IMPACT OF TRAINING ON PRODUCTIVITY OF ACADEMIC STAFF OF HIGHER EDUCATION INSTITUTIONS: A CASE STUDY OF KANO STATE, NIGERIA

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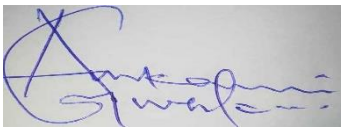
2025

DECLARATION

I hereby declared that this thesis has been written by me and it is a report of my research work. It has not been presented in any previous application for Ph.D. in Economics. All quotations are indicated and sources of information specifically acknowledged by means of references.



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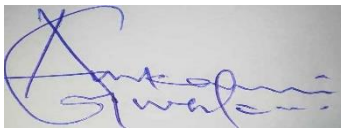
CERTIFICATION

Abdussalam Muhammad Kani, a PhD Scholar in the Department of Economics, Mittal School of Business, Lovely Professional University Punjab with registration number **11800360**, has satisfactorily completed his thesis titled "*Impact of Training on Productivity of Academic Staff of Higher Education Institutions: A Case Study of Kano State, Nigeria"* and fulfills the requirements for the award of Doctor of Philosophy in Economics. The work contained in this thesis is original and has never been submitted, in part or in full, for any other degree of this University or any other University.



Abdussalam Muhammad Kani	**Prof. Tanima Dutta**
PhD Scholar	**Supervisor**

DEDICATION

This thesis is dedicated to my parents, family and members of academic community of Higher Education Institutions used as area of this study.

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LIST OF ABBREVIATIONS

AACSB	American Assembly of Collegiate Schools of Business
ASTD	Academic Staff Training and Development
AUT	Association of University Teachers
BOT	Board of Trustees
CFA	Confirmatory factor Analysis
COE	College of Education
ETF	Education Trust Fun
FIRS	Federal Inland Revenue Service
GDP	Gross Domestic Product
GMM	General Moment Method
GTES	General Training Effectiveness Scale
HCT	Human Capital Theory
HEIs	Higher Education Institutions
HRD	Human Resources Development
ICT	Information Communication Technology
IP	Individual Performance
ITF	Industrial Training Fund
LP	Learning Performance
MDGs	Millennium Development Goals
NBTE	National Board for Technical Education
NCCE	National Commission for Colleges of Education
NMPT	New Mangalore Port Trust
NOUN	National Open University of Nigeria
NUC	National Universities Commission
NUS	National Union of Students
OP	Organizational Performance
PPMC	Pearson Product Moment Correlation
RP	Research Productivity
SEM	Structural Equation Model
SPSS	Statistical Package for Social Sciences
TE	Training Effectiveness
TETFund	Tertiary Education Trust Fund
TP	Teaching Productivity
UBE	Universal Basic Education
UNESCO	United Nations Educational, Scientific and Cultural Organization

ABSTRACT

This study examined the impact of training on productivity of academic staff of higher education institution in Nigeria. Cross-sectional research design was adopted using 589 as the population, 234 as the sample size and proportionate stratified random sampling as sampling technique of this study. Six (6) research questions and six (6) hypotheses led the investigation. A cross-sectional study design was used to collect data from academic staff at sampled Higher Education Institutions (HEIs). To address the research questions, the final data was analyzed using Pearson Product Moment Correlation (PPMC), while partial least square structural equation modeling was employed to assess the study hypotheses. The findings reveal that learning performance, individual performance, and organizational performance are all essential aspects in determining academic staff's research and teaching output in the study area. The findings also suggested that improving learning performance as a training dimension will lead to an increase in academic staff research productivity. Individual performance was also found to have a positive and significant impact on research productivity, implying that improvement in individual performance as a result of training will lead to increase in academic staff productivity in terms of the number of publications and citation indices. The findings also demonstrated that research productivity, which helps HEIs to be more efficient and improve their ranking, is strongly linked to organizational success. Similarly, the findings show that learning performance, which deals with changes in one's knowledge, ability to use or apply it, and confidence in mastering the knowledge, has a positive and significant impact on teaching productivity; individual performance, which involves upgrading an individual's work skills through training, has a positive and significant impact on teaching productivity; and organizational performance, which is one of the dimensions of training, is beneficial to teaching productivity. The findings of this study help policymakers and scholars to better understand the impact of training factors on academic staff productivity in Nigeria. The study suggests that (i) educational policies, programs, and interventions should be implemented at Nigerian HEIs to ensure that all academics have access to training, and that only training institutions that use up-to-date learning resources are chosen for the training; (ii) partnerships with donor communities and agencies should be established so that, in addition to the TETFund training intervention, more grants can be harnessed for more academic staff/faculty members to attend the training; (iii) the training should be linked to organizational objectives in order to prepare members of academia in Nigeria for a knowledge-based economy; and (iv) pre-training workshops should be organized so that those attending the training are better prepared for the training.

Key words: Impact, Training, Productivity, Learning Performance, Individual Performance, Organizational Performance, Research Productivity, Teaching Productivity, Higher Education Institution

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

A well-trained staff is the backbone of all human institutions (Bartel, 1991). Although the importance of resources such as finance, information, land and entrepreneur cannot be over-looked, human resources are most critical in moving a nation forward (Bishop, 1990). Human resources are also used as tools in converting other non-human resources to mankind's use and benefits (Dearden, Read & Reenen, 2000). Even in advanced nations, such as USA and Britain where machines are used in production process, the relevance of human resources cannot be ignored. Thus, how well a nation develops the skills of its human resources is critical in knowing the level of its socio-economic progress (Comma, 2008).

A number of methods are used globally in staff development but the well-known among them is through training (Gupta, 2012). Training represents investment by institutions interested in developing the skills, knowledge and attitude of their staff (Yeow, Chow, Chin, Karitha & Koe, 2012). Training serves as a key to unlocking the potentials of staff in any institution. Staff training and development offers a way of developing skill, enhancing performance, guaranteeing quality of work and building workers' loyalty to their institutions. Training helps in developing the staff cognitive, effective and psychomotor skills which, in turn, enhance their job performance (Ezeani & Oladele, 2013). Training is indeed the best way of enhancing the performance of staff, as well as communicating institutional goals to them (Ekaterini, 2009).

Globally, the origin of training can be traced back to the 18^{th} century; the era of industrial revolution when technological innovations and advancements called for the urgent need for staff training so as to improve their knowledge of modern technology (Lynch, 1988). Accordingly, training and development evolved when Sir Fredrick Taylor recognized that staff development are as important and efficient as investment in machines in an institution. Adam Smith, David Ricardo and other classical economists have made similar submission that investment in staff development is synonymous to investment in machines (Obi & Ekwe, 2014). In United Kingdom academic staff training has gained official recognition from 1929 to1956 (Brynmor, 1972). Its importance was revealed in various policy action statements of the Committee of Vice-Chancellors and Principals (CVCP) of the United Kingdom (Brynmor, 1972), the Association of University Teachers (AUT, 1967) and the National Union of Students (NUS, 1969). In the early 1970s a national coordinating committee was formed to design ways and procedures for academic staff training and development.

The committee was subsequently disbanded and later in 1982 a new one was introduced with Dr. William Taylor, the Principal of the University of London, as its first chairman (Hale, 1990).

Generally, the major responsibilities of academic staff in Higher Education Institutions (HEIs) are research, teaching and community service. Research deals with advancement of knowledge; teaching implies transmission of the knowledge while community service dwells on the application of the knowledge for the societal development (Perkins, 1973; Marsh and Hattie, 2002). However, it should be noted that a value hierarchy exists in which research is at the top of the pyramid, followed by teaching and then community service. Cargile and Bublitz (1986) found that academic staff/ faculty members perceive research to be twice as important as teaching and five times more important than community service. Boice (1987) found that faculty staff with the greatest early success as productive researchers demonstrated a more even balance among teaching, research and collegial networking.

In Nigeria, the need for staff training and development can be traced back to the colonial era (Dialoke, 2016). However, it became pertinent in 1980s when poor funding to education resulted to the decay of facilities at all tiers of education; morale of teaching staff due to poor salary and absence of training and development were at its lowest ebb and conducive learning environment was absent. To solve these problems, the Education Tax Decree was promulgated in January 1993. The Decree imposed a 2% tax on the assessable profits of all companies in Nigeria, so that the funds can be used to rehabilitate decaying educational infrastructure, restore the lost glory of education and confidence in the system, as well as consolidate the gains thereto; build capacity of teachers and lecturers; teacher development; and development of prototype designs The education Tax Decree of 1993 was later repealed and replaced by the Tertiary Education Trust Fund (TETFund) Act in May 2011. The TETFund was set up to provide interventions to public tertiary institutions in Nigeria. Having this objective in mind, Academic Staff Training and Development (AST&D) Scheme was introduced in 2008 by the TETFund to boost the capacity of the academic staff in public tertiary institutions in Nigeria (www.tetfund.gov.ng/).

This study investigates the impact of training on the performance of academic staff of higher education institutions in Kano State, Nigeria. Training and development are two interrelated and inseparable processes through which the productive capacities of staff are efficiently developed. Training and development are complimentary parts of the same process (Dialoke, 2016). They consist of a number of activities which an institution embarks upon to enhance the performance of its teaming staff. Ngu (1994) views training and development as a process of staff behavioral

modification that integrate organizational needs. Due to training and development, workers in developed economy such as Switzerland and USA are 20 to 30 times more productive and therefore richer than workers in developing countries such as Haiti and Nigeria. Thus, training and development aim at developing technical, human and managerial competencies of staff for individual and organizational growth.

Academic staff development through training enhances job performance in public tertiary institutions (Dawo, Simatwa and Okwatch, 2012). Training has been emphasized by different organizations as a tool of removing performance deficiencies and aligns its employees to the dynamics work-place demands. However, lack of training may lead to poor job performance in tertiary institutions. For instance, In Kenya there have been incessant public complaints about teaching staff poor performance as evidenced in skills, knowledge and attitudinal gap. It has also resulted to inadequate mastery of teaching subjects, poor content selection and delivery, poor lecturers' etiquette, insufficient ICT literacy as well as relative high failure rates among students of tertiary institutions students (Dawo, Simatwa & Okwatch, 2012). This may also be reason why half-baked graduates who cannot stand the test of time invade labour markets in most of the developing countries.

While the AST&D scheme under TETFund has substantially expanded formal qualifications among academic staff in Nigerian public HEIs, several weaknesses constrain the translation of training into sustained gains in teaching and research productivity. Key limitations include inadequate and delayed funding, a mismatch between training content and institutional needs, weak selection and equity mechanisms, limited post-training monitoring and mentoring, and structural constraints such as poor research infrastructure and recurrent industrial actions. These weaknesses suggest that training alone is necessary but not sufficient: policy reforms must pair capacity-building with predictable financing, robust monitoring and evaluation systems, strengthened research infrastructure and retention incentives to maximize returns on investment.

1.2 Statement of the problem

Although there is clear evidence that stakeholders in Nigerian HEIs realize the importance of training, there is still an unacceptably low level of research and teaching productivity. Why some HEIs perform better year after year in terms of research and teaching productivity while others do not is a puzzle (Creswell, 1985). The current climate threatens the Nigerian HEIs' ability to sustain the conditions that support training. Increased demands on government and private funding for

higher education sector, a deteriorating physical infrastructure, and increased pressure on students' admission have raised concerns about the continued capacity of HEIs in Nigeria to maintain research and teaching productivity as well as community service to the state.

Staff development has been given much attention by majority of the developed economies (Yeow, Chow, Chin, Kavitha & Koe, 2012). Cooper (1989) states that staff that are equipped with relevant skills and knowledge are likely to be more productive and showed improvement in their work. Similarly, labour economists have empirically demonstrated the importance of training and development towards effective performance of staff in an institution (Holzer, Richard & Marcus, 1991). Higher Education Institutions (HEIs), such as universities, colleges and polytechnics, are labour intensive in nature. Thus, the quality of academic staff of HEIs is central to their effective performance in terms of teaching and research. A recent World Bank (1994) paper states that "a high quality and motivated teaching staff and a supportive professional culture are essential in building excellence". In recognition of the important role of academic staff of HEIs, United Nations Educational, Scientific and Cultural Organization (UNESCO, 1997) passed a recommendation on the need to continually strengthened and enhanced the capacity of academic staff in HEIs.

There seems to be a unanimous consensus that training is highly important because it improves staff job performance and commitment (World Bank, 1994). It also enables staff to develop skills and competencies that is in demand and allows them opportunities to keep updated about the contemporary challenges posed by the globally competitive economy (Werner, 2006). Training is indeed a contract in which the deal between the employer and staff is different but mutually beneficial (Aguinis, 2017). Lack of training among academic staff has given chance to foreigners who are well trained to fill vacancies where high technical expertise is needed in most of the tertiary institutions in developing countries. A recent study shows that 22 out of 45 African universities still rely on foreign academics with vast training to fill 20% or more of their faculty positions (Sanit, 1992).

Staff development via training has no alternative (Aguinis, 2017). A recent study reveals that, the total human knowledge in some academic fields is doubling every five or ten years (Fielden, 1998). When knowledge advances are allied to similar changes in pedagogy, learning materials development and use of technology, the scale of self-improvement required becomes inevitable. Thus, training makes academic staff to perform effectively in their core areas of teaching and research. Without conscious investment in scholarship and self-tuition, it is impossible for an

academic staff member to remain in touch with his/her teaching subjects. This indicates that without training, academic staff responsibilities in the above two areas (teaching and research) will continue to be performed poorly. Poor content selection and delivery, poor lecturers' etiquette, poor research outputs, indifferent attitude towards community outreach as well as inadequate ICT literacy will also continue to persist in Nigeria's tertiary institutions if the academic staff are not well developed through training. Similarly, half-baked graduates who cannot cope with the challenges posed by the globally competitive economy will continue to flourish Nigeria's tertiary institutions labour market.

In recognition of the problems posed by lack of staff development, tertiary institutions in developing countries started investing to train their academic staff for effective service delivery. Public tertiary institutions in Nigeria are not an exception and as such the AST&D Scheme under the auspices of TETFund was introduced by the federal government to build the capacity of their academic. Despite the annual AST&D Scheme allocations to public tertiary institutions in Nigeria, researcher's observation have shown that academic staff of tertiary education institutions in Nigeria still exhibits certain characteristics that are indicative of poor teaching, inadequate research performance as well as ineffective community outreach. Thus, if academic staffs of tertiary education institutions are not adequately trained, societal expectations on them in terms of quality teaching and adequate research outputs will remain a mirage. Similarly, socio-economic development of Kano state in particular and Nigeria in general will be undermined because those who are supposed to impart the necessary knowledge, skills and attitude are ill-prepared to do so. It is against this backdrop that the present study intends to investigate the impact of training on the productivity of academic staff of tertiary institutions in Kano State, Nigeria.

1.3 Research Questions

Based on the above objectives, the following research questions are raised:

1. Does academic staff in the study area's research production suffer as a result of their learning performance?
2. Is there a link between individual performance and research productivity in the studied area?
3. Does the organizational performance have an impact on the research output of academics in the subject area?
4. Does the teaching productivity of academic staff at higher education institutions depend on learning performance?

5. What impact does individual performance have on the teaching productivity of higher education academic staff?
6. What effect does organizational performance have on the teaching productivity of higher education academic staff?

1.4 Objectives of the study

The major objective of this study is to investigate the impact of training on productivity of academic staff of higher education institutions in Kano State, Nigeria and the specific ones are as follows:

1. To investigate the impact of academics' learning performance on their research productivity at higher education institutions.
2. To determine the impact of individual performance on the research productivity of higher education academic staff.
3. To look into how organizational performance affects academics' research productivity in higher education institutions.
4. To examine the impact of learning performance on academic staff teaching output in the study area.
5. Determine the impact of individual performance on academic staff teaching output in the research area.
6. To look at the impact of organizational performance on academic staff teaching productivity in the study area.

1.5 Hypotheses of the study

From the above objectives, the following hypotheses were formulated:

H_1: Academic staff in the study area's research productivity is unaffected by their learning performance.

H_2: Academic staff at higher education institutions' research productivity is unaffected by individual performance.

H_3: The study area's academic staff's research production is unaffected by organizational performance.

H_4: Academic staff teaching productivity at higher education institutions is unaffected by learning performance.

H_5: Individual performance has no bearing on academic staff teaching output in the study area.

H_6: The teaching productivity of academic staff in higher education institutions is unaffected by organizational performance.

1.6 Relevance of the study

Information regarding influence of training on research and teaching productivity of academic staff will be of interest to a large number of institutions that are currently dealing with ways to boost the research and teaching productivity of their academic staff so as to compete in a globally competitive higher education. Although this study concentrates upon Nigerian HEIs for reasons of economy and scale, the investigation has been designed in such a way as to be useful to a wide range of situations, particularly where demographic and cultural factors are similar to the studied HEIs. The main objective of this study is to come up with empirical evidences that will assist in the design, development and formulation of institutional training policies in the changing global situation, and in particular to highlight those factors that should be emphasized in order to further encourage academic staff to participate in training with a view to increase their research and teaching productivity. It is anticipated that this investigation will provide new perspectives on how best training should be improved for academic staff to boost their research and teaching productivity.

The results of this study have both theoretical and practical significance. From theoretical perspective, the finding of the study provides data that is useful for clear understanding of Human Capital (HC) Theory. The basic premise behind HC theory is that a person's training is an investment in his/her human capital which makes him/her more productive and accrue him/her a future stream of both monetary and non-monetary benefits. These benefits include high productivity and higher wages. On the whole, the theory suggests that individuals who invest in education and training will increase their skill level and be more productive than those less skilled ones. Thus, it is expected that the findings of this study will help to explicate the theoretical postulations of HC theory which centered on the idea that development of human capital through education and training is significant in moving an institution forward.

Practically, the findings of this study are beneficial to education stakeholders (Federal ministry of education, National University Commission, Tertiary Education Trust Fund (TETFund), ASTD Scheme beneficiary higher education institutions, registered companies in Nigeria whose 2% of the assessable profits are used in funding the ASTD Scheme, the academic staff enjoying the ASTD Scheme and the general public). A study of this nature serves as a source of guide to Federal ministry of education, National University Commission and Tertiary Education Trust Fund (TETFund) who

are saddle with the responsibilities of tertiary education development in Nigeria. Specifically, the findings of this study help them to know the extent to which the ASTD Scheme impacted on the performance of academic staff of higher education institutions in Kano state. The findings of this study make the policy makers to know whether the ASTD Scheme deserves additional funding so that other levels of education in Nigeria could be covered. Equally, the study make the Tertiary Education Trust Fund (TETFund) to understand the post-training perception of academic staff of tertiary institutions in Kano State on the effectiveness of the ASTD Scheme. As a result of the findings of this study, TETFund can also understand the challenges of the ASTD Scheme as perceived by the academic staff that previously enjoyed the scheme. Similarly, the findings of the study help the registered companies in Nigeria whose 2% of the assessable profits are used in funding the ASTD Scheme to understand whether their contribution towards uplifting the higher education in Nigeria is yielding any positive result or not.

In general, the study contributes in investigating the impact of training on performance of academic staff of higher education institutions in Kano state, Nigeria. The findings of this study make educational stakeholders and the general public to appreciate why huge amount is budgeted annually for staff training and development in public higher institutions in Nigeria. It is also hoped that the useful insights from the study can guide ASTD Scheme beneficiary higher education institutions in an attempt to build the capacity of their academic staff. On one hand, the findings of this study are useful to ASTD Scheme beneficiary higher education institutions because it makes them to understand the extent of the linkage between training and performance of their academic staff in their core areas of teaching and research. The findings also help them to understand the post-training perception of their academic staff on the effectiveness of the ASTD Scheme and the challenges associated with it.

A major significance of this study has been to confirm the relevance of training and development towards influencing academic staff productivity and the urgent need to address the skills gap created by technological breakthrough and globalization. This skills gap has much effect on both employee and organizational productivity and can be addressed reasonably through training and development

Last but not the least, the findings of this study when documented, published and disseminated through workshops, academic journals, conferences and internet postings can add to the existing stock of knowledge in the areas of labour and managerial economics. Up-to-date literature related to staff development was made available to researchers in labour economics and the general public. It is also hoped that the research gaps identified in the previous studies are bridged through the findings

of this study and also serves as a good reference material for policy making and other academic purposes. Similar world economies such as India can benefit from the findings of this study. This is because the study helps their researchers in labour economics to gain useful insights about the impact of training on labour productivity. The study also enables them to appreciate Nigeria's context of labour productivity in higher education institutions. When the research is documented in India's libraries and uploaded to various open access data bases it can lead to cross-fertilization of knowledge and ideas about labour productivity. The findings of the study can as well provide an avenue for comparative analysis of labour productivity between Nigeria and India.

1.7 Scope of the study

Specifically, this study focuses on the investigation of the impact of Academic Staff Training and Development (ASTD) Scheme on the productivity of academic staff of higher institutions in Kano State, Nigeria. The ASTD Scheme is a scheme introduced in 2008 under the auspices of Tertiary Education Trust Fund (TETFund) with a view to building the capacity of the academic staff in all public tertiary institutions in Nigeria. Thus, training funded by the TETFund such as bench work, conference attendance, teaching practice, manuscript and research grants are not part of this study. Secondly, the study covers only the public higher institutions in Kano State, Nigeria. Thus, private higher institutions in Kano State are not part of this study. The public tertiary institutions in Kano State that are covered in this study are Bayero University, Kano (BUK); Kano University of Science and Technology, Wudil (KUST); Yusif Maitama Sule University, Kano; Sa'adatu Rimi College of Education (SRCOE) Kumbotso, Kano; Federal College of Education (FCE), Kano; Federal College of Education (Technical), Bichi, Police Academy Wudil and Kano State Polytechnics. Though the findings of this study can be generalized to other public higher institutions that enjoy the ASTD across the 36 States in Nigeria, public and private higher education institutions outside Kano State are not part of this study.

The study is based on a sample that covers only the academic staff of the above mentioned public higher education institutions that enjoyed the ASTD. Hence, non-academic staff training funded by the TETFund is not part of this study. Similarly, the study covers the period from2008 to 2018. This is done because every research, due to time and resources constrains has to be limited to a particular area and within a given period of time. In addition, other interventions made by the TETFund in terms of teaching practice, conferences and physical infrastructure are also kept outside the purview of this study. In a nutshell, this study dwells solely on the ASTD Scheme as its affect the overall performance of teaching staff of higher institutions in Kano State, Nigeria.

1.8 Organization of the thesis

The study is organized into six chapters. The first chapter is devoted to introduction of the study while chapter two provides an overview of the research environment, Nigerian historical background, reforms and development of higher education in Nigeria, Management and regulatory framework of higher education in Nigeria and establishment and mandate of Tertiary Education Trust Fund (TETFund) and the rationale for introducing Academic Staff Training and Development (AST&D) Scheme was presented in chapter two. Chapter three dwells on conceptual framework, review of related empirical literature on Training Effectiveness (TE) as a proxy of training, Research Productivity (RP) and Teaching Productivity (TP) as well as the theoretical framework which included review of various theories related to study variables. Relationship between TE and RP, relationship between TE and TP and development of hypotheses of the study the research model which is developed from the literature are all discussed in chapter three.

Chapter four discusses area of the study, research design, population, sample size and sampling technique adopted in this study. It further dwells on the sources of data collection and tools of data analysis. The chapter further specifies measurements and definition of the variables of the study. In addition, questionnaire development was presented for the variables and a discussion of control variables was advanced. Model specification and result of pilot study which shows validity and reliability of the items in the questionnaire were discussed. The chapter concludes with discussion of ethical considerations of the study. Chapter five deals with presentation of the data obtained, analysis of the results and discussion of the findings of the study. Specifically, data coding, questionnaire distribution, demographic attributes of the respondents as well pre-estimation tests are presented in chapter five. Under pre-estimation tests, missing values analysis, outliers' assessment, normality test and multi-collinearity test tests are performed. In addition, measurement model and structural model are conducted using Smart PLS 3 with a view to tests hypotheses of the study. Chapter six dwells on the summary, conclusion and recommendations of the study. Flow Chart of chapter one is shown in figure 1 to depict pictorial summary of the organization of the thesis.

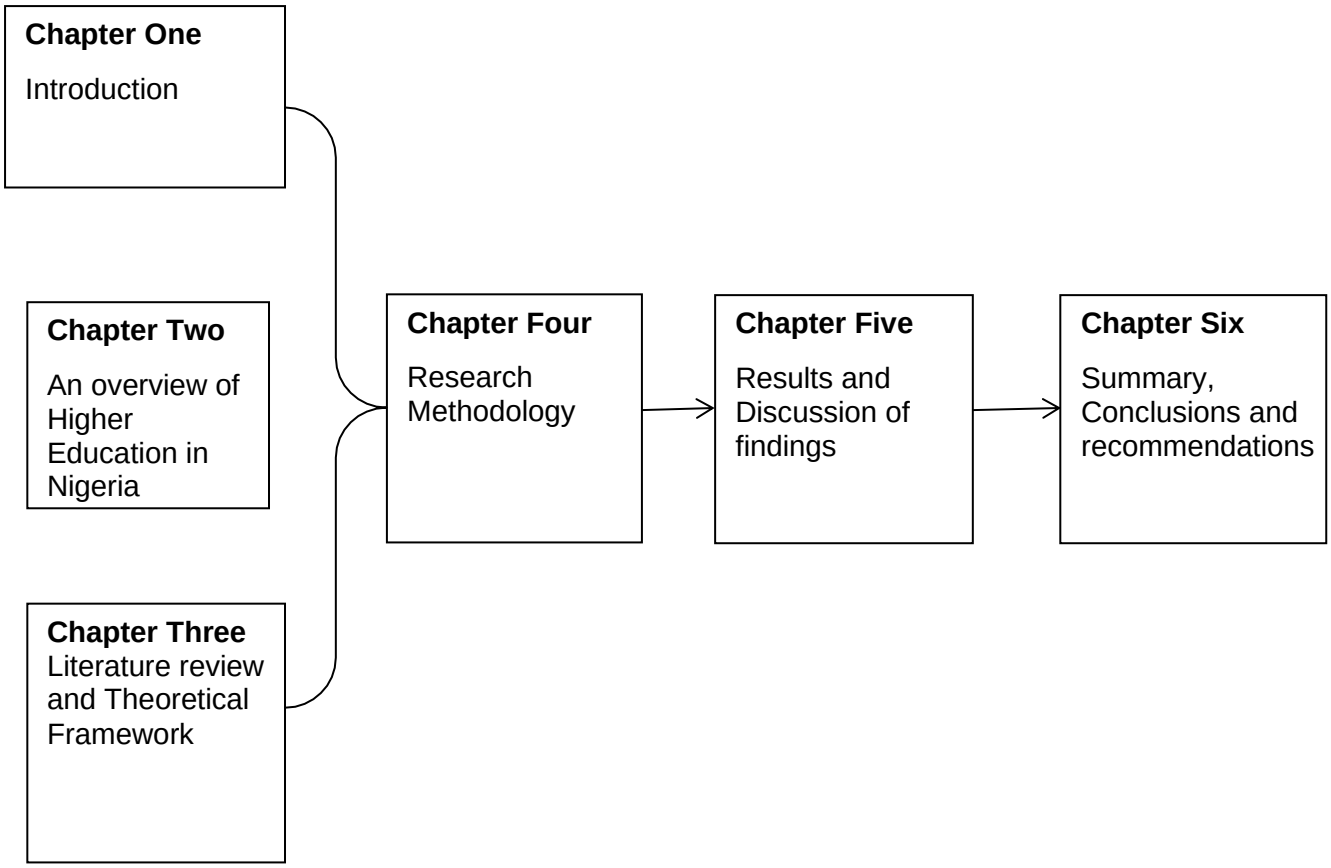

Figure 1: Flow chart of thesis organization

1.9 Definition of Terms

a) **Impact:** It means influence or effects of training on the productivity of academic staff in the study area.

b) **Training:** In this study, training refers to the Academic Staff Training and Development (ASTD) Scheme introduced with a view to building the capacity of the academic staff in Nigerian public Higher Education Institutions.

c) **Productivity:** It represents academic staff level of work achievement in terms of research and teaching that comes as a result of the training.

d) **Academic staff**: These are persons employed as faculty members in Higher Education Institutions to impact knowledge, conduct research and embark on community services.

e) **Higher Education Institutions:** These are post-secondary tertiary education institutions owned and controlled by either states or federal government in the study area.

CHAPTER TWO
AN OVERVIEW OF HIGHER EDUCATION IN NIGERIA

2.1 Introduction

Higher Education which plays a leading role in Nigeria's socio-economic development comprises of education offered by universities, colleges of education, polytechnics and monotechnics. This chapter reviews literature on Nigerian historical background, Reforms and Development of Higher Education in Nigeria and establishment and mandate of Tertiary Education Trust Fund (TETFund). The chapter provides appropriate definitions for the terms on which this study is conducted. A brief discussion on Academic Staff Training and Development (AST&D) Scheme in Nigeria was presented in this chapter. The challenges facing higher education in Nigeria is comprehensively reviewed in this chapter.

2.2 Nigerian Historical Background

Nigeria, known as the Federal Republic of Nigeria, is a democratic secular country that occupies a total area of 923,768 sq km in which land area is 910,768 sq km and water area is 13,000 sq km (Karaye, 2016). Nigeria borders Benin in the north, Chad in the northeast, and Cameroon in the southeast. Nigeria is located in Western Africa, bordering the Gulf of Guinea, between Benin and Cameroon (World Map, 2021). The country comprises 36 states and one Federal Capital Territory, Abuja. Lagos state is its largest city and Kano is the largest commercial city. Nigeria gained independence from the United Kingdom in 1960 and comprises with over 500 ethnic groups speaking different languages. Nigeria's official language is English. The country is located at 4° to 14° latitude and 2° to 15° longitude (www.vanguardngr.com/2017/06/nigeria-become-3rd-populous-country-2050-un-report).

Nigeria is the Africa's most populous country, is composed of more than 250 ethnic groups (Karaye, 2016). The major ethnic groups in Nigeria include Hausa 30%, Yoruba 15.5%, Igbo 15.2%, Fulani 6%, Tiv 2.4%, Kanuri/Beriberi 2.4%, Ibibio 1.8%, Ijaw/Izon 1.8%, other 24.7% as of 2018. English is the official language in Nigeria with Hausa, Fulani, Yoruba and Igbo as four major local languages and over 500 additional indigenous languages. Religion shows that Muslim 53.5%, Roman Catholic 10.6%, Christian 35.3%, other .6% as of 2018. It terms of urbanization 52.7% of total population lived in urban areas as of 2021. Major urban areas population shows that as of 2021 14.862 million Lagos, 4.103 million Kano, 3.649 million Ibadan, 3.464 million Abuja (capital), 3.171 million Port Harcourt, 1.782 million Benin City. Nigeria is a signatory to a number of Intentional Treaties which

include Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Climate Change-Paris Agreement, Comprehensive Nuclear Test Ban, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping-London Convention, Marine Dumping-London Protocol, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Wetlands (CIA Factbook, 2021).

