	.691	52.657	1	.000	3.657	6.364
Location	Marital status	.123	.052	5.601	1	.018	.021	.225
	Previous Qualification	.150	.077	3.774	1	.052	-.001	.302
	FREQICT	.427	.108	15.699	1	.000	.216	.639
	ICTLITC	.351	.097	13.043	1	.000	.160	.541
	PrevAcadN	.076	.036	4.408	1	.036	.005	.146
	FamilySize1	-.148	.113	1.714	1	.190	-.369	.073
	Gender	-.229	.133	2.975	1	.085	-.489	.031
	Age	.000	.099	.000	1	.997	-.193	.194
	Employment	.098	.072	1.862	1	.172	-.043	.239
	Work experience	-.026	.041	.394	1	.530	-.107	.055
	Home background	.004	.067	.004	1	.950	-.127	.136
	Learning Style	-.037	.055	.464	1	.496	-.145	.070
	Intconperday	.056	.067	.703	1	.402	-.075	.187
	Soicialnetperday	.009	.068	.018	1	.892	-.124	.143
	ComputerStd	-.129	.077	2.829	1	.093	-.280	.021
	LLI	.110	.098	1.253	1	.263	-.082	.301
	LII	-.166	.106	2.452	1	.117	-.373	.042
	LCI	.073	.123	.353	1	.552	-.168	.315
	Family Income	.054	.064	.712	1	.399	-.071	.179
	PARENTEDU	-.028	.087	.107	1	.744	-.199	.142

Link function: Logit.

The parameter estimates table above describes specifically the relationship between explanatory (independent) variables (IV) and the academic performance (DV) On complete model using logit link. The parameter estimates show that the model was significantly related to frequency of engagement with ICT at ($\beta = .427$, Wald = 15.699, $p < 0.01$); Students' ICT literacy level at ($\beta = .351$, Wald = 13.043, $p < 0.01$); Marital Status at ($\beta = .123$, Wald = 5.601, $p < 0.05$); previous academic performance at ($\beta = .076$, Wald = 4.408, $p < 0.05$) and as well as previous qualification at marginally significant at ($\beta = .150$, Wald = 3.774, $p = 0.052$).

The standard statistical level of significance, $p < 0.05$ was used for the OLR analysis used in this study. The Wald statistic value in ordinal regression is a measure of the relative predictive strength of explanatory (independent) variables for dependent variables. The higher the Wald statistic value the more predictive the independent variable is of the outcome-dependent variable. In order to make comparison easy, the majority of findings were presented in order of the Wald statistic value which is represented by "Wald" Egdorf (2013). According to Egdorf (2013), the statistical estimates show the direction of the results of the findings. It depends on how independent variables were coded; a negative estimate could result to an inverse relationship with the outcome (dependent) variable.

Chen and Hughes (2004) suggested that for appropriate explanation of the ordinal regression model, researchers should first look at the signs of the regression coefficients. These signs give a great deal of insight into the effects of the explanatory variables on the ordinal outcome. The positive regression coefficient indicated that there was a positive relationship between the explanatory variable and the ordinal outcome. For the opposite direction, the negative regression coefficient indicated that there was a negative relationship between the explanatory variable and ordinal outcome. If the logit link (or cloglog link) was a choice of the modelling equation, the magnitude (e.g., odds or $e\beta$) of the effect of a specific explanatory variable would be used to indicate that an average of one unit change on a specific explanatory variable affect the change of the odds (or relative risk) of the event occurrence by a factor of $e\beta$, holding other explanatory variables as constant.

In this study, all the significant variables were positive and were explained below based on the suggestion of Chen and Hughes (2004).

For frequency of engagement with ICT, we would say that for a one unit increase in frequency of engagement with ICT (i.e. going from 0 to 1), we would expect a 0.43 increase in the ordered log odds towards a higher level of academic performance, given that all of the other variables in the model are held constant. For students' ICT literacy level, we would say that for a one unit increase in students' ICT literacy level, we would expect a 0.35 increase in the log odds towards a higher level of academic performance, given that all of the other variables in the model are held constant. For marital status, we would say that for a one unit increase in marital status, we would expect a 0.12 increase in the log odds towards a higher level of academic performance, given that all of the other variables in the model are held constant. For previous academic performance, we would say that for a one unit increase in previous academic performance, we would expect a 0.08 increase in the log odds towards a higher level of academic performance, given that all of the other variables in the model are held constant. For previous qualification, we would say that for a one unit increase in previous qualification, we would expect a 0.15 increase in the log odds towards a higher level of academic performance, given that all of the other variables in the model are held constant.

Table 7.3: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	1960.989			
Final	1867.128	93.862	20	0.000

Link function: logit

The effect of each explanatory variable in the model need was determined in order to know whether the model improves our ability to predict the outcome. This was done by comparing a model without any explanatory variables (the baseline or "Intercept-Only" model) against the model with all the explanatory variables (the "final" model). The final model is then comparing with the baseline to see whether it has significantly improved the fit to the data. The model fitting information table gives the -2log likelihood (-2LL) values for the baseline and the final model, and a chi-square has been performed to test the difference between the -2LL for the two models. In the current study, the statistically significant chi-square statistic ($p < .001$) as shown in Table 7.2 indicated that the final model is a significant improvement over the baseline intercept-only model.

This reveals that the model gives predictions that are better than chance, based on the marginal probabilities for the outcome categories.

Table 7.4: Goodness-of-Fit

	Chi-Square	Df	Sig.
Pearson	3424.011	3996	1.000
Deviance	1859.027	3996	1.000

Link function: logit

Table 7.4 shows that Pearson's chi-square statistic for the model as well as another chi-square statistic based on deviance. These statistics are intended to test whether the observed data is consistent with the fitted model. If null hypothesis is not rejected (i.e. p-value is large) as in case of this study, it can be concluded that the data and the model predictions are similar and that we have a good model. In another way, if we reject the assumption of a good fit (if $p < .05$), then the model does not fit the data well. The results for this study suggest the model does fit very well $p = 1.000$ ($p > .05$).

Table 7.5: Pseudo R-Square

Cox and Snell	.088
Nagelkerke	.102
McFadden	.047

Link function: logit

Table 7.5 presents a summary of Pseudo R^2 which indicates the proportion of variations in the outcome variable accounted for by the explanatory variables. Since the Cox and Snell Pseudo R^2 value was 0.88, this suggested that the model was able to explain 8.8% of the variation in the model. The Nagelkerke Pseudo R^2 value was 0.102, suggesting that the model was able to explain 10.2% of the variation in the model. The McFadden Pseudo R^2 value was 0.047, suggesting that the model was able to explain 4.7% of the variation.

Table 7.6: Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Null Hypothesis	1867.128			
General	1804.179[a]	62.949[b]	60	.372

Link function: logit

Table 7.6 presents a summary of the test of parallel lines. Based on test of parallel lines, the -2log likelihood null hypothesis model (1867.128) was not significantly different from the -2log likelihood general model (1804.179), (Chi-square = 62.949, df = 60, $p > 0.05$). The null hypothesis stated that the located parameter (slope coefficients) is the same across response categories. This indicated that the assumption of test of parallel was not violated and the model is well fitted.

Table 7.7: Parameter Estimates on Explanatory Variables Associated with Academic Performance of Distance E-Learners Based on Reduced Model Using Logit Link

		Estimate	Std. Error	Wald	Df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[ACADPERF = 2.0]	-3.938	1.057	13.884	1	.000	-6.010	-1.867
	[ACADPERF = 3.0]	-1.436	.451	10.155	1	.001	-2.320	-.553
	[ACADPERF = 4.0]	2.136	.368	33.689	1	.000	1.415	2.857
	[ACADPERF = 5.0]	5.260	.405	168.847	1	.000	4.467	6.054
Location	Marital status	.162	.035	21.314	1	.000	.093	.231
	FREQICT	.420	.105	16.137	1	.000	.215	.625
	ICTLITC	.323	.092	12.427	1	.000	.143	.502
	PrevAcadN	.083	.035	5.508	1	.019	.014	.152
	Previous Qualification	.113	.074	2.345	1	.126	-.032	.257

Table 7.8: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1005.544			

Final	926.264	79.280	5	0.000

Link function: logit

Table 7.9: Goodness-of-Fit

	Chi-Square	Df	Sig.
Pearson	1186.683	1059	.004
Deviance	625.319	1059	1.000

Table 7.10: Pseudo R-Square

Cox and Snell	.074
Nagelkerke	.087
McFadden	.040

Link function: logit

Table 7.11: Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	926.264			
General	901.741	24.523	15	.057

Link function: logit

Table 7.12: Parameter Estimates on Explanatory Variables Associated with Academic Performance of Distance E-Learners Based on Complete Model Using Complementary Log-Log

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[ACADPERF = 2.0]	-5.197	1.075	23.354	1	.000	-7.305	-3.089
	[ACADPERF = 3.0]	-2.705	.490	30.462	1	.000	-3.666	-1.745
	[ACADPERF = 4.0]	.637	.402	2.511	1	.113	-.151	1.425
	[ACADPERF = 5.0]	2.601	.408	40.603	1	.000	1.801	3.402
Location	Maritalstatus	.102	.031	10.836	1	.001	.041	.163
	PreviousQualification	.098	.046	4.536	1	.033	.008	.188
	FREQICT	.182	.064	8.186	1	.004	.057	.306
	ICTLITC	.193	.058	11.117	1	.001	.079	.306
	PrevAcadN	.052	.021	5.926	1	.015	.010	.094
	FamilySize1	.016	.067	.054	1	.816	-.116	.147
	Gender	-.111	.078	2.008	1	.156	-.265	.043
	Age	.008	.059	.021	1	.886	-.107	.124
	Employment	.063	.043	2.173	1	.140	-.021	.147
	Workexprience	-.020	.024	.704	1	.401	-.068	.027
	Homebackground	.003	.040	.007	1	.933	-.075	.081
	Learningstyle	-.019	.032	.345	1	.557	-.083	.045
	Intconperday	.042	.040	1.150	1	.284	-.035	.120
	Soicialnetperday	-.010	.040	.059	1	.808	-.089	.069
	ComputerStd	-.078	.046	2.950	1	.086	-.167	.011
	LLI	.075	.058	1.691	1	.194	-.038	.189
	LII	-.116	.063	3.396	1	.065	-.240	.007
	LCI	.091	.073	1.547	1	.214	-.052	.234
	FamilyIncom	.004	.038	.011	1	.916	-.070	.078
	PARENTEDU	-.010	.051	.038	1	.845	-.111	.091

Link function: Complementary Log-log

Table 7.13: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	1960.989			
Final	1883.720	77.270	20	0.000

Link function: Complementary Log-log

Table 7.14: Goodness of Fit

	Chi-Square	Df	Sig.
Pearson	3541.561	3996	1.000
Deviance	1875.619	3996	1.000

Link function: Complementary Log-log.

Table 7.15: Pseudo R-Square

Cox and Snell	.073
Nagelkerke	.085
McFadden	.039

Link function: Complementary Log-log.

Table 7.16: Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Null Hypothesis	1883.720			
General	1797.918[a]	85.801[b]	60	.016

Link function: Complementary Log-log.