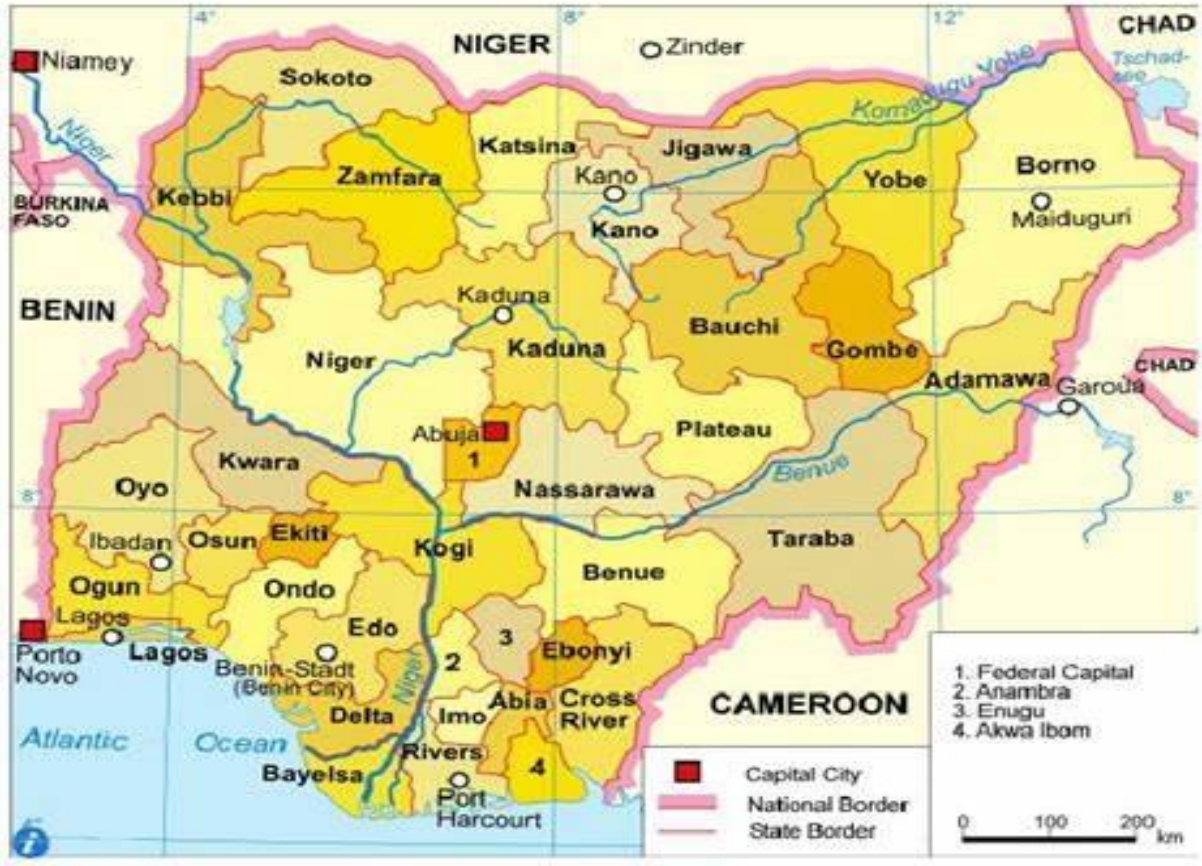

Figure 2: Map of Nigeria **Source:** CIA World Fact book (2020)

Nigeria is the seventh most populous country in the world, with its population accounting for 2.6 per cent of the world's population, and 47 per cent of West Africa's population (UN, 2020). As of 2021, the estimated population of Nigeria is 200.1 million, and is expected to grow by over five million, taking into account expected migration of 60,000 per year, reaching 206 million in 2020. Current population growth is approximately 2.6 per cent each year. By the year 2050 Nigeria's population is expected to be over 300 million, which would make it the third most populous country (UN, 2020). Nigeria is also country in the world with a median population age of 18 years, with those aged fewer than 14 representing 44 per cent per cent of its total population. People aged 65 and older are currently just 3 per cent of the total population, although by 2050 this is expected to rise to about 9

per cent. Nigeria's urban population was 49.6% as at 2011 estimate, and the urbanization rate was estimated at 3.75% per annum for the period of 2010 to 2015. The major urban areas include Lagos, Kano, Ibadan, Abuja (capital), Port Harcourt and Kaduna (www.worldpopulationreview.com/countries/nigeria-population/).

The climate varies from equatorial in the south, tropical in the center and arid in the north. The terrain of the country is lowlands merge into central hills and plateaus in the south, mountains in the southeast and plains in the north. Nigeria is endowed with natural resources such as natural gas, petroleum, tin, iron ore, coal, limestone, niobium, lead, zinc and arable land. The country is facing environmental issues ranging from soil degradation, rapid deforestation, urban air and water pollution; desertification, oil pollution including water; air and soil have been damaged by oil spills, loss of arable land and rapid urbanization (CIA Fact Book, 2020).

Nigeria is the 10th oil producer in the world and Africa's biggest oil exporter. It holds 9th position in terms of gas reserves in the world. 98% of Nigeria's foreign earnings comes from crude oil sale and it constitutes 83% of government revenues and 14% of its GDP in 2018 (Kani, 2021). Nigeria's Gross Domestic Product (GDP) was estimated at 375.77 billion US dollars, with an average growth rate of 5.7 per cent per year (World Bank, 2017). Despite Nigeria's economic comparative advantage, the country is currently facing a lot of socio-economic challenges ranging from unemployment, poverty, inflation, insecurity and naira devaluation. Nigeria is ranked 157th in the United Nation's Human Development Index, 31st out of 169 global ranking of unemployment in 2016, and 144th out of 180 in Transparency International report of global corruption, 1 out of 4 worlds out of school children and world capital city of poverty of 61.1% (100m) overtaking India. With an adult literacy rate of 51 per cent, a gross enrolment ratio in tertiary education of just 10.1 per cent in 2014, and a consistently underfunded tertiary sector. Despite the numerous socio-economic challenges faced by Nigeria, the country has made significant socio-economic progress over the last 6 years, especially in agriculture and reducing the spate of insecurity in the country and Sub-Saharan Africa as a whole (Kani, 2021).

2.3 Reforms and Development of Higher Education in Nigeria

Education is the sum total of a person's experience (Nduka, 1964). It is also define by Jaja (1996) as "a way of life and the process of transmitting, advancing and consolidating culture". National Policy on Education (2004) defines Higher Education as the Post -Secondary Section of the National education system, which is given by universities, polytechnics, monotechnics and colleges of Education, Advanced Teachers Training colleges, Correspondence Colleges and such institutions as may be allied to them. Obanya (1999) posits that the "Higher Education includes all forms of professional institutions drawing from the available pool of persons who have completed a various forms of secondary school education: Institution of the military, the police, nurses, agriculture, forestry, veterinary workers, catering services, tourism, secretarial services and other possible combinations of programmes. Adeyemi (2001) defines higher education as a system which embraces much of the country's research capacity and reproduces majority of the skilled professionals that are required in the labour market. Higher education in Nigeria is aimed at providing specialized manpower needed for nation building, promotion of the economic and social well-being of the nation, self-reliance and self-sufficiency (Galadanchi, 2010). According to National Policy on Education (2004), Higher education including professional education has the following aims:

i. the acquisition, development and inculcation of the proper value orientation for the survival of the individual and societies;
ii. the development of the intellectual capacities of individuals to understand and appreciate environment;
iii. the acquisition of both physical and intellectual skills which will enable individuals to develop into useful members of the community;
iv. the acquisition of an overview of the local and external environments Nigeria's higher education sector had expand rapidly to respond to strong population growth with over 60 per cent of population under the age of 24.

Higher education in Nigeria dates back to the 19th century. The first tertiary education called Yaba Higher College was established in 1934 in Nigeria. In 1948 University of Ibadan was founded. At independence in 1960 University of Nigeria, Nsukka was established. In 1962 three universities i.e. Ahmadu Bello University, Zaria, University of Lagos and the University of Ife were established. In 1970 only university of Benin was established. With the twelve states structure and the frequent agitation for more universities, seven universities (known as second generation universities) were established in 1975. These universities are University of Jos, university of Maiduguri, Usman

Danfodio University, Sokoto, Bayero University, Kano, University of Ilorin, University of Calabar and University of Port Harcourt. Thus, Nigeria has witnessed increase in the number of universities from 2 at independence in 1960 to 55 as at November, 2005, to 73 in 2012, and about 181 other tertiary institutions with students' enrolment up to 24 million (Jaja, 2013). As of 2017 there are 40 federal universities, 44 state universities and 68 private universities accredited to award degree (s) by the National University Commission (NUC). In the late 1990s establishment of private universities was encouraged by the government. Since then, private universities proliferated at a rapid pace, from 3 in 1999 to 68 in 2017.

The proportion and modalities of funding tertiary education in Nigeria vary across institutions. For instance, National Universities Commission (NUC) makes it mandatory for all federal universities to generate 10% of their annual funds internally. Similarly, the Education Tax Decree No.7 of 1993 makes it mandatory for limited liability companies registered in Nigeria to pay 2% tax on their profits. This is disbursed according to the ratio 50:40:10 to higher, primary and secondary levels of education respectively. The share of Tertiary Education is further re-disbursed to universities, polytechnics and colleges of education according to the 2:1:1 ratio respectively (TETFund Quarterly report, 2018). Students, parents, guardians, individuals, voluntary agencies, and Governments have invested and have continued to invest in higher education in Nigeria because for society and government it is a tool for development. National resources committed to education are about 16 percent of annual budget. Private contribution to education is as high as the social contributions. The human resources committed to education in form of teachers and non-teaching in universities are tremendous. Facilities and equipment committed to education both publicly and privately as well as to formal and non-formal education are countless. This is because education performs many functions, to mention but few:

1**)** *Political development:* Politically, education brings about enlightenment among members in the country. Through political education, national unity can be achieved especially in a plural society like Nigeria. Although for Nigeria, our politically educated seem to be our problem. However, it makes one better informed to play better roles in society.

2) *Literacy, numeracy and communication skills:* It confers permanent literacy, numeracy and the ability to communicate effectively. It provides sound citizenship as a basis for effective participation in and contribution to the life in the society. Education develops in the recipients, the ability to adapt to changing circumstances. It provides tools for further advancement and equips the recipients to

live effectively in a modern society of science and technology, while at the same time develops and projects culture, art and languages.

3) *Economic development:* Economically, education provides skills and techniques necessary to improve human competencies. The educated man provides the society with human capital as a result of his income which represents not only his earnings, but also his potential for further achievement. It increases stock of knowledge and ensures its diffusion. University education raises recipients' level of productivity, creativity, initiative and innovation. The educated are prime movers of innovation in various areas of economic endeavour (Hasbison, 1971).

4) *Social development:* Socially, higher education plays a vital role in group, occupational effectiveness and development of self-confidence. It brings changes in attitude, motivation and incentive which lead to technology changes, invention, innovation and initiation (Adams, 1970). It instills discipline, hard work and morality.

The Nigerian higher education is the largest system of education in Africa. Economic survey on education as a % of GDP in Nigeria reports from 2014 to 2019 % of education to GDP stagnated at 2.3% and increased to 3-3.5% respectively from 2019 to 2020. Ideally, 6% of the GDP must be allocated to education. In an attempt to further reform higher education for service delivery, federal government of Nigeria established different agencies as the external supervising agencies to oversee the various higher institutions in the country. National Universities Commission (NUC) and National Commission for Colleges of Education (NCCE) are examples of established agencies to spearheaded tertiary education in Nigeria. The NUC was established in 1962 with the task of developing and managing university education in Nigeria. Its functions include:

i. granting approval for all academic programmes in Nigerian universities;
ii. granting approval for the establishment of all higher educational institutions offering degree programmes;
iii. ensuring quality assurance, through regular accreditation, of all academic programmes in universities;
iv. Advising the federal Government on the establishment and location of universities, creating new facilities and post graduate units in the universities.
v. Advising Government on the fundamental needs of the universities.
vi. Carrying out periodic plans on the general programme to be pursued by universities staff;
vii. Preparing periodic plans on the general programme to be pursued by the universities
viii. Receiving and disbursing Federal grants to Federal Universities.

ix. Establishing and maintaining the minimum academic standards.

The NCCE is a parastatal of the Federal Ministry of Education established by Decree 13 of 1989. The establishment of the Commission was a resultant effect of the utmost importance accorded to quality teacher education by the Federal Government of Nigeria. Since its inception, the Commission has continuously pursued the goals of quality assurance in teacher education. It has continuously reviewed and standardized the curriculum of colleges of education in the country (NEEDS, 2014).

Established by Act No. 9 of 1977, the National Board for Technical Education (NBTE) is a parastatal created to handle all aspects of technical and vocational education falling outside university education. The Board supervises and regulates, through an accreditation process, the programmes offered by technical institutions at secondary and postsecondary school levels. It is also involved in funding of polytechnics owned by the Government of Nigeria.

Outward-student mobility was embraced in Nigeria due to the inability of the Nigerian higher education system to meet growing demand, and the rapid expansion of its middle class, has led many students who can afford it to seek higher education opportunities abroad (Asiyai, 2020). The government also actively supports outward student mobility with an extensive scholarship scheme through Tertiary Education Trust Fund (TETFund). About 40 per cent of Nigerian students studying abroad are supported by scholarships. Nigeria is the 9th largest sending country of international students to the UK (Jaja, 2013). In recent years, Nigerian students have also increasingly taken the opportunities provided by growing regionalization in Africa, with Ghana recently overtaking the US as the second most popular destination country. Another country that has recently emerged as a popular destination for Nigerian students, especially among the Muslim population, is Malaysia. Malaysia does not only represent an Islamic country, but offers low tuition and living costs, as well as the opportunity to study at one of the several international branch campuses in the country.

2.4 Tertiary Education Trust Fund (TETFund): Establishment and Mandate

The need for staff training and development in Nigeria can be traced back to the colonial era (Dialoke, 2016). In pre-colonial Africa there was no system of organized educational training. The acquisition of skills was achieved through the simple process of observation and imitation with little or no overt instructions (Jaja, 2013). In 1959 Lord Ashby Commission was set up to look into staff development need in relation to different sectors of the economy over the next twenty years. Consequent upon the findings of this Commission a number of training institutions were set up by the Federal government to cater for continuous training of staff through both on-the-job and off-the-job training programs (TETFund Annual report, 2019). Some of these institutions include:

i. The Industrial Training Fund (ITF) 1971
ii. Centre for Management Development, 1973
iii. The Administration Staff College of Nigeria, 11973
iv. The Nigerian Institute for Policy and Strategic Studies
v. The Agricultural and Rural Management Training Institute, 1980
vi. Micheal Imoudo National Institution of Labour Studies, 1992

Apart from the above training institutions, a number of institutions at state, local and federal tiers of government were established after Nigeria's return to democracy in 1999 with a view to strengthening the performance of staff in both public and private sectors. For instance, Tertiary Education Trust Fund (TETFund) whose Act came into effect in 2011 was established to serve as an intervention agency in all government owned tertiary institutions in Nigeria. From 1980's and beyond, the decay of all tiers of education was monumental (Dialoke, 2016). Facilities had almost collapsed; teachers and lecturers' morale were at its lowest. Enabling environment for conducive teaching and learning was absent. The administration of President Ibrahim Babangida mindful of the reality of the situation took measures to arrest the rot. Thus, in December 1990 the Federal Government constituted the Gray Longe Commission to review the post-independence Nigerian Higher Education. The Commission recommended among others the funding of higher education through earmarked tax to be borne by companies operating in Nigeria. An implementation committee under the chairmanship of Professor Olu O. Akinkugbe was constituted to implement the Grey Longe's Commission recommendations. Similarly, an agreement was signed between the Federal Government and ASUU on the 3rd September, 1992 on funding of public universities in Nigeria (Dialoke, 2016).

The Education Trust Fund (ETF) was established as an intervention agency under the Education Tax Act No7 of 1993 and amended by Education Tax (Amendment) Act No 40 of 1998. The Decree imposed a 2% tax on the assessable profits of all companies registered in Nigeria. This was a home-grown solution to address issues of funding to rehabilitate decaying infrastructure, restore the lost glory of education and confidence in the system as well as consolidate the gains thereto; build capacity of teachers and lecturers; teacher development; and development of prototype designs. Based on the Act, the 2% education tax collections is to be disbursed to all levels of public education. Some of the challenges faced by the Education Tax Act No 7 of 1993 include:

a. The education tax collections were overburdened and overstretched and could only render palliative support to all levels of public educational institutions in Nigeria;
b. Duplication of functions and mandate of other agencies set up after the Act, such as Universal Basic Education (UBE) and Millennium Development Goals (MDGs); and
c. The rot and dilapidation of facilities issues in the tertiary education continued to be irritating as the education tax collections are only thinly spread.

In May 2011 the Act was, due to the challenges faced by Education Tax Act No 7 of 1993, it was repealed and replaced by the Tertiary Education Trust Fund (TETFund) Act. The Act replaced both Education Tax Fund (Amendment) Act No 17, 2003 and the Education Tax Act Cap E4 Laws of the Federation of Nigeria 2004. The Fund was set up to manage and disburse education tax collections to the public tertiary institutions in Nigeria defined under the Act as Universities, Polytechnics and Colleges of Education. The main source of income available to the Fund is the 2% deduction tax paid from the assessable profit of companies registered in Nigeria. The tax is collected by the Federal Inland Revenue Service (FIRS). The enabling Act establishing the Fund prescribes the distribution of the Funds in the ratio 2:1:1 respectively to Universities, Polytechnics and Colleges of Education. The Act provides that fairness and equality should be ensured in the distribution of the Funds to the beneficiary institutions (TETFund Monthly Digest, 2017).

The Fund is managed by an eleven (11) member Board of Trustees with members drawn from the six geo-political zones of the country as well as representatives of the Federal Ministries of Education, Federal Ministry of Finance and the FIRS. The secretariat is headed by the Executive Secretary, who is the chief Executive and the Accounting Officer of the Fund. Directors and Heads of Department and Units assist him in the day-to-day running of the offices of the Fund. The Board of Trustees of the Fund is saddled with the following responsibilities:

a. Monitoring and ensure collection of education tax collections by the Federal Inland Revenue Services and ensure transfer to the Fund.
b. Manage and disburse the education tax collections.
c. Liaise with appropriate ministries and bodies responsible for collection or safe keeping of the education tax collections.
d. Receive request and approve projects after due consideration.
e. Ensure disbursement to various public tertiary education institutions in Nigeria
f. Monitor and evaluate execution of projects
g. Invest funds in appropriate and safe securities
h. Update the Federal Government on its activities and progress through annual audited reports among the states of the Federation.
i. Review progress and suggest improvement within the provisions of the Act.
j. Do such other things that are necessary or incidental to the objective of the Fund under the Act or as may be assigned by the Federal Government.
k. Issue guidelines, from time to time, to all beneficiaries on disbursement of monies from the Fund on the use of monies received from the Fund.

To be enlisted as a TETFund beneficiary institution, the following must be fulfilled by prospective institution:

a. The prospective beneficiary must be a public tertiary institution that is, Federal or State University, Polytechnic or College of Education (COE).
b. The institution must be recognized by the relevant regulatory body-NUC, NBTE or NCCE as the case may be and evidence of this should be available both with the institution and the regulatory body for citing.

c. The institution must have been established by law via an Act of Parliament or Edict of the State House of Assembly and signed into law by the President or State Governor, as the case may be.
d. Academic activities, that is, Student Admission, teaching and learning, must have commenced at the institution.
e. The prospective institution shall formally apply to the Fund to be enlisted as a beneficiary of the Fund.
f. TETFund shall visit to verify that academic activities have commenced and thereafter recommend to the Board of Trustees for enlistment as a beneficiary.
g. Following approval by the Board of Trustees, the institution shall be enlisted and formally notified.

TETFund provides two interventions for physical and manpower development in publicly owned HEIs in Nigeria. There is a regular (Annual) intervention which is provided a yearly and consists of the following:

a. Infrastructural and Equipment/Furniture-based intervention projects
b. Equipment Fabrication
c. Entrepreneurship
d. ICT Support
e. Library intervention
f. Academic Staff Training and Development (AST&D)
g. Research
h. Journal Publication
i. Conference Attendance
j. Manuscript Development
k. Teaching Practice
l. TETFund Project Maintenance

The second intervention is called special intervention which is usually provided at the discretion of the Board of Trustees but on equality of geo-political zones as enshrined in TETFund enabling Act. Special intervention includes the following:

a) *High impact intervention:* The special high impact intervention seeks to massively inject funds into selected tertiary institution to achieve a major turnaround through program upgrade and improvement in the teaching and learning environment. Beneficiary institutions are selected by the Board of Trustees (BOT) on the recommendation of management. The principle of equality of zones is employed in making the recommendations to the Board.
b) *BOT Special Intervention:* These are interventions which in the opinion of the Board of Trustees are deemed critical and essential for the improvement of quality and maintenance of standards in the tertiary educational institutions. This intervention also seeks to address peculiar situations that may arise in some beneficiary institution arising as a result of natural disaster, government directives and other unforeseen circumstances.

Process for the utilization of the ASTD intervention provides that:

a. All submissions from beneficiary institutions in respect of recommendation for the utilization of the ASTD intervention must be accompanied by the Minutes of meeting of the relevant selection Committee (TETFund Interventions Implementation Committee or Academic Board Committee or Committee of Deans & Directors).
b. Submissions should not be made in piece-meal i.e. submissions must be made at the beginning of each quarter of the year and at least 3 months to the deadline of registration.
c. All submissions must be accompanied with supporting documents (Admission Letter, Filled TETFund Nomination Form, and Resume `of Applicant, Schedule of fees from the University, Bond Form, and Medical Certificate & Bank Details).
d. Apart from the hard copy, submissions must be accompanied by a soft copy in a memory stick (not CD-ROM) prepared in MS-Excel in accordance with the approved template. Advance soft copy may also be sent to es@tetfund.gov.ng and astd@tetfund.gov.ng.
e. Approval must be sought and obtained from the Fund before any scholar commences a programme. No request for reimbursement will be entertained on expenditure incurred by beneficiaries without prior approval by the Fund.
f. Requests for variation in the cost of sponsorship will not be entertained after approval has been granted and funds released to the beneficiary institutions.

g. On completion of the vetting process, the Fund would communicate approval or otherwise to the beneficiary institution as well as the individual scholars. Thereafter, successful scholars would be paid their living expenses through their institutions who would release them to commence their study fellowship.
h. Yearly progress reports on each scholar under the scheme should be provided to the Fund by all beneficiary institutions based on the approved reporting template. Failure to submit progress report will affect subsequent disbursements.
i. The tuition fees would be paid directly to the foreign institution by the Fund.
j. The living expenses of PhD scholars should be paid to the scholars account on annual basis after receiving satisfactory progress report.
k. All PhD dissertations of successful returnee scholars should be submitted to the Fund by the beneficiary Institution in both soft (pdf format) and hard copies for consideration for publication by the Fund's Book Development Committee.
l. All submissions for ASTD sponsorship must represent 60% for science and technology-based courses, while 40% to represent arts and social science courses.
m. All PhD programmes should not exceed 3 years anywhere in the world.
n. All Masters Programmes should not exceed 2 years in Nigeria and 1 year in Europe and North America. However, Master's degree programmes in Malaysia, India, Taiwan, Thailand, and the United Arab Emirate could be for a maximum of 2 years.

2.5 Academic Staff Training & Development (AST&D) Scheme in Nigeria

AST&D Scheme is aimed at building the capacity of academic staff working in public Universities, Polytechnics and Colleges of Education in Nigeria. The Scheme gives all academic staff opportunity to pursue Masters and Ph.D. degrees both at home and overseas. Beneficiary Institutions may also recommend for sponsorship, a scholar pursuing a doctorate degree in Nigeria to travel aboard for bench work for a period not exceeding twelve (12) months and not less than three (3) months provided the programme is science-based. Prior to TETFund only 40% of academic staff in public higher education in Nigeria had PhD but as of 2019 nearly 70% either hold Masters or PhD due to AST&D Scheme (Bogoro, 2019). For instance, in 2016 TETFund allocated 1. 9 Billion Naira each to all the Federal and State Universities and 700 Million Naira each to all Polytechnics and Colleges of Education owned by Federal and State governments. Concomitantly, in 2017 around N700 million (Seven Hundred Million Naira only) were allocated to each university and for Colleges of Education and Polytechnics around 600 million naira (Six Hundred Million Naira only) each. Thus, from 2008 (when the AST&D Scheme officially started) to 2015 over 22,000 lecturers were sponsored to pursue

Masters and PhD programs in various fields, both at home and abroad. Similarly, from 2016 to 2017 9,000 scholars were trained under TETFund AST&D Scheme. The AST&D allocation is disbursed as follows:

a. A maximum of 50% of allocation is to be spent on foreign scholarship.
b. A maximum of 10% of the allocation is to be spent on bench work.
c. At least 40% of the allocation is to be spent on sponsoring scholars in Nigerian Universities.

The Academic Staff Training & Development (AST&D) department was created in June 2013 out of the Education Support Service (ESS) department with a view to ensuring effective co-ordination, quality and prompt delivery of Academic Staff Training & Development (AST&D), Conference Attendance (CA), and Teaching Practice (TP) interventions in accordance with the. Basically, Academic Staff Training & Development (AST&D) department performs the following functions:

a. Ensure the vetting of submissions on Academic Staff Training and Development (AST&D), conference attendance and teaching practice received from all TETFund beneficiary institutions.
b. Facilitate disbursements of the Fund to beneficiary institutions of the annual training interventions.
c. Ensure prompt and quality delivery of all TETFund educational intervention programmes and projects domiciled in the department.
d. Ensure cordial, effective and sustainable partnership building with beneficiary institutions of TETFund Academic Staff Training & Development (AST&D) programmes.
e. Provide advice to the management on issues relating to intervention programmes domiciled in the department.

Trainee's Eligibility for ASTD nomination is anchored on the following conditions:

a. The nominee for AST&D must be a full-time confirmed academic staff, working at and nominated by a beneficiary Institution;
b. The nominee for AST&D has secured admission to pursue a full-time programme of study base on World University Ranking of Times Higher Education;
c. The nominee for AST&D is not applying to study for a second master's degree or a second doctorate degree;

d. The nominee for AST&D must be bonded by the Institution;
e. A nominee for doctorate scholarship who has benefitted from the Fund's scholarship for Master's degree must have lived the bond period of the Master's degree before applying to be sponsored for the doctorate study;
f. The nominee for AST&D must not be in receipt of any other scholarship; and
g. The nominee for AST&D must provide evidence of medical fitness from a public hospital and not health centers.

2.6 Challenges facing Higher education in Nigeria

Despite the progress made in the development of higher education in Nigeria from 1960 to data, there still pockets of challenges facing the survival of tertiary education in terms of quality teaching and research outputs. According to Jaji (2004) one of the major challenges facing tertiary education in Nigeria is inadequate staffing. Quality teachers have never been in good supply in tertiary education institutions in Nigeria. Only 43% of Nigeria's universities teaching staff held PhD degrees as of 2006. Audit report shows that in 2006 there was 30,450 academic staff in Nigerian universities as against 50,000 required.

It was also gathered that in polytechnics/monotechnics out of 30,016 needed only 12,938 were available. Similarly, in the colleges of education, there was 11,256 academic staff instead of 26,114 needed. According to Coombs (1970), teachers are the hub of any educational system. Teachers determine the quality of education because they transmit educational policies into practice and action. As rightly pointed out by Ukeje, (1996) without adequate number of inspiring, well-informed teachers, fully prepared to meet their responsibilities in our schools, we cannot have good education and without good education, we cannot hope for long to meet successfully, the challenges of a changing world. Despite the importance of teachers in the attainment of good education, institutions of higher learning in Nigeria are short of lecturers to adequately handle teaching and learning activities. Bamiro (2012) attributed the problem of de-intellectualization of the academia to low quality of staff of some institutions of higher learning in Nigeria. Where there is inadequate teaching staff and poor quality of lecturers, the attainment of good quality in higher education will be difficult.

Under-funding and academic corruptions are twin challenges facing tertiary education in Nigeria. Most of Nigeria's public universities are in deteriorating condition due to poor funding. Udida *et al.* (2009) cited in Akinola (1990) that "Our higher institution education systems are in dire need of money.....to cater for both their capital and recurrent needs. Between 2003 and 2013 education

spending fluctuated from 8.2% of 2003 budget to 6.42% in 2009 and to 8.7% in 2013. This can be the reason why students lecture theatre are overcrowded, student-teacher ratios have increased, faculty shortages are chronic, and laboratory facilities, libraries, dorms and other institutional facilities are in a state of decay. Similarly, academic corruption and fraud ranging from cheating during examinations to more serious behaviours, such as impersonation, falsifying academic records, paying for grades/certificates, money or sexual favours, terrorizing examiners and assaulting invigilators are prevalent in Nigeria's tertiary education institutions. According to Premium Times (2020) the Tertiary Education Trust Fund (TETFund) has accused lecturers across the country's public tertiary institutions of diverting research grants to build homes, purchase cars, and engage in other frivolous activities.

Poor implementation of educational policies, reforms and programs deter the speedy development of HEIs in Nigeria. Poor or non-implementation is responsible for the abysmal low performance of graduates of institutions of higher learning in Nigeria. Factors that could be adduced as inhibitors to smooth implementation of educational policies are government underfunding of education and poor judicious utilization of available funds by implementation agencies-vice chancellors, rectors, provosts deans of faculties and heads of department. Similarly, quality higher education is dependent on the quality and quantity of human and material resources put in place in institutions of higher learning. Adejompo (2017) observes that there is actually a general belief that the condition of school's learning environment, especially infrastructure has an important impact on students' academic performance and effectiveness. The facilities that are needed to facilitate effective learning in an educational institution include adequate power and water supply, good communication system, improved transportation system, adequate classrooms, libraries, laboratories as well as furniture items and sporting equipment. However, poor and inadequate infrastructures such as science laboratories, workshops, students' hostels, libraries and electricity will proportionately affect the quality of education. Besides, the libraries in most institutions of higher learning in the country are stocked with obsolete text books, with current journals and text books lacking. Kamm (1980) opines that the library is at the heart of the academic effort in a college or university. For an institution to be strong academically, it must have a formidable library put in place. This explains why the top universities of the world (Harvard, Cambridge, Tokyo and University of California etc) are academically of high strength and quality. The acute shortage of educational facilities in institutions of higher learning in Nigeria has led to decline in the quality of higher education in the country. Worried about the poor quality of graduates of higher education institutions in Nigeria, the National

Universities Commission (NUC) carried out a Need Assessment Survey which was reported by Okebukola, (2005) and highlighted the following:

a. only about 30% of Nigerian students' population has adequate access to classrooms, workshops, lecture halls, laboratories and libraries; and
b. deficient libraries in terms of currency and number of books, journals, and electronic support facilities

Information Communication Technology (ICT) facilities in institutions of higher learning in Nigeria are either simply inadequate. As part of education reforms, Nigerian government adopted information communication technologies in all levels of education so as to improve teaching and learning, enhance higher education research, enhance collaboration among peers and improve quality of education. Curriculum content could be enriched through search from the reliable internet sources by teachers. Through ICT relevant school practices which are unknown to teachers and students and which cannot be found in textbooks, can easily be downloaded for use. ICT in education has been continuously linked to higher efficiency, higher productivity and higher educational outcomes, including quality of cognitive, creative and innovative thinking (Olatoye, 2011).

Incessant staff union disputes and subsequent closures of the institutions do not go in tandem with global standard of education. Asiyai (2005) catalogue of strikes by the Academic Staff Union of Universities (ASUU) and the Senior Staff Association of Nigerian Universities (SSANU) within fourteen years reveales that there were too many strikes, some of which lasted up to six months. Variables identified by Asiyai (2006) as borne of contention include non-implementation of ASUU/FGN or SSANU/FGN agreements, lack of financial and administrative autonomy by HEIs in Nigeria. The disruption of academic programmes of institutions of higher learning affects students learning outcomes. In most cases a semester's course work is sandwiched to few weeks during which lectures are rushed to accommodate the time lost to strike. This type of academic rush is a big threat to attainment of quality in higher education in Nigeria.

Academic staff Training and development is central to HEIs development in Nigeria. Though much success stories were recorded through TETFund annual interventions related to Academic Staff Training and Development (AST&D), research grants, sponsorship of journal publication, conferences attendance, manuscript development and Teaching Practice (TP) token money as a motivation to academics going for students' TP supervision, there still exist evidences of poor

teaching and low research outputs as well as little or no community outreach by the HEIs in Nigeria. Therefore, staff training and development should be on a continuous basis so as to help academic staff to clarify and modify their behaviour, skills, attitude, values and competencies. In this way, they grow and develop their knowledge and thus become more effective and efficient in their primary responsibilities of teaching and research. Oghuvbu (2009) reports that poor staff training and development program accounted for the decline in quality of HEIs in Nigeria. Similarly, Adeogun (2006) noted that an employee who is not trained and exposed to continuous retraining in the modern methods and new discoveries in his or her field will soon become irrelevant to his employee and society at large.

Brain drain is almost a household name in Nigeria. Over the past decades, there has been mass exodus of brilliant and most talented academicians/faculty members to high paid countries all over the world. Bangura (1994) reveals that between 1988 and 1990, over 1000 academicians/faculty members left the federal university system in Nigeria. Professor Joseph Stilglitz, 2001 Nobel Prize winner in Economics while delivering a lecture at the first Dr. Pius Okadigbo memorial lecture series in Enugu said that there is a particular university in the U.S. that has over 25 Nigerian professors. He submitted that the above pointer is instructive for any serious-minded government that wants to address the issue of brain-drain.

Poor leadership cutting across state, federal and institution levels have been a serious challenge to quality in higher education in Nigeria. Since the nineties, the government of the country has not shown enough commitment to develop higher education in Nigeria. A key to evaluating government commitment to education is budgetary allocation. Udida *et al.* (2009) observe that some individuals appointed as vice chancellors of some university are weak, not competent and lack administrative potentials; such appointees must possess administrative qualities and must lead by example. UNESCO had recommended 26% budgetary allocation to education but the amount allocated to education in Nigeria has continued to be smaller when compared to other African countries. A World Bank Report cited by the Academic Staff Union of Universities noted that in 2012 Nigeria's GDP was 262.2 billion USD while allocation to education was 1.96 billion USD (ASUU, 2013).

Little involvement of staff union members in decision making, dismissal of some academics without following due process, government adamant attitude to fulfilling its agreements with Union leaders and such resulted to series of strikes and subsequent closure of some institutions. For instance, 177days were spent during strikes in 1993. This unhealthy situation led to strained relations between university staff unions and management, increased hostility and aggression and increased mutual

suspicion which are all threats to mutual co-existence for the attainment of good quality in institutions of higher learning (Iyayi, 2002; Osiebe; 1999; and Bamiro, 2012).

The insecurity facing the country is another challenge preventing effective administration and management of higher institutions in Nigeria. The insurgents in the Northern part of Nigeria have attacked many higher institutions disrupting their academic programme, killing students and destroying infrastructural facilities meant for teaching and learning. Insecurity in Nigeria and in the Northeast in particular has done more damages to the educational infrastructural facilities. Abubakar (2016) observes that these facilities were either burnt down or destroyed by the militants during crises because there is no enough security in most of our schools. The Cable (2019) cited the United Nations Educational, Scientific and Cultural Organization (UNESCO) who reports that Boko Haram has killed 2,300 teachers in Nigeria's Northeast since the start of the insurgency in 2009. In the 2018 UNESCO Global Education Monitoring report (GEM), the UN agency said 19,000 teachers have been displaced in the region, affecting access to education. The latest education Needs Assessment found that out of 260 school sites, 28% had been damaged by bullets, shells or shrapnel, 20% had been deliberately set on fire, 32% had been looted and 29% had armed groups or military in close proximity.

COVID-19 related problems vis-à-vis acute shortage of internet connectivity and reliability for smooth running of academic activities. Outbreak of COVID-19 resulting to shutdown of educational institutions in Nigeria is another problem facing HEIs. Deborah (2020) study on the perception of undergraduate students on the impact of COVID-19 pandemic on higher education development in Federal Capital Territory, Abuja, Nigeria found out that 100% of the respondents agreed that Covid-19 pandemic affects the academic calendar of higher institutions; 90.5% of the respondent agreed that Covid-19 pandemic would have effect on implementation of higher institutions financial budget for 2020; 94.5% of the respondents agreed that Covid-19 pandemic have relationship with reduction of manpower in higher institutions; 100% of the respondents agreed that Covid-19 pandemic have relationship with the cancelation of academic conferences of higher institutions and 89% of the respondents agreed that online education is the alternative measures for conversional in class teaching and learning for future occurrences of any pandemic.

The effects of the above challenges include inadequate and outdated library books and journals, inadequate scientific materials, non-existent fund for conferences and exchange program, inadequate resources for recurrent expenditures; inadequate capital resources, which have led to suspension and or non-completion of capital projects, leading to overcrowded and rundown facilities, lecture hall and hostels; inadequate staffing and training, poor motivation and low staff morale; instability in academic calendar caused by incessant strike actions by students and teachers; deficiencies in the curriculum and its delivery; cultism in student life; examination malpractices; and mercenary attitude to teaching and research.

2.7 Chapter Summary

The system of higher education in Nigeria dated back to the 19th century when Yaba higher college in 1934 (Jaja, 2013). Therefore, even up to the early late 1930's Nigerian higher education showed no significant reforms and development. But since 1975, profound and unprecedented changes have taken place in Nigeria's higher education system due to its growing population and quest for knowledge as an engine for economic prosperity. Thus, from 2 universities at independence in 1960 to 55 as at November, 2015, to 73 in 2012, and over 181 different tertiary institutions with students' enrolment of over twenty four million, is an indication of how higher education in Nigeria metamorphosed from its embryonic stage to present.

This chapter reviews literature on Nigerian historical background, reforms and development of its higher education. Management and regulatory framework of higher education in Nigeria and establishment and mandate of Tertiary Education Trust Fund (TETFund) was also highlighted in this chapter. A brief discussion on the rationale for introducing Academic Staff Training and Development (AST&D) Scheme was also presented. The chapter wraps up with discussion of the challenges facing higher education in Nigeria. The next chapter will dwells on conceptual framework, review of related empirical literature on Training Effectiveness (TE) as a proxy of training, Research Productivity (RP) and Teaching Productivity (TP) as well as the theoretical framework which included review of various theories related to study variables.

CHAPTER THREE
LITERATURE REVIEW AND THEORETICAL FRAMEWORK

3.1 Introduction

Out of the three segments in this chapter, part one deals with conceptual issues related to training, among which are concept of training, types of training, training effectiveness as a proxy of training in this study, studies on training effectiveness as well as measurement of training effectiveness. Part two discusses the concept and typology of productivity; concept of research, research productivity; and concept of teaching, teaching productivity, measurement of teaching productivity and previous studies on both research and teaching productivity. The last part of the Theoretical framework of the study is discussed in the last segment of this chapter.

3.2 Concept of training

Training is one of the best-known techniques of HRD (Abonyi, 2007). Training means changing what employees know how they work and their attitudes towards their work. Training is a systematic development of skills, attitude and knowledge required by an employee to perform a given task efficiently (Abiodun, 2008). Training as opine by Blundell *et al.* (1999) means "course(s) designed to help individuals develop skills that might be of use in their job". Ohakwe (2007) cited in Dialoke *et al.* (2016) defines training as a "continuous assistance or instruction given to an employee in order to make him have the current knowledge of the job content, scope and relationship within the organization".

Training refers to the teaching-learning activities carried on for the primary purpose of helping members of an organization to acquire and apply the knowledge, skills, abilities and attitude needed by that organization (Arun and Mirza, 2001). This means that training is an act of increasing the knowledge and skill of an employee for doing a particular job. It is a process of learning sequence of programmed behaviour. Training basically gives employees awareness of the rules and procedures to guide their behavior. It is application of knowledge and it attempts to improve the performance of workers on the current job and prepares them for the intended job. Training is a short-term process utilizing a systematic and organized procedure by which non-managerial personnel acquire technical knowledge and skills for a definite purpose (Mamonia, 2000).

As noted by Price (1975) a training need exists when there is gap between the present performance of an employee and the desired performance. This is why in Nigeria programmes such as AST&D Scheme were introduced to build-up the right ability and capacity in teaching staff in Nigerian tertiary institutions. Generally, the need for training and development as stated by Prince (1975) may arise for the following reasons:

a) Technological changes necessitating acquisition of new knowledge, ability and skills;
b) Increasing uncertainties and complexities in an institution or its environment calling for flexible and adaptive responses from the institutions;
c) Need for both individual and organization to grow at rapid pace to meet the challenges in global competitions;
d) To harness the human potential and give expressions to the creative urges and move the employees from one job to another job;
e) To reduce wastage of time, money and absenteeism so as to achieve optimum performance and bring down the grievances;
f) To improve the efficiency of employees and prepare workforce for future work; and
g) To boost morale of employees and to enhance their personal career growth.

Michael (2001) defines training as "the systematic development of knowledge, skills and attitudes required by an individual to perform adequately a given tax. In his own word Flippo (1984) sees training as "an act of increasing knowledge and skill of an employee for doing a particular job." Training means orienting workers towards achieving high productivity in an institution or organization. Specifically, training aimed at attaining organizational goals by maximizing outputs using few inputs. This is why Ikeanyibe (2009) defines training as a "process of helping an employee to acquire basic skills required for the effective execution of the functions for which he is assigned". Similarly, Atiomo (2000) defines it as "process of acquiring knowledge, skills and attitude for the sole purpose of executing a specific or present job efficiently." Chandra (2011) states the basic purposes of training and development as follows:

i. It improves employee's performance;
ii. It enables employees to update their skills;
iii. It avoids managerial obsolescence;
iv. It improves labour quality;
v. It helps in preparing for promotion and managerial succession;

vi. It helps in retaining and motivating employees;
vii. It improves organizational climate;
viii. It improves health and safety; and
ix. It enhances labour personal growth.

Training consists of planned program designed to improve performance at the individual, group, and organizational levels. Improved performance, in turn, implies that there have been measurable changes in knowledge, skills, attitude, and/ or social behavior (Cascio, 1995). The need for labour training arises from any of the following reasons:

a) An increased use of technology in production;
b) Labour turnover arising from normal separations due to death or physical incapacitation, for accident, disease, voluntary retirement, promotion within an institution and change of occupation;
c) Need for additional hands to cope with an increased production of goods and services;
d) Employment of new, inexperienced labour requires training for an effective performance of a job;
e) Old employees need refresher training to enable them to keep abreast of the changing methods, techniques and use of sophisticated tools and equipment;
f) Need for enabling employees to do the work in a more effective way;
g) Need for reducing grievances and minimizing accident rates; and
h) Need for maintaining the validity of an organization as a whole and raising the morale of its employees.

Training methods could be broadly classified into behavioral and cognitive approaches. Behavioural approach which is also called on-the-job training allows trainees to practice behavior in real or simulated fashion. On-the-job training is a planned and organized training conducted at employers' worksite or elsewhere. It is used to broaden workers skills and productivity. It is also appropriate for developing proficiency skills unique to an employee's job-especially jobs that are relatively easy to learn and require locally-owned equipment and facilities. Types of on-the-job training include job rotation, coaching, mentoring and apprenticeships and internships.

Cognitive approach which is also known as off-the-job training method provides verbal and written information, demonstrate relationships among concepts or provide the rules for how to do something. Off-the-job training separates the trainees from their institution and focuses their attention on various learning activities in a different environment. Cognitive training is best for knowledge and behavioral development (Blanchard & Thacker, 1998). AST&D Scheme falls under the purview of off-the-job training because the target trainees are separated from their respective tertiary institutions and confine to training programs at different places both at home and abroad. It is said to be the best method of training because the trainees are not required to attend to their official duties but solely focus on the training program. Types of the off-the-job training include induction, lectures, case study, role play, games and simulation, computer-based training, web-based training, self-instruction, team-building exercises and training through social networks.

The decision about which method to use for labour training and development depends on several factors that include objectives of the training, amount of funding available for the training, speciality and complexity of the knowledge and skills needed, timeliness of the training needed, and the capacity and motivation of the learner. For any training to be effective in bringing the expected changes in the trainees, the training approach should clearly demonstrate the desired skills to be acquired and motivate the trainees towards accomplishment of such skills. It should also provide an opportunity for active participation by the trainees, provide an opportunity to practice, provide timely feedback on the trainees' performance, provide some means for reinforcement while the trainees learn, the training program be structured from simple to complex tasks, the training be adaptable to specific problems, encourage positive transfer from training to work-related activities (Woods, 1995).

Training and development of any kind should have its objectives so that the performance of the trainees becomes more useful and productive for him and for the organization of which he/she is a part. Training and development normally concentrate on the improvement of either operative skills, inter-personal skills or decision-making skills (Jeff, 1976). Thus, training and development can be seen as the cornerstone of sound management, for it makes employees more effective and productive. The objectives of training and development include the following:

1. Improving quality of workforce: Training and development are purposely organized so as to help in improving the quality of labour in an institution or organization. In relation to AST&D Scheme, academic staff is trained in relation to their field of specialization so as to enable them to excel in effective service quality delivery.

2. Enhance employee growth: Through training and development programs, workers are helped to grow themselves in a professional way.
3. Prevention of obsolence: Training and development help workers to keep themselves up to date with the new trends in their work-related activities which reduce the chances of termination of their employment in the near future.
4. Bridging the gap between planning and implementation: Training and development helps educational institutions achieve their targets and goals in term of teaching and research. Through training schemes employees are well prepared to know their jobs better and they deliver the quality performance according to needs of their management.
5. Health and safety measures: Training and development clearly identifies and teaches employees about the different kind of risk involved in their job, the different problems that can arise and how to present such problems. Thus, training and development helps to improve the health and safety measures in the company.

3.2.1 Measurement of Training

Organizing employee training has grown into an international trend especially for those organizations aimed at promoting the productivity of their employees (Bersin, 2008; Griffin, 2012). Powell (2009) reported that U.S.A. spends $134.39 billion, while Griffin (2010) reported that U.K. spends £38.6 billion annually on training and development. In developing country, such as Malaysia, training is also a major concern, in which employers must contribute as much as one per cent annually from their employees' salary for training (Maimunah and Aahad, 2013). Given this willingness for employee training, measuring its effectiveness becomes a necessary component in improving productivity as well as to develop the human capital (Schonewille, 2001; Ramos *et al*., 2004).

Despite the obvious fact that training has grown into international trend, general instrument or scale for its measurement is limited in developing economies such as Nigeria. Therefore, the developed General Training Effectiveness Scale (GTES) by Abdul Aziz (2015) which offers useful information on training evaluation is adopted in this study. The GTES provides a general scale to measure the impact of training at different levels using trainees' self-report. Table 3.1 shows the various dimensions of GTES as proposed by Abdul Aziz (2015).

Table 3.1: General Training Effectiveness Scale (GTES)

Levels of training evaluation	Number of items
Learning Performance (LP)	1. The learning resources I used during the training were adequate and up-to-date.
	2. The course tutors I met at the training institutions were excellent in their respective areas of specialization.
	3. The courses I covered during the training were relevant in helping me to specialize in my area of study.
	4. I can lists down all the important things emphasized during the training
	5. The skills acquired during the training taught me how to solve certain job problems
	6. By applying knowledge acquired during the training I became efficient in the task (s) assigned to me
	7. I have the capability to perform the skills taught during the training
Individual Performance (IP)	8. The training has significantly improved my personal competencies to handle different tasks
	9. I am being more professional in certain tasks after attending the training
	10. By applying the skills learnt during the training my job performance has significantly improved
Organizational Performance (OP)	11. The training outcomes has directly impacted on the productivity of my workplace
	12. What I learned during the training has improved my job performance and subsequently my organizational performance
	13. I have contributed to improving my organization's reputation due to the outcome of the training either directly or indirectly

Source: Adopted with some modifications from Abdul Aziz, S.F. (2015)

Training extends its benefits far beyond research and teaching, impacting multiple disciplines and sectors. It enhances individual competencies, organizational performance, and societal development. Training in healthcare—covering clinical skills, patient communication, and emergency response—improves patient outcomes, safety, and satisfaction. For example, continuous professional development for nurses reduces medical errors and enhances treatment quality. It is on this note that the World Health Organization (2013) emphasizes that capacity-building in healthcare systems is critical for improved service delivery.

In Engineering and Technical Professions, skills-based training ensures engineers and technicians remain updated on technological innovations, safety standards, and sustainability practices. For instance, renewable energy systems training equips engineers to implement green solutions for climate change mitigation. Training reduces equipment downtime and increases efficiency in manufacturing industries (Salas, Tannenbaum, Kraiger & Smith-Jentsch, 2012).

In relation to Public Administration and Governance, training enhances public servants' capabilities in policy analysis, project management, and service delivery. For example, anti-corruption and transparency training strengthens institutional integrity in government ministries. UNDP (2015) notes that capacity-building of civil servants improves citizen trust and policy effectiveness.

In business and corporate Management, training improves decision-making, strategic thinking, and team management. For example, customer service training increases brand loyalty and sales performance. Bartel (1994) found a positive link between employee training and productivity growth in U.S. businesses. Similarly, ICT training enhances digital literacy, cybersecurity awareness, and system optimization skills. For example, data analytics training allows employees to make data-driven decisions that improve operational efficiency. The International Telecommunication Union (2018) reports that digital skills training drives innovation and competitiveness.

In agriculture, training equips farmers with modern farming techniques, pest management strategies, and market access skills. For example, climate-smart agriculture training increases crop yields and resilience against environmental shocks. FAO (2014) links farmer field schools to higher productivity and income.

In relation to security and law enforcement, training improves law enforcement officers' skills in crime prevention, investigation, and community policing. For example, human rights training fosters ethical and community-focused policing. Police academies with regular refresher courses have shown reduced use-of-force incidents.

To sum it up, training's influence is multisectoral, it enhances technical competencies, fosters innovation, promotes ethical standards, and ensures organizations can adapt to evolving challenges. Across healthcare, governance, engineering, ICT, agriculture, and security, effective training translates to higher productivity, improved service delivery, and sustainable development.

3.3 Concept of productivity

The rate of economic growth is reflected in the increase of output of goods and services of a nation over a given period. In the process of economic growth, production and productivity are the significant elements. Increase in productivity of an institution is an essential factor for stepping up the rate of economic growth. Productivity drive has a great role to play in increasing the production per unit of input and thereby augmenting national income. Increase in production must be accompanied by a reduction in the cost of production of every additional unit. It is on this note that, the International Labour Organization opines that in as much as the interest must often centered round the relationship of production and labour, the word 'productivity' always referred to output in relation to labour. Thus, productivity can be expressed as an output-input ratio. Units of output produced per unit of input are called single-factor productivity. More output per unit of input reflects relatively greater productivity. If the greatest possible output per unit of input is achieved, a state of absolute or optimum productivity has been achieved it is not possible to become more productive without new technology or other changes in the production process.

Claugue (2017) submits that the word productivity is a word which we use broadly to express the overall efficiency with which we our institutions perform. Thus, it is imperative for an institution to improve the productive capacity of its workers through training and development as this benefit not just the workers but the institution as a whole. International Labour Organization is the "ratio between output and any one of the factors of input". One of the key determinants of international income differences is differences in capital per worker. Capital per worker is greater in rich countries and is an important reason why workers in such places are more productive than their counterparts in developing nations. For instance, Switzerland and USA workers are 20 to 30 times more

productive and even richer than the typical worker in developing countries such as Haiti, India and Nigeria (Abonyi, 2007).

Productivity means the total production compared with inputs or consumption over the same period of time, which serves as a measure of whether the producer's production processes are working efficiently (Witzel 1999). According to Boice (1987), productivity should emerge from hard work, and a fair schedule for research activity should utilize a benchmark that encourages a struggling researcher to relate to their current level of activity. For example, Boice (1987) found that a new faculty member who could find only one hour per weekday to work on their research, generally managed to submit about 1.5 manuscripts per year, which is then consistent with the expectations for a pay rise and higher tenure status. Furthermore, faculty members who adopt a regimen of brief daily periods for research projects typically experience less stress in managing their time and their lives (Boice 1987). Five things that can be adduced about the term productivity are:

i. Productivity is a form of efficiency;
ii. Productivity is the utilization of resources;
iii. Productivity is a ratio rather than a phenomenon;
iv. Productivity is a measure of some kind; and
v. Productivity is a rate of return.

In labour economics, productivity means the most economic utilization of available resources of man, machinery, materials, money, power and land. It simply shows the ratio of output to input both measured in real terms. Productivity can be seen in terms of a comparison between the quantity of goods and services produced and the quantity of resources employed in the process of production. On the other hand, labour productivity is described as the ratio between the output and the number of man hours being utilized along with other factors of production. Thus, labour productivity is always expressed as "labour cost per unit of output." While productivity is very important in industrial circles, public concern over competitiveness and productivity is HEIs enters virtually every policy discussion, whether the subject is education, the budget deficit or national politics (Krugman, 1991). Three important factors which influence the productivity of labour force include:

(a) Willingness of the workers to do the work assign to him/her;
(b) Ability of the labour to do the work assign to him/her; and

(c) The environment under which he/she has to work assign to him/her.

Labour productivity as opined by a number of labour economists is very difficult to measure because of the dynamistic nature of the labour characteristics and other factors influencing his/her performance. For instance, there is difficulty in arriving at the homogeneity of data concerning labour due to differences in skills, energy, training, environment, incentives and rates of pay. Secondly, though all factors of production play different role in production but not all of them are included in measuring productivity. Other difficulties in the measurement of labour productivity as stated by Chandra (2011) include:

a. Production of service industries like education, banking and insurance cannot be measured directly in terms of physical units.
b. In the case of maintenance of scientific and industrial research universities, laboratories, and market research institutes, it is not possible to consider many invisible and intangible outputs or associated services which may have no bearing on the current productivity.
c. Though labour productivity is the most important in measuring institutional productivity, the bases like man hours worked or the total number of workers employed are always not clearly defined. The man hour's concept does not consider the qualitative differences in the characteristics and composition of labour.
d. Output is usually conceived as the volume of completed or finished product and little attention is paid to the work-in-progress which is just as much as the result of application of input factor, as the completed product.
e. The compilation of international is highly complicated and a very difficult task. There is indeed a difficulty in selecting a suitable yardstick for measuring productivity. In certain countries the real net product per man-hour worked is taken as a yardstick while in other productivity of capital is taken.

Productivity of labour depends upon a number of factors some of which as stated by Gupta (2012) include:

a) Training and development: This is one of the key determinants of labour productivity. Thus, Productivity of labour largely depends on the training and development given to labour force which, in turn, depends on the nature size and needs of the institution.

b) Quality of labour force: Productivity of labour largely depends on the quality of labour force which, in turn, depends on the nature and extent of investment in human capital in the form of provision of better payment of wages, health facilities, good nutrition as well as better opportunities for expressing one's talent and innate ability.
c) Quality of labour management: Productive efficiency of an institution depends to a great extent upon the quality of the managers of an institution, better personnel relations, and delegation of authority.
d) Incentives leave, bonuses, seminars, hospitals payment
e) Conducive working atmosphere

3.3.1 Research Productivity

Since research productivity is a key element in the development of research questions and hypotheses in this study, it should be carefully defined. To begin with, Oxford University (1995) defines research as a careful study or investigation with a view to discovering new facts or information. Research is typically a private and self-mastered activity, and it can be difficult for university staff members to balance an effective project agenda with the demands of teaching, service and life in general. It is also any activity that academic staff/faculty members perform with intention to contribute to the existing body of knowledge in a given discipline. For instance, a research proposal for a grant, a research publication in refereed or non-refereed journal; a research report for an agency or institution; a monograph, academic book or book chapter, submitting an article to newspapers or magazines; producing a creative work or innovative item, a license or patent; being on book or journal editorial boards; being a post-graduate supervisor; or being on a committee for oral exam or dissertations (Creswell 1986). Thus, research activity refers to academic lecturers' series of activities that academicians/faculty members perform in the process of doing research such as defining a research problem, carrying out a literature review, collecting data, analyzing data or writing a report. The quantity and quality of finished research works and publications produced by academic lecturers is termed as research output.

American Assembly of Collegiate Schools of Business (AACSB) states four justification for research (i) improving the general knowledge of society; (ii) to serve a necessary ingredient for effective teaching; (iii) to improve the practice of a particular discipline in the real world of affairs; and (iv) to perpetuate one's own discipline or one's own self-image (Jacobs, Reinmuth and Hamada, 1987). Research productivity is viewed as a key element in status attainment of post-secondary institution. However, in combining the two words as 'research' and 'productivity', a simple

definition becomes more difficult in a research environment because different people have very different perceptions about its meaning. Whilst productivity is very important in industrial circles, public concern over competitiveness and productivity in HEIs enters virtually every policy discussion, whether the subject is economics, management or national politics (Krugman 1991).

Research productivity can be defined as research output compared with inputs (money, time, facilities, researchers' and team's efforts). Research output represents the quantity and quality of finished research works and publications produced by academic staff at different period of time or after completing their training as in the case of this study. Print and Hattie (1997) define research productivity as the totality of research performed by academics in HEIs and related contents within a given time period. Kostoff (1995) who sees research efficiency as a proxy of research productivity defines it as the productivity of research per unit of input resource. Turnage (1990) defines it as the relationship between the outputs generated by a system and the inputs provided to create those outputs. Research productivity is an outcome measurement of scholarly effort (Jacobs, Hartgraves & Beard 1986; Kurz *et al.*, 1989), and has two components i.e. (i) knowledge creation (research) and (ii) knowledge distribution (productivity) (Gaston, 1970). For the most part, the 'product' of academic lecturers' research is scholarly publication (Carnegie Foundation 1991). The importance of this definition of research productivity is that it enables faculty members to share insights, demonstrate academic scholarship, gain recognition for creative thinking, and finally to develop a reputation for expertise in a specialty area (Rhodman 2002).

Taking a slightly wider view, Creswell (1986) posits that research productivity can include research publication in professional journals and in conference proceedings, manuscript development or book (s) chapter, gathering and analyzing original evidence, working with post-graduate students on dissertations and class projects, obtaining research grants, carrying out editorial duties, obtaining patents and licenses, writing monographs, developing experimental designs, producing works of an artistic or creative nature, engaging in public debates and commentaries.

3.3.1.1 Role of Research Productivity in Higher Education Institutions (HEIs)

The role of research productivity in HEIs can be divided into three; institutions, academic staff members/faculty members and students.

3.3.1.1a) Role of Research Productivity for Institutions

Promotions, ranking and reward systems in institutions is solely based on the quality and quantity of institutional research productivity, teaching performance and community outreach (Read, Rae & Raghunandan 1998; Kotrlik *et al.*, 2002). Greatest emphasis is placed on the relationship between institutional research productivity and rewards by offering pay rises, tenure, and promotion. The rewards can be extrinsic (e.g. salary increase and promotions) or intrinsic i.e. a reward associated to one's personal satisfaction arising from completion of projects or activities, for instance, publishing a research paper, developing manuscript or simply developing personal feelings of increase autonomy and personal growth through successful completion of research work (Konrad & Preffer 1990; Lane, Ray & Glennon 1990; Laviton & Ray 1992; Pfeffer & Langton 1993; Im & Hartman 1997'; Gibbon, Ivancevich and Donelly, 1994; and Katz and Coleman, 2001). Research productivity was the most important criterion for making promotion and tenure decisions of chairs and committees. This assertion was confirmed by Gibbs and Locke (1989) in their study involving the survey of 59 chairs and committees in 93 universities in which they found that research productivity was the main criterion for making promotion and tenure decisions. In the same vain, Read *et al.* (1998) buttressed this claim that academic staff/faculty members promoted in in recent years had more publications than those promoted in earlier years. This increase in research compared to teaching and community service has been accepted and duly recognized by academic staff members/faculty members since the 1980s (Cargile & Bublitz 1986; Schultz, Mead & Hamana, 1989). The findings of a survey by Albach and Lewis (1995) among faculty members of 14 countries reveal that more than three quarters of them were of the view that successful research is important in faculty evaluation and, further, that majority of them agreed that it is difficult for someone to achieve future if he or she does not publish. A popular cliché among academics in Nigeria is "publish or perish". Kfir, Libman and Shamai (1999) in their study conducted in Colleges of Education (CoEs) in Israel found out that although not all faculty members can or should engage in research, the CoE as a whole should be exposed to research and participate in the academic research culture.

Research productivity is not only important for promotion and appointments, but an inevitable tool for enhancing an institution's ranking, reputation and socio-economic status (Blackburn *et al.*, 1991). Faculty publications and productivity could be demonstrated as an index of departmental and institutional prestige (Creamer, 1998). Institutional ranking and academic performance contributed

to the benchmarking of an institution's research productivity and that an increase in productivity proportionately led to high prestige for the institution (Henthorne *et al*., 1998; and Olsen; 1994). Numerous other studies reported the fact that promotion and tenure extension are guided by one's academic contributions in terms number and quality of publications in referred journals (Perry *et al.*, 2000; & Henthorne, LaTour & Loraas, 1998).

Higher education in Nigeria is presently very competitive and demanding but faced with a major problem of attracting more students to justify their economic operations in the country. Empirical evidences drawn from America have shown that those institutions in which research was emphasized tended to have larger students enrolment (Marchant & Newma, 1994). To sum it up, for higher education institutions in Nigeria, academic staff/faculty members' research productivity that is produced each year and is publishable is not only criteria for academic promotion, but can also enhance Universities, Colleges and Polytechnics access to research grants and even attract investors. Whenever an institution of higher learning has prestige and recognition, the number of students can be shown to increase and the institution could receive a higher income for development.

3.3.1.1b) Role of Research Productivity for Academic staff/ Faculty members

While it is obvious those faculties explore and disseminate knowledge through production of research, it is also certain that research can provide an important background for academic staff/faculty members to become successful lecturers (Dundar & Lewis 1998; Henthorne *et al*., 1998; Williams, 2000). Research productivity enhances quality of teaching effectiveness, because it develops the knowledge and reinforces many of the same skills that are required for effective teaching. This includes the ability to organize one's thoughts and to communicate well. Faja (1976) found that HEIs that emphasis and encourage research among its faculty members, teaching awards are almost twice as likely to go to faculty members who publish than those who do not publish. Thus, active researchers are more effective at instilling a critical approach to understanding complex research findings rather than a passive acceptance of facts. These characteristics can be usefully communicated to students during classroom instructions.

Another role that research productivity plays to academic staff/faculty members is that makes them in touch with the latest happenings in their field. Research experience enhances knowledge and intellectual vitality (Jenoks & Riesman, 1968). Academic staff who is involved in research is more likely to be at the forefront of their discipline. Research productivity shapes the ability of lecturers to meet the challenges of a dynamic and knowledge-based economy and at the same time, provides

them with empirical evidences that will influence the outcomes for teaching and learning (Fresko 1997 & Gray, 1998). Outcomes of the study conducted by Katz and Coleman (2001) reveal that participation in research improves teacher educators' self-confidence, enhances their professional status and contributes to their professional growth and self-actualization. Research is, therefore, important for academic staff training and development. Engaging in research can enhance faculty members' knowledge, increase teaching effectiveness and the ability to think and communicate. Academic staff who is involved in research usually gain promotion opportunities, access research grants, attend more conference and develop more manuscripts and ultimately attain higher academic status.

3.3.1.1c) Role of Research Productivity for Students/ Research Scholars

Classroom success is directly proportional to effective teaching and research productivity. This is confirmed by two studies conducted differently but arrived at the same finding that teaching effectiveness is a product of effective research outputs (Logue, 1991 & Blake, 1994). Students too are challenged to learn many things if the facilitator is grounded in research activities. This is the reason why students appreciate teachers who cite their own research outputs during classroom instructions than those cite others or end the classroom instructions with no reference to their research outputs or others. For instance, an academic staff that develops a manuscript and publishes it is seen as an authority by his students in the field or area he/she wrote the script. Students respond positively and proudly being taught by a faculty member whose book they know will be read by students elsewhere (Marsh & Hattie, 2002; Hicks, 1974 & Rowland, 1996).

Desirable student outcomes are found to be proportionately related to the quality of academic staff research productivity. This can be attributed to cross-fertilization of ideas and exchange or sharing of research findings with other academics or students and that, this helps the teacher to clarify their subject material perfectly and professionally. Objective criticisms, valid comments, observations and relevant questions help in elucidating new research directions among academic community. Sharing one's research outputs with appreciative audience provides reinforcement for having done the research and contributes to the pursuit of further investigation (Marsh & Hattie, 2002).