Table 7.17: Parameter Estimates on Explanatory Variables Associated with Academic Performance of Distance E-Learners Based on Reduced Model Using Complementary Log-Log

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[ACADPERF = 2.0]	-5.278	1.022	26.665	1	.000	-7.281	-3.274
	[ACADPERF = 3.0]	-2.786	.358	60.554	1	.000	-3.488	-2.084
	[ACADPERF = 4.0]	.553	.222	6.193	1	.013	.118	.989
	[ACADPERF = 5.0]	2.497	.232	115.978	1	.000	2.042	2.951
Location	Marital status	.095	.021	20.774	1	.000	.054	.136
	FREQICT	.182	.061	8.779	1	.003	.062	.303
	ICTLITC	.182	.054	11.211	1	.001	.076	.289
	PrevAcadN	.051	.021	6.038	1	.014	.010	.092
	Previous Qualification	.086	.044	3.876	1	.049	.000	.172

Link function: Complementary Log-log

Table 7.18: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	1005.544			
Final	941.735	63.809	5	0.000

Link function: Complementary Log-log

Table 7.19: Goodness of Fit

	Chi-Square	Df	Sig.
Pearson	1509.229	1059	.000
Deviance	640.790	1059	1.000

Link function: Complementary Log-log.

Table 7.20: Pseudo R-Square

Cox and Snell	.060
Nagelkerke	.071
McFadden	.032

Link function: Complementary Log-log.

Table 7.21: Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Null Hypothesis	941.735			
General	902.583[a]	39.152[b]	15	.001

Link function: Complementary Log-log.

Based on the above, the following model is being proposed as the best predictors of academic performance of distant e-learners in Nigerian universities. The discussion of the model follows in the next chapter.

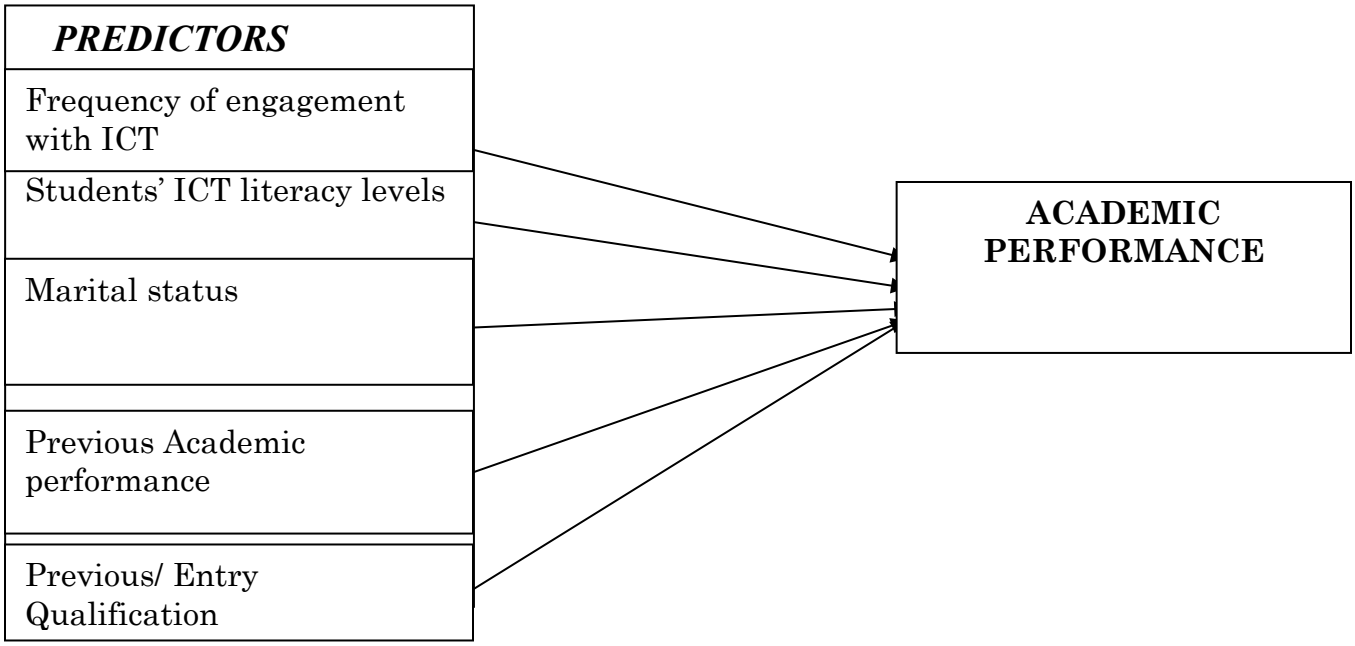


Figure 7.1: A final model for measuring the effect of e-learning on distance e-learners' academic performance

This study revealed that the developed model (Table 7.1) has the potential to be used in measuring the effect of e-learning on academic performance of distance e-learners in Nigerian universities and other higher institutions. The results obtained from a mixed-method approach indicated that frequency of engagement with ICT, students' ICT literacy levels; marital status, previous academic performance and previous qualification are significant measurable predictors of the model. The model developed by the researcher for the purpose of this study is important because it will guide policy makers, university managements and other educational stakeholders in measuring the effect of e-learning on academic performance so as to understand the position of e-learning for justifying the total investment in learning context. This will serve as the contribution of the study to the body of knowledge.

7.7 Conclusion

This chapter explained in detail the procedures for designing, evaluating and interpreting an ordinal regression model without violating parallel lines of assumptions. The chapter explained the process of constructing complete and reduced model using both logit link and the complementary log-log (cloglog) link and how to determine the best model for the study in

progress. This chapter concluded that the only model and the best model that does not violated all the assumptions of ordinal regression as explained is the Complete model using logit function as shown in Table 7.2, Table 7.3, Table 7.4, Table 7.5 and Table 7.6, and this was used for this study. The model revealed that frequency of engagement with ICT, students' ICT literacy levels, marital status, previous academic performance and previous qualification are the best predictors of academic performance.

Chapter 8 discusses the results of research question two and answers research question three using the qualitative part of the study. The chapter also discusses the new themes which emerged from the qualitative part of the study.

8. RESEARCH QUESTION THREE AND DISCUSSION

8.1 Research Question Three

Research question three: How and why do these factors affect academic performance of distance e-learners in the way they do?

All the explanatory variables were evaluated by using an ordinal regression analysis to determine the best predictors of academic performance on the dependent criterion variable academic performance (ACADPERF) as explained above in Chapter 7.

The parameter estimates show that the model was significantly related to frequency of engagement with ICT at ($\beta = .427$, Wald = 15.699, $p < 0.01$); students' ICT literacy level at ($\beta = .351$, Wald = 13.043, $p < 0.01$); marital Status at ($\beta = .123$, Wald = 5.601, $p < 0.05$); previous academic performance at ($\beta = .076$, Wald = 4.408, $p < 0.05$) and as well as previous qualification at marginally significant at ($\beta = .150$, Wald = 3.774, $p = 0.052$). After all, the models as shown in Tables 7.2 to 7.6 were subjected to the assumptions of the ordinal regression model. It was found that a complete model using logit function was the best model with strong statistics as shown in Tables 7.2 to 7.6 having obeyed all the assumptions of the ordinal regression model. Table 7.2 shows that a complete model using logit function revealed that the best predictors of academic performance are frequency of engagement with ICT followed by students' ICT literacy level, marital status, previous academic performance and previous qualification. It must not be misconstrued that those explanatory variables were not significant in the model do not play a role in distance e-learners' academic performance but they are not reliable or consistent predictors of academic performance.

8.2 Frequency of Engagement with ICT as Predictor of Academic Performance

Table 7.2 revealed that the coefficient for the frequency of engagement with ICT was 0.43 and was statistically significant. For every unit increase in frequency of engagement with ICT, a 0.43 unit increases in academic performance of distance e-learners was predicted, holding all other variables in the model constant. It implies that as the students' frequency of engagement with ICT increases (from none to most frequent users), they have a high tendency of earning higher grades. This may be because frequency of engagement with ICT improved the level of knowledge,

provision of access to studying through a variety of methods and eradication of time constraints or barriers. This may also be because the distance e-learners used ICT extensively in the university to access course materials online, continuous assessment, communication and interactions. The university has a discussion (interaction) forum called "ilearn" a forum where students interact with their colleagues or interact with their facilitators to share ideas (see collaborative learning theme below). For the distance e-learner to be involved in discussion forums actively, they must be frequent users of ICT.

The above quantitative result was supported by the following responses from qualitative part of the study:

> *Yes although I'm not frequent but I believe if I'm frequent on the system or I'm a frequent user, I will perform better than my present performance.*
>
> *Engagement with ICT helps me to have more knowledge of what is taught in the school and make you to understand more.*
>
> *I'm not really frequent but the little I know about it really influences my academic performance. Assuming that I'm frequent or most frequent my performance will be better.*
>
> *We do most things online. If you are not frequent with your computer is not going to be easy for you to be an excellent student. If you are given course materials to study, if you are not satisfy with what is there you have to go online to clarify some issues.*
>
> *If though you are perfect on system, if you are using it every day you will see a new thing different from what you know before. So, the more you familiar with the way you get another thing from it. Familiarity with computer leads to high performance.*

This study is consistent with Rodgers (2008) who found that one extra hour of e-learning engagement increases the module mark by 1.035% and later concluded that greater e-learning engagement leads to better academic performance. This study is consistent with Rodgers and Ghosh (2001) who found that engagement levels were highly significant in determining student examination performance but it was conducted in a non e-learning context. This study is also consistent with Carini et al (2006) who found that student engagement predicts school grades.

8.3 Students' ICT Literacy Level as Predictor of Academic Performance

Table 7.2 reveals that the coefficient for the students' ICT literacy level was 0.35 and was statistically significant. For every unit increase in student ICT literacy level, a 0.35unit increase in

academic performance of distance e-learners was predicted, holding all other variables in the model constant. It implies that as the students' ICT literacy level increases (from none to high ICT literacy level), they have a high tendency to earn higher grades. This may be so because ICT literacy is necessary for distance e-learners during their years of study under an e-learning setting, and lack of ICT literacy could lead to poor academic performance. It implies that students under an e-learning setting cannot cope without ICT literacy; they either learn it or must be ready to drop out of the program. ICT literacy determines their academic performance. This may be because ICT is used at almost all the stages of the students' study cycle, namely the application stage, the admission stage, the registration stage, the learning stage, the evaluation stage and the transcript stage. In all these stages, they are expected to be ICT literate so as to carry out these assignments. This will enable them to access their course materials online.

The above quantitative result was supported by the following responses from the qualitative part of the study:

> *Be average student, this really affected me because there are some things that I can't do on my own without consulting computer guru. Had it been that I'm expert I wouldn't seek the assistance of guru.*
>
> *It really affects my academic work because any assignment I want to do, I will search the Internet or google it. If I have acquired the knowledge of ICT that I don't have before, I believe that I will perform better in my examination.*
>
> *When I was newly admitted into this university, I was a novice, I don't know how to operate computer at all. I consulted my colleagues and they taught me the steps and procedure to follow during examination. From there, I acquired a perfect knowledge. The first examination was poorly affected but I was able to perform excellently in my second exam.*
>
> *When I got here, I don't know about computer but gradually I begin to know moreso in my year3. I believe if I get to year 4, I will perform better than this. I can say I perform better in my year 2 better than year1.*

This study is consistent with Andreoli (2014) who indicated there was a significant relationship between the students' academic performance and their computer literacy i.e. the higher computer proficiency, the higher the scores of the students in the distance learning course. This study was supported by Miller et al., (2003) as quoted by Welsh (2007) who reported that students who have weak computer skills are at risk of falling behind as they try to master the online technologies involved in navigating through the course.

8.4 Marital Status as a Predictor of Academic Performance

Table 7.2 revealed that the coefficient for the marital status was 0.12 and was statistically significant. For every unit increase in marital status, a 0.12 unit increases in academic performance of distance e-learners was predicted, holding all other variables in the model constant. This implies that marital status was a determinant of academic performance of distance e-learners. As explained under research question one, this study revealed that single distance e-learners perform better than their married counterparts. This may be because of challenges associated with marriage, pregnancy and child bearing. There is a tendency for married distance e-learners to have carryovers (re-sit examinations) because of the problems associated with marriage.