Drawing from the above empirical studies, it can be deduced that academic staff accomplishment is directly related to their research productivity, and that students accord them special respect and honour because they attempted to distinguish themselves as productive researchers not a faculty member who seldom do research or at most publish for promotion alone. It is concluded that

academic staff teach well within shortest possible time if they are sound in research processes and activities.

3.3.1.2 Measurement of Research Productivity

Research productivity is the best way to demonstrate faculty performance. Productive research in most HEIs worldwide is determined by the number of published articles in internationally refereed journals and conference proceedings, which are the usual channels for the dissemination of research and development activities among researchers. Hence, publishing a paper is an indication of success in advancing the frontiers of knowledge and it is also the criterion for academic promotion (Brooks & German, 1983). Faculty research productivity is typically defined by the number of publications in academic refereed journals and scholarly books (Denton *et al.,* 1986). Sometimes the number of presentations at professional meetings is also included as are grant applications, awards, and the dollar amounts of grants (Wilson, 2001).

Several measures were put forward by scholars on measuring one's research productivity but the most pervasive issue regarding the measurement is the confusion of quality of publications with quantity of publications (Lawrence & Green, 1980). Debate over the most appropriate measure of research productivity revolves around two fundamental dimensions i.e. quality and quantity (McGuire *et al.*, 1988). Importantly, while research productivity can be measured at individual level, there is also a need to develop hierarchical measures at the sub-department, department and HEI level.

Brocato (2001) suggested that perhaps the easiest way to gather counts is to ask respondents to self-report the number of publications produced for a particular period of time. However, counting all publications equally may be simplistic because it ignores the quality of the publication. One method of adding quality into self-reported counts is to define eligible publications carefully. Faculty members can be asked to list non-refereed publications separately from refereed quantity measurement of research productivity journals. Single authored papers can be distinguished from multiple-authored ones. The types of publications, for example journal articles, books, monographs, or book reviews, can also be easily distinguished.

The most frequently used measure of the quantity or amount of research productivity is a numerical publication count or the journal article count over a certain time period. The activities included in measuring productivity range from a narrow perspective of 'number of research articles published' to a broad interpretation which consists of presentations, both formal and informal, number of graduate students that a staff member is advising, publication of any type and proposals submitted

for funding. Publication is any activity that aims to make the products of academic research generally known to the public. It is not only research published in refereed or non-refereed journals, but also on websites, in exhibitions, radio or television broadcasts or governmental report papers.

Rotten (1990) states that a common approach to measure RP was to count the number of books, articles, technical reports, bulletins, book reviews published as well as presentations given and grants received through reviewing curriculum vitae or other print materials. Equally, quantity measurement of RP includes counts of the number of editorial duties, conference deliveries, licences, patents, monographs, experimental designs, and works of an artistic or creative nature, public debates and commentaries (Creswell, 1986).

Fielden and Gibbons (1991) pointed out that most HEIs emphasize articles published in referred journals and trivialize all other measures of research productivity. Clement and Stevens (1989) found that management administrators put greater weight on scholarly research (i.e. articles published in referred journals) and less on trade and newspapers articles than their non-management peers. Thus, publication in referred journals was ranked as the most important factor in research productivity while paper presentations at conferences are very important component of faculty productivity (Radhakrishma, Yoder and Scanlon, 1994; Radhakrishma & Jackson, 1993). This statement was buttressed by Cooper (2002) when he opines that, the only magic number is zero; if you have not published in referred journals, then publications in research conference proceedings, books and other publications are meaningless.

Determining RP using quantity measure is a complex task in which either a straight counts or weighted counts are used (Collins, 1993). Straight count is to ask respondents to self-report the number of publications they produced for a particular period of time. However, straight counting of all publications may be simplistic and hence the need to define eligible publications using weighted counting. Academic staff/faculty members may be asked to list non-referred publications separately from referred ones. Single authored papers can as well be distinguished from two or more authored ones. The type of publications, for instance journal articles, books, monographs or book reviews can also be easily distinguished (Brocato, 2001). Comparisons between journal articles and books need some form of weighting system because there are many journal articles that cannot be used to measure research productivity so also, we have several types of books that don't meet the criteria for the weighting counts. Thus, problems could arise when equal weight is given to many of the books or peer-reviewed publications in newer journals whose review standard may be less rigorous than the longer established journals or book of readings (Creswell, 1986).

Braxton and Toombs (1982) used an objective method of weight assignment by using a panel of scholars of the academic profession or of graduate education to measure the research productivity. The experts were asked to rate the publications on scale of zero to ten and the median ratings obtained were then used to construct a scale of the weighting system. The results indicated that books review published in academic or professional journals had a mean rating of 8.8; a published edited book 4.2; assignment of current scholarly books as required course reading 5.5; a paper presented at a conference 8.9; article on current disciplinary topics published in local newspapers 8.9; and textbooks published 9.3. Making similar but different submission, Creswell (1986) found out that textbooks are weighted higher than edited books, whereas edited books are weighted equally with articles published in high-quality journals but higher than ones published in journals of lower perceived quality. Miller and Serzan (1984) submitted that special characteristics of the journals affects the weighting system because articles published in referred journals are assessed higher and certified as a contribution to knowledge than articles in non-referred journals.

However, there are also unpublished research outcomes that are recognized as form of research productivity. Papers presented at professional meetings and the final report of funded research is classical examples of unpublished research outcomes that are recognized as a form of research productivity. Weights for these items may also be needed because a grant differ in terms of their value and area of coverage and the prestige of professional associations also varies with their geographical coverage of members (Creswell, 1986). Similarly, service as a reviewer of grant proposals is another pertinent measure of research productivity (Pellino, Blackburn & Boberg, 1984).

Apart from quantity measurement of RP, quality measurement is also of paramount importance in determining the dimensions of RP. Generally, two quality measures i.e. peer review rating and citation analysis are used as quality measurement of Research Productivity. Peer review as a quality measurement of RP refers to a process in which one or group of qualified persons professionally peer review one journal article paper (s) and decide whether it should be accepted for publication in a scholarly journal or book (Upali, Hebert & Nigel, 2001). During peer review experts who scrutinize one's journal article do not know the names of authors of manuscripts they are asked to review. Nonetheless, the case of assessing grant proposals may be different, because the peer review process in grant proposals has considerable interest in what are the particular characteristics of the researcher such as his/her age, gender, rank, potential conflicts of interest (Chubin, 1994).

Kirkpatrick and Locke (1992) found a statistically significant positive correlation between individual peer rating and measures based on article counts and citation counts. However, peer rating are not without their lmitations, for instance, it can be influenced by the personality of the scholar being judged and/or by the prestigate of the institution of affiliation (Folger, Astin & Bayer, 1970). In the same vein, Nelson, Buss and Katzko (1983) found out that other limitations of peer rating include; (i) the quality of the personal work is not being measured in peer reviews, (ii) journals different in scope of articles published because some journals may concentrate on contribute to knowledge while others may focus on more creative contributions and (iii) peer rating is affected by rapid changes of editorial staff and publishing policies.

The second quality measurement of RP is citation counts which means number of times one's published papers are cited by different scholars in their works over a period of time. Citation count sums the citations received by one's articles or papers in a data source. Citation per output calculates the number of citations received by each output (paper or article) at a given period of time. Citation measurements have been used to measure faculty members' research productivity (Braskamp & Ory 1994: Creamer 1998). Centra (1981) claims that citation data better reflects the impact of faculty members' research work. One way of gathering citation data is by obtaining curriculum vitae from faculty and verifying listed citations via citation abstracts and databases.

As opined by Creswell (1986) and Brocato (2001) citation counts are not without limitations. First, there are substantial differences in citation rates among various disciplines because of the rates of publication and the acceptance rates of journals. Second, significant research may not be recognized for a considerable period of time, but a scholar who has published a number of pieces in a fixed period of time might expect to generate at least a few citations. Citation rates decay substantially (Line 1984), thus staff who work for a longer period of time generally have more publications and more opportunity to be cited. Consequently, citation counting must be a restricted compilation to a fixed span of time in both citation sources and the citation documents. Third, a scholar who is a junior author of a piece, and therefore not first named, would be missed in simple counts. Fourth, some surnames are subject to common misspelling by citing authors, and these errors are preserved in the citation indexes. Fifth, citations may be for criticisms and rejections of research rather than its merit and utility. Sixth, several critics of citation tools have noted that self-citations and citation of friends' work may distort realistic measurement. Finally, citation counts do not distinguish between positive and negative comments about the work. Furthermore, citation indices are subject to a long lag-time because of the long peer review and publication process. Wanner, Lewis & Gregorio (1981)

noted that the quality measure of research productivity is not as frequently used as simple counts since the cost of gathering information on citation is quite considerable. In addition, the correlation range between citation counts and publication counts are only 0.6 to 0.72 (Cole & Cole, 1967). Both quantity and quality dimensions of RP are shown in table 3.2.

Table 3.2: Measurement of Research Productivity (RP)

Author (s)	**Quantity dimensions of RP**
Creswell (1986), Lawrence & Green (1980), McGuire et al (1988)	Research articles published, Students' projects, dissertations and theses guided or supervised/co-supervised, Academic proposals submitted for funding, Number of editorial duties, Number of conferences deliveries, Number of experimental designs, Number of licenses, patents, monographs and books
Rotten (1990)	Books published Article papers published, Number of technical reports, Number of bulletins , Books reviews published and Number of grants received
Fielden and Gibbons (1991), Clement and Stevens (1989), Radhakrishma and Jackson (1993), Radhakrishma, Yoder and Scanlon (1994), Kotrlik et al. (2002)	Articles published in refereed journals, paper presentations at a conferences, publications in research conference proceedings, number of single-authored or multiple-authored textbooks,
Creswell (1986)	Chapters in book of readings, monographs, edited textbooks and peer-reviewed articles in different journals
Braxton and Toombs (1982), Miller & Serzan (1984), Pellino, Blackburn & Boberg (1984)	Articles published in newspapers, presentations at conferences, published book reviews, published edited book, papers presented at professional meetings, gatherings and events, number of service as a reviewer of grants proposals and the final reports of funded research works
Christopher and Iyabo (2013)	Chapters in book of readings, authored textbooks, patents and certified invention, monographs, occasional papers, scientific peer-reviewed articles, number of conference papers, working papers and technical reports
Authors	**Quality measurement of RP**
Upali, Hebert & Nigel (2001), Chubin (1994), Kirkpatrick and Locke (1992), Braskamp & Ory 1994: Creamer (1998), Brocato (2001), Creswell (1986), Kaplan (1965), Line (1984), Cole & Cole (1967) and Wanner, Lewis & Gregorio (1981)	Peer review rating and citation analysis

3.3.2.1 Teaching Productivity

Teaching is more than standing before a class and applying few specific techniques. It is not merely presenting textbooks information and then testing the students' ability to repeat it. Teaching is not everybody's cup of tea. Teaching is not a monologue but a dialogue; a dialogue in which one partner (teacher) is vocal, the other partner (student) may, by simple expressions on his/her face, partakes in the dialogue. Teaching, unlike other professions, concerns with the development of the whole individual-intellectually, socially, spiritually, and to some degree, physically. Teaching is a skill like any other skill; it can be acquired and refined with the aid of carefully choosen training (Kani, 2013).

The term teaching connotes transformation of ideas, knowledge, norms and values from one person to another. The 6th edition of Oxford Advance Learners' Dictionary defines it as "a process of helping somebody to learn something by giving him or her information about it." Israel cited in Saminu (2008) defines teaching as "an activity aimed at the achievement of learning and practice in such a manner as to respect the students' intellectual integrity and capacity for independent judgement." Therefore, teaching implies imparting of skills, ideas and knowledge by an instructor to the learners. Teaching as an art is organize in a sequence, that is, from analysis to synthesis, from the simple to the complex, from the whole to part, from the concrete to abstract, from the particular to the general, from the empirical to rational, from the psychological to logical and from the actual to the representative. Thus, teaching as an art goes beyond mere acquisition of knowledge.

Teaching is typically a private and self-mastered activity, and it can be difficult for an academic staff member to balance an effective project agenda with the demands of teaching, service and life in general. It is also any activity that academic staff/faculty members perform with intention to impart knowledge to learners. Thus, teaching activity refers to academic lecturers' series of activities that they perform in the process of doing preparation and delivery of a body of knowledge to students.

Teaching productivity can be defined as teaching output compared with inputs (money, time, facilities and teacher's efforts). Teaching output represents the quantity and quality of learning activities produced by academic staff at different period of time. Print and Hattie (1997) define teaching productivity as the totality of teaching activities performed by academics in HEIs and related contents within a given time period. Teaching productivity is the productivity of teaching per unit of input resource. Teaching productivity as stated by Muda, Ali and Jusoh (2017) include teaching preparation, teaching presentation, communication skills, classroom management and control skills, students' evaluation skills and teachers' responsibility/professional attitude and

values. With some modifications, Table 3.3 presents the dimensions of measuring teaching productivity developed by Musa *et al.* (2017).

Establishing a psychometric scale of teaching and learning performance is an innovative step towards improving teaching productivity, quality and efficiency. Based on Kirkpatrick's four levels of evaluation model, Musa, Ali and Jusoh (2017) developed a psychometric scale for measuring teaching and learning performance in the institution of higher learning. The Exploratory Factor Analysis (EFA) provides dimensionality of measures for teaching and learning performance and the scale alpha coefficient (Cronbach's alpha) in the range of 0.894 to 0.904 provides a reliable measure of internal consistency in pilot testing of their scale development. Based on the field study data, the confirmatory factor analysis (CFA) for the measurement model in SEM verified the construct of the teaching and learning performance scales.

The dimensions of TP proposed by Musa *et al.* (2017) teacher's ability to explain the lesson's objectives, making what the students are expected to learn in the lesson clear, ability of teachers to cover all the topics planned for the class session, making good use of class time teaching the materials related to learning, presentation of the lesson content in an orderly, clear and logical manner, using relevant examples to reinforce understanding of the lesson's contents, linking theory and its practical application to the real work environment, teaching at a level / speed appropriate to the students' abilities, students active participation in class discussions, teachers' ability to define and apply the concepts, principles, facts and techniques learned in class, improvement in students' knowledge after attending the class session, skills on the subject improved because of attending the class session and class environment motivation to learn and apply knowledge. Theoretically, this study had provided a new dimension for the psychometric scale of teaching and learning performance based on Kirkpatrick's model of the reaction (level 1) and learning (level 2). Practically, both HEIs and academic staff can use this measurement scale or dimensions to assess TP in the context institution of higher education. With some modifications, table 3.3 presents the dimensions of measuring teaching productivity.

Table 3.3: Measurement of Teaching Productivity (RP)

Authors	Dimensions of Teaching productivity
Kani (2015)	Teaching preparation, teaching presentation, communication skills, classroom management and control skills, students' evaluation skills and teachers' responsibility/professional attitude and values
Berk (2005)	Student ratings, peer ratings, self-evaluation, student interviews, alumni ratings, employer ratings, administrator ratings, teaching scholarship, teaching awards, learning outcome measures, and teaching portfolios.
Muda, Ali and Jusoh (2017)	Teacher's ability to explain the lesson's objectives, making what the students are expected to learn in the lesson clear, ability of teachers to cover all the topics planned for the class session, making good use of class time teaching the materials related to learning, presentation of the lesson content in an orderly, clear and logical manner, using relevant examples to reinforce understanding of the lesson's contents, linking theory and its practical application to the real work environment, teaching at a level / speed appropriate to the students' abilities, students active participation in class discussions, teachers' ability to define and apply the concepts, principles, facts and techniques learned in class, improvement in students' knowledge after attending the class session, skills on the subject improved because of attending the class session and class environment motivation to learn and apply knowledge.

3.4 Empirical review of related literature

For an economy to remain competitive at international markets, enhancing labour productivity through training and development is very essential. This is because trained workers were found to be more productive and efficient compared to those without it (Bartel, 1999). Similarly, industrialists on their parts have also tried to find the long-term effects of change in productivity as accounted for by the training and development. Measuring labour productivity is difficult because of the fact that the data needed to do the analysis is limited and, in many occasions, unavailable. Thus, some studies took an indirect approach relying on increment in wages as an indicator of one's improvement in productivity (Brown, 1989; Lunch, 1988; Lillard & Tan, 1986).

Globally, several studies were conducted to establish the link between training and employees' productivity. For instance, findings of Harris and Sass (2008), in which they investigate the effects of training on teacher's ability to promote students achievement, suggest that teacher professional development is positively related to teaching productivity among middle and high students. Secondly, their finding reveals that more experienced teachers appear more effective in teaching reading and mathematics for both elementary and middle class students. Their findings in line conformity with that of Fejoh and Faniran (2016) in which they found those workers' job performance and optimal productivity are significantly influenced by various training and development programs. Fejoh and Faniran (2016) conclude that public schools should frame a well-articulated staff in-service training and development programs so as to boost their morale and optimal job performance.

Middlewood (1999) examines the effects of training and development using primary data collected from higher education institutions in UK and based on the results, revealed that new skills that are linked to professional career development, improved working relations and environment as well as overall status of higher education institutions are improved through training. This view suggests that improvement career development and institutional effectiveness are proportionate to investment in organizational training and development. In similar vein, Suwanwala (1991) investigates perception of academic lecturers at Chulalongkorn University, Thailand on research productivity and based on the result, revealed that academic staff in the study area was not adequately equipped with the requisite skills, tools, knowledge and experience necessary to improve their research productivity. This study hence, suggests the need for investment in AST&D program so as to enhance their proficiency in research productivity.

Juthawattanathorn (1994) examines the challenges of academic community related to training and development and among others, revealed that most of the training funds were not sufficient, and that the system for training fund allocations, releases and disbursements were not flexible. Based on this, many HEIs that received the training fund found it extremely difficult to decide who will attend the training among their academic staff. The findings of Wongwichai (2000) echoed the study of Juthawattanathorn (1994) in which he inadequate funding, poor training and absence of single research unit to coordinate academic staff training and development as major challenge causing low quality research productivity.

Kani and Dutta (2021) assess academic staff utilization and satisfaction with AST&D interventions in Kano State, Nigeria. Using data from a survey of 130 academic staff, the study presents a logistic model that explores respondents' knowledge about TETFund Interventions, utilization and satisfaction. The study further examines how effective are the interventions in improving research and teaching outputs of academic staff in the study area. On one hand, the descriptive statistics of results reveal margin between overall levels of utilization (57.3%) not utilized (42.7%); and satisfaction (73.83%) and not satisfied (26.17%), implying that most of the respondents accessed the interventions and make full utilization as per guidelines of the Fund. Concomitantly, the margin between overall levels of satisfaction (73.83%) and not satisfied (26.17%) buttresses the apriori expectation of the researcher that most of the respondents are satisfied with the conditions, categories and guidelines for TETFund interventions in the study area. On the other hand, the results obtain from logistic regression suggest significant factors that affect overall utilization and satisfaction with the TETFund include age, educational qualifications, marital status, expertise of TETFund desk officer, time taken to release the intervention, and beneficiary institution response and adherence to TETFund guidelines. The overall conclusion is that strengthening the funding capacity of TETFund is not only timely and necessary but inevitable so that global ranking and prestige of Nigerian HEIs can be enhanced. Similarly, the oversight aspect of AST&D and the beneficiary tertiary institutions need to be revisited with a view to ensuring effective utilization of interventions that will, in turn, enhance the research and teaching productivity of academic staff in the study.

Using Structural Equation Model (SEM) Kani and Dutta (2021) investigates the relationship between training and teaching productivity among academic staff of HEIs in Kano State of Nigeria. The findings indicate that the three dimensions of training evaluation which are learning, individual and organizational performance are positively and significantly related to teaching productivity in the study area. The study suggests that academic staff training and development funding should be

strengthened so that more faculty members of HEIs in Nigeria can be trained with skills and knowledge needed to perform effectively during classroom instructions. It also calls for placing greater emphasis on content-oriented courses in teacher training programmes with a view to improving teaching productivity in the study area.

Using a survey conducted among 285 academic staff in Nigeria, Kani (2021) investigates whether training dimensions are related to research productivity. The findings indicate that dimensions of training have positive and significant relationship with research productivity in the study area. The implication of this study is that, the educational stakeholders should ensure that improving the research productivity during the training receive the required attention. Similarly, research skills which can be learnt through longer and rigorous period of training should be incorporated as a component of training scheme. For future research, the paper recommends the need to measure the factors affecting both training and productivity in the study area.

Fejoh and Faniran (2016) investigated the impact of in-service training on workers' job performance and optimal productivity in public secondary schools in Osun State, Nigeria and based on the results, reveals that, workers' job performance and optimal productivity is significantly influenced by the in-service training in the study area. The study, therefore, concludes that public schools should frame a well-articulated staff in-service training and development programs so as to boost their morale and optimal job performance. Effectiveness of training and development on employee performance of National Thermol Power cooperation in India was conducted by Mittal (2016) where 350 questionnaires were administered to employees and then analyzed using multiple regressions. The result show that improves delegation of authority has highest Pearson correlation value of 0.92, personal growth 0.901 and enrichment of excellence 0.890. Thus, the study revealed the existence of significant impact of training and development on employee performance. The study, among others, suggests that more and more personality development programs should be organized, monetary rewards for the best performed trainees during the training programs be introduced and multi-skill based training programs to meet the further organizational needs should be emphasized.

Using sample of 205 academic staff and Pearson Product Moment Correlation Peretomode and Chukuwa (2016) investigate the impact of manpower development on lecturers' productivity in tertiary institutions of Delta State, Nigeria. The findings reveal that only 8% of the total variation in lecturers' productivity is accounted for by training. This means that the relationship between manpower development and lecturers' productivity is positive but the magnitude was very

insignificant. Hanaysha (2016) investigates the impact of empowerment, teamwork and training on employees' productivity in Malaysian HEI. Though only 14% of the total variation in employees' productivity is accounted for by the independent variables, the results indicated that the independent variables exert some influence on employees' productivity. The study recommends that the study variables should be given utmost priority so as to achieve organizational effectiveness and growth.

Using content analytical approach Gambo (2015) study the nexus between training and development and workers' productivity. The findings indicate that training and development significantly improved the academic staff job performance during the examined period. The finding also reveals that, the 2010 TETFund interventions have positively enhanced workers' technical know-how to face the competitive challenges of contemporary times. Udu and Nkwede (2014) study on TETFund Interventions and its implications for sustainable development in Nigeria juxtaposed the fact that training has positive effect on human capital development in Nigerian Universities. Based on the results, the study recommends that, TETFund as an institution need to eliminate its unhealthy practices hindering many institutions from accessing the interventions. It further recommends the need to ensure that only eligible applicants for AST&D scheme are allowed to access the intervention. Competent contractors too should be engaged by the beneficiary tertiary institutions to handle the capital projects allocated to them by the TETFund.

Obi and Ekwe (2014) assessed the influence of training and development on organizational effectiveness. The findings show that one unit increase in training and development will, in turn, lead to about 0.689 increases in the organizational effectiveness. It also reveals that improved inter-personal and teamwork among the workers are directly linked to training and development. The main finding is that, overall variation in job satisfaction and organizational performance is accounted for by the training and development in the study area. Based on these results, the study concludes that investment in human resources by an institution through effective training and development has both immediate and long-term returns in terms of increase in job satisfaction and organizational performance. The study recommends, among others, that institutions need to regularly organize training and development activities so as to keep their workers updated on the dynamics of work environment. Since mere investment in human resources is not enough; the employers need to monitor and appraise the performance of their employees so that the returns from the investment will be proportionate to the amount spent for training and development programs.

Tahir *et al.* (2014) investigate the effect of training and development on employees' performance and productivity in Peshawar Region, Pakistan. The $R^2 = 0.476$ indicates that about 48% of the total variation in the performance and productivity of employees in the study area is accounted for by the training. This finding suggests that training and development has significant positive effect on employees' performance and productivity. In the same vein, Sabir *et al.* (2014) examine the correlation between training and productivity of employees of electricity Supply Company in Pakistan. The results show that training is positively related to employees' productivity while job involvement, feedback and compensation are insignificantly related to employees' productivity. The study recommends the need for continuous training so as to uplift the productivity of the employees in the study area.

Yeow, Chow, Kavitha and Loe (2012) investigate the effect of training and development among the academic staff of higher learning institutions in Malaysia. Overall results revealed that training is positively and moderately correlated with attitude and performance. It also shows the existence of weak but positive relationship between training and loyalty, motivation and job satisfaction. The study recommends that the employers should take the above key variables into account while designing and implementing training and development policies and programs.

Effect of training and development programmes on productivity was investigated by Naveen (2012) among the employees of New Mangalore Port Trust (NMPT) Employees, India. The findings indicate that training and development programs are directly linked to quality of work and competency of employees in the study area. On the contrary, the findings also show that the training and development activities of NMPT are not based on cost-benefit analysis and are unplanned and unsystematic. The study concludes with the recommendation that training and development should be employee-centric and it should lead to value creation and value delivery in an organization. With special reference to large scale industries in Kumaun Region of India, Chandra *et. al*. (2011) examines how training programmes impacted on labour productivity. On one hand the result indicates that age and gender are statistically significant in determining overall efficacy of the training program and on the other hand, it reveals the positive and significant correlation between training and development programmes and labour productivity.

Impact of foreign employees on productivity was investigated by Noor, Isa, Said and Jalil (2011) using secondary data obtained from Malaysian Manufacturing sector survey 1972 to 2005. The result shows that, the continuous proliferation of foreign nationals to work in Malaysia was attributed to a number of factors including rapid economic growth, shortage of labour as well as cheaper cost of foreign workers. It was found that one percent increase in the number of foreign nationals employed to work will increase productivity in Malaysia Manufacturing sector by 0.172%. However, Granger Causality test reveals that the relationship between domestic and foreign workers in Malaysia was not statistically significant. This implies that foreign workers are neither substitutes nor complements for domestic labour in Malaysia. The study recommends that, there is need for the government to initiate policies that will reduce the dependency on foreign workers as well as non-wage differential between local and foreign workers.

Verma and Goyal (2011) analyze the available training and development practices in Life Insurance Corporation in India and the results reveal that perception of employees regarding training and development do not differ significantly among the respondents in the study area. The finding further reveals the training program in Life Insurance Corporation is average. Based on this the study recommends that training should be given utmost consideration as it help an organization to achieve not only high productivity but customer loyalty and patronage. Concomitantly, an effect of training on productivity and wages in Belgium was investigated by Konings and Vanormelingen (2010) using panel data of 170,000 firms. The finding shows that, training and development has much impact on productivity compared to wages. Based on the results the study calls for future research to explore the optimal versus the current number of training programs as well as the extent of government intervention towards attainment of optimal level of workers' productivity and substantial increase in wages and salaries.

Relationships between training and workers' performance and productivity in Ghanaian public sector organizations were examined by Laing (2009). The results show that most of the employees that participated in the training were of the view that training improves their productivity. However, the findings revealed that the training and development programs offered to the employees in the study area were not in tune with the international best practices. The study, therefore, recommends that training and development programmes should comply with best practices world over. It also suggests that employers should guide their employees to identify their career paths and then give them training that will make them to attain success in their respective choosen careers. On their study, Jajri and Isma'il (2009) investigate the effect of technical progress on labour productivity and

the result, apart from revealing positive effect of technical progress on labour productivity, further shows that technical progress has complementarity with skilled labour. Similarly, the findings reveal that Small and Medium Scale Industry (SMIs) in Malaysia are slow to adopt technology. Hence, the study recommends the need to have more educated workforce and provide them with up-to-date training. It also recommends the need to adopt quality control in production and compensation practices that emphasis job stability and skill acquisition in an organization.

Using primary data Arvanitis and Loukis (2009) carried out a comparative study between Greece and Switzerland on the effect of ICT, human capital development, and workplace organization on labour productivity and the result shows that in terms of ICT, human capital and workplace organization Swiss firms were more efficient than Greece ones. The tests of null hypotheses reveal that ICT, human capital and workplace organization have statistically significant positive effects on labour productivity. Based on this, the study recommends the need for both Greece and Swiss governments to design industrial policies that will promote investment in employees' training and development.

Rasheed (2008) examines the impact of manpower training on staff performance and retention in Federal College of Education Zaria, Kaduna State of Nigeria. The study shows that the training programs that are majorly emphasized in the college are rather too academic in nature and as such failed to address the peculiar training needs of the academic staff in the study area. On the impact of the training programs, findings from the study reveal that the various training programs offered have not impacted positively in enhancing the skill, knowledge as well as job performance. The study calls for adopting effective strategies so as to properly evaluate the results of the training and development. Added to this, the training should be consistently conducted so as to equip members of academia with the requisite knowledge, skills and attitudes needed to accelerate their job performance. The study concludes that training should not be seen as a routine activity, but as an important aspect of personal management and it should be a constant and continuous exercise.

Aghazadeh (2007) examines the nexus between training and productivity improvement in service sector. The study reveals that inadequate investment in training contributes to workers low productivity, resentment and absent of co-operation in solving organizational problems. Thus, the study calls for adequate investment in training with the sole aim of improving workers' productivity and promote co-operation in solving organizational problems.in the same vein, relationship between training, teamwork and empowerment and academic staff productivity in Malaysia was investigated

by Hanaysha (2006). Though only 14% of the variation in academic staff productivity was accounted for by the independent variables, the study indicates that empowerment, teamwork and training have significant positive effect on employees' productivity. Thus, the study recommends that other factors apart from empowerment, teamwork and training should be given utmost priority so as to achieve the overall organizational productivity.

Dearden, Reed and Reenen (2005) using British industries Panel data of 1983 and 1996 evaluate the nexus between training and workforce productivity and wages and the result suggests that a 1% increase in worker's training is associated with 0.6% and 0.3% increase in productivity and wages respectively. Thus, the findings show that training is associated with significant increase in both productivity and wages. The findings equally reveal that change in wages is only half as large as the change productivity due to training. Exploration of more aspect of training and development in relation to its returns to employers and the economy as a whole is the major recommendation in the study.

Relationship between training and corporate productivity of British industries was investigated by Dearden, Read and Reenen (2000) between 1983 and 1996. Multiple regressions, ANOVA and General Moment Method (GMM) were utilized as the tools for the data analysis and inferences. The results show that an increase in workers training by 5% is associated with 4% and 1.6% increase in productivity and wages respectively. This result coincided with the earlier finding of Dearden *et al.* (2005) that increase in wages due to training is just half as large as it has on the productivity of labour. Similarly, this finding is in conformity with the finding of Zwick (n.d.) that an increase in workers training by 1%, on average, will lead to change in corporate productivity growth by more than 0.7%.

Groot (1999) examines the influence of enterprise-related training on productivity and wage among firms in Netherlands. The productivity difference between trained and non-trained employees was estimated and the findings reveal that the average wage growth is less than ¼ of the 16% average productivity growth associated with training. This implies that both the productivity and the wage are high due to the training received by the workers. Thus, the study recommends that the workers who contribute to the cost of the training should benefit from it more than those without having contributed to its costs. Similarly, relationships between training, wages and job performance among manufacturing firms in USA was investigated by Bartel (1999) and the results show that wage growth which translates into increase in manufacturing firms rate of return of at least 13% was attributed to investment in staff training and development. The study further reveals that

improvement in job performance was directly linked to training received by the employees in the study area.

Nexus between productivity gains and implementation of employees training programs in UK manufacturing sector between 1983 and 1986 was investigated by Bartel (1991). The results show that labour productivity was low prior to the implementation of the training programme but subsequent upon employees' training it resulted in significant increase in labour productivity. Nonetheless, the positive influence of training program on labour productivity growth was found to be inconsistent because the implementation of new staff policies other than training did not have significant effects on firms' labour productivity growth. Based on these findings, it is deduced that, though there are other factors influencing labour productivity, training programs is said to be a vital determinant of firm's labour productivity. Among others, the study recommend that further studies should investigate other dimensions of employee training programs such as money spent on the trainees, nature of the training, time spent as well as the long run impact of the training on both labour productivity and firms' profitability.

3.5 Summary of the Research Gaps

i. It is obvious from the empirical evidences that studies on training and development vis-à-vis labour productivity do exist, but only few of them were conducted in relation to education sector (Agba & Ocheni, 2017; Chowdhury & Zelenyuk, 2016; Shao & Sun, 2016; Obi & Ekwe, 2014; Bassem, 2014; Konings; Vanormelingen, 2010 & Dearden, Reed & Reenen, 2005; & Bartel, 1991).

ii. The few studies conducted in Nigeria are either too general (i.e. investigating education sector as a whole) or investigating a single school or higher institution in Nigeria (Gambo, 2015; Obi & Ekwe, 2014; & Rasheed, 2008).

iii. In addition, most of the few studies conducted were qualitative not quantitative and they were carried out in the South Western part of Nigeria (Agba & Ocheni, 2017; Fejoh & Faniran, 2016; Daloke, Finian & Innocent, 2016).

iv. Despite almost a decade of introducing the ASTD scheme in public higher institutions in the study area, there are still dearth of empirical evidences on its impact on research and teaching productivity of academic staff. Similarly, educational planners, policy makers and other HEIs regulatory agencies do not have comprehensive information to guide informed decision.

3.6 Theoretical Framework

A number of theories were developed to establish the linkage between training and productivity. These theories have attempted to show that human elements cannot be self-growth without being empowered through training. Some of these theories include Galvin model (1983), Brinkenhoff's model (1987), B.F.Skinner Theory, Frederick Winslow Taylor's theory (1911), Kraiger, Ford and Sala's model (1993), Donald Kirkpatrick model (1996), Cannon-Bowers (1995), Samuelson's public goods theory (1994) and Eckstrand system theory (1964). Though only Cannon-Bowers (1995) HRD model three levels of the evaluation of training effectiveness vis-a-vis labour productivity fits this study as justified in a number of previous studies, Kirkpatrick model of training evaluation on which Canon-Bowers HRD model was built is revisited in this chapter.

Evaluation of training and development of labour helps in gaining information on how it contributed to the objectives and goals of the trainees' institutions. Whether to continue funding the training programme or halt it all depends on the outcomes of the evaluation. The outcomes of the evaluation be it positive or negative helps to improve future training programs in terms of funding and duration. It is on this premise that, Donald Kirkpatrick (1967) developed four levels that can be used in evaluating the effectiveness of training program and its impact on labour productivity. These four levels are discussed as follows:

1) *Trainees' Reaction to the training:* This is the first level of evaluation which focuses on the AST&D Scheme beneficiaries' expectations about the training and experiences after the training. Reaction is simply a measure of trainees' satisfaction about the training program.
2) *Learning/Skills acquisition level:* This deals with the skills acquired by the trainees training programs funded under AST&D Scheme. Increase in knowledge, improvement in skills and change in attitudes towards work are part of learning/skills acquisition level. Thus, pre-training expectations and post-training experiences of the AST&D Scheme beneficiaries will be check to measure whether their knowledge have increased, skills have improved and their attitude towards work have changed.
3) *Trainees' behavioral change:* This measures whether the ideas, knowledge and skills acquired by the trainees during the training were transferable to the working environment with a view to reflecting positive changes in behavior and job performance.
4) *Training outcomes:* The result of the trainees' reaction to AST&D Scheme, the skills acquired while undergoing the training and the changes in behavior due to the training program are all

part of the training outcomes. This level seeks to determine whether the AST&D Scheme has impacted on the Nigerian tertiary institution through provision of quality teaching staff and increase in research and its applications for teaching and community services.

This study is hinged on the theoretical foundation of Human Capital Theory (HCT) proposed by Cannon-Bowers (1995). As a modified version of Kirkpatrick (1967) four levels of training evaluation, Cannon-Bowers (1995) human capital theory examined training effectiveness based on learning, individual, and organizational performance. Cannon-Bowers (1995) argued that trainees' reaction should not be considered as a level of training evaluation because it fails to differentiate the effect of training transfer on job performance. Alleger (1997) study in which he found the existence of insignificant correlation between trainees' reaction to training and other dimensions of training evaluation was in agreement with the submission of Cannon-Bowers. In the same vein, Holton (2005) juxtaposes the fact that trainees' reaction to training has no relationship with training objectives and hence, should be ignored as part of training evaluation.

Prior studies such as Borges (2008) and Garcia (2005) found that training evaluation can be performed using the three levels proposed by Cannon-Bowers. Since the purpose of training will not always involve all the levels as proposed by Cannon-Bowers, some studies such as Kontoghiorghes (2004) and Kraiger *et. al.,* (1993) opined that training can be evaluated using selective levels. However, the nature of the relationship among training dimensions varied from weak, moderate, strong and perfect. For instance while Tziner *et. al.* (2007) found a strong relationship between learning performance and individual performance, Bell and Ford (2007) found weak relationship between the same variables in their study.

The three dimensions of training proposed by Cannon-Bowers (1995) were conceptualized as follows:

Learning Performance

This refers to the outcomes achieved in the process of acquiring and applying knowledge during or after training. It is about how well individuals learn, retain, and transfer new skills or knowledge to their academic functions. In relation to teaching, lecturers learn to integrate digital tools, inclusive pedagogies, or research-based teaching methods, and apply them effectively in classrooms. In relation to research, researchers learn to use statistical software, advanced research methodologies, or proposal-writing techniques, and successfully apply them in their studies. Learning performance

focuses on the quality of the learning process and the effectiveness of knowledge transfer from training into practice.

Learning performance is simply the knowledge acquired by the trainees during the training. Bersin (2008) states that learning performance measures training objectives with a view to finding out changes in trainees' ability to perform the task (s) assign to him/her in an institution or organization. Thus, learning performance focuses on the evaluation of training objectives to find whether it has impacted the expected attitude, skills and knowledge to the trainees. Kirkpatrick (1996) argument is in tune with the theoretical underpinning of this study that, learning performance determines whether the training outcomes provide the trainee (s) the skills, expertize and capability that can improve his/her research and teaching productivity. Learning performance is measured in this study using trainees' self-report perception about the three dimensions of training. This is because there is no significant difference between learning performance measured by trainees' self-report perception or students' learning test if both are measuring the same criterion of learning to achieve the same learning objective (Stehle *et al.,* 2012)

Individual Performance

This refers to how well a staff member (lecturer, researcher, or academic staff) applies the knowledge and skills gained from training in their day-to-day work. In teaching, it means improved classroom delivery, use of modern teaching methods, better student engagement, or effective assessment strategies. In research, it means higher research output, quality publications, ability to attract grants, and application of innovative research techniques. It is essentially the direct impact of training on the knowledge, skills, attitudes, and productivity of the individual academic or researcher.

Individual performance is the application of the knowledge, skills and attitude acquired through training in one's work place. It is simply the transfer of learning outcomes to working environment. It is evaluated by assessing the improvement in trainees' job performance. Self-report responses of the respondents on improvement in their research and teaching productivity are used in this study to evaluate individual performance. This is because trainees' perception in self-report is more reliable than supervisor's or trainees' job performance record that can be manipulated for political reason (Axtell, 1997; Nijman, 2006; and Tziner, 2007).

Organizational Performance

This is the broader impact of training on the institution as a whole (e.g., a university, faculty, or research institute). It is about how individual and learning performance aggregate to improve institutional effectiveness, reputation, and competitiveness. In relation to teaching, it signifies improved student performance, higher graduation rates, international recognition, and better teaching rankings. In terms of research, it means increased publications in high-impact journals, more external research funding, stronger collaborations, and higher university research rankings. Organizational Performance simply measures how training translates into improved institutional capacity, sustainability, and academic excellence.

Organizational performance refers to the general improvement in the attainment of institutional goals and reputation due to training. It also entails changes in people's satisfaction about general performance of an institution as a result of staff training and development. Improvement in organizational teamwork and efficiency due to training outcomes are also part of organizational performance. Griffin (2012) argues that organizational performance is meant to determine the impact from training on organizational effectiveness. Brinkerhoff (2006) suggests that effect of training on senior managerial staff can be used to evaluate organizational performance. Trainees' self-report on general improvement in organizational reputation, teamwork and customer satisfaction are used in this study to evaluate organizational performance.

Canon-Bowers (1995) theory of HRD offers the theoretical framework of this study by assuming that training leads to improvement in knowledge acquired; its application as well as its benefit to an organization. Canon-Bowers (1995) HRD model is an economic model of investment on one hand (learning performance), and expected returns of the investment on the other hand (individual and organizational performance).

As observed in the literature, training has an impact on productivity of academic staff of tertiary education institutions. Higher education institutions performance ultimately depends upon academic staff productivity and training is a tool to improve their productivity. ASTD annual allocations are essentially meant to improve research and teaching outputs in publicly owned tertiary education institutions. Thus, as Nigeria's productivity in terms of research and teaching improves, its GDP will

ultimately increase and hence paving ways for more funds available for continuous investment in training and development.

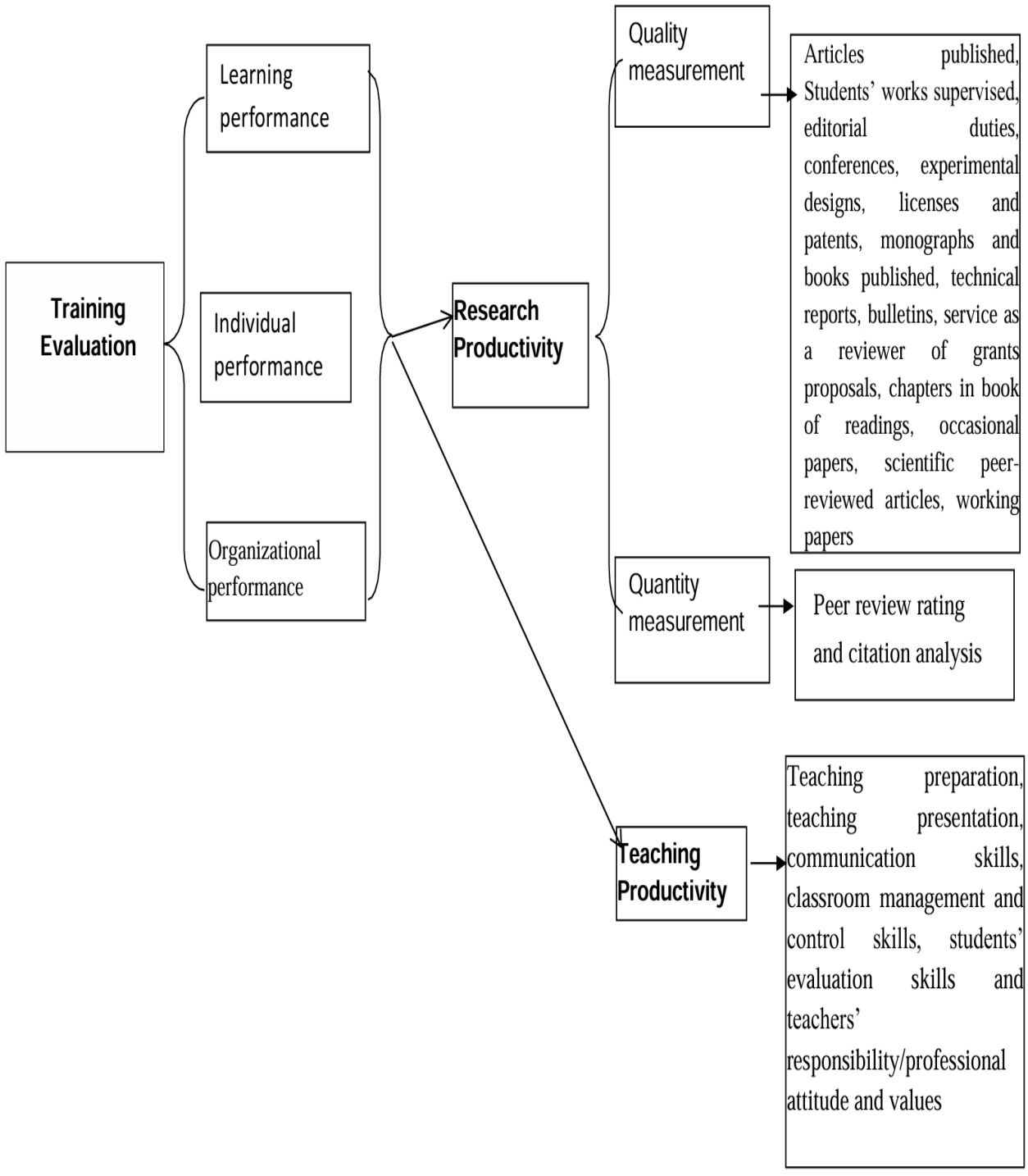

Figure 3: Theoretical framework of the study

The theoretical linkage of training on individual and organizational levels is well-established by varied theories. For instance, Human Capital Theory (Becker, 1964) posits that investment in worker training raises the stock of human capital the KSAs, or knowledge, skills, and abilities, of people. This, in turn, raises the productivity of workers, adding to overall organizational performance. Resource-Based View (Barney, 1991) theory opines that education assists in developing distinctive and valuable internal assets specifically employee capabilities that are potential sources of competitive advantage when they are valuable, rare, inimitable, and non-substitutable (VRIN). AMO Framework (Appelbaum et al., 2000) amplifies that training impacts performance when workers possess the Ability (training skills), Motivation (inclination), and Opportunity (organizational assistance in skills use).

At individual-level training significantly improves individual job performance, knowledge, and skill levels (Tharenou, Saks, and Moore (2007). On Job satisfaction and retention Ehrhardt et al. (2011) demonstrated that trained employees are likely to retain an organization longer and report a higher sense of job satisfaction.

At Organizational-level outcomes empirical studies validate the proposition that aggregate training produces better organizational performance. On organizational performance and financial outcomes, Huselid (1995) discovered that companies that invested in training in the framework of high-performance work systems (HPWS) had higher productivity and profitability. On innovation and adaptability, Lopez-Cabrales et al. (2006) showed that training enhanced firms' capacity for innovation, particularly in dynamic industries.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter deals with the discussion of the methods, procedures and techniques used for data collection and analysis. Specifically, it covers the description of the area of the study, research design, population and sampling techniques, sources of data collection and tools of data analysis. The chapter addresses the issues of validity and reliability of the research instrument through pilot study. It concludes with the discussion of the ethical considerations in the study area.

4.2 Area of the study

The area of the study is Kano state which is one among the thirty six (36) states in Nigeria. Kano is semi-arid region in sub-Saharan West Africa and a predominantly commercial state in Nigeria. The State has land coverage area of 20,760 KM2 and 1,754,200 hectares. The agricultural land use in the area is 75,000 hectares (UNDP, 2004). Kano share common boundary with Jigawa state from the north East, Katsina state from the North West, Bauchi state from the south east and Kaduna state from the South western part of Nigeria. The geographical location of Kano State is between latitude 110 5N to 120 7N and the longitude of 80 23E to 80 5E. The state has elevation of 400m to 500m above the mean sea level of the terrain topography. The main climate in Kano is Wet and Dry seasons of 160C to 210C in the month of December and January as the lowest temperature and the highest temperature period of 300C to 400C in March to end of May (Olofin, 1987).The seasonal rainfall of tropical region is 800mm to 1000mm that usually start in the beginning of May and stop in the month of October with natural vegetation cover of savannah type with the different characteristics of tree species with bold canopies (Schoeniech,1998). Usually, the vegetation cover of Kano State is in extinction due to the act of deforestation of natural forest as a result of population growth which leads to the high demand of firewood and the urban expansion in the area (Isah, 2015).

Kano is the most populous state among the 36 states in Nigeria, with preliminary figures of 9.4 million citizens and an annual population growth rate of 3.5% (Mater Web, n.d.). The state has 44 local government areas (highest in the country) out of the 778 local government areas (LGAs) that exist in Nigeria. Like other states in Nigeria, basic and senior secondary education is provided by both government and private schools (Kano State Ministry of Education, 2010). According to 2015-

2016 school census report, the state has a total of 1,505 public secondary schools and a total of 784 private secondary schools which are located in both rural and urban areas. The state has four universities, two belonging to the federal government i.e. Bayero University, Kano and National Open University of Nigeria (NOUN), Kano branch; the remaining two i.e. Kano University of Science and Technology, Wudil and Maitama Sule University belong to the state government. There are other higher education institutions which include Kano state polytechnics and three colleges of education i.e. Saadatu Rimi College of Education, Federal College of Education, Kano and Federal College of Education, Technical Bichi. There is also Aminu Kano College of Islamic and Legal Studies (AKCILS) and Kano state College of education and Remedial Studies. The state also has a number of private higher education institutions such as Skyline University, AI-Istiqama University, etc.

Kano state was selected for this study for the fact that although there is clear evidence that Tertiary Education Trust Fund (TETFund) annually allocate huge amount as AST&D Scheme interventions to all public Higher Education Institutions (HEIs) in Nigeria, there are still concerns about the continued capacity of HEIs to maintain quality research outputs, effective teaching and embark on other community services. Researcher's observation reveals that, faculty members/academic staff that accesses TETFund interventions is found to have significant improvement in their research and teaching productivity while those that do not access the fund are found to exhibit poor research outputs and less quality teaching. The researcher suggested that such discrepancies may, in part, be attributed to that fact that academic staff of public HEIs in the study were often faced with a number of adverse factors that impact on their overall productivity. These factors include, inter alia, lack of awareness about AST&D Scheme, failure to fulfill eligibility conditions for accessing the interventions, selection bias and delay in disbursement of funds for training and development.

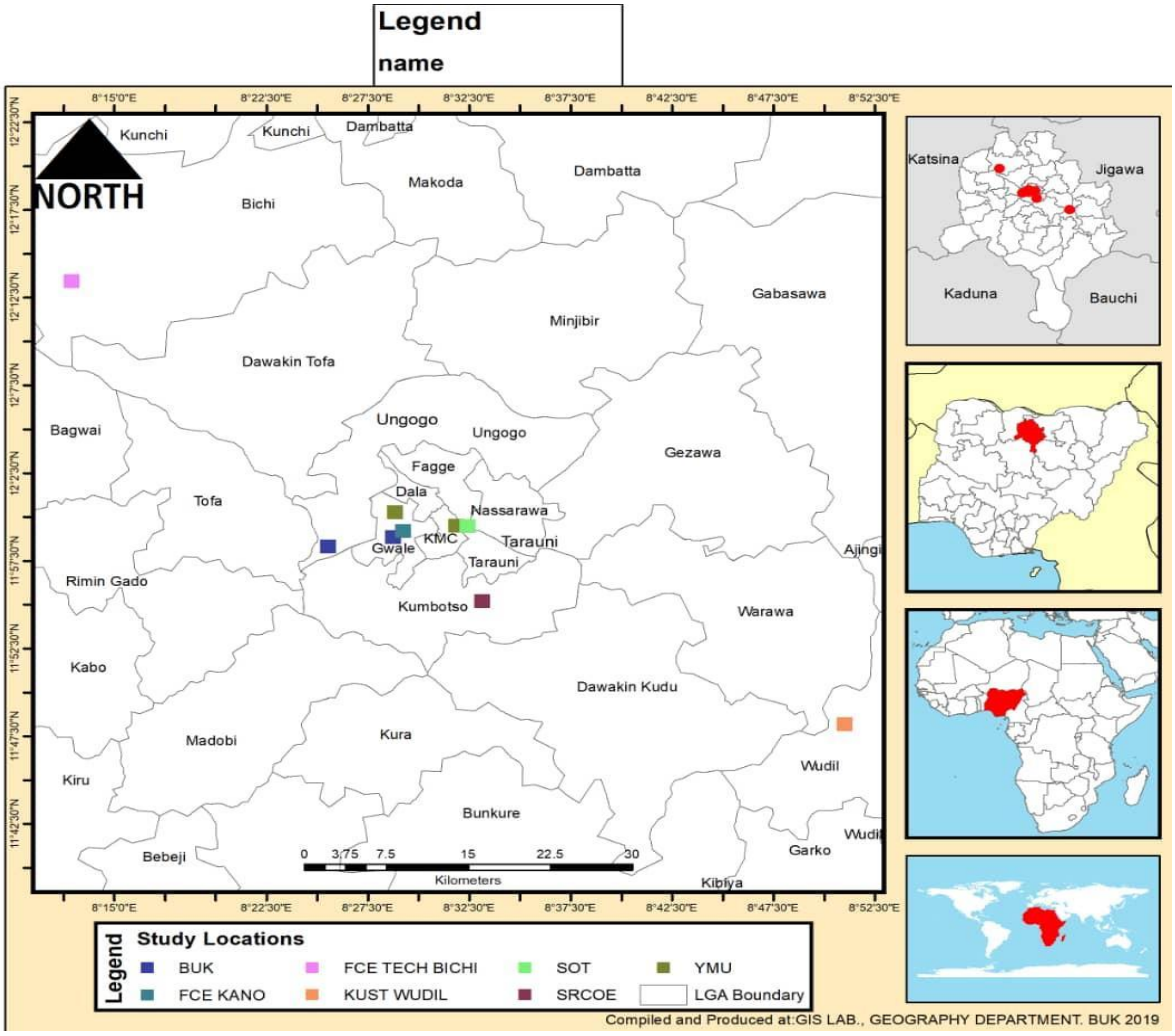

Figure 4: *Map showing the area of the study*

Kano state is a commercial Centre in northern Nigeria. The socio-economic activities of the state attracted migration that subsequently led to urban expansion and accelerate its population increase. The state is the second largest industrial location in Nigeria. Most of the intensive groundnuts production by the British colonial masters in Nigeria took place in the ancient city of Kano. The first industrial location of Kano state was in the area called *Bompai*. These industries were designed by the British Colonies with substantive industrial facilities of road network and railway lines to each one of the industries in Bompai industrial area. The urban expansion of the Kano City led to another industrial extension at Sharada industrial area around 1970 to 1980. Subsequently with rapid growth, a new industrial location emerged at Challawa industrial estate; a highly developed industrial plants that include Coca Cola company and other textiles industries. It is located by 15km away from the Kano metropolis. The city continued to growth leading to another industrial location at Tokarawa industrial layout located area along Hadejia Road with about 15km coverage. Plastic and rubber shoes manufacturing industries are now cited in Tokarawa industrial lay out (Isah, 2015).

In relation to tourism, Kano has historical monuments that were in existence since beginning of 15th century. Some of these historical monuments including old market in West Africa known as Kurmi Market (*Kasuwar Kurmi*), sabon Gari market, Kwari market, Singer market, Dawanau Grains market, Kofar Mata dye pits, Dala Hills, Makama Mesuem (Gidan Makama) and majestic Emir's palace that always attract tourists especially during historical festivals in the state. The map of the study area is shown in figure 4.

4.3 Research Design

Zikmund (2003) defines research design as a master plan specifying the methods and procedures for collecting and analyzing the needed data. Vogt (1993) defines it as a science and/ or art of planning procedures for conducting studies to get the most valid findings. Determining the right research design when conducting a research depends on through understanding of the issue at hand and the type of investigation one intends to do. There are three types of research i.e. exploratory research, descriptive research and casual research. Exploratory research is conducted to highlight more on the issue yet do not offer a final suggestion. It, therefore, requires the researcher to know the issue before constructing any model (Sekarau, 2003; and Zikmund, 2003). The presence of a theory helps in guiding the hypotheses development about the problem one intends to study. Exploratory research is designed to discover new relationships, patterns, themes and ideas (Hair, et al., 2007). Descriptive study is carried out when there are at least few knowledge about the problem and the study is employed to offer a more precise interpretation of the problem (Vogt, 1993). Descriptive research is also designed to get data that reveals the features of the issue of interest in the study (Sekarau, 2003). Casual research is conducted to further understand the nature of the relationships among the variables being investigated (Sekarau, 2003; and Zikmund, 2003). Casual research tests whether or not one event causes another. Specifically, causality means a change in one event brings about a corresponding change in another (Vogt, 1993). There are four conditions for testing cause and effect relationship. The first condition is that, the cause must take place before the effect; second the change in the cause must be associated with the change in the effect; third the effect must be as a result of a cause, not any other variable, and lastly there should be a theoretical support for why the relationship exists (Hair *et al.*, 2007).

This study employs casual research to investigate the causal process existing between training effectiveness (used here as a proxy of training) and productivity. The study has tested hypotheses which explain the direct relation between the dependents and independent variables. The research setting is a cross-sectional type of research setting is a cross-sectional type of research design. It involves gathering the data within a period of time or at once that help to meet the research objectives (Vogt, 1993). The advantage of using cross-sectional is an economy of research since data is collected at a given period of time.

Research design is of three classifications i.e. non-experimental or survey research design, experimental research design and historical or documented research design. Non-experimental is a study in which the researcher has no control over the study variables, experimental research design is usually a study carried out in a laboratory while historical research design investigates using secondary information (Zikmund, 2003). The present study employed a non-experimental research design or cross-sectional survey research design in which the researcher exercise no control over the independent variables and inferences about relations among the variables will therefore be made without a current interaction between the dependent variables (i.e. teaching and research productivity of academic staff) and the independent variable (i.e. training proxied by effectiveness of training). The researcher can only have influence on the measurement but don't alter the research settings. The study has gathered facts from the available literature on training effectiveness (as a proxy of training) and productivity (teaching and research productivity) of academic staff in the study area. Specifically, the study examined the impact of training on academic staff productivity in the study area.

4.4 Population of the study

This study has utilized public Higher Education Institutions (HEIs) in Kano state, Nigeria as unit of analysis. Thus, consists of the beneficiaries of the ASTD Scheme in tertiary institutions in Kano State, Nigeria. In Kano State there are eight (8) public higher education institutions that benefit from the annual ASTD Scheme interventions. Table 1 shows these eight higher education institutions and their respective numbers of beneficiaries.

Table 4.1

Population of the Study

S/N	Name of the Target Higher Education Institution	Population of the respondents
1	Bayero University, Kano	120
2	Kano University of Science and Technology, Wudil	35
3	Yusif Maitama Sule University	16
4	Sa'adatu Rimi College of Education Kumbotso, Kano	130
5	Federal College of Education, Kano	120
6	Federal College of Education (Tech), Bichi	45
7	Kano State Polytechnics	108
8	Police Academy, Wudil	15
	Total	**589**

Source: Researcher's field work, 2019

4.5 Sample size and Sampling technique

Using Krejcie and Morgan (1970) table for sample size determination, 234 were chosen as the sample size of the study. Kreycie and Morgan (1970) table formula/table for determining sample size is in line with the Ferketitch (1991) and Dillman (2000) formulas for calculating sample size. The population sample of 234 is within Roscee's guideline for defining sample size greater than 30 and less than 500 suitable for most studies. In a multivariate study, the sample size has to be ten (10) times the number of variables in the study (Hair *et al.*, 2007).

Two kinds of sampling technique are probability and non-probability sampling technique. Probability sampling is based on the idea of random choices which assumes that each population component is possible to be part of the sample. Probability sampling has a better validity and reliability if carefully planned and carried out. Types of probability sampling techniques are simple random sampling; systematic sampling; stratified sampling, cluster sampling and multistage sampling (Sekaran & Bougie, 2010; Henry, 1990). On the other hand, non-probability sampling is non-random and prejudiced because each member may not have a nonzero probability of being incorporated (Cooper

& Schindler, 2003). Two kinds of non-probability sampling are; convenience sampling, and purposive sampling (Cooper & Schindler, 2003; Sekaran & Bougie, 2010).

Since the purpose of the present work is to conduct a cross-section study within higher education institutions in Kano state, Nigeria, stratified random sampling which involves categorization followed by selection of subjects from each stratum using simple random sampling procedure is suitable and utilized in this study. The subjects drawn from each stratum (a) Universities b) Colleges of Education (COEs) c) Polytechnics and d) Police Academy) is proportionate to the total number of elements in the respective strata. Therefore, 39.7% (234/589x100) of the population elements from each stratum were selected. The breakdown of the stratified sample size for each category is shown in table 4.2. Even though stratified random sampling suffers from the disadvantage of being time-consuming, expensive and tedious, the technique guaranteed a bias-free sample and accorded the sample an ability to be generalized (Cavana et al., 2001).

Table 4.2

Determination of proportionate sample Size of the respondents

S/N	Institution	Population	Cal. (39.7% of the population)	Proportionate Sample size
1	Bayero University, Kano	120	47.6	48
2	Kano University of Science and Tech., Wudil	35	13.9	14
3	Yusif Maitama Sule University, Kano	16	6.3	6
4	Sa'adatu Rimi College of Education Kumbotso, Kano	130	51.6	51
5	Federal College of Education, Kano	120	47.6	48
6	Federal College of Education (Tech), Bichi	45	17.8	18
7	Kano State Polytechnics	108	42.9	43
8	Police Academy Wudil	15	5.9	6
	Total	**589**	**233.6**	**234**

Source: Researcher's field work, 2019

4.6 Estimating expected responses Rate

For this study, a total of 234 questionnaires were distributed and objective was to achieve at least 50% responses rate i.e.117 responses. This response rate was set to ensure no response bias and non-response rate have an effect on the result. This percentage was calculated in line with response rate of preceding studies such as Gurondutse (2014), Karaye, (2016), Cheng, Abdul Kadir and Bohari (2012), Ravichandran, Mani, Kumar and Prabhakaran (2010) and Zafar, Asif, Zafar, Hunjra and Ahmad (2012) that employed non-probability sampling of 36%, 85% and 38.4% respectively. Going by the above calculation, this study employs 234 HEIs with an anticipated rate of at least 50% for consistent and valid result.

4.7 Unit of Analysis

Unit of analysis is who or what is being studied in a given research (Goron Dutse, 2014). Evidences from the social sciences research have established a unit analysis as an organization, an individual, a social interaction or a group of organizations/individuals (Hair *et al*., 2010). Unit of analysis must be consistent with research problems, research questions and objectives of the study. The target population for this study is 589 academic staff of public HEIs in Kano state, Nigeria. The main feature that justified the selection of public HEIs was the fact that they are beneficiaries of TETFund Academic Staff Training and Development (AST&D) Scheme which this study seeks to investigate its impact on research and teaching productivity of the respondents in the study area. The fulltime academic staffs of public HEIs in the study area were seen as the most appropriate respondents for this research because they are the direct beneficiaries of Academic Staff Training and Development (AST&D) Scheme.

4.8 Sources of data collection

Apart from secondary data used for literature, this study was purely based on primary data. The data needed for the study of was obtained using questionnaire. The study's data on training effectiveness (as a proxy of training) and research and teaching productivity of academic staff are obtained using adopted instruments from Abdul Aziz (2015), Creswell (1986), Lawrence & Green (1980), McGuire *et. al.* (1988), Rotten (1990), Fielden and Gibbons (1991), Clement and Stevens (1989), Radhakrishma & Jackson (1993), Radhakrishma, Yoder and Scanlon (1994), Kotrlik *et. al.* (2002), Creswell (1986), Braxton and Toombs (1982), Miller & Serzan (1984), Pellino, Blackburn & Boberg (1984), Christopher and Iyabo (2013), Upali, Hebert & Nigel (2001), Chubin (1994), Kirkpatrick and Locke (1992), Folger, Astin & Bayer (1970), Nelson, Buss and Katzko (1983), Braskamp & Ory 1994: Creamer (1998), Brocato (2001), Creswell (1986), Kaplan (1965), Line

(1984), Cole & Cole (1967) and Wanner, Lewis & Gregorio (1981), Kani (2015), Berk (2005) and Muda, Ali and Jusoh (2017).

4.8.1 Questionnaire Development and Operationalization on the Study Variables

Research methods in social sciences are often divided into two types; quantitative and qualitative methods. Quantitative research is explaining phenomena by collecting numerical data that are analyzed using different tools (Johnson, *et al*., 2007). Questionnaire, which is considered as one of the most appropriate data collection tools in quantitative research, is used in this study (Asika, 1991). The questionnaire used in this study is a structured one with closed-ended questions. No identification of the respondents is provided within the survey, though the HEIs locations were identified for coding purposes. The questionnaire survey is primarily used to collect data needed to answer research questions and test the hypotheses formulated in this study. To be tested, the hypotheses must be specific and complete enough to allow the calculation of probabilities for all possible observations that might be made (Dominuswki, 1980). It is this calculation of probabilities which will decide on the acceptance or rejection of the null hypothesis. Dominuswki, (1980) stated that to prove itself, the null hypothesis must be accepted before the data collection and after the data collection. Unless the data seriously contradicts the null hypothesis, it will not be rejected. In instances where it is rejected, the alternative hypothesis will be accepted.