The above quantitative result was supported by the following responses from qualitative part of the study:

> *Trying to combine work and family issue with study is not easy. Assume there is no challenges of family issue and others, if one is a novice, he will improve while moving from one year to another.*
>
> *My first year was okay, I read very well because I was excited for gaining admission but now it has dropped because I was not engaged or married then.*
>
> *Esh! My brother let me not deceive you, my colleagues have not mentioned one point probably because they are still single. I think marital life determines academic performance.*
>
> *Assuming, I have not married I will perform far better than my present performance in respective of my year of study or course of study.*

This study supported Oladejo et al (2010) who reported that marital status is a predictor of distance e-learners' academic performance. This study is similar to the study conducted by Yess (2009) on the influence of marital status on the academic performance of 240 community college students in the US. He found that marital status was a significant predictor of achievement among community college graduating students. This study is in consistent with Petrol (2010) who found that marital status is a good predictor of the academic achievement of NCE students in Kashim Ibrahim College of Education. This study supported Oladejo et al. (2010) who reported that marital status is a predictor of distance e-learners' academic performance.

8.5 Previous Academic Performance as Predictors of Academic Performance

Table 7.2 revealed that the coefficient for the previous academic performance was 0.08 and was statistically significant. For every unit increase in previous academic performance, a 0.08 unit increase in academic performance of distance e-learners was predicted, holding all other variables in the model constant. This implies that as the students' previous academic performance increases (from ordinary pass to distinction), they have tendency to earn higher grades. This may be because candidates who had a distinction or first class in their former school are likely to graduate with the same grade, all things be equal.

According to Wolfe and Johnson (1995), as quoted by Luo et al. (2014), 19% of the variance in institution GPA can be predicted by high school GPA. Hoffman and Lowitzki (2005), Schwartz and Washington (2002) and Mattson (2007) reported that high school GPA was a successful positive predictor of success of at-risk students.

This study is in disagreement with Huws and Talcott (2006) who opposed the view that previous academic performance is a predictor of academic performance of students.

8.6 Previous/Entry Qualification as Predictors of Academic Performance

Table 7.2 revealed that the coefficient for the previous or entry qualification was 0.15 and was statistically significant. For every unit increase in previous or entry qualification, a 0.15unit increase in academic performance of distance e-learners was predicted, holding all other variables in the model constant. This implies that as the students' entry qualification increases (from SSCE to Masters), they have a tendency to earn higher grades. This could also suggest that students with a high entry qualification may perform better than those with a low entry qualification. This may also be because there was a link between the previous qualification and the present course of study and probably the students were trained, certificated in ICT or had a diploma in computer-related courses before admission. However, the correlation result showed there was no correlation existed between entry qualification and academic performance. Contrary to the correlation result, the model revealed that previous qualification was one of the predictors of academic performance. The following responses were extracted from the qualitative part of the study may be the reasons

why previous qualification was suggested by the model as a predictor of academic performance of distance e-learners.

> *I have SSCE, NCE and B.A.Ed before I was admitted at NOUN. So, I have qualifications before I was admitted. The qualifications are my base. I will build on then. They have a link and surely there is a link because of ICT certification.*
>
> *I studied computer and presently I'm studying Computer and Mathematics. What I have studied before is the same thing but with little different. I also have computer background in my secondary school and this has influence my academic performance.*
>
> *After my secondary school, I was exposed to computer training and this serves as background when I gained admission into NOUN. I have knowledge of computer-related courses. This really contributes to my academic performance.*
>
> *Yea, it does if there is a link. I'm an SSCE and ND holder of UNILAG, I studied Human Kinetic and later I proceed for my NCE at Osun State College of Education. I did Biology/Integrated Science and I landed here studying Integrated Science.*
>
> *If you have gone to higher institution before NOUN, it will go along way in assisting you. You can't compare yourself with somebody from high school and carry the materials and go, it will be somehow cumbersome and hectic for high school students coming down here to performance well.*

This study is consistent with the study conducted by McKenzie, Gow and Schweitzer (2004) who reported that previous qualification assumes an important part in predicting students' learning outcomes. Wambugu and Emeke (2013) reported that entry qualification is the predictor of a quality student.

The coefficient of pseudo R^2 of 10.2 as shown in Table 7.5 indicates that the model containing the above variables is likely to be a relatively poor predictor of the academic performance of distance e-learners. The relatively low pseudo R^2 (10.2) does not refute the influence of independent variables that are found significant. The model only accounted for 10.2% of the factors influencing the academic performance of distance e-learners. This may suggest that there might be other predictors that may play a vital role in the academic performance of distance e-learners which are not included in this model. This was addressed by the focus group interview (qualitative part of the study) conducted by the researcher and this is discussed below. This low percentage may be because only one semester result was considered for this study. As observed by the researcher in the literature review, the majority of the studies carried out on these variables were focused on on-campus students, and this may be another cogent reason accounting for the low percentage. This

study is similar to Owino (2013) who investigated four independent factors (hours spent online, gender, location setting and subject) in his study and accounted for 54.5% of academic performance of both convention mode and e-learning mode of learning. According to him, a further 45.5 per cent of academic performance was attributed to other factors, not investigated in his study. Owino's study focused on both the conventional mode and e-learning mode of learning while the current study focused only on students under an e-learning setting.

8.7 Themes from Qualitative Analysis

The researcher conducted focus group interviews with the aim of getting qualitative responses from the participants on factors affecting academic performance of distance e-learners. This assisted the researcher to explain the quantitative results in detail. This was supported by (Creswell, 2013).

The following new themes emerged from the qualitative part of the study after transcription.

8.7.1 Computer Reliance and Knowledge

The participants commented that without a computer they cannot do anything under an e-learning system of learning and this indicates their total reliance on computers. They believed that their computer knowledge assisted them in using a computer for various activities. This is what the participants had to say:

> *Without computer knowledge, I wouldn't be able to do anything, due to computer age that is the reason. It is everything will do with computer. If I don't have knowledge of computer, I will not be able to perform under e-learning setting.*
>
> *Let me say in our Open University here, without computer knowledge you can't do anything.*
>
> *By handling the computer, I improve on it as I'm using the computer by studying, by reading through the computer. As I'm using the computer, I understood more of my subject areas.*
>
> *When I got to NOUN, I learnt more about computer because I'm going to use computer for exam and other things. When I got here I used computer often, everyday, regularly. Even though, I'm planning to have café on my own.*

My computer knowledge makes me to perform in e-exams better than pen-on-paper exams because we are in computer age. People are ready to sit down with computer rather than sit down with book and read.

So, I can say with my computer, it influences my performance, even in my exam I'm having good grade. I work with computer a lot. I don't have computer knowledge before I was admitted, I only have elementary knowledge.

8.7.2 Benefit of Internet

The participants commented that the benefit from Internet usage in term of downloading useful materials, Google searching for relevant information and for electronic examination has really influence their academic performance.

The following are extracted from the responses of the participants:

I opened my laptop searched for all cases online as a Law student and I was able to download them.

I think we are learning in higher way because you have to go deep and deep down search by yourself and study on your own before facing the examination

It affects my academic performance because searching for what you don't know and bring it to academic world boost your ego. When you are talking of ICT, it goes wide you have to go Internet to google to gain one or two things.

We download our course materials/contents from the Internet and that have assisted me to improve on my academic performance.

I got a lot of information and development day by day through the Internet, ICT and this has reflected in my performance. Had it been that I don't know how to access Internet my performance will be lower.

Do your assignment, your TMA even doing it at home online is part of ICT. It really influences performance because doing assignment you have to google, search the net.

The following previous studies supported the results of the finding:

Asdaque, Khan and Rizvi (2010) found that students who used the Internet for downloading assignments and books/journals had a higher CGPA compared to those who used the Internet for purposes other than assignments or downloading software/songs. Ogedebe (2012) reported in his study that 79% of his participants agreed that Internet improved their academic performance.

Siraj et al (2015) concluded that high Internet usage brings about better academic performance because the Internet gives students the benefits of entering the information.

Salam et al. (2011) remarked that there has been growing concern regarding the risk of excessive Internet usage but it cannot be prevented because of the many benefits linked to the Internet.

8.7.3 Prior ICT Experience

Almost all the participants were unanimous in supporting that prior ICT experience influenced distance e-learners' academic performance. They commented that those who have ICT experience will likely perform higher than their counterparts without ICT experience because of their mode of study.

The following extracts indicate that prior ICT experience influenced academic performance of distance e-learners:

> *Like where I worked before in accounting firm, we exposed to computer come here now make it easier.*
>
> *If one has prior ICT experience, it will add like 100% contribution to his present academic performance.*
>
> *If you are study English without prior ICT experience, it might affect your academic performance. In short, ICT experience determines the academic performance.*
>
> *I was able to perform because of ICT experience. I have gone for different trainings on ICT. Assuming I don't know have knowledge of ICT, it will have affected my academic negatively.*
>
> *There is a correlation between ICT work experience and academic performance. My mates called me" guru" in the class but that is the result of my work experience. I have pre-knowledge of computer both theory and practical before I gained admission.*
>
> *With my ICT previous experience it make me know that this is the keyboard, monitor unlike those who are not having previous experience. There is different between person who is able to hold mouse before been admitted and those who cannot. The mostly different is the background.*
>
> *It really helps me because I was working in a computer company as an engineer where I do interact with computer at times. I do engineer work all these stuffs with computer. So, I have some much interest in computer before getting to school and it impacted expensive*

and good thing into my career. When I get here to use computer to do my exam and test, it wasn't a problem for me and it influences my performance very well.

The researchers Alavi et al. (2002), Lee et al. (2001), Marks, Sibley, and Arbaugh (2005) reported that students' prior knowledge with online mode of learning was found to have significant effects on their current distance education background. They also found that students who had previous online courses performed better than their counterparts who are new to online mode of learning. Barlow-Jones and Westhuizen (2013) revealed that the computer-literate students performed significantly better during the first semester compared to the computer-illiterate students. They reported that computer-illiterate students indicated that the lack of computer experience influenced their ability to pass computer-related subjects.

8.7.4 Collaborative Learning

Almost all the participants commented positively that the interactive (i-learn) forum at NOUN brings about collaborative learning. According to the participants, the forum enabled them to come together to share ideas and knowledge in their areas of specialisation with their colleagues, university staff and facilitators. Those who are not constantly on the forum also agreed that the forum helps them to have collaborative learning among their colleagues and facilitators across the nation and thereby influences their academic performance. The researcher observed that if this variable was captured in the questionnaire, it would probably be the best predictor of distance e-learners' academic performance.

The following extracts indicate that collaborative learning affects academic performance of distance e-learners:

It helps to share our ideas with students from other study centres. We are being using it very good for us. We have seen a lot of past questions. It really helps in our exam and test.

You meet different people you have not come across before; he/she shed more light on what you don't know before. If you are the one that know the topic, you bring the topic and started chatting on the topic. I think it really helps.

This is an interaction forum, an i-learn blog when you are entering on the blog everyday and you are close to your departmental students. They will discuss something that will sink to your brain because the questions you pulled you will see many ways of solving them. You will see many things there in educational aspects. The social aspect is also there because when we are not social we can't organise ourselves. This has really contributed to my academic performance because we share ideas and knowledge on that i-learn.

We interact with facilitators, colleagues from other centres all over the country. This is a forum where people come together to share ideas.

The usefulness of that i-learn is that anybody from other universities can log in because many useful materials are there for students to make use of. People interact there, to exchange ideas and share knowledge.