In this study, the respondents are located in different HEIs in Kano State, Nigeria. In the questionnaire a number of similar issues were asked in different formats, to assess the validity of the responses. The questions asked were aimed at testing hypotheses which were derived from the previous studies and for testing the conceptual model on which the study is based. The questionnaire underwent a number of refinements with the assistance of research guide and other faculty members within and outside. The initial questionnaire was reviewed by five (5) academics (2 professors and two senior faculty members and 1 faculty member from education with speciality in test and measurement). TETFund desk officers in some selected HEIs were given the questionnaire to make their inputs. Some changes were made and modified version of the questionnaire was subjected to pilot study, and after which it was found out that no additional changes are necessarily needed as reported in table 4.4 Cronbach Alpha of each constructs is above the threshold of 0.70.

Five (5) points Likert scale is used in measuring the responses in the questionnaire. Nunally (1978) opines that 5 or seven numerical scales are good, and the more the better until eleven points where a diminishing return was observed. Empirical evidences have found that a scale between 5 to 7 points is more reliable and valid than shorter and longer scales (Krosmick and Fabrigar, 1997).

Fazer and Lawley (2000) noted that tangible rewards such as gift items, Christmas cards, etc can be used to encourage a greater response rate. Employment of research assistants at each of the places where the data will be collected will speedy the response rate and makes it authentic and valid if the research assistant is well-known in the area. Even though it is difficult to determine the effect of the incentive; the response rate of 78.2% was much higher than the standard response rate of 25-30% (Ticehurst and Veal, 1999). One pitfall with offering a reward is that it may attract only certain respondents to respond to the questionnaire. However, along with a number of respondents (approximately one third) who wish to voluntarily partake in filling the questionnaire, it can be deduced that they are more interested in supplying information and not in the prize offered.

The questionnaire designed for this study consists of four (4) sections. Section 1 contains questions on the demographic attributes of the respondents; section two contains questions on training effectiveness (as a proxy of training) while sections three and four include questions on research and teaching productivity respectively. Even though, questionnaire has been subjected to a certain criticisms (Bennigto and Cummane, 1988), it still remains a common tool for data collection in social sciences, education and by extension in many studies related to arts and sciences (Bennigto and Cummane, 1988; and Thomas, 1997). Benefits of questionnaire survey are that, researcher's bias is eliminated and it has the ability to reach geographically dispersed segments of the population (Frazer and Lawley, 2000). It is also beneficial due to the dispersed nature of the sample, and it is a quick, inexpensive, efficient and accurate means of accessing information about the population (Zikmund, 1977).

Notwithstanding the above cogent reasons in support of using questionnaire, there are a number of potential flaws associated with it as noted by Zikmud (1997) and Frazer and Lawley (2000):

a. Random sampling error, in which a representative sample of the population is sought, but the possibility of chance variation is present;
b. Systematic error, which may result from a flaw in the design of the research;
c. A sample bias, in which the results may deviate from the true value;
d. Non-response error, in which only a small sample of the population responded to the survey; and

e. Response bias, in which the respondent may misrepresent the truth (consciously or unconsciously).

4.9 Tools of data analysis

Various statistical tools are used in analyzing the data. Specifically, the following were employed in analyzing the data in this study:

4.9.1 Descriptive statistics

Descriptive analysis is used in order to clarify and describe the characteristics of the variables of interest in a situation (Sekaran and Bougie, 2010). Generally, mean, median, mode, variance, range, and standard deviation are widely applied in describing the descriptive statistic. Specifically, mean and standard deviation are used in this study; while mean is the total scores in a data distribution divided by the number of scores, standard deviation is the square root of the variance (Gorondutse, 2014). The advantage of using descriptive analysis is that it helps to summarize the samples. It also forms basic quantitative data analysis with simple graphics analysis. In this research, descriptive analyses were performed for the demographic attributes of the respondents using tabulation method with frequency and percentages. Statistical Package for Social Sciences (SPSS) version 19 is used in reporting the descriptive statistics of the study.

4.9.2 Pearson Product Moment Correlation (PPMC)

Co-efficient of correlation is a numerical index that tells us to what extent the two variables are related and to what extent the variations in one variable changes with the variations in the other. The co-efficient of correlation is always symbolized either by r or ρ (Rho). The notion 'r' is known as product moment correlation co-efficient or Karl Pearson's Coefficient of Correlation. The symbol 'ρ' (Rho) is known as spearman's Rank Correlation Coefficient.

The size of 'r' indicates the amount (or degree or extent) of correlation-ship between two variables. If the correlation is positive the value of 'r' is + ve and if the correlation is negative the value of -ve is negative. Thus, the signs of the coefficient indicate the kind of relationship. The value of V varies from +1 to -1. Correlation can vary in between perfect positive correlation and perfect negative correlation. The top of the scale will indicate perfect positive correlation and it will begin from +1 and then it will pass through zero, indicating entire absence of correlation.

To answer the research questions, data collected were analyzed using Pearson's correlation analysis at the significance level of 0.05. The relationship of training effectiveness (as a proxy of training), teaching and research productivity were considered to exist if the level of significance is below of 0.05 ($P < 0.05$). However, where the significance is above of 0.05 ($P > 0.05$), the relationship of training effectiveness (as a proxy of training), teaching and research productivity were considered not to exist (Kani, 2018).

4.9.3 Confirmatory factor Analysis (CFA)

Confirmatory factor Analysis (CFA) is used as an evaluation of constructs validity so as to make sure that the hypothetical denotation of a variable is statistically answered by its items (Bryn, 2010 and Kelloway, 1998). It is also used to authenticate the amount of latent constructs underlying the items tally with the figure that the researcher may expect. CFA can be used to assess both the worth of a factor clarification and the precise parameters which represent a model (Steenkamp and Trijp, 1991). It is applied when the measurement scales are adopted from previuos studies. In this study, CFA was used for testing whether the pre-specified association predicted by the theory existed in the data (Gorundutse, 2014). Like Explanatory Factor Analysis (EFA), CFA can be used to reduce the number of items in the measurement scales (Netemeyer *et. al*., 1996).

CFA was used in this study because all the items in the measurement scales, except factors affecting access to training, were adopted from the previous studies (Hair *et al*., 2010). Partial Least Square (PLS)-inbuilt Principal Component Analysis (PCA) was used conducting CFA to determine the structure of the constructs adopted in this study.

4.9.4 Structural Equation Modeling (SEM)

SEM is a cross-sectional statistical modeling technique used to analyze the relationship between independent and dependent variables. Thus, this study uses Partial Least Square-Structural Equation Modeling (Smart PLS-SEM 3) as a robust technique which display the relationship between the variables of the study. All the hypotheses are tested using SEM. There two types of models used are:

a. *Measurement model:* The measurement model represents the theory that specifies how measured variables come together to represent the theory. It simply deals with the validity and reliability of the data.

b. *Structural model:* This represents the theory that shows how constructs are related to ther constructs. It simply deals with test of hypotheses.

The following are the assumptions of PLS-SEM:

i. *Multivariate normal distribution*: The maximum likelihood method is used and assumed for multivariate normal distribution. Small changes in multivariate normality can lead to a large difference

ii. *Linearity*: A linear relationship is assumed between endogenous and exogenous variables

iii. *Outlier*: Data should be free from outliers before the final analysis

iv. *Sequence:* There should be a cause and effect relationship between endogenous and exogenous variables and a cause has to occur before the event.

v. *Non-spurious relationship*: Observed covariance must be true.

vi. *Uncorrelated error terms***:** Error terms are assumed uncorrelated with other variable error terms.

vii. *Data:* Interval data is used.

CFA (Confirmatory Factor Analysis) and SEM (Structural Equation Modeling) are often considered more important or more powerful than many alternative tools of data analysis, especially in social science, management, and educational research, because they go far beyond the capabilities of simpler statistical methods. CFA/SEM allows you to test hypotheses derived from theory rather than just exploring patterns in data. Alternative tools like correlation analysis or multiple regression can only test relationships between observed variables, not verify whether a proposed theoretical structure fits the data. For instance, in this study CFA could confirm whether the measurement items actually represent the latent constructs "training effectiveness," "teaching productivity," and "research productivity." (Kline, 2016).

In terms of handling of latent variables and measurement error**,** CFA/SEM explicitly models latent constructs using multiple observed indicators, and it accounts for measurement error. Tools like ordinary regression assume that measurements are error-free, which is unrealistic in survey-based research. By modeling error, SEM provides more accurate and unbiased parameter estimates (Byrne, 2013).

In terms of simultaneous estimation of complex relationships, SEM can estimate multiple dependent and independent relationships at once including mediation and moderation within a single model. In contrast, traditional regression would require multiple separate analyses, increasing the risk of error and making it harder to interpret the overall system of relationships (Hair, Black, Babin & Anderson, 2019)

In terms of goodness-of-fit assessment, SEM and CFA provide goodness-of-fit indices (e.g., CFI, RMSEA, SRMR) to judge how well the proposed model matches the observed data. Regression and ANOVA have no direct equivalent—they can tell you about individual relationships, but not whether the *overall theoretical model* fits reality (Hu & Bentler, 1999).

In relation to flexibility with different data structures, SEM can incorporate hierarchical models, longitudinal data, and multi-group comparisons in one framework. For example, you could test whether the training–productivity relationship differs between universities and polytechnics or across regions of Nigeria**.** Many traditional methods would require separate, less efficient analyses for each comparison (Hair et.al, 2019).

In a nutshell, CFA/SEM is not just another statistical method, it's a theory-testing and model-validation framework**.** This makes it especially valuable in academic research like yours, where constructs are abstract (training quality, productivity) and must be measured indirectly through indicators, while also validating the theoretical model that links them.

4.10 Pilot study

In order to test for the validity and reliability of the survey instrument prior to the final survey, a pilot study was conducted. The essence of pilot study is to give the researcher insight into the real condition of the problem in the context that allows the study to anticipate a potential problem and correct it before embarking on the final study. Validity is concerned about whether an instrument is measuring what it is intended to measure, and reliability, on the other hand, is concerned with how the items come together to measure their construct (Sekaran & Bougie, 2010).

4.10.1 Validity test

A scale is said to be valid if it measures correctly what it is expected to measure. In other words, a scale is valid only when it is real and correct. The validity of a questionnaire relies first and foremost on reliability. Items selected for the constructs were mainly adopted from previous studies to ensure content validity. If the questionnaire cannot be shown to be reliable, there is no discussion of its validity. For the content validity, a thorough review of the literature was conducted. As mentioned earlier, all items of the constructs have been drawn from well-established studies to ensure content validity. Items in the questionnaire were compared with both the objectives and hypotheses formulated to ensure its content validity. The instrument was tested through two stages. In the first stage, two English faculty members reviewed the instrument to ensure the clarity of items and the accuracy of the language. In the second stage, panel of experts from economics, management and education were selected to establish face and content validity of the instrument. They were instructed to freely make observations on the items. The changes suggested by the experts were incorporated to improve both the content and clarity of the items on the questionnaire.

4.10.2 Reliability test

Reliability, also called consistency and reproducibility, is defined in general as the extent to which a measure, procedure, or instrument yields the same result on repeated trials (Carmines & Zeller, 1979). It can be used to assess the degree of consistence among multiple measurements of variables (Hair, Anderson, Tathman, & Black, 1998). The internal reliability of the measurement models was tested using Cronbach's alpha (Fornell and Larcker, 1981). There are several types of reliability test ranging from Cronbach's alpha, split half, temporal stability (test re-test) etc. Cronbach's alpha was widely used as a measure of reliability (Devellis, 2003). Therefore, the Cronbach's alpha was used to measure reliability in this pilot study. The reliability test was calculated using SPSS version 19.

The Cronbach's reliability coefficients of all variables should be higher than the minimum cut-off score of 0.70 (Nunnally 1978; Nunnally and Bernstein, 1994). The questionnaire was pre-tested with 50 academic staff of Jigawa State higher education institutions that previously enjoyed the training but not part of this study. The result shows that the Cronbach's reliability coefficients of all variable are above the minimum cut-off score of 0.70. The constructs and their Cronbach's alphas were presented in table 4.3.

Table 4.3

Reliability test

S/N	Construct	No of items	Cronbach's Alpha
1	Learning performance	08	0.778
2	Individual performance	06	0.824
3	Organizational performance	06	0.743
4	Research Productivity	14	0.835
5	Teaching Productivity	18	0.933

4.11 Ethical considerations

As this study involves the opinions and perspectives of human subjects, and this makes ethical issues inescapable. This work recognized that the ethical risks associated with this research could be minimized by carefully setting questionnaire, particularly in respect of avoiding any line of inquiry related to psychological issues that the respondent might have. The environment during distribution and retrieval of the questionnaire was relaxed and friendly and without attempt to force the respondents to answer those questions that they were unwilling to answer. Respondents were also informed that they had the right to withdraw from participation in the study at any time, and that they could withdraw any unprocessed materials which the research had uncovered. It was made clear that no reference would be made to any respondent who had withdrawn from the study for any reason.

Confidentiality, privacy and voluntariness are important ethical considerations in this study. All data that were collected in this study were kept confidential. No individual or workplace was identifiable by name or description in the final thesis. Before data collection, an introductory consent note and other details about the study was provided in the questionnaire for each respondent to read before filling it. The objectives and procedure of the research was summarily provided at the beginning of the questionnaire so as to guide the respondents and seek for his/her consent and voluntary participation in the research. The cultural and social background of the participants was also taken into consideration in this study. All participants are current academic staff in the selected HEIs where the study was conducted. The researcher respected their values, ideas, concerns and viewpoints on their responses to the issues raised in the questionnaire. As required by ethical

procedures, the entire questionnaire retrieved from the respondents were kept in a safe box at the researcher's office and will remain secured for five years, after which time it will be destroyed. It is understood that the researcher will be responsible for the security of confidential data.

4.12 Chapter Summary

This chapter presents discussion about area of the study, research design, population, sample size and sampling technique adopted in this study. It further dwells on the sources of data collection and tools of data analysis. The chapter further specifies measurements and definition of the variables of the study. In addition, questionnaire development was presented for the variables and a discussion of control variables was advanced. Model specification and result of pilot study which shows validity and reliability of the items in the questionnaire were discussed. The chapter concludes with discussion of ethical considerations of the study. The next chapter reports presentation of results and discussion of the findings of the study.

CHAPTER FIVE
RESULTS AND DISCUSSION OF FINDINGS

5.1 Introduction

This chapter deals with presentation of the data obtained, analysis of the results presentation and discussion of the findings of the study. Specifically, data coding, questionnaire distribution, demographic attributes of the respondents as well pre-estimation tests are presented in this chapter. Under pre-estimation tests, missing values analysis, outliers' assessment, normality test and multi-collinearity test tests are performed. In addition, Pearson correlation analysis is used in answering the research questions in the study while measurement model and structural model are conducted using Smart PLS 3 with a view to tests hypotheses of the study.

5.2 Data Coding

Items measuring each construct are arranged based on sections. A code number is given to each item for easy identification. This is in conformity with the view of Churchill (1979) that questions be arranged based on the construct they are measuring and coded with number. The constructs used in this study are coded as in table 5.1.

Table 5.1

Construct Coding

S/N	Construct	Code	No of items
1	Learning performance	LP	08
2	Individual performance	IP	06
3	Organizational performance	OP	06
4	Research Productivity	RP	14
5	Teaching Productivity	TP	18

5.3 Questionnaire Distribution

A total of 234 questionnaires were distributed to the sampled respondents. Being a member of academic staff, the researcher was able to get willing research assistants, one each from the eight tertiary institutions in the study area. Thus, the questionnaires were distributed from October, 2019 to April, 2020. Efforts were made to attain higher response rates through phone calls and short text messages as a reminder to the respondents who gave the researcher or any of his assistants their business card (Traina, MacLean and Kahn, 2005; and Sekaran, 2003). In addition, personal visits were made by the researcher and his team to the institutions of the respondents. The initial distribution of the questionnaire was conducted by the researcher and his assistants, after which the researcher travelled back to India for his End of the Term Presentation (ETP). All in all two follow up visits were made in the process of the study. The researcher was able to come for one follow up and the remaining was made by his assistants.

Out of the two hundred and thirty-four (234) of the questionnaires distributed, two hundred and fifteen (215) were returned. This gives a response rate of ninety-six-point seven percent (91%). This is probably because the research assistants are members of academic staff in the institutions assigned for each of them to distribute and collect the questionnaires. All the two hundred and fifteen (215) returned questionnaires were used for further analysis. According to Sekaran (2003), a response rate of 30% is considered sufficient for further analysis of the result. Hence the response of 91% has achieved the threshold for further analysis. In addition, the response rate achieved in this study is in conformity with similar studies in Nigeria where they got a response rate of 82.6%, 76% and 64% respectively (Karaye, 2016 ;Gorondutse, 2014; and Hilman, 2014). Table 5.2 summarizes the details of the distributed, returned and valid questionnaires in the study.

Table 5.2

Summary of response rate analysis

Response	**Number of questionnaires distributed**	**Percentage (%)**
Questionnaire distributed	234	100
Questionnaire returned	215	91
Questionnaire rejected	0	0
Valid Questionnaire	215	91
Unreturned Questionnaire	19	8.11
Total	**234**	**100**

5.4 Demographic Attributes of the respondents

Demographic attributes of the respondents are presented and described in this section. Age, institution, gender, place of training, certificate obtained, and area of specialization and duration of the training of the respondents are described under demographic attributes. Table 5.3 summarizes the demographic information of the respondents in the study area.

Table 5.3

Demographic attributes of the respondents

Items	**Frequency**	**Percentage (%)**
Age		
30-35 years	60	28
36-40 years	80	37
41-45 years	100	19
46 and above	40	16
Total	**215**	**100**
Gender		
Male	115	53.4
Female	100	46.6
Total	**215**	**100**
Place of training		
Local (Home)	155	72
Foreign	60	28
Total	**215**	**100**
Certificate obtained		
Masters	120	55.9
PhD.	95	44.1
Total	**215**	**100**

Institutions		
Bayero University, Kano	45	21
Kano University of Scince and Technology, Wudil	31	14.4
Yusif Maitama Sule University	13	6.04
Saadatu Rimi College of Education	35	16.2
Federal College of Education, Kano	16	7.4
Federal College of Education, Technical Bichi	41	21
Polytechnics	20	9.3
Police Academy	14	07
Total	**215**	**100**
Specialization		
Sciences	100	46
Social Sciences	45	21
Arts and Humanities	70	33
Total	**215**	**100**
Duration of the training		
1 year	30	14
1 and half year	25	12
2 years	120	56
3 years	24	11
Above 3 years	16	07
Total	**215**	**100**

Source: Author's Computation, 2020

As shown in table 5.3 the responses are dispersed over eight (8) higher institutions in the study area. Two hundred and thirty-four (234) questionnaires were distributed, two hundred and fifteen (215) were returned, 19 unreturned and none of them was rejected for any reason. Thus, the study obtained 215 valid questionnaires out of 234 distributed questionnaires from the survey for further analysis.

On the age of the respondents, table 5.3 shows 60 (28%) are 30 to 35 years and 80 (37%) for between 36 to 40 years. The respondents with age 41 to 45 constitute 100 (19%) while the remaining 40 (16%) of the respondents fall within 46 years and above. This implies that, most of the respondents fall between 36 to 40 years. Concomitantly, table 5.3 also reveals that 115 (53.4%) of the respondents were male while the remaining 100 (46.6%) were female. This shows that most of the respondents are males in the study area.

Concerning the place where the respondents attended their training, table 5.3 shows that 155 (72%) of them attended the training locally (i.e. in Nigeria) while the remaining 60 (28%) attended it abroad. This indicates most of them attended the training in Nigeria. This is in line with the researcher's apriori expectation that academic staff prefer to attend training in Nigeria due to family responsibilities, parents' pressure and spending less money for the training.

Table 5.3 reveals that 120 (55.9%) of the respondents obtained Master's degree certificates while the remaining 95 (44.1%) obtained PhD degree certificates. This is not unconnected with the fact most of the academic staff in Nigerian institutions especially in colleges and polytechnics are first degree holders**.** Similarly, the institutions of the respondents indicated that 45 (21%) of the respondents are from Bayero University, Kano, 31 (14.4%) are from Kano University of science, 13 (6.04%) are from Yusif Maitama Sule University, 35 (16.2%) are from Sa'adatu Rimi College of Education, 16 (7.4%) are from Federal College of Education, Kano, 41 (21%) are from Federal College of Education, Kano, 20 (9.3%) are from Kano state Polytechnics and 14 (07%) are from Police Academy, Kano.

On the field of specialization, table 5.3 indicates that 100 (46%) specialized in Pure Sciences, 45 (21%) of them specialized in Social Sciences while the remaining 70 (33%) specialized in Arts and Humanities. This reveals that most of the respondents specialized in the field of social sciences. This is connected with the fact Nigeria like all other developing nations is placing utmost importance to sciences than other fields. Regarding the duration of the training, table 5.3 shows that 30 (14%) spent 1 year, 25 (12%) one and a half year, 120 (56%) spent 2 years, 24 (11%) spent 3 years while the

remaining 16 (07%) of the respondents spent above 3 years during their study. This implies that most of them spent 2 years for master's degree and 3 years for PhD degree. This is in line with global standard that the minimum years for master degree is two years while PhD is of minimum of three years.

5.5 Pre-estimation tests

The quality of research output depends largely upon the conduct of pre-estimation tests (Hair *et al*., 2010). This reason makes it imperative to perform data screening and cleaning before embarking on test of hypotheses. Therefore, missing values, outliers, normality and multi-collinearity are checked and treated accordingly.

5.5.1 Missing Values Analysis

Statistical Package for Social Sciences (SPSS 19) is used for checking missing values in this study. According to Hair *et al.* (2010) any case up to 50% missing data should be deleted. Similarly, missing data of 5% and below are considered insignificant and therefore ignored (Schafer, 1999; and Tabachnick and Fidell, 2007). Missing data detected are normally replaced using series mean in line with the view of Tabachnick and Fidell (2007). The summary of missing data analysis is presented in table 5.4.

Table 5.4

Summary of the missing data

Construct	**Missing values**	**Computation of total cases**	**Total cases in each construct**
Learning performance	0	08x234	2, 510
Individual performance	0	06x234	2,008
Organizational performance	0	06x234	2,008
Teaching Productivity	0	18x234	9,036
Research Productivity	0	14x234	7,028
Total	0	52x234	26,104
Percentage of missing values	**(0/26,104x100)**		**0%**

After subjecting the data to missing values analysis as reported in table 5.4, it appears that none of the constructs of this study records either 50% or 5% missing values. Therefore all items are retained for further statistical analysis.

5.5. 2 Outliers Assessment

Outliers are extreme value (s) that is inconsistent with the remaining data set and have the possibility of affecting the outcome of the study negatively (Barnett and Lewis, 1994 cited in Karaye, 2016). In the words of Bryn (2010) and Hair *et al.* (2010) outliers are having an exceptionally high or low value or a unique combination of values across many constructs which affect the analysis of the data. Outliers are deleted because they have the potentiality of affecting the outcome of the study negatively. According to Verardi and Croux (2008) data for regression analysis must be free from outliers; otherwise it may cause serious distortions and hence leads to unreliable result.

Outliers are of two types i.e. univariate and multivariate outliers. The former is data point that consists of an extreme value on one variable; and the latter is a combination of unusual score (s) on two or more variables. Both outliers are checked using SPSS version 19 and deleted to make the data free from distortions. Univariate outliers are checked by detecting values with larger standardized z-score value above +/-3.29. Any value above this threshold is considered a univariate outlier (Tabachnick and Fidell, 2007). After checking the standardized z-score values, two univariate outliers i.e. ZLP01 (4.32) and ZLP08 (5.21) are detected and deleted on the basis of univariate assessment. Therefore, the study is left with 500 data sets to be used for multivariate assessment.

The multivariate outliers are detected using the Mahalonobis Distance (D2) which is the distance of a value from the centroid of the remaining values where the centroid is the point created at the intersection of the means of all variables (Tabachnick and Fidell, 2007). This study has eight (8) items under learning performance, six (6) items under individual performance, six (6) items under organizational performance, eighteen (18) items under teaching productivity and fourteen (14) items under research productivity, altogether making 52 items. These 52 items minus one item constitute the degree of freedom for the study, which is 51 and under the probability of 0.001 (p=0.001), the chi-square value is 89.272. thus, any value above this threshold of 89.272 will be deleted to avoid multivariate outliers. After observing the above process on multivariate outliers, two multivariate outliers i.e. 251.535 and 247.2034 that are above the threshold of 89.272 are detected and deleted. The possible reason for having only two outliers each for both univariate and multivariate outliers in this study may be because the questionnaire was initially subjected to validity and reliability tests.

In addition, the respondents are knowledgeable enough to fill the questionnaire appropriately. The study is finally left with 498 data sets to be used for further analysis.

5.5.3 Normality Test

Normality is concerned with the nature of the data spread for the individual construct and its association with the normal distribution. In addition, when the objective of the study is to make some conclusions, test for normality is a necessity (Hair *et al*., 2010). It is based on the above that this study test for normality using both skewness and kurtosis. Graphical histogram method is also used to further ascertain the normality of the data. The threshold of skewness is a maximum of 2 and that of kurtosis a maximum of 7 (Tabachnick and Fidell, 2007). As shown in table 5.5, both the skewness and kurtosis are within the acceptable limit because the former ranges from -0.013 to 1.437 while the latter ranges from -0.023 to 5.524.

Table 5.5

Skewness and kurtosis statistics

		LP	**IP**	**OP**	**TP**	**RP**
N	Valid	234	234	234	234	234
	Missing	0	0	0	0	0
Skewness		1.437	.321	-.312	-.168	-.013
Std. Error of Skewness		.109	1.321	.0212	.109	.109
Kurtosis		5.524	.313	1.431	-.222	-.023
Std. Error of Kurtosis		.218	3.211	.033	.218	.218

In addition, the data is plotted on a histogram graph to depict the shape of the distribution with the aim of detecting whether it is normal or non-normal. Figure 5.1 shows the normal distribution histogram of the data. Since the data is free from being a non-normal data, the assumption that the relationship between the constructs is homoscedastic and that of heteroscedasticity is non-existing (Tabachnick and Fidell, 2007).

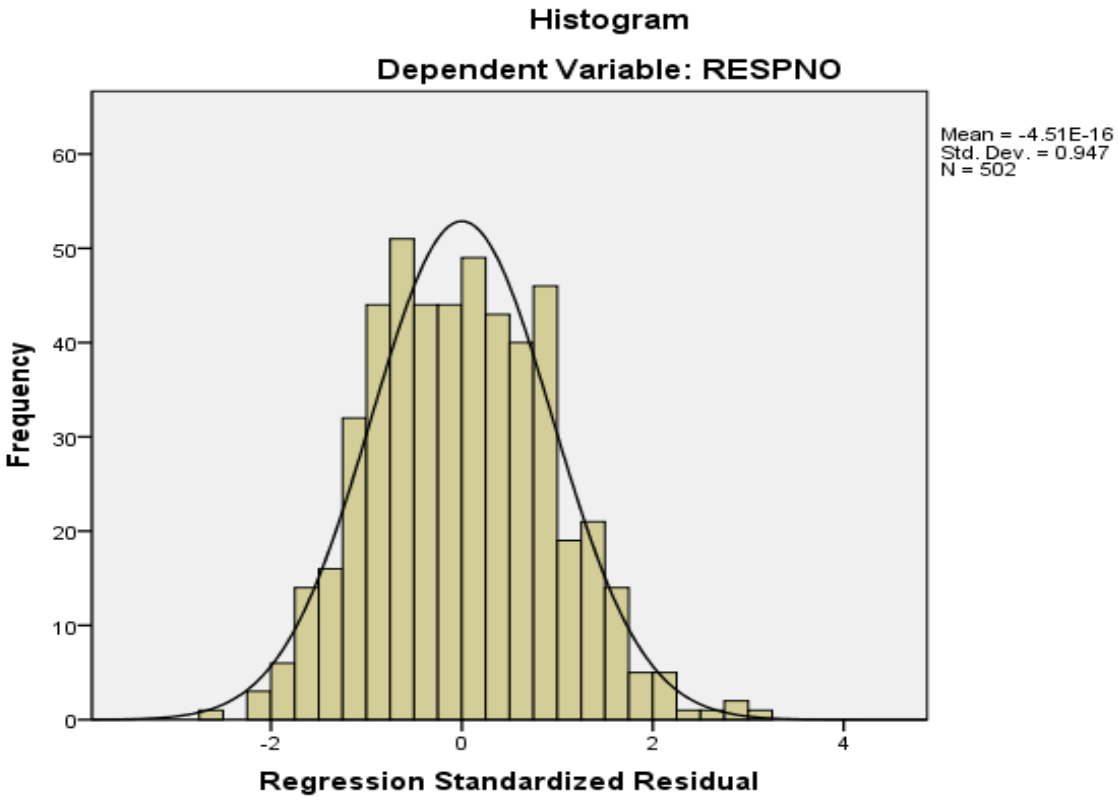

Figure 5: Normal Probability Plot (Histogram)

5.5.4 Multicollinearity Test

Multicollinearity exists when independent variables are correlated with one another. Once the problem of multicollinearity arises in a study, the highly correlated exogenous variables enclose unnecessary information that leads them to increase the size of the error term and then weaken the analysis. Multicollinearity is said to exist when the correlation is 0.90 and above (Hair *et al*., 2010 and Tabachnick & Fidell, 2007 cited in Karaye, 2016). Two methods i.e. correlation matrix and use of Variance Inflated Factor (VIF) and tolerance were used to identify if there is problem of multicollinearity.

The first method was the use of correlation matrix to detect if there is multicollinearity problem. It is said to exist when the correlation is 0.90 and above (Karaye, 2016). The correlation matrix in table 5.6 shows that none of the exogenous variables are highly correlated. This implies that this study is devoid of multicollinearity problem using correlation matrix.

Table 5.6

Correlation among exogenous variables

		LP	IP	OP	TP	RP
LP	Pearson Correlation	1.000				
IP						
	Pearson Correlation	0.314	1.00			
OP	Pearson correlation	-.012	0.121	1.00		
TP	Pearson Correlation	-.043	0.004	0.002	1.000	
RP	Pearson Correlation	.020	0.087	0.044	.063	1.000

The second method was use of Variance Inflated Factor (VIF) and tolerance to identify if there is problem of multicollinearity. The VIF should not be above 10, and the tolerance should not be below 0.10 (Hair *et al*., 2010). Thus, this study run 5 regression for 5 exogenous variables using SPSS version 19 taking one exogenous variable as the dependent variable and the rest as the independent variables. The endogenous variables are presented horizontally on the top of table 5.6 while the exogenous variables are presented vertically. The VIF and tolerance value of the 5 regressions indicate the non-existence of multicollinearity in the exogenous variables because VIF is not be above 10, and the tolerance too is not below 0.10.

Table 5.7

Summary of tolerance and Variance Inflated Factor (VIF)

Endogenous variables	**LP**	**IP**	**0P**	**TP**	**RP**
Exogenous variables					
LP		0.999(1.00)	0.998(1.02)	0.998(1.02)	.288(1.03)
IP	0.991(1.09)		0.998(1.02)	0.989(1.01)	.144(1.99)
0P	0.991(1.09)	1.000(1.00)		0.991(1.09)	.508(1.08)
TP	1.000(1.00)	1.000(1.00)	1.000(1.00)		.188(1.00)
RP	0.891(1.02)	0.721(1.09)	0.953(1.09)	0.293(1.02)	

Note: Values outside the brackets indicates the tolerance while in the brackets is VIF and LP: Learning Performance IP: Individual Performance OP: Organizational Performance RP: Research Productivity TP: Teaching Productivity

5.6 Descriptive statistics of the latent variables

Descriptive statistics of latent variables of the study are reported and discussed in this segment. Constructs of the study are measured using 5 points Likert scale ranging from 5 strongly agree, 4 agree, 3 neutral, 2 disagree to 1 strongly disagree. Table 5.8 summarizes the descriptive statistics of latent variables.