On getting there, you put the question on the forum. Is there anybody that can show more light about this particular subject matter and before you know people from different study centres will respond, you will be enlightened. This will definitely contribute to my performance.

It gives room for interaction with students from other centres not only Akure centre across the whole centres in the federation. They are sometime you can get past question, likely questions when you answer them.I think that has really helped me in one of my exams, the likely questions that may come out in the examination. When you practice it, it becomes part and parcel of you. That interaction forum really influences my academic performance.

The result above was supported by previous studies (Lamb & Johnson, 2007; Jones, 2010; Chawner & Lewis, 2013) who remarked that collaborative learning assisted students to interact with each other by participating in online discussions and sharing the knowledge gathered with one another. This study is consistent with the findings of researchers Bliss and Lawrence (2009) who reported that group work through computer-mediated collaboration brings about improvement in academic performance, interaction and critical thinking. This study is also in agreement with Kumar et al. (2017) who found that collaborative mobile learning and individual e-learning resulted to improved academic performance among the students in contrast to the traditional method.

8.7.5 Parent Influence – ICT Literacy

Some participants commented that their parents' ICT literacy influenced their academic performance positively. They commented that they were earlier introduced to computer by their parents because they were ICT literate, and they were also encouraged by their parents.

Below are some of their responses.

Because my father is educated, he introduced me to computer so that I can have more knowledge. He did so because he is ICT literate/compliance. What I can't get in the school and I will get it online. That is why my parents supported me. Although what one do continuously will become part of him.

He bought palmtop for me, being a computer and ICT literate. In short, my parent ICT education really influences my academic performance.

I think this has influenced my academic performance because of his ICT literacy and the knowledge transferred. My Dad is computer literate, being an educated person. There is a widely know philosophy that we are in computer age and everybody believe this is true. So, being an educated person he was the one that asked me how to do you do your TMA? Don't you need a computer? Don't you need a phone to do those things? He bought palmtop for me, being a computer and ICT literate. In short, my parents' ICT education really influences my academic performance.

They are computer literate. Assume they are not computer literate; it will not influence my performance.

The results of this finding are consistent with the study conducted by Adekunle et al. (2014) to determine the relationship between parents' computer literacy and academic performance of computer science students. They concluded that there was a significant relationship between the two.

The result of the finding is similar to the study carried out by Valcke, Bonte, Wever and Rots (2010) on the impact of parenting style on the Internet use of primary school pupils. They found that that parental style, parent Internet behaviour and parents' educational background significantly predicted the Internet usage of children at home.

8.7.6 Self-Efficacy and Motivation

The participants totally disagreed that their courses of study do not influence their academic performance in any way under e-learning during the focus group interview but their self-efficacy and motivation do. They participants vehemently agreed in the qualitative part of the study that under an e-learning setting, those with high self-efficacy and motivation will likely perform higher than their counterparts with low self-efficacy and motivation.

The following quotes were extracted from their responses:

The academic performance doesn't depend on your course of study but determination to excel. I don't agree that students in computer science will perform better than those of us Law under e-learning setting. Even if you are not computer literate but you can determine to be one.

The course of study does not determine the academic performance of students under e-learning setting. What determine my performance is the interest and the knowledge of ICT.

The academic performance doesn't depend on your course of study but determination to excel. I don't agree that students in computer science will perform better than those of us Law under e-learning setting. Even if you are not computer literate but you determine to be one.

Course of study has nothing to do with academic performance of students under e-learning setting but determination and interest do.

The fact my colleague is study computer doesn't indicate that he will perform better than me. What matters is how to manipulate computer not course of study.

The course of study does not determine the academic performance of students under e-learning setting. What determine my performance are the interest and the knowledge of ICT.

In my year 1, I happened to be the one that scored highest mark in CIT 100 which is a general computer course and despite that the fact that I'm not study computer. This was possible because of self motivation/ determination.

Everything being equal 1+1=2, computer science may have edge over others but not everybody due to determination. The way they use it may be a little fast but due to determination one can perform well irrespective of course of study. If I work harder I can beat the person in computer whether is e-learning setting or not.

I don't believe that the person in computer technology can perform more than me studying agricultural extension management since e-learning system is not until you know the whole computer before you can operate system. The whole thing is for you to get yourself prepare for the examination with computer. So far you know how to operate computer, I don't think those in computer technology can perform better than me. It depends on your seriousness and how you concentrate not the course of study.

These researchers supported the above comments that self-efficacy influences students' academic achievement: Joo et al. (2013), Mega et al. (2014) and Caprara et al. (2011). Consistent with the above were Abd-Elmotaleb and Saha (2013) who remarked that students with high senses of self-efficacy have a tendency to engage in challenging tasks and show excellent academic performance in comparison with students who lack such confidence. The comments are also in line with Meral (2012) et al who reported that self-efficacy is an important variable on students' academic performance and self-efficacy has more influence on academic performance than socioeconomic variables.

8.7.7 Progressive Use of Computer and Benefits

The participants commented that as they were progressing in computer usage for educational purposes from year to year, so also their academic performance improves. They also commented

that the more they continue to progress in computer usage for their learning, the more improvement in their knowledge which reflects positively in their academic performance.

The following are extracted from their responses:

> *Every year I can see that I'm upgrading, adding more knowledge to my knowledge.*
>
> *My first year was easy because I was average in term of ICT but now I'm improving and we did general course then but now we are on three unit course, congent courses. It takes reading and browsing. This really contributes to my performance.*
>
> *What I have not been exposed to, I think every semester, and I'm exposed to it. So that it has improved my knowledge.*
>
> *You know as an empty student, it is very compulsory for the students that have just been admitted in any university to be developing academically. In my first semester of 100 level, I experienced many things and knew a lot of things and in my second year I also know a lot of things. The knowledge I acquired in my 100 level has nothing to do with that of 200 level. The knowledge I acquired in my 200 level is very advance. Even it helps to be a student that can speak publicly and to have confidence in myself confidence. In short my year of study has a lot to do my academic performance.*
>
> *When I first got in first semester, everything was new. I will perform better because things are no longer new and my feets are on ground.*
>
> *Because of the school I am right now. We do most of the things online. Because of my frequent engagement with ICT, I'm able to learn more.*
>
> *I will perform better in my year 2 because things are no longer new and my feets are on ground.*
>
> *There is an improvement in year by year. I was a Novice in ICT in my year 1 but I observed rapid improvement in year2 likewise year 3.*

The researcher therefore concluded that the factors listed above may account for the larger percentage of the factors influencing academic performance of distance e-learners.

8.8 Discussion of 3P Model of Teaching and Learning

PRESAGE

PROCESS

PRODUCT

STUDENT CONTEXT
(My variables)

- Prior ICT knowledge,
- Entry Qualification
- Learning style
- Socio-demographic factors
- Socio-economic factors

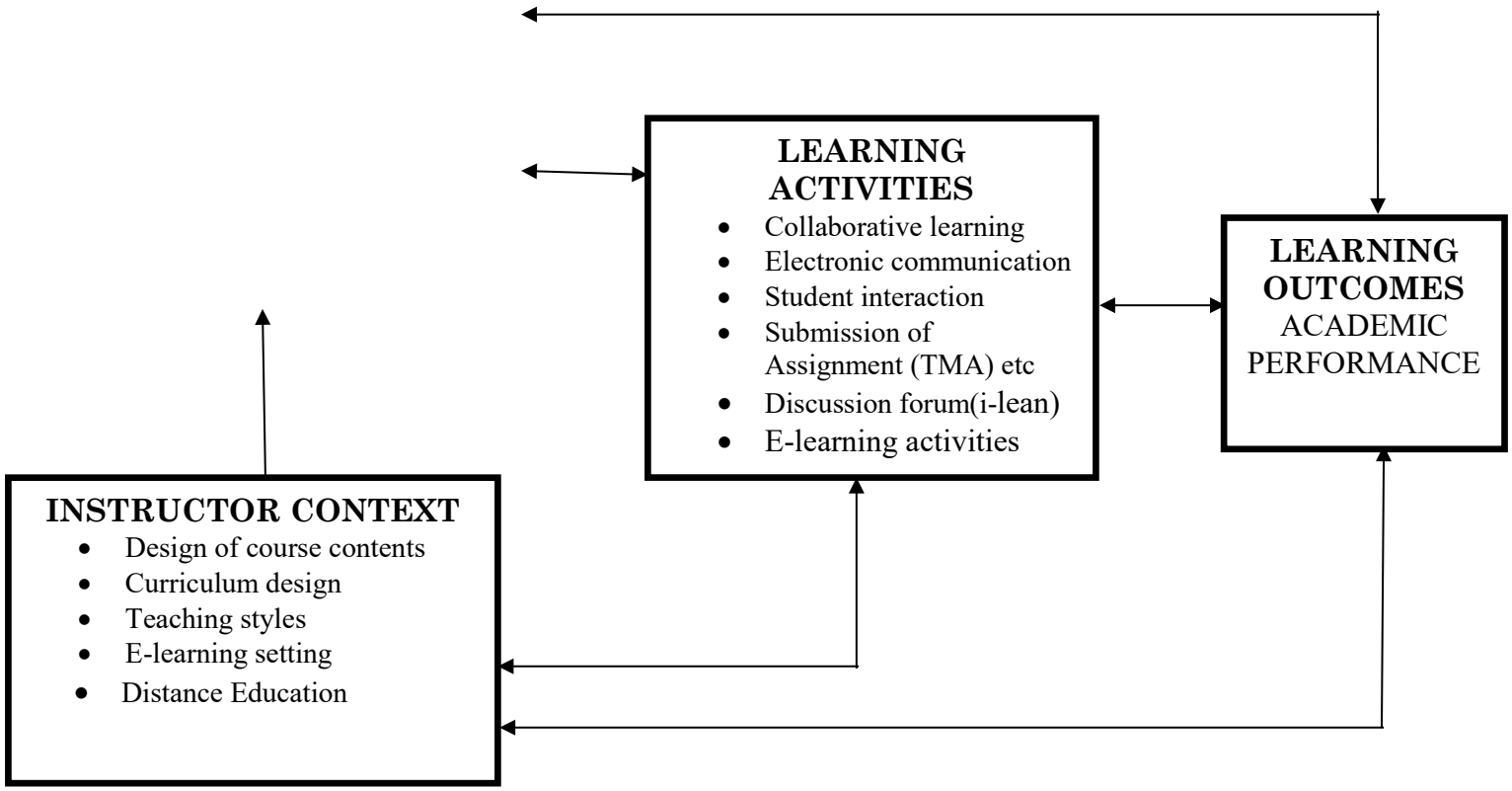


Figure 8.1: 3P Model of teaching and learning adapted from Biggs (1999)

The 3P model proposed by Biggs (1999) (Figure 8.1) explains why students learn in different ways and how students' approach to teaching is related to quality of learning and outcome. The model integrates teaching-, student- and process-based approaches to learning. According to the 3P model, learning is seen as a progression from presage (learning context) through process (learning acts) to products (learning achievement). Presage factors exist prior to actual engagement in learning and comprise both teaching and student presage factors. The two stages of presage factors interact. Student presage factors measure the learning-related characteristics such as abilities, prior knowledge, motivation, personality, learning styles, and stabilised learning approaches. Teaching presage factors focus on teacher behaviour and the role of the learning environment (e.g. course structure, curriculum content, method of teaching and assessment, classroom climate). Process variables include the actual activities that take place in the classroom. The process part of the model starts with the interaction of student characteristics and learning environment. This interaction determines students' perceptions, and the perceptions drive the strategies selected for

handling the task. The last construct in the model, product, describes the outcomes achieved in the learning process.