Table 5.8

Descriptive statistics of the latent variables

Latent variables	Number of items	Minimum	Maximum	Mean	Std. Deviation
LP	08	2.23	3.77	3.4194	.43807
IP	06	2.56	3.98	3.455	.3334
OP	06	2.62	4.24	3.112	.4677
TP	18	2.61	4.22	3.4854	.31754
RP	14	2.46	4.62	3.6062	.33442

It is important to note that since the maximum of the Likert scale used in this study is 5, the threshold of the mean is 2.5. It can be deduced from table 5.8 that, the mean and standard deviation of learning performance are 3.4194 and 0.43807 respectively. This explains that, on average, respondents believe that the training improves their learning performance. Similarly, the mean of individual performance as reported in table 5.8 is 3.455 and the standard deviation is 0.3334. This, on average, implies that respondents are of the view that training improves their individual performance. It is also observed from table 5.8 indicates that the mean and standard deviation of organizational performance are 3.112 and 0.4677 respectively. This explains that, on average, respondents in the study area believe that training improves their organizational performance.

The mean and standard deviation of teaching productivity as shown in table 5.8 are 3.4854 and 0.31754 respectively. This explains that, on average, respondents are of the view that training contributes to their teaching productivity. Reading between the lines, table 5.8 indicates that the mean and standard deviation of research productivity are 3.6062 and 0.33442 respectively. This explains that, on average, respondents believe that training improves their teaching productivity in the study area.

5.7 Pearson Product Moment Correlation (PPMC)

To answer the research questions of the study, data collected was subjected to Pearson Product Moment Correlation (PPMC) analysis using SPSS version 2.0. The decision guide was the significance level of 0.05 i.e. existence of relationship between training dimensions and teaching and research productivity if the level of significance is above 0.05 (P > 0.05) and otherwise, non-existence of relationship between training dimensions and teaching and research productivity if the level of significance is below 0.05 (P < 0.05).

Research Question One: Is learning performance related with research productivity of academic staff of higher education institutions in Kano State, Nigeria?

Table 5.9

Pearson correlation showing the relationship between learning performance and research productivity of academic staff in the study area

		Learning performance	**Research Productivity**	**Decision**
Learning performance	Pearson Correlation Sig. (2-tailed) N	1 215	-.621 .781 215	High negative relationship
Research Productivity	Pearson Correlation Sig. (2-tailed) N	-.621 .781 215	1 215	

Table 5.9 shows that the value of the correlation coefficient (r) is -.621. This implies that learning performance and research productivity of academic staff in the study area have high negative relationship.

Research Question Two: Is individual performance related with research productivity of academic staff of higher education institutions in Kano State, Nigeria?

Table 5.10

Pearson correlation showing the relationship between individual performance and research productivity of academic staff in the study area

		Individual performance	**Research Productivity**	**Decision**
Individual Performance	Pearson Correlation	1	.933**	Strong positive relationship
	Sig. (2-tailed) N	215	.000 215	
Research Productivity	Pearson Correlation	. 933**	1	
	Sig. (2-tailed) N	.000 215	215	

Table 5.10 shows that the value of the correlation coefficient (r) is 0.933. This implies that individual performance and research productivity of academic staff in the study area have strong positive relationship.

Research Question Three: Is organizational performance related with research productivity of academic staff of higher education institutions in Kano State, Nigeria?

Table 5.11

Pearson correlation showing the relationship between organizational performance and research productivity of academic staff in the study area

		Organizational performance	**Research Productivity**	**Decision**
Organizational Performance	Pearson Correlation	1	.007	Low positive relationship
	Sig. (2-tailed) N	215	.891 215	
Research Productivity	Pearson Correlation	. 007	1	
	Sig. (2-tailed) N	.891 215	215	

Table 5.11 shows that the value of the correlation coefficient (r) is 0.007. This implies that organizational performance and research productivity of academic staff in the study area have low but positive relationship.

Research Question Four: Is learning performance related with teaching productivity of academic staff of higher education institutions in Kano State, Nigeria?

Table 5.12

Pearson correlation showing the relationship between learning performance and teaching productivity of academic staff in the study area

		Learning performance	**Teaching Productivity**	**Decision**
Learning performance	Pearson Correlation	1	.812**	Strong positive relationship
	Sig. (2-tailed) N	215	.000 215	
Teaching Productivity	Pearson Correlation	. 812**	1	
	Sig. (2-tailed) N	.000 215	215	

Table 5.12 shows that the value of the correlation coefficient (r) is 0.812. This implies that learning performance and teaching productivity of academic staff in the study area have strong positive relationship.

Research Question Five: Is individual performance related with teaching productivity of academic staff of higher education institutions in Kano State, Nigeria?

Table 5.13

Pearson correlation showing the relationship between individual performance and teaching productivity of academic staff in the study area

		Individual performance	**Teaching Productivity**	**Decision**
Individual Performance	Pearson Correlation	1	.905**	Strong positive relationship
	Sig. (2-tailed) N	215	.000 215	
Teaching Productivity	Pearson Correlation	. 905**	1	
	Sig. (2-tailed) N	.000 215	215	

Table 5.13 shows that the value of the correlation coefficient (r) is 0.905. This implies that individual performance and teaching productivity of academic staff in the study area have strong positive relationship.

Research Question Six: Is organizational performance related with teaching productivity of academic staff of higher education institutions in Kano State, Nigeria?

Table 5.14

Pearson correlation showing the relationship between organizational performance and teaching productivity of academic staff in the study area

		Organizational performance	**Teaching Productivity**	**Decision**
Organizational Performance	Pearson Correlation	1	.765**	High positive relationship
	Sig. (2-tailed) N	215	.000 215	
Teaching Productivity	Pearson Correlation	. 765**	1	
	Sig. (2-tailed) N	.000 215	215	

Table 5.14 shows that the value of the correlation coefficient (r) is 0.765. This implies that organizational performance and teaching productivity of academic staff in the study area have strong positive relationship.

5.8 Confirmatory Factor Analysis (CFA)

This study adapts all the study items with exception of factors affecting access to training alone which a scale is developed for it as in the previous literature. Therefore, the adapted items i.e. Learning Performance (LP), Individual Performance (IP), Organizational Performance (OP) Research Productivity (RP) and Teaching Productivity (TP) are subjected to Confirmation Factor Analysis (CFA) using the Principle Component Analysis (PCA) technique to examine their suitability in context of this study. The smart PLS 3 has CFA inbuilt in it; therefore, the PCA is taken care by the software (Hair *et al*., 2010).

5.9 Assessment of PLS-SEM Path model results

The result of PLS-SEM is evaluated using a two-stage process i.e. outer measurement model and inner structural models (Henseler, Ringle and Sinkovics, 2009). The summary of the evaluation method in each stage is presented in table 5.15.

Table 5.15

Two stages of result evaluation in PLS-SEM

Stage	Name	Test conducted
1	Measurement model	Assessment of the internal consistency
		Assessing individual item reliability
		Assessment of convergent validity
		Assessing discriminant validity
2	Structural Equation Model	Assessing the level of R-square values
		Examining the level of effect size
		Assessment of the predictive relevance
		Assessment of the significance of the path coefficients

Source: Hair *et al.* (2014)

5.9.1 Research Productivity Measurement Model (outer model)

Internal consistency, individual item reliability, convergent validity and discriminant validity of research productivity are assessed using measurement model. Fornell-Larcker criterion, Heterotrait-Monotrait Ratio (HTMT) and cross loadings are used to evaluate discriminant validity (Hair *et al*., 2016).

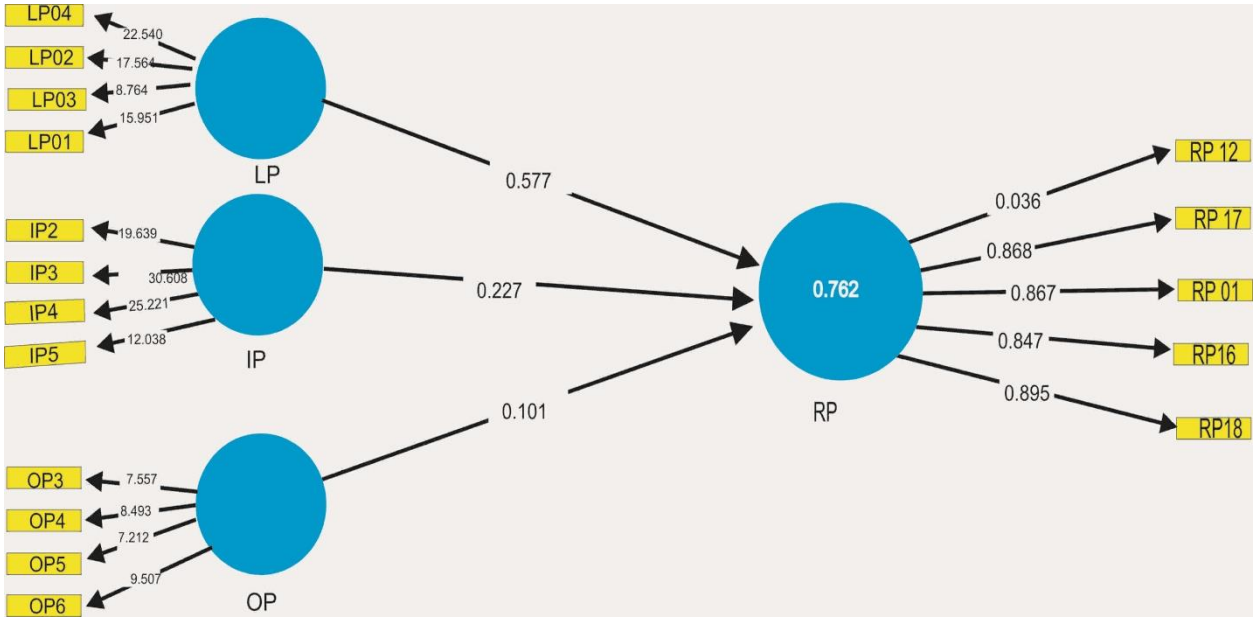

Figure 6: RP Measurement model of the study

Figure 6 reveals that a unit change in learning performance will lead to a change in research productivity by 0.577 (57%) while a unit change in individual performance will lead to change in research productivity by 0.227 (22%). In the contrast, figure 5.3 further shows that a unit change in organizational performance by one will lead to change in research productivity by 0.101 (10%).

5.9.2 Internal consistency reliability

A Cronbach's Alpha below 0.60 is unacceptable, 0.60 to 0.65 as undesirable, and 0.66 to 0.70 as minimally acceptable, 0.71 to 0.80 considered respectable and 0.80 and above are considered very good (Devellis, 2003). The minimum threshold of composite reliability is 0.70 (Bagozzi & Yi, 1988; Hair *et al.*, 2014). The Cronbach's Alpha and composite reliability of the study constructs is presented in table 5.16.

Table 5.16

Summary of Cronbach's Alpha and Composite Reliability

S/N	Construct	Cronbach's Alpha	Composite Reliability >0.7
1	Individual performance	0.680	0.824
2	Learning performance	0.621	0.791
3	Organizational performance	0.727	0.846
4	Research productivity	0.940	0.952

The Cronbach's Alphas of the study's constructs as shown in table 5.16 are all within the acceptable range. The construct with the highest alpha is research productivity (0.940) and learning performance (0.621) with the lowest alpha.

Due to limitations of Cronbach's Alpha composite reliability was computed. As reported in table 5.16 the composite reliability of the study's constructs are all within the very good range because they are even above the minimum threshold of 0.70. The construct with the highest composite reliability is research productivity (0.952) and learning performance (0.791) with the lowest composite reliability.

5.9.3 Assessment of convergent validity

Outer loadings of items and Average Variance Extracted (AVE) are considered in order to establish convergent validity. The rule of thumb is that outer loading of each item should be greater than 0.7 and AVE of each construct should be greater than 0.50. In general, the larger the loadings, the stronger and more reliable the measurement model will be. As shown in table 5.17 outer loading of all items are above 0.70, which is within the acceptable threshold.

Table 5.17

Outer loadings and Average Variance Extracted (AVE)

Constructs	Items	Outer loadings	AVE >0.5
Individual performance	IP02	0.759	
	IP03	0.819	0.610
	IP04	0.763	
Learning performance	LP03	0.782	
	LP04	0.707	0.558
	LPO2	0.749	
Organizational performance	OP01	0.805	0.646
	OP02	0.810	
	OP03	0.796	
Research productivity	RP01	0.886	
	RP02	0.868	
	RP03	0.894	
	RP04	0.867	0.768
	RP05	0.847	
	RP06	0.895	

Apart from the outer loadings AVE is also used to assess convergent validity. As reported in table 5.17 AVE of all the items are above 0.50, which is acceptable and in line with the minimum threshold of >0.50. The lowest AVE (0.558) is learning performance (LP) and the highest AVE (0.768) is research productivity (RP).

5.9.4 Assessment of discriminant validity

There are three measures of discriminant validity i.e. the cross-loadings, Fornell-Lacker criterions and Heterotrait-Monotrait Ratio (HTMT). The cross-loadings criterion establishes the discriminant validity when the outer loading of an item is higher on its associated construct than the other constructs of the study. Fornell-Lacker criterion compares the square root of AVE with the latent variable to assess discriminant validity. The square root of AVE should be greater than the constructs correlation with construct to establish discriminant validity (Fornell & Lacker, 1981). As reported in table 5.18 all the indicators loaded very high on their associated constructs than on the others, indicating existence of discriminant validity.

Table 5.18

Cross loadings

	IP	**LP**	**OP**	**RP**
IP02	**0.759**	0.471	0.110	0.409
IP03	**0.819**	0.552	0.605	0.461
IP04	**0.763**	0.530	0.489	0.408
LP03	0.344	**0.782**	0.306	0.635
LP04	0.629	**0.707**	0.587	0.396
LPO2	0.606	**0.749**	**0.805**	0.435
OP01	0.606	**0.749**	**0.805**	0.435
0P02	0.359	0.471	**0.810**	0.409
OP03	0.586	0.459	**0.796**	0.375
RP01	0.452	0.534	0.426	**0.886**
RP02	0.490	0.610	0.442	**0.868**
RP03	0.508	0.589	0.492	**0.894**
RP04	0.459	0.540	0.429	**0.867**
RP05	0.430	0.617	0.375	**0.847**
RP06	0.527	0.663	0.495	**0.895**

The second method used for assessing discriminant validity is Fornell-Larcker criterion. The square root of AVE is compared with the latent variable correlation to assess discriminant validity. The square root of AVE should be greater than the construct's correlation with other constructs to establish discriminant validity (Fornell-Larcker, 1981; Hair *et al*., 2014). Table 5.19 presents the square root of AVE and correlations of the constructs.

Table 5.19

Fornell-Larcker criterion

	IP	**LP**	**OP**	**RP**
IP	**0.781**			
LP	0.663	**0.747**		
OP	0.310	0.705	**0.804**	
RP	0.547	0.679	0.507	**0.876**

The square root of AVE (boldly written in table 5.19) ranges from 0.781 to 0.876 for all the constructs. The square root of AVE for all the constructs is higher than their correlations with other constructs. This indicates the attainment of discriminant validity.

The third way of assessing discriminant validity is Heterotrait-Monotrait Ratio (HTMT). In a well-fitting model, Heterotrait-Monotrait Ratio (HTMT) ratios should be below 0.9 (Hair *et al*., 2016). The result as depicted in table 5.20 shows that all variables obtained are less than the maximum value. This implies that discriminant validity using HMTM is established between a given pair of reflective constructs.

Table 5.20

Heterotrait-Monotrait Ratio (HTMT)

	IP	**LP**	**OP**	**RP**
IP				
LP	1.073			
OP	1.154	1.102		
RP	0.680	0.844	0.610	

5.10 Teaching Productivity Measurement Model (outer model)

This deals with the examination of reliability and validity of the data before testing the hypotheses of the study. Internal consistency, individual item reliability, convergent validity and discriminant validity are assessed using measurement model. Fornell-Larcker criterion, Heterotrait-Monotrait Ratio (HTMT) and cross loadings are used to evaluate discriminant validity (Hair *et al*., 2014).

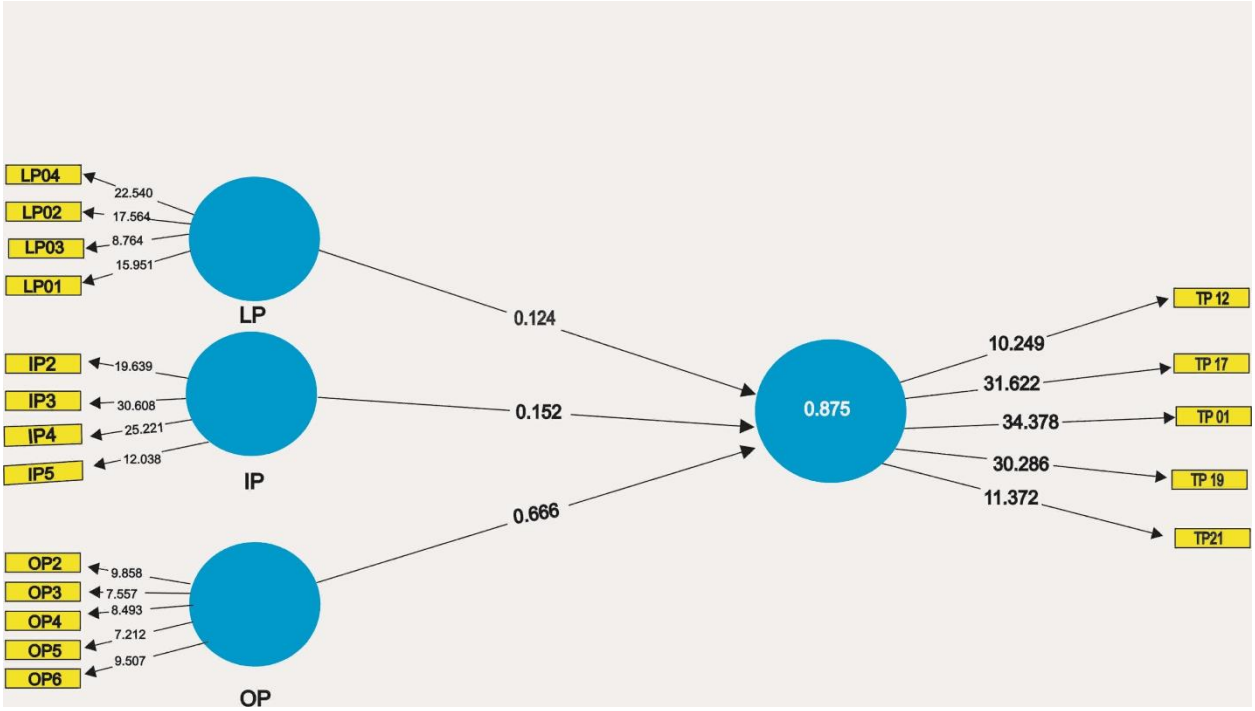

Figure 7: TP measurement model of the study

Figure 7 reveals that a unit change in learning performance will lead to a change in teaching productivity by 0.124 (12%) while a unit change in individual performance will lead to change in teaching productivity by 0.152 (15%). On the other hands, figure 5.2 further shows that a unit change in organizational performance will lead to change in teaching productivity by 0.666 (66%).

5.10.1 Internal consistency reliability

Internal consistency means the extent to which items on a scale come together to measure the same concept (Bagozzi & Yi *et al*., 2014). Cronbach's Alpha and composite reliability are used to assess internal consistency. The former estimates the reliability based on inter-correlations between the items while the latter estimate the reliability based on the actual contribution of each item in the construct. A Cronbach's Alpha below 0.60 is unacceptable, 0.60 to 0.65 as undesirable, and 0.66 to 0.70 as minimally acceptable, 0.71 to 0.80 considered respectable and 0.80 and above are considered very good (Devellis, 2003). The minimum threshold of composite reliability is 0.70 (Bagozzi & Yi,

1988; Hair *et al.,* 2014). The Cronbach's Alpha and composite reliability of the study constructs is presented in table 5.21.

Table 5.21

Summary of Cronbach's Alpha and Composite Reliability

S/N	Construct	Cronbach's Alpha	Composite Reliability
1	Individual performance	0.680	0.819
2	Learning performance	0.670	0.859
3	Organizational performance	0.727	0.844
4	Teaching productivity	0.689	0.826

The Cronbach's Alphas of the study's constructs as shown in table 5.21 are all within the acceptable range. The construct with the highest alpha is organizational performance (0.727) and learning performance (0.670) with the lowest alpha. However, Cronbach's Alpha suffers some limitations which include consideration of all items as equally reliable. It is also sensitive to a number of items in the scale, that is, the higher the items the higher the alpha. It therefore underestimates the internal consistency reliability.

It is in recognition of the limitations of Cronbach's Alpha stated above, composite reliability is developed. Unlike Cronbach's Alpha, the composite reliability considers the actual contribution of each item to the construct. Secondly, composite reliability is not sensitive to the number of items per construct (Hair *el al., 2014*). Thus, the present study computed internal consistency using composite reliability to reconfirm the reliability of the items so that limitations of Cronbach's Alpha can be overcomed. As reported in table 5.21 the composite reliability of the study's constructs are all within above the minimum threshold of 0.70. The construct with the highest composite reliability is learning performance (0.859) and individual performance (0.819) with the lowest composite reliability.

5.10.2 Assessment of convergent validity

Convergent validity deals with the extent to which an item correlates positively with other items that are measuring the same construct (Hair *et al*., 2014). Outer loadings of items and Average Variance Extracted (AVE) are considered in order to establish convergent validity. The rule of thumb is that outer loading of each item should be greater than 0.7 and AVE of each construct should be greater than 0.50 . in the same vein, item loading between 0.40 and 0.70 are to be deleted only if their deletion improves the composite reliability or AVE (Hair *et al*., 2014). Measurement loadings are

the standardized path weights connecting the factors to the indicator variables. In general, the larger the loadings, the stronger and more reliable the measurement model. As shown in table 5.22 outer loading of all items are above 0.70, which is within the acceptable threshold.

Table 5.22

Outer loadings and Average Variance Extracted (AVE)

Constructs	**Indicator**	**Loadings**	**Average Variance Extracted (AVE)**
IP	IP02	0.845	0.602
	IP03	0.775	
	IP04	0.701	
LP	LP04	0.825	0.754
	LPO2	0.909	
OP	OP01	0.805	0.644
	0P02	0.833	
	OP03	0.767	
TP	TP12	0.827	0.614
	TP17	0.726	
	TPO1	0.795	

Apart from the outer loadings AVE is also used to assess convergent validity. The outer loading establishes the existence of convergent validity at indicator level while AVE does the same at construct level (Hair *et al*., 2014). The AVE is the grand mean of the indicator's squared loadings. As reported in table 5.22 AVE of all the items are above 0.50, which is acceptable and in line with the minimum threshold of >0.50. The lowest AVE (0.602) is individual performance (IP) and the highest AVE (0.754) is learning performance (LP).

5.10.3 Assessment of discriminant validity

Discriminant validity explains how a construct distinguishes itself from other constructs. It also shows the extent to which the construct of concern is truly distinct from another construct by emphirical standard (Hair *et al*., 2015). There are three measures of discriminant validity i.e. the cross-loadings, Fornell-Lacker criterions and Heterotrait-Monotrait Ratio (HTMT). The cross-loadings criterion establishes the discriminant validity when the outer loading of an item is higher on its associated construct than the other constructs of the study.

Fornell-Lacker criterion compares the square root of AVE with the latent variable to assess discriminant validity. According to Fornell and Lacker (1981), the latent factors must have more variance than the other latent. Similarly, discriminant validity can also be established the square root of AVE greater than the construct's correlation with other constructs (Fornell & Lacker, 1981). As reported in table 5.23 all the indicators loaded very high on their associated constructs than on the others, indicating existence of discriminant validity.

Table 5.23

Cross loadings

	IP	**LP**	**OP**	**TP**
IP02	**0.845**	0.534	0.333	0.123
IP03	**0.775**	0.561	0.602	0.579
IP04	**0.701**	0.558	0.487	0.476
LP04	**0.623**	**0.825**	0.591	0.582
LPO2	0.598	**0.909**	**0.805**	**0.790**
OP01	0.598	**0.909**	**0.805**	**0.790**
0P02	0.345	0.534	**0.833**	**0.823**
OP03	0.595	0.495	**0.767**	**0.779**
TP12	0.235	0.525	**0.824**	**0.827**
TP17	0.551	0.468	0.547	**0.726**
TPO1	0.560	0.168	0.269	**0.795**

The second method used for assessing discriminant validity is Fornell-Larcker criterion. The square root of AVE is compared with the latent variable correlation to assess discriminant validity. The square root of AVE should be greater than the construct's correlation with other constructs to

establish discriminant validity (Fornell-Larcker, 1981; Hair *et al*., 2014). Table 5.24 presents the square root of AVE and correlations of the constructs.

Table 5.24

Fornell-Larcker criterion

	IP	**LP**	**OP**	**TP**
IP	**0.776**			
LP	0.697	**0.868**		
OP	0.257	0.818	**0.802**	
TP	0.439	0.803	0.527	**0.784**

The square root of AVE (boldy written in table 5.24) ranges from 0.776 to 0.868 for all the constructs. The square root of AVE for all the constructs is higher than their correlations with other constructs. This indicates the attainment of discriminant validity.

The third way of assessing discriminant validity is Heterotrait-Monotrait Ratio (HTMT). In a well-fitting model, Heterotrait-Monotrait Ratio (HTMT) ratios should be below 0.9 (Hair *et al*., 2016). The result as depicted in table 5.25 shows that all variables obtained are less than the maximum value. This implies that discriminant validity using HMTM is established between a given pair of reflective constructs.

Table 5.25

Heterotrait-Monotrait Ratio (HTMT)

	FAAT	**IP**	**LP**	**OP**	**TP**
FAAT					
IP	0.691				
LP	0.665	1.045			
OP	0.648	1.154	1.122		
TP	0.729	1.158	1.133	1.259	

5.11 Structural Model

After ensuring that there were no issues with the model measurement in terms of validity and reliability, the next step is to determine R-squared value (R^2), effect size (f^2), predictive relevance (Q^2) of the models and test hypotheses of the study.

5.11.1 Assessment of the R-Squared value (R^2)

Assessment of the R-squared value is one of the criterions for structural model assessment in PLS-SEM (Hair *et al*., 2014). R^2 is also called coefficient of determination. The coefficient of determination (r^2) explains how much the independent variable explains the dependent variables. R^2 assess the overall effect of exogenous variable on the endogenous variable. The higher the R-squared, the higher will be the predictive accuracy of the exogenous variable on the endogenous variable. R^2 of 0.75, 0.50 and 0.25 is considered strong, good and weak (Henseler, 1998).

The coefficient of determination (R^2) is calculated to explain the variation in the dependent variables that is accounted for by the variation in the independent variable. The formula for calculating the coefficient of determination (R^2) is given as:

$$R^2 = \frac{\text{Explained variation}}{\text{Total variation}}$$

The R-squared value is sensitive to a number of exogenous variables in the model, as a result, the value may be biased (Hair *et al.,*2014). Hence there is need to adjust the R-square value to take care of the number of the exogenous variables especially when assessing and comparing different models (Hair *et al*.,2014). The adjusted R-squared can take of the limitations of the R-square although the adjusted R-squared cannot be interpreted (Falk and Miller, 1992). This study computed its R-squared value using the PLS-SEM algorithms, and adjusted R-squared manually using the following formula as provided by Hair *et al.* (2014):

$R^2_{adj} = 1-(1- R^2). n-1/n-k-1$

Where n= sample size k = number of exogenous latent variables used to predict the exogenous latent variable considered.

This study has two endogenous variable i.e. teaching productivity and research productivity. Table 5.26 shows the R-squared and adjusted R-squared values of this study.

Table 5.26

Coefficient of determination (R^2) of the study

Construct	**R Square (R^2)**	**R^2 Adjusted**
Teaching productivity	0.875%	0.874%
Research Productivity	0.762%	0.478%

As reported in table 5.26 the exogenous variable of the study explain up to 0.875 (87%) of the variability in teaching productivity and about 0.762 (76%) of the variation in research productivity. According to (Henseler, 1998) the R^2 of 87% and 76% represents strong influence of training on teaching and research productivity respectively.

5.11.2 Assessment of the effect size (f^2)

The R-squared value assesses the overall effect of all the exogenous variables on the endogenous variable while effect size (f^2) assesses the individual effect of the exogenous variable on the endogenous variable. Effect size (f^2) is obtained by assessing the change in R-squared value after omitting a specific exogenous variable to assess its impact on the endogenous variable (Hair *et al*., 2014). The effect size (f^2) is calculated using the formula below as provided by Wilson, Challaghan, Ringle and Henseler (2007).

$$f^2 \text{ effect size} = \frac{R^2 \text{ included} - R^2 \text{ excluded}}{1 - R^2 \text{ included}}$$

According to Cohen (1988), f^2 values of 0.02, 0.15 and 0.35 represent small, moderate and large effect sizes respectively. Table 5.27 presents the effect sizes of the exogenous variables on the endogenous variable.

Table 5.27

Effect size of the latent variable

Endogenous variables	**Exogenous variables**	**f-squared**	**Effect size**
TP	IP	0.048	Small
	LP	0.040	Small
	OP	0.612	Large
RP	IP	0.032	Small
	LP	0.260	Moderate
	OP	0.006	Small

The effect sizes as reported in table 5.27 shows that individual performance, learning performance and organizational performance have effect sizes of 0.048, 0.040 and 0.612 respectively. Based on the interpretation of Cohen (1988), the exogenous variables are having small, small and large effect sizes on the first endogenous (teaching productivity). Moreover, table 5.27 shows that individual performance; learning performance and organizational performance have effect sizes of 0.0325, 0.260 and 0.006 respectively. This implies that exogenous variables are having small, moderate and small effect sizes on the second endogenous (research productivity) as captured in the interpretation of Cohen (1988).

5.11.3 Assessment of the predictive relevance (Q^2)

Apart from assessment of R^2 and f^2, predictive relevance (Q^2) is the next to be determined. Predictive relevance (Q^2) is used to estimate of the predictive ability of the model. Q^2 is also used as a supplementary assessment of goodness of fit in PLS-SEM. Predictive relevance of the model is conducted using Stone-Geisser's Q^2 value (Hair *et al*., 2014). The predictive relevance is estimated using blindfolding which omits some data in the endogenous variables and replaces them with mean values, repeating the same until all data points are omitted and replaced, then it compares the true values (omitted) and the predicted values to assess the predictive accuracy of the model (Henseler, 2009). Where the Q^2 value of an endogenous variable is greater than zero, it indicates the predictive relevance of the model for that constructs (Henseler, 2009). The study applied a cross-validated redundancy approach to calculate the blindfolding predictive relevance of the model. Table 5.28 reports the predictive relevance (Q^2) of the model.

Table 5.28

Predictive Relevance (Q^2) of the model

Total	SSO	SSE	I-SSE/SS0
Teaching Productivity	1992.000	1368.216	0.313
Research Productivity	2490.000	1748.985	0.298

As shown in the table 5.28, the cross-validated redundancy (I-SSE/SSO) predictive relevance of both teaching and research productivity is 0.313 and 0.298 respectively. The results of Q^2 obtained are above zero and positive, meaning that the two models have predictive relevance of exogenous variables on the endogenous variables.