As elaborated in Chapter 2, it has been indicated that different factors influence academic performance of students. The 3P Model of learning approach outlined the influence of presage, process and product factors (Figure 8.1) which was adopted in this study. The three stages are applicable to this study, fit the model, and the variables are explained as they are related to this study.

In the context of this study, the first stages have been conceptualised to include the variables such as socio-demographic factors (age, gender, marital status), socioeconomic factors (family income, home background), hours spent on the Internet and social media, previous academic performance, learning style, previous qualification and work experience are classified according to the model as the first stage of presage factors. The second stage of presage factors, called institutional factors, have been conceptualised to include learning under an e-learning setting, designing of course contents, curriculum design, teaching style etc. The next stage is referred to as the process stage, according to the model, and includes activities or events that take place under an e-learning environment such as electronic communication, collaboration, discussion forums, e-learning engagement, student interaction, submission of TMA, writing e-exams, pen-on-paper exams, checking of results online etc. Process stages gave birth to interaction between student factors and institutional factors in presage factors. The interaction affects students' immediate and ongoing approach to a specific learning task. In this study, the learning outcomes or products refer to students' academic performances and were determined using the previous semester's results. Take, for instance, the results of this study that revealed that hours spent on the Internet per day influence academic performance of distance e-learners. To perfectly fit into the model, previous (before the university study) academic performance must have a connection with learning approach at university, associated with academic performance at university, and also influence the way distance e-learners assess their learning environment (e-learning setting). Also, hours spent on the Internet per day must have a link with learning approach at university, associated with academic performance at university, and also influence the way distance e-learners assess their learning environment (e-learning setting).

From all the presage factors, the variables students' ICT literacy levels, frequency of engagement with ICT, marital status, previous academic performance, family size, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day were proved to have a significant effect and influence academic performance (product). In light of this, the researcher used the 3P Model to further explain the results in Chapter 6. The variables age, gender, family income, parent education, home background, employment, work experience, LCI, LII, learner-learner interaction etc., although they fall into the category of presage factors, did not show a significant effect and they did not influence the academic performance (product). Due to their non-significance, they were not related to the 3P model.

The qualitative responses in this study are likened to the perception of the distance e-learners (process stage). According to the participants, although it was not quantitatively proved that collaboration learning (learning activities), that is, the process of exchange ideas and knowledge among their colleagues and facilitators influence their academic performance (learning outcome). Before students will be able to collaborate or share ideas and knowledge with fellow students in a discussion forum, they must have prior ICT experience, which is a presage factor according to the model. This shows that there is a linear movement or a straight line from prior ICT experience to collaborative (exchange of knowledge) to academic performance. Distance e-learners under this study perceived the knowledge they acquired through interaction with colleagues during discussion under an e-learning setting as influencing their academic performance (learning outcome). Also, during the qualitative results revealed that the participants proved that prior ICT experience, parental influence (ICT literacy), benefit of Internet, progressive use of a computer and self-efficacy or motivation influenced their academic performance. These perceptions cannot be isolated from their background or student's activities that take place before learning started, which is referred to as presage stage according to the model. There is a link between these perceptions and students' activities, which will eventually reflect in their academic performance. For instance, the participants commented that they were able to perform better under an e-learning setting because of their prior ICT experience. The presage in this case is prior ICT experience which was their background or prior experience before learning started, process stage is e-learning activities such course participation, discussion forum or interactive forum while academic performance is the leaning outcome. A majority of the studies (Hailikari et al., 2008; Biggs & Tang, 2007; Tew, 2015) on the 3P Model of teaching and learning agreed that students' prior

knowledge influenced their learning process as well as academic performance. This study supports the above studies that prior ICT knowledge influences distance e-learners' learning processes and their academic performance. They were able to participate effectively because of the link. The explanation above proves that this study fits into the three stages of the model. Entwistle (2007) remarked that the outcome of the learning process related to Biggs' 3P Model of Learning is commonly seen to be related to both presage and process, while the learning outcome is due to the interaction taking place between student characteristics, the learning environment, and how the students engage with the course contents.

8.9 Conclusion

This chapter discussed the result of research question two in detail, supported with qualitative results. The results of ordinal regression analyses revealed that the best predictors of academic performance are frequency of engagement with ICT followed by students' ICT literacy level, marital status, previous academic performance and previous qualification. OLR analysis indicated that the aforementioned independent variables accounted for 10.2% of the accumulated variance. OLR analysis results demonstrated that all five predictors were significant ($p < .05$) with an overall reliable model. The OLR model analyses also showed that based on estimates, frequency of engagement with ICT has the greatest impact on academic performance. The chapter outlined the model developed to determine academic performance of distance e-learners. Also, in this chapter the new factors that emerged from the qualitative part of the study were identified, explained and supported with literature.

The chapter concluded with the discussion of 3P Model of teaching and learning and how it relates to the current study.

9. CONCLUSION AND RECOMMENDATIONS

9.1 Introduction

The purpose of this research was to critically analyse the effect of e-learning on academic performance of distance learners in a Nigerian university. More exclusively, the researcher wanted to find out if factors like distance e-learners' (students) ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day affect their academic performance. In addition to the above, this study set out to determine the best predictors of academic performance of distance e-learners in a Nigerian university and thereby propose a model to enhance academic achievement.

In order to achieve the aims of the study, the researcher set out to determine the effects of each of the above factors by using correlation analysis. Further, the researcher used ordinal regression analysis to try to determine the best predictors of distance e-learners' academic performance.

9.2 Research Questions

The following research questions were posed:

- What correlations exist between distance e-learners' ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and their academic performance?
- What is the best predictor of academic performance of distance e-learners?
- How and why do these factors affect the academic performance of distance e-learners in the way they do?

Twenty hypotheses were constructed and tested to assist in answering research question one specifically.

9.3 Summary of Findings

This study revealed that correlation does not exist between socioeconomic status, gender, previous qualification, learner-content-interaction, learner-instructor-interaction, learning style, work experience and academic performance of distance e-learners (See Table 5.3, Table 5.2, Table 5.6, Table 5.7, Table 5.15 and Table 5.12). ANOVA results supported these results (see Table 5.33, Table 5.37, Table 5.41, Table 5.26, Table 5.49, Table 5.61, Table 5.65, Table 5.53 and Table 5.12). This implies that these variables do not affect academic performance of distance e-learners. Although gender was not significant, female distance learners outperformed their male counterparts.

The study revealed that a positive and weak correlation does exist between students' ICT literacy level, marital status, frequency of engagement with ICT, previous academic performance, hours spent on the Internet per day, hours spent on social media per day and academic performance of distance e-learners. The study revealed that a negative and weak correlation does exist between family size and academic performance of distance e-learners (See Table 5.1, Table 5.2, Table 5.4 and Table 5.13). ANOVA results supported the above results (see Table 5.19, Table 5.29, Table 5.45, Table 5.77, Table 5.81, Table 5.85 and Table 5.89). The researcher therefore concludes that students' ICT literacy level, frequency of engagement with ICT, marital status, previous academic performance, hours spent on the Internet per day, hours spent on social media per day and family size do affect academic performance of distance e-learners.

The study revealed that socio-demographic factors such as marital status affect academic performance of distance e-learners. Unmarried distance e-learners performed significantly higher than their married counterparts.

The study revealed that a very weak correlation does exist between age, employment, learner-learner-interaction and academic performance of distance e-learners (Table 5.2, Table 5.7 and Table 5.13). The ANOVA results as shown in Table 5.23, Table 5.73 and Table 5.69 revealed that age, employment and LLI were not statistically significant with academic performance. In light of this, the researcher concludes that age, LLI and employment status do not affect academic performance of distance e-learners. Although age does not affect their academic performance, the results revealed that majority of participants are younger distance e-learners between ages 18 and

40 contrary to general belief that distance programmes are meant for adults. The results also show that younger distance e-learners scored higher, but not significantly, than their adult counterparts.

The study revealed that a very weak correlation does exist between the learner-content-interaction, learner-instructor-interaction, learner-learner-interaction and academic performance of female distance e-learners (Table 5.8). ANOVA results further revealed that learner-content-interaction and learner-instructor-interaction were significant with academic performance (Table 5.9 and Table 5.10). The researcher concludes that LCI and LII mostly affect academic performance of female distance e-learners.

Although correlation does not exist between the hours spent on a computer for studies per day and academic performance of distance e-learners, the ANOVA revealed that there was a significant difference (Table 5.93). The researcher therefore concludes that hours spent on a computer for studies per day affect academic performance of distance e-learners because those students who used a computer for educational purposes did benefit academically compared to those who did not use a computer for educational purposes. The results revealed that frequency of engagement with ICT, students' ICT literacy level and hours spent on the Internet per day have more impact on academic performance of students in the discipline of Health Science than other disciplines (Table 5.14). The result also revealed that the variables under investigation have more influence on academic performance of visual distance e-learners than other learning styles (See Table 5.15).

The following explanatory variables were found to be the predictors of academic performance of distance e-learners (see Table 7.2).

- Frequency of engagement with ICT;
- ICT literacy level;
- Marital Status;
- Previous academic performance; and
- Previous qualification.

The model only accounted for 10.2% of the factors affecting the academic performance of distant e-learners. This may be because there are other factors affecting academic performance of distant

e-learners, which were not covered in the quantitative part of the study but were revealed in qualitative part of the study.

The following new themes emerged from the qualitative part of the study after transcription.

i. Computer reliance and knowledge;
ii. Benefit of the Internet;
iii. Prior ICT experience;
iv. Collaborative learning;
v. Parent influence – ICT literacy;
vi. Self-efficacy and motivation; and
vii. Progressive use of computer and benefits.

These new variables could probably account for a larger percentage of the factors affecting the academic performance of distant e-learners.

9.4 Recommendations of the Study

Subsequent to the data collected and analysed, the study suggests the following recommendations:

9.4.1 Frequency of Engagement with ICT

The findings indicated that frequency of engagement with ICT affects academic performance of distance e-learners. Therefore, policy makers, educational stakeholders and government must take steps to facilitate the increasing use of ICT for distance learning programs. Governments should concentrate on setting up and improving wireless environments which will assist distance e-learners to have access to educational benefits, and discover knowledge on their own. Governments like Nigeria's, which have limited resources, cannot exclusively work to enhance educational quality through ICT on their own, but must join forces with private sectors, particularly, the innovation business, for sustainable improvement of ICT use in training. Government should give full support to set up ICT infrastructures that are believed to have a genuine effect on students' academic performance.

9.4.2 Student ICT Literacy Level

The findings indicated that students' ICT literacy level affects academic performance of distance e-learners. In light of this, the researcher recommends that computer literacy should be advocated among distance e-learners and other students in Nigerian universities. Government and management of NOUN should provide suitable computer systems in all the study centres of the university across the nation and also provide distance e-learners with appropriate training on computer literacy.

9.4.3 Marital Status

The findings revealed that marital status affects academic performance of distance e-learners. As a result of this, the course facilitators and the management of NOUN should design course contents and form a flexible discussion forum that will take into account the marital status of distance e-learners.

9.4.4 Social Media and Internet Usage

The findings revealed that hours spent (for educational purposes) on social media and the Internet per day affect academic performance of distance e-learners. The researcher therefore recommends that Nigerian students including distance e-learners should be restricted to use social networks for their educational purposes only in order to guard against distraction. The university management should organise workshops or training sessions on how to use social networks for group discussion and collaborative learning. The university management should take necessary measures by developing guidelines and administrative strategies that will accelerate Internet and social media usage in universities for educational purposes in order to improve academic performance.

9.4.5 Computers for Studies

The findings revealed that those students who used a computer for educational purposes did benefit academically compared to those who did not. The researcher therefore recommends that government should subsidise PC and ICT facilities for Nigerian universities and students in order to promote ICT usage for educational purposes.

9.4.6 Previous Academic Performance

The findings revealed that previous academic performance affects academic performance of distance e-learners. The researcher therefore recommends that Nigerian universities should base their admission standards on previous academic performance for both undergraduate and postgraduate programs.

9.4.7 Interactive Learning

The findings revealed that interactive learning affects academic performance of female distance e-learners. The researcher therefore recommends that the university should improve on the existing e-learning interactive forum (i-learn) and students should be encouraged to fully participate in the discussion forum. Educational stakeholders, policy makers and planners should equally establish an e-learning interactive forum for other higher institutions. This will assist distance e-learners and other students to meet for discussions based on their studies and this should be monitored by university management to ensure effectiveness. Finally, for i-learn currently existing in the university to be successful live teleconferencing facilities should be made available to all the study centres across the nation.

9.5 Themes Emerging from Qualitative Part of the Study

9.5.1 Prior ICT Experience

The researcher therefore recommends that distance e-learners should be encouraged to register for ICT training before being admitted into higher institutions. This will enable them to acquire previous ICT knowledge and exposure.

9.5.2 Collaborative Learning

The researcher recommends that instructors should concentrate on interactive learning tasks in order to encourage collaborative learning to facilitate sharing of knowledge and ideas. Course facilitators should continually promote the setting up of online tutorial study groups or discussion forums intended for sharing of ideas and knowledge.

9.5.3 Parent ICT Literacy

In the qualitative part of the study the participants agreed that their parents' ICT exposure or literacy influenced their academic performance. The researcher recommends that the university should promote adult education by providing ICT literacy courses.

9.5.4 Benefits of Internet

The participants commented that the benefit from Internet usage in terms of downloading useful materials, Google searching for relevant information and for electronic examination has a real influence on their academic performance. The researcher recommends therefore that the university should sustain present Internet links and connect additional PCs to the Internet. The management of the university should give open access to the Internet and e-mail in the university by establishing ICT learning resource centres that give room for students to access relevant software, applications and technology of any form. Government should subsidise Internet access in all the universities in Nigeria for educational purposes in order to improve academic performance. Government should make Internet connectivity a priority for the university by increasing bandwidth to enable the students to use the Internet effectively for educational purposes.

9.5.5 Self-Efficacy and Motivation

The participants agreed that under an e-learning setting, those with high self-efficacy and motivation will likely perform higher than their counterparts with low self-efficacy and motivation. Therefore, as stated above, the need for frequent engagement with ICT and students ICT literacy are necessary which will also lead to self-efficacy and self-motivation. The researcher recommends that the management of the university should integrate learner control in an e-learning setting as a component of the course design, which will enable the distance e-learners to have high self-efficacy over their learning environment.

9.6 Limitations of the Study

The researcher was only able to cover four centres of NOUN in South-Western Nigeria, because of the vast extent of the land and spread of study centres across the nation. Otherwise, the researcher would have covered many more areas in South-Western Nigeria. Therefore, any prediction or generalisations can only be applied over these four study centres.

9.7 Suggestions for Further Research

For further research, the study suggests the following:

i. After splitting the data based on discipline, the researcher observed the variables seem not to have correlation with academic performance of distance e-learners in studying Law and Management Science. Since this is outside the scope of this study, there is a need to carry out a study on the factors that influence academic performance of distance e-learners in studying Law and Management.

ii. After splitting the data based on discipline, the study revealed that frequency of engagement, ICT literacy level, hours spent on the Internet have positive, moderate and significant correlation on academic performance of Health Science distance e-learners. In view of the fact that this was outside the scope of the study, the researcher suggested a further study in order to establish how and why these factors affect academic performance of Health Science distance e-learners in the way they do.

iii. The study revealed that visual distance e-learners recorded the highest correlation compared to others when the data was split based on learning styles. In view of the fact that this was outside the scope of the study, the researcher suggested a further study in order to ascertain how and why these factors affect academic performance of visual distance e-learners than others in the way they do.

iv. A similar study can be duplicated in other e-learning universities in Nigeria such as the University of Ibadan, University of Abuja and others to find out the effect of e-learning on academic performance in order to improve the generalisability of the results.

9.8 Final Conclusion

This study highlighted the impact of e-learning on academic performance of distance e-learners in a Nigerian university. The problem of poor academic performance of students in Nigerian universities has increased to the extent that it has turned into an issue of genuine national concern, requesting earnest and intense intervention. One way of addressing this predicament is to study the effects of e-learning on academic performance in a Nigerian university.

Based on a comprehensive review of relevant literature, a conceptual model (see Figure 8.1) was developed in an attempt to predict the effects of the following variables: distance e-learners' ICT

literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day; on academic performance of distance e-learners. From the findings of Spearman's Correlation Coefficient analysis and post-hoc tests, the study concluded that students' ICT literacy level, frequency of engagement with ICT, marital status, previous academic performance, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day and family size do affect academic performance of distance e-learners. Similarly, the study concluded that distance e-learners' socioeconomic status, gender, previous qualifications, LCI, LII, learning style, work experience, previous academic performance, age, employment and LLI do not affect academic performance of distance e-learners.

In addition to the above, the study concluded that frequency of engagement with ICT, students' ICT literacy and hours spent on the Internet per day have the highest impact on academic performance of students in the discipline of Health Science than other disciplines. It also concluded that none of these variables influences academic performance of students in the faculty of Law and Management Science. It was concluded in this study that the variables under investigation have the highest impact on academic performance of visual distance e-learners than other learning styles.

Furthermore, from the ordinal regression analysis, the study concluded that five variables (frequency of engagement with ICT, students' ICT literacy level, marital status, previous academic performance and previous qualification) were the best predictors of academic performance of distance e-learners. OLR analysis indicated that the aforementioned independent variables accounted for 10.2% of the accumulated variance. Although this was a small percentage accounting for the variance, other factors did surface in the qualitative part of the study. The OLR model analysis also showed that based on estimates, frequency of engagement with ICT has the greatest impact on academic performance. In light of this, the study developed a model that has the potential to be used in measuring the effect of e-learning on academic performance of students in Nigerians universities. This serves as the contribution of the study to the body of knowledge.

Finally, the following new themes emerged from the qualitative part of the study as the factors perceived by the students to influence their academic performance:

- Computer Reliance and Knowledge;
- Benefit of Internet;
- Prior ICT experience;
- Collaborative learning;
- Parent influence – ICT literacy;
- Self-efficacy and motivation; and
- Progressive use of computer and benefits.

To derive maximum benefit from the use of e-learning for distance e-learners at Nigerian universities, policy makers as well as senior management would need to take cognisance of all of the recommendations presented above with emphasis on the best predictors of academic performance for distance e-learners.

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Appendix A: Questionnaire

Dear Participant,

The researcher is carrying out a study whose main objective is find out if factors like distance e-learners'(students) ICT literacy levels, socio-demographic factors, socioeconomic status, frequency of engagement with ICT, previous qualifications, e-interactive learning, learning styles, work experience, previous academic performance, family size, employment status, hours spent on the Internet per day, hours spent on social media per day, hours spent on a computer for studies per day would affect academic performance of distance e-learners.

You have been selected as one of the participants for the study. The information you will provide will be treated with the utmost confidentiality and used purely for academic purposes. Please spare some of your valuable time to answer these questions.

Thank you.

Yours sincerely

Olukayode S. Aboderin

PhD Student (Computer Science Education)

SECTIONA-Socio-demographic characteristics

Please use a tick to indicate an appropriate choice.

1. What is your gender?

- ○ Female
- ○ Male

2. Which category below includes your age?

- ○ 17 or younger
- ○ 18-20
- ○ 21-29
- ○ 30-39
- ○ 40-49
- ○ 50-59
- ○ 60 or older

3. Which of the following categories best describes your employment status?

- ○ Employed, working 1-39 hours per week
- ○ Employed, working 40 or more hours per week
- ○ Not employed, looking for work
- ◉ Not employed, NOT looking for work
- ○ Retired
- ○ Disabled, not able to work

4. Marital status

- ○ Married
- ○ Widowed

- Divorced
- Separated
- Never married

5. Do you have any children?

- Yes
- No
- Not applicable

6. How many children do you have?

- A. 1 - 2
- B. 3 - 5
- C. 5 - 9
- D. 10 and above
- E. Not applicable

Previous mode of study

8. What was your previous mode of study?

- Online/Distance
- On-Campus
- Sandwich
- Part time

9. Work experience

- 1-9 years
- 10-15 years
- 16 -25 years
- 25 years and above

10. Student entry/ previous qualification

O-level /SSCE

ND/NCE

B.Sc./B.A./B.Ed.

PGD

Masters

SECTION B

11. Which of the following qualifications do either of your parents have?

- O-level /SSCE
- ND/NCE
- B. Sc/B. A/B. Ed
- PGD
- Masters
- PhD

12. **Family income**

Please rate the income level of your parents.

	High (*N1,000,000 and above*)	Medium (*between N500,000-1,000,000*)	Low *(Below N500000)*	Un- employed
Father				
Mother				

13. Home background

Rural

Urban

Semi-urban

14. Present faculty of study/school

Agriculture Science	
Arts and Social Sciences	
Education	
Health Science	

Law	
M a n a g e m e n t Sciences	
Science & Technology	

15. Year of study

Year 1	
Year 2	
Year 3	
Year 4	
Year 5	

16. Course of study/programme

Please indicate your course of study

B.A.	
B.Sc.	
B.Sc.Ed./B.A.Ed./B.Ed.	
PGD	
Masters/MBA	
PhD	

17. Previous academic performance

What was your average score for your previous college/school/University?

- A/Distinction/Upper Credit/First Class
- B/Credit/ Upper Credit/Second Class upper
- C/Merit/Lower credit/ Second Class Lower
- D/Third Class
- E/Pass

SECTIONC

18. Present academic performance

Please indicate your last result in your previous year of study

Course	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

SECTION D: Frequency of engagement with ICT

19. How often do you make use of the following ICTs?

ICTs	Never	Occasionally (Monthly or less)	Frequently (Weekly)	Most Frequently (Daily)
Computer				
E-mail				
Internet				
Digital camera				
Scanner				
Video equipment				
Data Projector				
VCD Player				
Satellite TV				

Mobile phone				

20. How many hours a day are you connected to the Internet?

- 0-2 hours
- 3-5 hours
- 6-8 hours
- 9-12 hours
- More than 12 hours

21. How many hours a day do you interact with social networks (Facebook, Twitter, etc.)?

- 0-2 hours
- 3-5 hours
- 6-8 hours
- 9-12 hours
- more than 12 hours

22. How many hours in a day do you spend using your computer for your studies?

- A. 1 – 2 Hours
- B. 3 - 5 Hours
- C. 5 – 9 Hours
- D. Greater than 9 hours

SECTION E: Students' ICT literacy

23. How competent are you using each of the following?

ICTs	High	Moderate	Little	None
Word processing				
Spreadsheet				
Databases				
Presentation				
Internet explorer				

E-mail				

SECTION F

24. Learning style

How would you best categorize your learning style?

- Learning by listening (Auditory)
- Learning by seeing (Visual)
- Learning by experimenting and feeling (Kinesthetic)
- Learning by reading/writing (read/write)

SECTION G

25. Interactive learning

Please indicate your level of agreement or disagreement with each of the following. The keys are:

SA - Strongly Agree

A - Agree

D - Disagree

SD - Strongly Disagree

Learner- content- interactions in e-learning	**SA**	**A**	**D**	**SD**
E-learning eases the process of learning.				
E-learning encourages me to learn more.				
E-learning increases my capacity.				
E-learning increases the motivation to learn.				
E-learning increases my productivity.				
E-learning helps me to manage my time and self-discipline.				
E-learning encourages me to increase learning time.				
I prefer to do the tasks and tests through e-learning tools.				

I prefer to obtain my score through e-learning tools to what I received in traditional learning.				
E-learning meets my needs.				
E-learning meets my expectations.				
I enjoy learning by e-learning.				
I feel more freedom learning by e-learning.				
E-learning increases my confidence.				
I want to take other courses by e-learning.				
Learner-instructor-interaction in e-learning **SA A SD S**	**SA**	**A**	**D**	**SD**
I prefer to communicate with the instructor by e-learning compared to face to face.				
E-learning increases communication with the instructor.				
I built a productive relationship with the instructor via e-learning.				
E-learning eases discussion with my instructor.				
E-learning encourages me to discuss with my instructor.				
I enjoy contacting my instructor via e-learning.				
In e-learning I receive more attention from my instructor				

.

Learner-learner-interaction in e-learning	**SA**	**A**	**SD**	**S**
I prefer to communicate with my classmates by e-learning compared to face to face.				

E-learning has increased my communication with other learners.				
I built a productive relationship with other learners via e-learning.				
E-learning eases discussion with my classmates.				
E-learning encourages me to participate in discussion with my classmates.				
I enjoy contacting my classmates via e-learning.				
E-learning increases cooperation among learners.				

SECTION H

26. Socioeconomic status

Please indicate your level of agreement or disagreement with each of the following. The keys are:

SA - Strongly Agree

A - Agree

D - Disagree

SD - Strongly Disagree

S/N	Items	SA	A	SD	D
1	High socioeconomic status of parents makes students very successful in their academic performance.				
2	Very bright students cannot come from families of medium socioeconomic status				
3	Medium socioeconomic status of parents cannot prevent a student from performing well in the class.				
4	Underperforming students cannot emanate from families of medium socioeconomic status.				
5	Parents of medium socioeconomic status are educated and on account of this, their children are very intelligent.				

6	Medium socioeconomic families face many options for high-quality child care that force them to pay less attention to the education of their children.				
7	Student's academic performance is determined by hard work and nothing more.				
8	Student's excellent performance is not as a result of the high socioeconomic status of parents but on account of his/her hard work.				
9	Students of high socioeconomic families cannot perform below average in the class.				
10	High socioeconomic status of parents makes students very successful in their academic performance.				
11	Rich families can provide their young children with High-quality learning materials to enhance their learning activities at home.				
12	A child's achievement at school is not dependent on the family's social status.				
13	Students from high socioeconomic families often display extraordinary skills.				
14	Students from medium socioeconomic families are attentive in the class more than those from rich families.				

Adapted from Aboderin (2011), Algahtani (2011), Martha (2009) and Owino (2013).

Appendix B: Focus group interview questions

1a. What is your level of ICT literacy?

b. Does your level of ICT literacy influence your academic performance?

c. How does your level of ICT literacy influence your academic performance?

2a. What is your level of engagement with ICT?

b. Does your level of engagement with ICT influence your academic performance?

c. How does your level of engagement with ICT influence your academic performance?

3a. How best would you categorize your learning style?

b. Does your learning style influence your academic performance?

4a. What is your home background/parent education?

b. Do you think your home background/parent education influence your academic performance under e-learning setting?

c.If yes, How?

5a. What is your working experience?

b. Do you think your working experience influence your academic performance under e-learning setting?

c.If yes, How?

6a. What can say about NOUN mode of e-interaction?

b. Does it influence your academic performance?

c.How does influence your academic performance?

7a. What is your previous qualification/mode of entry?

b. Does your previous qualification/mode of entry influence your academic performance under e-learning setting?

c. How?

8a. What is your course of study?

b. Does your course of study influence your academic performance under e-learning setting?

c. How?

9. What is your year of study?

b. Does your year of study influence your academic performance under e-learning setting?

Appendix C: Letter of Request

04/06/2015

The Director,
National Open University of Nigeria,
Akure Study Centre,
Ondo State,
Nigeria.

Dear Sir,

Request to conduct research study in your University in Nigeria

This is to request for your permission to allow me to conduct a research study in your University. I am currently doing my PhD programme at the University of KwaZulu-Natal, South Africa.

Topic: A Critical Analysis of the effect of E-learning on Academic Performance of distance e-learners in a Nigerian University.

The purpose of this study is to investigate the factors that influence the academic performance of distance e-learners in Nigeria and develop a model that can be used to enhance academic achievement of distant e-learners.

The findings from the research will be useful to:

- Nigeria Universities' policy maker, Stakeholders, Educators, National Open University management and the Ministry of Education on what policies and strategies that will improve academic performance of distance e-learners.
- Development of the society and Nigeria at large because the nation cannot afford to lag behind in the area of ICT and this will enable us to meet the dynamic educational demands of the 2^{1st} century.

- Provision of additional knowledge to the field of technology-enhanced learning environments, which may benefit university decision-makers, academic advisors, faculty, and students.

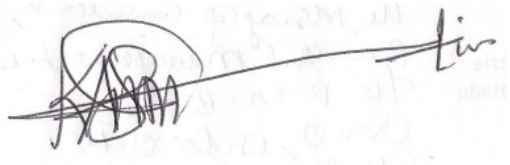
To achieve all these, I hereby request to conduct a study of all the schools or faculties in the University by collecting information required to answer the research questions in the form of a questionnaire. The questionnaire will involve your students. To achieve all of this, I request to be allowed to collect data from the University for a period of six (6) months (January 2016 – June 2016) for the research study.

Kindly note that:

- Attempts will be made not to disrupt the day to day operations of the school programme.
- The privacy, anonymity and confidentiality of the University shall be upheld.
- Data that will be collected from the University will not be used against the University, but rather it will be used for purposes of this research study as well as any other publication that might arise from the study.

I look forward to your positive response.

Yours sincerely,



ABODERIN OLUKAYODE SOLOMON
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College of Humanities: School of Education
Private Bag X03, Ashwood, 3605
Durban, South Africa
Tel: (+27) 0833303915 or +2348034951970
Email**:** abodkayaaua@gmail.com or 214585808@stu.ukzn.ac.za

Appendix D: Consent Letter (To all participants)

National Open University of Nigeria,
Akure Study Centre,
Ondo State,
Nigeria.

Dear Participant,

LETTER OF CONSENT

I am Doctoral student at the University of KwaZulu-Natal. This letter is to ask for your permission to participate in my research. The research will be carried out from January to June 2016 and is titled: **A Critical Analysis of the effect of E-learning on Academic Performance of distance e-learners in a Nigerian University.**

The research is to be conducted among distance learners (undergraduate and postgraduate) who will voluntarily agree to take part in the research. You have been identified as one of the participants. It is hoped that my study will contribute to the understanding of factors that influence the academic performance of distance e-learners in Nigeria and develop a model that can be used to enhance academic achievement of distant e-learners.

Enclosed here is a letter from my University authorizing me to conduct the research in your University. You have the option not to participate and/or to withdraw your participation at any time during the research, and that will not disadvantage you or your school or your family or your community in any way. However, we encourage you to participate in this study as it will help improve education.

All information that you will provide will not be linked to your name, school, community or family. Similarly, all reports that will be written using the information obtained will not bear your name or the name of your school or family. Only I and my supervisor will have access to the information that you will provide.

My supervisor for this study at UKZN is **Prof. D.W. Govender**; and he can be contacted at any time. His contact details are: govenderd50@ukzn.ac.za; Telephone: +27 0312603428. Fax:+0865176317.

Thank you for your cooperation.

Researcher:

Olukayode S. Aboderin

University of KwaZulu-Natal: Edgewood Campus

College of Humanities: Faculty of Education

Private Bag X03, Ashwood, 3605

Durban, South Africa

Tel: (+27) 0833303915 or +2348034951970

Email**:** abodkayaaua@gmail.com or 214585808@stu.ukzn.ac.za

Supervisor:

Prof. D.W. Govender

Discipline of Computer Science Education

School of Education (Edgewood Campus)

University of KwaZulu-Natal

Durban, South Africa

Tel.: 031 2603428/3455

E-mail: Govenderd50@ukzn.ac.za

Thank you for your contribution to this research.

Declaration

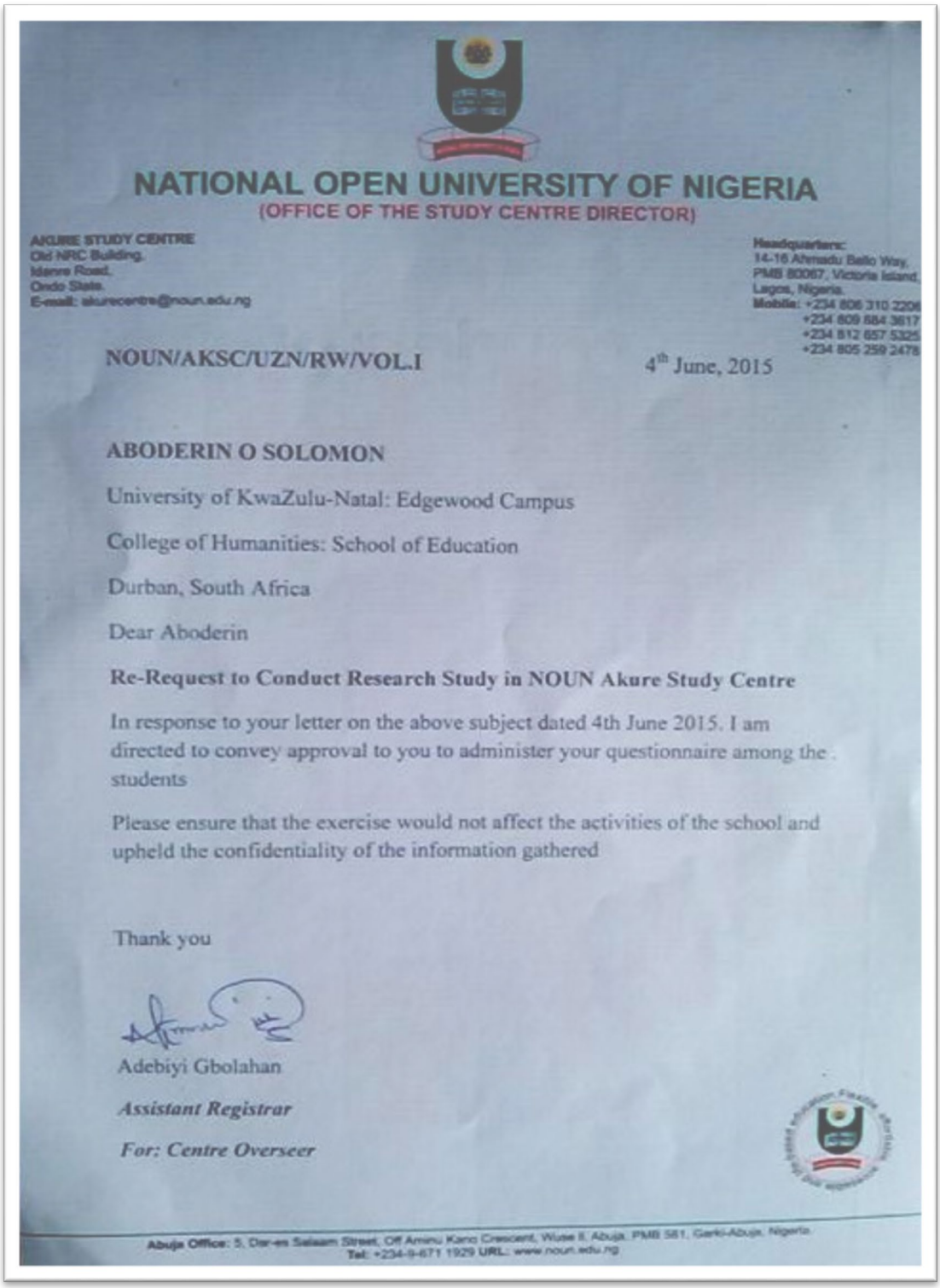
I,……, (full names of participant), hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participate in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

…… ……

SIGNATURE OF PARTICIPANT **DATE**

Appendix E: Letter of permission 1 (NOUN)



NATIONAL OPEN UNIVERSITY OF NIGERIA

(OFFICE OF THE STUDY CENTRE DIRECTOR)

AKURE STUDY CENTRE
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Ondo State.
E-mail: akurecentre@noun.edu.ng

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NOUN/AKSC/UZN/RW/VOL.I

4th June, 2015

ABODERIN O SOLOMON

University of KwaZulu-Natal: Edgewood Campus

College of Humanities: School of Education

Durban, South Africa

Dear Aboderin

Re-Request to Conduct Research Study in NOUN Akure Study Centre

In response to your letter on the above subject dated 4th June 2015. I am directed to convey approval to you to administer your questionnaire among the students

Please ensure that the exercise would not affect the activities of the school and upheld the confidentiality of the information gathered

Thank you

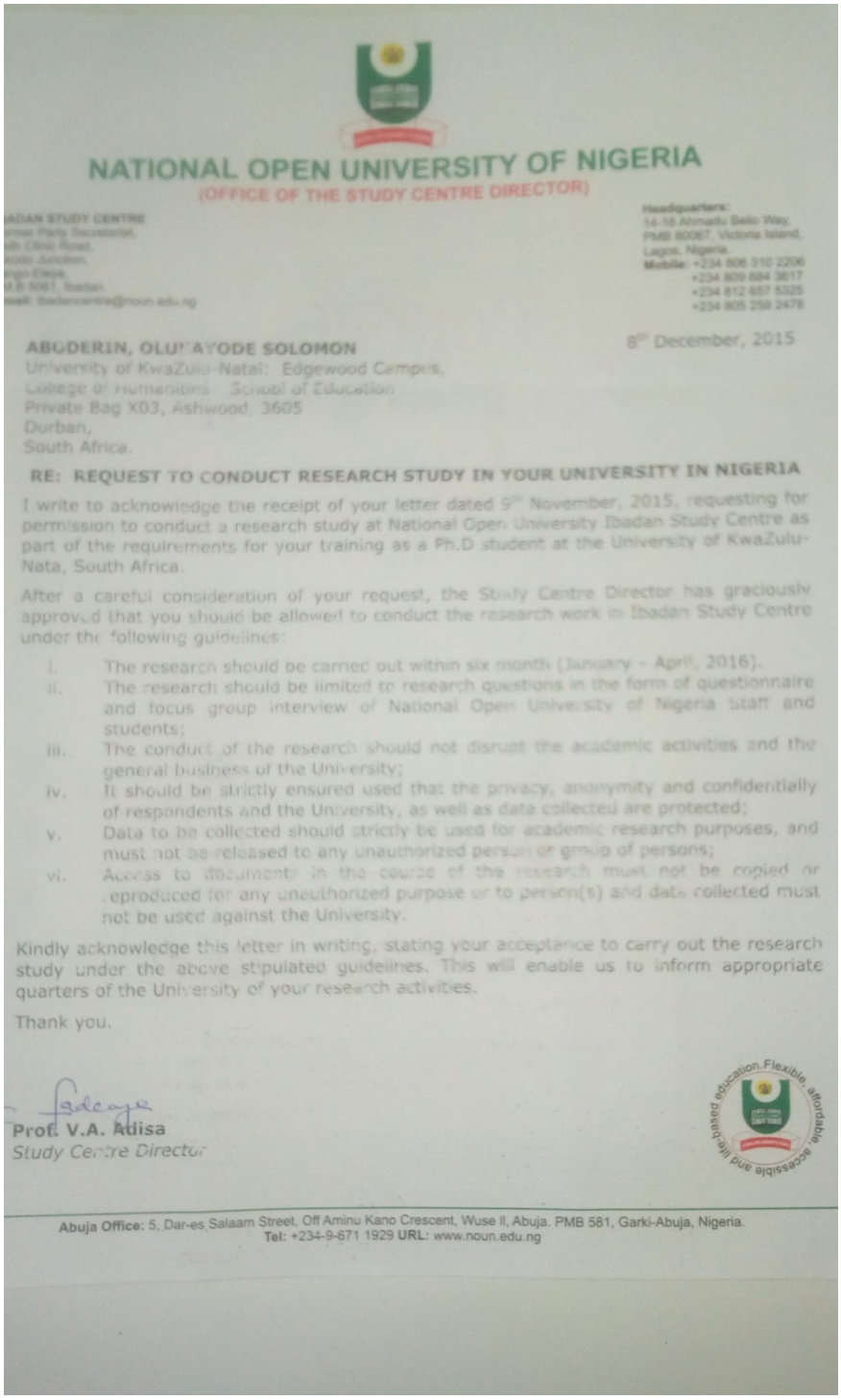
Adebiyi Gbolahan

Assistant Registrar

For: Centre Overseer

Abuja Office: 5, Dar-es Salaam Street, Off Aminu Kano Crescent, Wuse II, Abuja. PMB 581, Garki-Abuja, Nigeria.
Tel: +234-9-671 1929 URL: www.noun.edu.ng

Appendix F: Letter of permission 2 (NOUN)



NATIONAL OPEN UNIVERSITY OF NIGERIA

(OFFICE OF THE STUDY CENTRE DIRECTOR)

IBADAN STUDY CENTRE
Inner Party Secretariat,
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8th December, 2015

ABODERIN, OLUFAYODE SOLOMON
University of KwaZulu-Natal: Edgewood Campus,
College of Humanities: School of Education
Private Bag X03, Ashwood, 3605
Durban,
South Africa.

RE: REQUEST TO CONDUCT RESEARCH STUDY IN YOUR UNIVERSITY IN NIGERIA

I write to acknowledge the receipt of your letter dated 9th November, 2015, requesting for permission to conduct a research study at National Open University Ibadan Study Centre as part of the requirements for your training as a Ph.D student at the University of KwaZulu-Nata, South Africa.

After a careful consideration of your request, the Study Centre Director has graciously approved that you should be allowed to conduct the research work in Ibadan Study Centre under the following guidelines:

i. The research should be carried out within six month (January – April, 2016).
ii. The research should be limited to research questions in the form of questionnaire and focus group interview of National Open University of Nigeria staff and students;
iii. The conduct of the research should not disrupt the academic activities and the general business of the University;
iv. It should be strictly ensured used that the privacy, anonymity and confidentially of respondents and the University, as well as data collected are protected;
v. Data to be collected should strictly be used for academic research purposes, and must not be released to any unauthorized person or group of persons;
vi. Access to documents in the course of the research must not be copied or reproduced for any unauthorized purpose or to person(s) and data collected must not be used against the University.

Kindly acknowledge this letter in writing, stating your acceptance to carry out the research study under the above stipulated guidelines. This will enable us to inform appropriate quarters of the University of your research activities.

Thank you.

Prof. V.A. Adisa
Study Centre Director

Flexible, affordable, accessible and life-based education

Abuja Office: 5, Dar-es Salaam Street, Off Aminu Kano Crescent, Wuse II, Abuja. PMB 581, Garki-Abuja, Nigeria.
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Appendix G: Letter of permission 3 (NOUN)

NATIONAL OPEN UNIVERSITY OF NIGERIA
(OFFICE OF THE STUDY CENTRE DIRECTOR)

OSOGBO STUDY CENTRE
Beside St. Charles,
Okedo, Former SDP Building,
Ilesha Road,
Osogbo, Osun State.
E-mail: osogbocentre@noun.edu.ng

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21st June, 2016.

ABODERIN, OLUKAYODE SOLOMON
University of KwaZulu-Natal: Edgewood Campus,
College of Humanities: School of Education,
Private Bag X03, Ashwood 3605,
Durban,
South Africa.

RE: REQUEST TO CONDUCT RESEARCH STUDY IN YOUR UNIVERSITY IN NIGERIA

This is to acknowledge the receipt of your letter dated 20th January, 2016, requesting us to permit you conduct a research study at National Open University of Nigeria, Osogbo Study Centre as part of the requirements for your training as a Ph.D student at the University of KwaZulu-Nata, South Africa.

With a keen consideration of the relevance of your topic, the Study Centre Director, has unreservedly approved that you should be permitted to conduct the research work in Osogbo Study Centre under the following guidelines:

i. The research should be carried out within six months (January – June, 2016).
ii. The research should be limited to research questions in the form of questionnaire and focus group interview of National Open University of Nigeria Staff and students;
iii. The conduct of the research should not disrupt the academic activities and the general business of the University;
iv. It should be strictly ensured that the privacy, anonymity and confidentiality of respondents and the University, as well as data collected are protected;
v. Data to be collected should strictly be used for academic research purposes, and must not be released to any unauthorized person or group of persons;
vi. Access to documents in the course of the research must not be copied or reproduced for any unauthorized purpose or to person (s) and data collected must not be used against the University.

Please acknowledge this approval in writing, stating your acceptance to carry out the research study within the listed guidelines. This will enable us prepare an enabling environment within the University for your research activities.

Thank you.

NATIONAL OPEN UNIVERSITY OF NIGERIA, OSOGBO STUDY CENTRE
21 JUN 2016

Pitan, O.O. (PhD)
Study Centre Director
Study Centre Director

Appendix H: Letter of permission 4 (NOUN)

NATIONAL OPEN UNIVERSITY OF NIGERIA
(OFFICE OF THE STUDY CENTRE DIRECTOR)

ADO EKITI STUDY CENTRE
Government Housing Estate,
Afao Road,
Ado-Ekiti.
E-mail: adoekitistudycentre@noun.edu.ng

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Lagos, Nigeria.
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+234 809 684 3617
+234 812 657 5325
+234 805 259 2478

10th February, 2016.

ABODERIN, OLUKAYODE SOLOMON
University of KwaZulu-Natal: Edgewood Campus,
College of Humanities; School of Education
Private Bag X03, Ashwood, 3605
Durban,
South Africa.

Dear Sir,

RE: REQUEST TO CONDUCT RESEARCH STUDY IN YOUR UNIVERSITY IN NIGERIA

I write to acknowledge the receipt of your letter dated 9th November, 2015, requesting for permission to conduct a research study at National Open University of Nigeria, Ado-Ekiti Study Centre as part of the requirements for your training as a Ph.D student at the University of Kwasulu-Nata, South Africa.

After a careful consideration of your request, the Study Centre Overseer has graciously approved that you should be allowed to conduct the research work in Ado-Ekiti Study Centre under the following guidelines:

i. The research should be carried out within six month (January-April,2016).
ii. The research should be limited to research questions in the form of questionnaire and focus group interview of National Open University of Nigeria Staff and students;
iii. The conduct of the research should not disrupt the academic activities and the general business of the University;
iv. It should be strictly ensured used that the privacy, anonymity and confidentially of respondents and the University, as well as data collected are protected;
v. Data to be collected should strictly be used for academic research purposes, and must not be released to any unauthorized person or group of persons;
vi. Access to documents in the course of the research must not be copied or reproduced for any unauthorized purpose or to person(s) and data collected must not be used against the University.

Kindly acknowledge this letter in writing stating your acceptance to carry out the research study under the above stipulated guidelines. This will enable us to inform appropriate quarters of the University of your Research Activities.

Thank you.

Mrs. B.I. Silas
Study Centre Overseer