5.12 Hypotheses Testing

After successful assessment of R-squared value (R^2), effect size (f^2) and predictive relevance (Q^2) of the models, the next step is to test hypotheses using the structural models of TP and RP. We run bootstrapping with 5000 subsamples as recommended and the purpose behind the large subsamples is to ensure the stability of results (Hair *et al*., 2016). Table 5.29 shows the summary of the result of hypotheses while figure 5.4 and 5.5 illustrate the structural model results. This study sets the significance level at P-value < 0.05 and P< 0.05 recommended by Hair et al., (2010) and Jameel and Ahmad (2020).

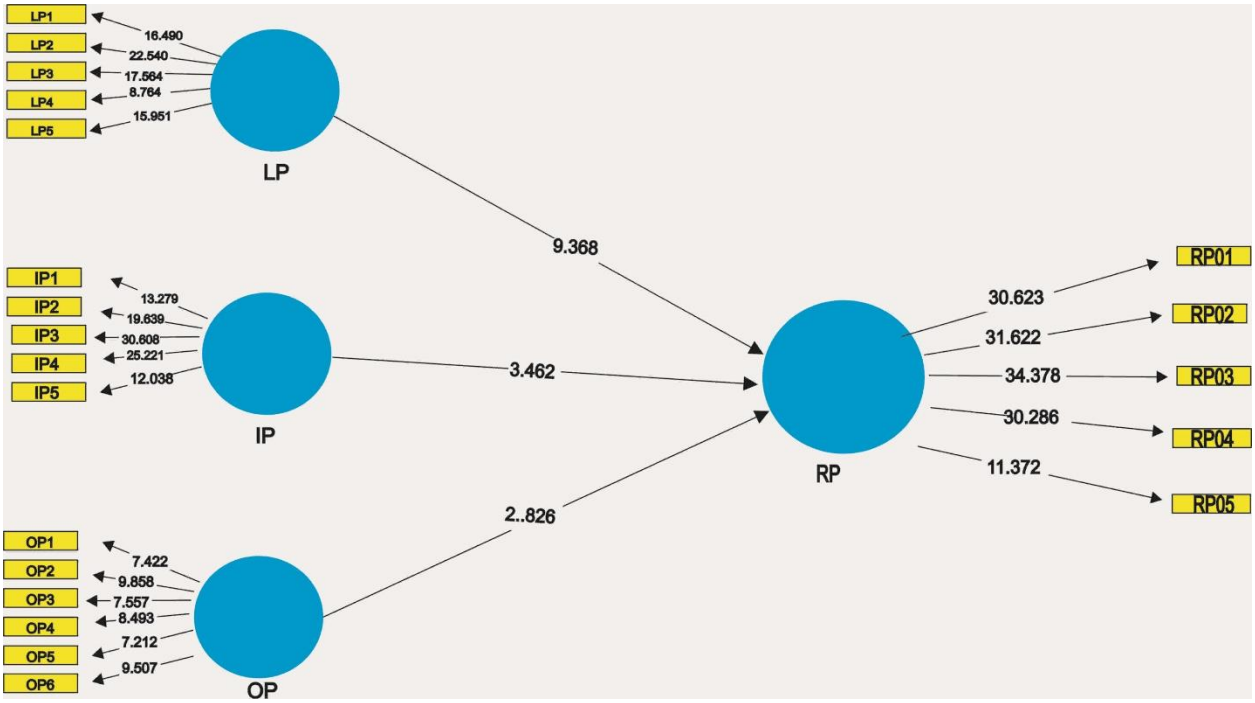

Figure 8: RP *Structural model of the study*

The result of hypothesis one as reported in table 5.29 shows that β= 0.227, t-value = 9.368 and p-value = 0.001. Since P 0.00 < 0.05, there is sufficient evidence to reject the null hypothesis and conclude that learning performance have positive and significant impact on research productivity among academic staff. The path coefficient (βeta) 0.227 shows that for every unit change in learning performance, research productivity will increase by 0.227 (227%) among academic staff in the study area.

Hypothesis two predicts that individual performance have positive and significant relationship with research productivity among academic staff. The result as shown in table 5.29 reveals that β = 0.577, t-value =3.462 and p-value =0.000. Since the probability value of 0.000 is less than the 0.05 level of significance (P <0.05), the null hypothesis which stated that individual performance have no positive and significant impact on research productivity is rejected, and concluded that individual performance have positive and significant relationship with research productivity among academic staff in the study area. The path coefficient (βeta) 0.577 shows that for every unit change in individual performance, research productivity will increase by 0.577 (577%) among academic staff in the study area.

The relationship between organizational performance and research productivity among academic staff is tested by hypothesis three and the result (β =0.101, t-value = 2.826 >1.96 and p-value = 0.000 < 0.05) as shown in table 5.29 indicates that there is positive and significant relationship between

organizational performance and research productivity. The path coefficient (βeta) 0.101 further shows that for every unit change in organizational performance, research productivity will increase by 0.101 (101%) among academic staff in the study area.

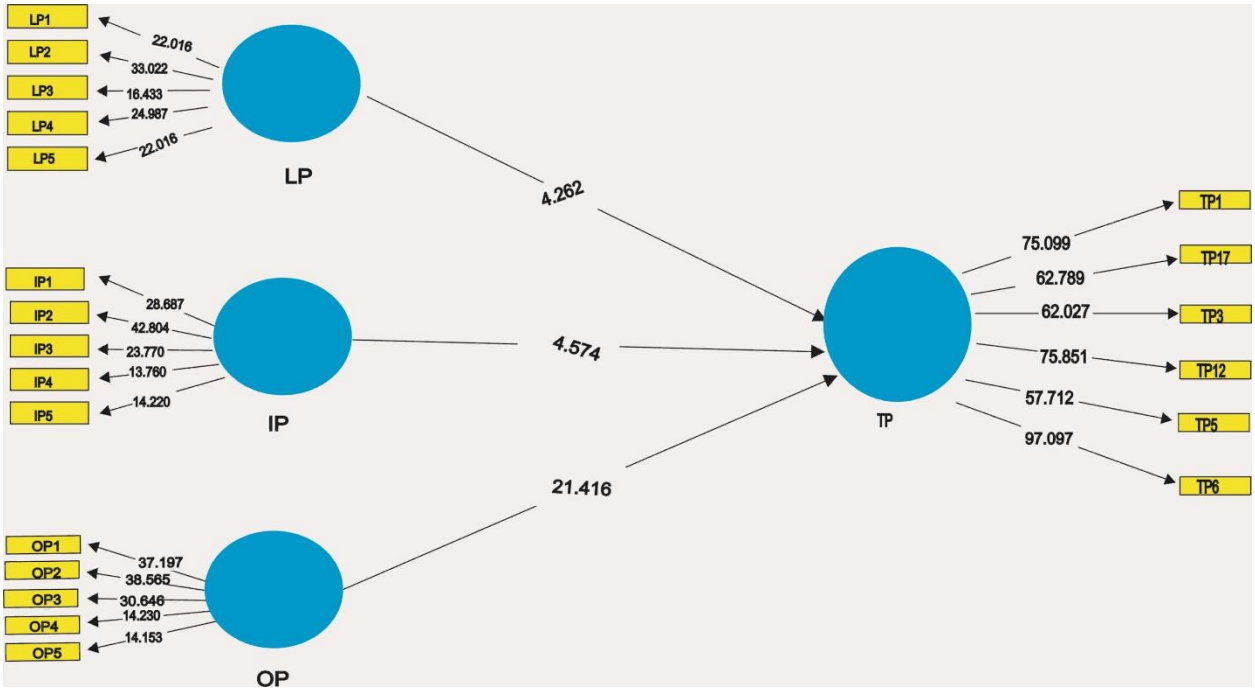

Figure 9: TP *Structural model of the study*

The fourth hypothesis proposes that learning performance is not positively to teaching productivity. The result as reported in table 5.29 shows that the path coefficient is 0.152, t-value 4.262 and p-value 0.000. Since p-value is less than 0.05 $H0_1$ is rejected and hence we conclude with sufficient evidence that there is positive and significant relationship between learning performance and teaching productivity among academic staff in the study area. The path coefficient (βeta) 0.152 indicates that for every unit change in learning performance, teaching productivity will rise by 0.152 (152%) among academic staff.

The firth hypothesis proposes that individual performance leads to improvement in teaching productivity among academic staff, and the result as shown in table 5.29 reveals that t-value is 4.574 and P-value is 0.000. Since the probability value of 0.000 is less than the 0.05 level of significance (P<0.05), the fourth null hypothesis is rejected, implying that individual performance have positive and significant impact on teaching productivity among academic staff in the study area. The path coefficient (βeta) 0.124 shows that for every unit change in individual performance, teaching productivity will rise by 0.124 (124%) among academic staff.

The sixth hypothesis advances that organizational performance has no positive and significant impact on teaching productivity. The result in table 5.29 indicates that t-value is 21.416 and p-value 0.000. Since the probability value of 0.000 is less than the 0.05 level of significance (P <0.05), the null hypothesis which stated that organizational performance have no positive and significant impact on teaching productivity is rejected. This implies that organizational performance have positive and significant relationship with teaching productivity among academic staff in the study area. In the same vain, the path coefficient (βeta) 0.666 shows that for every unit change in organizational performance, teaching productivity will increase by 0.666 (666%) among academic staff in the study area.

Table 5.29

Summary of the result of hypotheses

Hypotheses	**Path**	**βeta**	**T-values**	**P-values**	**Decision**
Ho_1	LP-> RP	0.227	9.368	0.001	Rejected
Ho_2	LP-> RP	0.577	3.462	0.000	Rejected
Ho_3	OP->RP	0.101	2.826	0.001	Rejected
Ho_4	LP-> TP	0.152	4.282	0.000	Rejected
Ho_5	IP-> TP	0.124	4.574	0.000	Rejected
Ho_6	OP->TP	0.666	21.416	0.000	Rejected

5.13 Discussion of the findings of the study

The findings of this study demonstrate that structured and relevant training significantly enhances both teaching effectiveness and research productivity among academic staff in Nigerian higher institutions. This aligns with the assertion of Becker (1964) in Human Capital Theory, which posits that investment in employee skills yields measurable productivity gains. Similarly, Olatunji and Adebayo (2020) found that academic staff who participated in targeted pedagogical training

exhibited superior instructional delivery and student engagement compared to their untrained counterparts.

The study revealed that training fosters the acquisition of updated pedagogical methods, technological competence, and enhanced methodological rigor. This corroborates the findings of Eze, Okonkwo, and Olatunbosun (2018), who reported that professional development programs significantly improved lecturers' use of digital tools and innovative teaching strategies. Additionally, Okeke and Ede (2019) highlighted that faculty members who engaged in research-focused training were more likely to publish in high-impact journals and attract external funding.

Empirical evidence further supports the study's finding that the frequency, relevance, and quality of training are critical determinants of impact. For instance, Yusuf and Lawal (2021) observed that sustained and discipline-specific training programs produced more substantial gains in academic performance than short, generic workshops. The importance of institutional support, such as mentorship and research grants, is also consistent with the conclusions of Amadi and Promise (2022), who noted that enabling academic environments amplify the benefits of staff training.

Moreover, the study's results resonate with the Resource-Based View (Barney, 1991), which asserts that unique, valuable, and inimitable competencies such as those acquired through specialized training serve as a competitive advantage for institutions. Thus, Nigerian universities that institutionalize continuous professional development are better positioned to improve both knowledge dissemination and scholarly output.

In summary, the convergence between the present findings and prior empirical studies reinforces the proposition that training is a critical driver of academic excellence. However, the evidence suggests that the mere provision of training is insufficient; its design, delivery, and contextual relevance ultimately determine its effectiveness in enhancing teaching and research productivity.

5.13.1 Impact of learning performance on research productivity

The first objective of this study is to examine the relationship between learning performance and research productivity. In order to achieve this objective, the hypothesis which predicted a positive relationship between learning performance and research productivity was assessed in line with PLS output. Based on the result it was found that learning performance is directly impacted on research productivity. This finding is supported by the study of Fulton & Trow (2015) in which they found direct link between training and research productivity. The implication is that enhancing learning

performance through training will, in turn, lead to enhancement of academic staff productivity in terms of knowledge of research methodology, tools of data analysis, classification of journals and other things related to research productivity. This finding is also in line with Kani (2021) in which he found positive and significant relationship between learning performance and research productivity among academic staff in Kano state of Nigeria. This finding also concurs with Hunt and Vitel, (2020) who found positive effects of learning performance on research productivity. In the same vein, Randall (1987) argues that high levels of learning performance may have positive effects both on persons' research productivity in the form of reduced number of times in conducting research, use of software for data analysis and publication of high-quality papers.

5.13.2 Impact of individual performance on research productivity

The second objective is to identify the relationship between individual performance and research productivity. The second direct hypothesis, which states that, ―individual performance is positively related to research productivity in Nigeria, was also tested using PLS output path analysis. Individual performance which involves keeping and accomplishing research obligations and other academic workload bestowed on an individual is positively associated with research productivity. The result revealed that there is a significant positive association between individual performance and research productivity in the Nigerian higher education institutions. Hattie & Marsh (2017) supported the rejection of the hypothesis two in this study and hence infer that individual performance positively impacted on research productivity. Thus, research productivity which increases the productivity of academic staff is positively associated with individual performance. Thus, the implication of this finding is that improvement in individual performance as a result of training will, in turn, lead to improvement in academic staff's productivity in relation to number of one's academic publications and citation indices. In addition, higher education institutions have an opportunity to use this finding while simultaneously planning their strategic objectives and making contributions to society. This will be more successful in influencing other stakeholders to prioritize training and development which consequentially can lead to overall improvement in academic staff research productivity. In addition, Jones (1995) found that continued connections with stakeholders to invest in training and development should be based on nexus between individual performance and research productivity since such actions are beneficial to a nation building.

5.13.3 Impact of organizational performance on research productivity

Objective three examine the relationship between organizational performance and research productivity in Nigeria. In order to achieve this objective, Hypothesis 3, which states that, ―there is no significant relationship between organizational performance and research productivity, was equally tested using PLS output analysis. The statistically results recommend that there is a reasonably significant relationship between organizational performance has positive and significant on research productivity. Research productivity which increases the ranking of higher education institutions is significantly associated with organizational performance. The implication is that improvement in research through organization performance as a component of training effectiveness will lead to high ranking and reputation of a higher institution. This finding is attested by Rhodman (2002) in which they found that, training apart from being a key determinant of employee productivity, also promotes the efficiency of HEIs and research productivity as measured by self-report of both employees and employers. The findings of Keawmani (1991) also buttressed the fact that organizational performance directly relates to improvement in research productivity. In addition, in his survey on organizational performance in US, Hansen *et al.* (2011) found that organizational performance has a positive and significant relationship with research productivity in the study area.

5.13.4 Impact of learning performance on teaching productivity

The influence of learning performance on teaching productivity is another objective of this study. Thus, the fourth hypothesis on the relationship between learning performance and teaching productivity was tested using PLS output, and consequently accepted based on the statistically results. It was found that learning performance has positive and significant on teaching productivity. Learning performance which deals with changes in one's knowledge, his ability to use or apply it and confidence in mastering the knowledge is empirically proved to have impact on teaching productivity. Kani (2021) study where he found that learning, individual and organizational performance are positively and significantly related to teaching productivity is in accord with the finding of hypothesis four. Daloke, Finian and Innocent (2016) also concurred with this finding in their study where they found positive effects of strong relationship between learning performance and teaching productivity. Similarly, Comma (2008) argues that high learning performance as a result of training may have positive effects on teaching productivity. Thus, the higher the levels of learning performance, the more likely it is to have a favorable change in teaching productivity among the subjects in the study area. Further, the finding suggests that organizations that have invested in training and development would most likely notice its positive manifestations in terms of better teaching productivity. Interestingly, this finding corroborates several other previous studies, such as

Ahmad et al. (2011); and Denison, (1996) who found that change in learning performance has a positive effect on teaching productivity.

5.13.5 Impact of individual performance on teaching productivity

The fifth objective of this study is to examine the relationship between individual performance and teaching productivity. In order to achieve this objective, the hypothesis which predicted a positive no relationship between individual performance and teaching productivity was assessed in line with PLS output. Based on the result it was found that learning performance positively and significantly impacted on teaching productivity. Individual performance, which involves upgrading the skills of an individual work through training, has positive and significant impact on teaching productivity. Findings of Print & Hattie (1997) that skills and competencies needed for a smooth teaching career can be developed through regular training programs buttresses the result of hypothesis five. This finding was also in conformity with the studies of Aghazadeh (2007), Arvanitis *et al.* (2009) and Bartel (1991). The impact of learning performance on teaching productivity could be possibly due to the effectiveness of the knowledge acquired through training given by the academic staff in the study area. In addition, the statistical relationship between the two constructs is positive. Thus, the higher the learning performance is, the more likely it is to increase teaching productivity. Higher education institutions can only keep on existing if they place much emphasis on training and development which is matched with society's own value system. Interestingly, the relationship between learning performance and teaching productivity is far stronger than the relationship between any other sets of constructs in the study which has higher statistical power. Therefore, this study clearly contributes in understanding of the relationship of learning performance and teaching productivity. This is of great value to Nigerian higher education system; this relationship has must be considered in strategic planning and decision making in order to developed comprehensive understanding of academic staff training and development vis-à-vis teaching and research productivity.

5.13.6 Impact of organizational performance on teaching productivity

Objective six aimed at identifying the impact of organizational performance on teaching productivity. The sixth hypothesis, which states that, organizational performance is positively related to teaching productivity in Nigeria, was also tested using PLS output path analysis. The result revealed that organizational performance has significant positive impact on teaching productivity among the respondents in the study area. Organizational performance which involves reputation of the organization in terms of quality teaching and research outputs is positively associated with

improvement in teaching productivity due to the training undergone by the academic staff in the study area. The implication is that if organizational performance improves as a result of training, it will, in turn, lead to increase in teaching productivity. Obi *et al.* (2014), Peretomode *et al.* (2016) Rashid (2008) and Tahir *et al.* (2014) have all arrived at the conclusion that continued organizational performance through training are beneficial to institutions as it significantly impacted on teaching productivity of members of academic community. In addition, higher education institutions have an opportunity to uses these finding while simultaneously planning their strategic objectives and making contributions to society.

Many reasons can be deduced behind the weak correlation between learning performance and productivity. First, although academic staff may perform well in training (i.e., high learning performance), this does not guarantee transfer of skills to their actual work, especially in teaching and research. Transfer of training is influenced by several post-training factors such as institutional support, opportunities to apply skills, and personal motivation (Baldwin & Ford, 1988). In Nigerian tertiary institutions, systemic constraints such as limited research infrastructure, poor access to teaching technology, and bureaucratic bottlenecks can inhibit the application of newly acquired knowledge.

Mismatch Between Training Content and Job Requirements may be another reason why the correction is not strong. Training programs funded by TETFund may not always be aligned with the real-world demands of academic staff in teaching and research. Training may be too generic or theoretical, lacking relevance to subject-specific or context-specific challenges faced by academics in Nigeria. When learning content does not match performance expectations, even high-performing trainees may not experience corresponding gains in productivity (Salas, Tannenbaum, Kraiger & Smith-Jentsch, 2012).

Productivity in academia, especially in Nigeria, is often constrained by structural and environmental limitations, regardless of how well staff perform in training. Poor research funding, lack of access to scholarly journals, unreliable electricity and internet, and high administrative burdens reduce time and resources available for productive work (Ogbogu, 2011).

Another factor is the measurement issues between learning and productivity metrics. There may be a disconnect between how learning performance and productivity are measured. Learning is often assessed through tests or assessments immediately after training, which reflect short-term retention rather than long-term application. Productivity in teaching and research involves longer-term outputs like publications, grants secured, student feedback, and curriculum development, which may not show immediate change after training (Kirkpatrick & Kirkpatrick, 2006).

High learning performance does not always equate to high motivation to apply the learned skills. Some academic staff may attend training primarily for promotion requirements or allowances, not because they are committed to applying the skills gained. Organizational culture, lack of recognition for research or teaching innovations, and low morale can further discourage application of training outcomes (Ezeani, 2015).

In the context of Nigerian tertiary institutions accessing TETFund training grants, the weak correlation between learning performance and productivity is largely due to the complex interplay between institutional, contextual, motivational, and design-related factors. This finding underscores the importance of not just providing training, but also ensuring institutional readiness, training relevance, and post-training support to drive real productivity improvements.

5.14 Summary

This chapter provides an overview of the data collected, profiles of respondents and statistical results including descriptive statistics of the main constructs involved in the study. This chapter presents the empirical results and hypotheses of the study. The findings from the data collected show support for the hypotheses, based on the measurement and structural models. Generally, the training variables are related to the teaching and research productivity of the respondents in the study area. The results are based on SEM output, and findings are also compared to the results of relevant prior studies.

CHAPTER SIX
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter concludes the results of the data analysis from the previous chapter. It reviews the major findings, theoretical and managerial implications, limitations of the study and presents suggestions for future research.

6.2 Summary

The broad aim of this study is to investigate the impact of training on productivity of academic staff of higher education institutions in Kano State, Nigeria. Chapter two focuses on historical development of HEIs in Nigeria whereas chapter three dwells on literature review and theoretical framework. The theoretical framework describes the study variable which focuses on the relationship of three training components and productivity. Canon-Bowers theory of HRD was adopted in this study. Chapter three concludes with summary of the research gap. In section three, empirical review of related literature was presented. The related literature reviewed demonstrated that there are consistent results on the relationships between training and productivity.

The broad objective of this study is to examine the impact of training on productivity of academic staff of higher education institution in Nigeria. In recent years, there are numerous calls in the literature to examine the relevance of training and development. The literature review in chapter three demonstrated that there are consistent results on the relationships between training and productivity. The conceptual framework in chapter three also describes the study which focuses on the relationship of three training components (learning, individual and organizational performance) and productivity vis-à-vis research and teaching in the study area. The conceptual framework is explained by the human capital theory.

The study examined the impact of training on productivity of academic staff of higher education institution in Nigeria. Cross-sectional research design was adopted using 589 as the population, 234 as the sample size and proportionate stratified random sampling as sampling technique of this study. Data obtained using questionnaire was pre-tested with 50 academic staff of Jigawa State higher education institutions. After the main data collection, research questions were answered using PPMC whereas CFA and measurement model were conducted to test the constructs using Smart PLS software 2.0. The six hypotheses formulated in this study were tested using structural model. After

drawing conclusions from the findings, recommendations were made to guide future studies. The results of the pilot test confirmed that the instrument is reliable and valid. After the main data collection, CFA and measurement model were conducted to test the constructs using SmartPLS software 2.0. Subsequent to deleting some items, both the measurement model and structural model were established to sufficiently fit the data.

Secondly, it was found that individual performance has a significant positive relationship with research productivity in Nigeria. This finding implies that Nigerian higher education institutions attach more significance to improving research productivity of members of its academic staff. In addition, given that the association between individual performance and research productivity is positive, this indicates that if Nigerian tertiary education institutions continuous rejuvenating the capacity of its academic staff through training and development, then they may likely have a more positive effect on research productivity. Stakeholders in higher education in Nigeria and beyond have the opportunity to relate this finding and priories in their strategic planning decisions which can influence the overall performances of the higher education institutions in Nigeria.

Thirdly, organizational performance was found to have a significant positive relationship with research productivity. As mentioned earlier, organizational performance has to do with perception on the organizational performance in relation to training and development. Since the association between the constructs is positive, it means that an improvement in organizational performance due to training and development leads to a positive influence on research productivity. In addition, the study concludes that the more investment in training proxied by organizational performance, the more the tendencies for research productivity to be enhanced. Hence, higher education institutions in Nigeria should focus on training and development in planning strategic decisions which can increase overall productivity.

Fourthly, the study found that the learning performance has a significant positive association with teaching productivity. The improvement in learning performance goes a long way in determining the teaching productivity of tertiary education institutions in Nigeria. Therefore, if tertiary institutions perceive that learning performance is high, then they are more likely to invest more in training and development so as to uplift the teaching productivity. In addition, since the relationship between the two constructs is positive, the higher the improvement in teaching productivity due to change in learning performance, the higher would be their commitment to investment in training and development and vice-versa. Managers need to understand training and development and its

impactful contribution to enhancing teaching productivity in Nigeria. This study therefore has shown the important relationship of this variable in an organizational setting particularly higher education institutions in Nigeria; the management should continue having this causal relationship so as to enhance overall productivity of higher education institutions in Nigeria.

Fifthly, individual performance was found to have a significant relationship with teaching productivity. Hence, since the association between these two constructs is positive, this means that a positive individual performance leads to a better teaching productivity. In addition, the study confirmed that a individual performance plays an important role in developing teaching productivity of academic staff in the study area.

Sixthly, the study found that organizational performance has a significant positive relationship with teaching productivity. The improvement in organizational performance due to staff training and development go a long way in influencing teaching productivity. If organizational performance of Nigerian higher education institutions is high, then they are more likely to invest more in training and development. Organizational performance is a good way to elicit better teaching and research productivity.

6.3 Conclusions

The study examined the relationship between training and the teaching and research productivity of academic staff in Nigerian higher institutions. Findings revealed that well-structured and relevant training significantly enhances both teaching effectiveness and research output. Specifically, training equips academic staff with updated pedagogical skills, methodological competencies, and technological proficiency, which collectively improve instructional delivery and student learning outcomes.

Furthermore, the results demonstrated that training contributes to research productivity by enhancing scholarly writing skills, fostering methodological rigor, and promoting the adoption of innovative research tools and techniques. Institutions that prioritize continuous professional development tend to produce faculty who are more research-active, publish more frequently, and secure higher levels of research funding.

The study also established that the type, frequency, and quality of training are critical determinants of its impact. Short, generic workshops often have limited effect, while targeted, discipline-specific, and sustained training programs yield more substantial improvements in academic performance. In addition, institutional support—such as the provision of research grants, mentorship programs, and access to academic resources—was found to amplify the benefits of training.

Overall, the evidence underscores that training is not merely a supplementary activity but a strategic investment in human capital. When properly designed and implemented, it serves as a catalyst for enhancing both teaching quality and research excellence, thereby contributing to the broader institutional mandate of knowledge creation and dissemination.

Contributions of the Study to Present-Day Nigeria and Beyond

a. The study provides empirical evidence on the role of training in enhancing teaching and research productivity among academic staff in Nigerian tertiary institutions.
b. It offers data to support policy reforms and targeted interventions by education stakeholders such as TETFund, the Federal Ministry of Education, and the National Universities Commission.
c. The research highlights the necessity of continuous academic staff development in light of globalization and technological advancements.
d. It bridges knowledge gaps in human capital theory application within Nigerian higher education.
e. The findings serve as a benchmark for comparative analysis with similar economies like India, fostering cross-national learning and collaboration.
f. The study proposes strategies to optimize the AST&D Scheme and improve its relevance and outcomes in the current academic and economic context.

6.4 Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. There is need for Higher institutions in Nigeria to establish mandatory and sustained Continuous Professional Development (CPD) programs tailored to discipline-specific needs. These programs should integrate modern pedagogical approaches, digital literacy, and advanced research methodologies to enhance teaching and research competencies.

2. There is need to prioritize quality and relevance of training among Nigerian universities through design training programs based on comprehensive needs assessments to ensure that content is contextually relevant and aligns with emerging trends in academia. Training should be evaluated regularly for effectiveness using measurable performance indicators such as research output, teaching evaluations, and student learning outcomes.
3. Academic staff should be supported through mentorship schemes, research grants, and access to state-of-the-art facilities. Evidence from Amadi and Promise (2022) shows that enabling academic environments maximize the returns on training investments.
4. There is need to adopt a multi-modal training approach to training delivery by combining in-person workshops, online learning platforms, and collaborative peer-learning models to enhance accessibility and knowledge retention.
5. Integrate Training into Career Progression Frameworks so that academic staff promotion and tenure criteria should include evidence of participation in relevant training programs, thereby incentivizing continuous skill development and lifelong learning.
6. Nigerian tertiary Institutions should partner with international universities, research institutes, and funding agencies to expand training opportunities, incorporate global best practices, and increase exposure to cutting-edge research techniques.
7. The findings of this study have confirmed the important place occupied by training in influencing research and teaching productivity in the study area. Therefore, stakeholders in Nigerian Higher Education Institutions should recognize the indispensability of training as a tool of improving research and teaching productivity and incorporate it in the identification, selection and training of academic staff in the study area. Specifically, academic policies, programs and interventions that allow all academics access to training and development program should be incorporated into Nigerian higher education policy. In addition, research and teaching skills that are critical should also be co-opted into training and development of Nigerian Higher Education Institutions in Nigeria.
8. Relevant higher education institutions stakeholders should ensure that identification and selection of trainees is solely based on merits and adequate funding for the settlement of training expenses and allowances are made. This will, in turn, help the trainees to perform better during the training and ultimately leads to improvement in their productivity in terms of research and teaching. Partnerships with donor communities and agencies can be established so that apart from TETFund grant for ASTD scheme; more grants can be harnessed for more academic staff/ faculty members to partake in the training and development.

9. Finding of the study that various types of training especially in-service teacher professional development training appeared effective in promoting research and teaching productivity suggests that relatively more resources ought to be put in place to ensure continuous AST&D Scheme in Nigeria. Hence, Nigerian Higher Education Institutions should accord training utmost priority as source of building and preparing the country for the knowledge-based society. Training programs for members of academia should be carried out by using up to date resources and in a conducive learning environment.
10. Nigerian Higher education institutions should be organizing pre-training workshops for those who are attending training at home or in abroad so that they will be made to understand that as faculty members, one of sole aim of going for training is improving their teaching and research productivity. Similarly, the trainees after their training should be motivated to organize in-house training for other faculty members and intimate them about the opportunities and challenges associated with training and development.
11. It was evident from the findings that academic staff had insufficient research and teaching knowledge and experience because there were inadequate training programs among Nigerian Higher Education Institutions in the study area. It is, therefore, recommended that adequate and properly developed training programs in Nigerian Higher Education Institutions be put in place to serve as the central conduit for inculcation of skills and attitudes meant for the improvement of productivity of academics.
12. Nigerian Higher Education Institutions need to recognize that giving appropriate training to academic staff is not only indispensable but a pre-condition for continues improvement of academic staff research and teaching outcomes. Therefore, there is need to choose training related to research and teaching skills and look for training institutions (Universities and colleges) that possess the resources needed for the training and ultimately ensure that the training is linked to organizational objectives of Nigerian Higher Education Institutions. Similarly, there is need to establish permanent training centers in Nigerian Higher Education Institutions, forming groups in which those attended the training will, from time to time, come and discuss their training learning outcomes and provide ideas about training cycle to potential trainees among academic staff/ faculty members in the study area.
13. To achieve the benefits of training and development, Nigerian Higher Education Institutions should conduct manpower survey to identify the causes of less productivity among academic staff, where and how to address the problem, what type of training is required and for who in order to avoid unnecessary expenses and achieve desired training outcome.

14. Nigerian Higher Education Institutions should lay emphasis on training and development of their workforce in order to meet up with the challenges, dynamic trends and competitive nature of education industry in this current era of the Forth Industrial Revolution.
15. Nigerian Higher Education Institutions should expose all academic staff to training at least once in every year. This will make them to meet up with the demanding nature of teaching load and research. Similarly, re-training of already trained staff should be periodically organized so as to spring up the desire employees' performance that will inspire better organization's performance and productivity.
16. The study recommends that Nigerian Higher Education Institutions should conduct training needs assessment to ensure that the right training that can improve teaching and research productivity of the academic staff is given.
17. For training and development to have impact on the productivity of Nigerian Higher education institutions, reward system for academic staff who performed exceptionally well during training sessions should be introduced so that other academic staff will in turn be motivated to aspire to excel. This will also help tertiary education institutions to have available academic staff with special skills and talents.
18. Nigerian Higher Education Institutions should pay credence to morale refurbishment in their training process as that will go a long way in ensuring better organization's performance and productivity. That is to say that, when staff have morality, they are likely to have good integrity.
19. Nigerian Higher Education Institutions should identify the required training programmes that will increase the quality of output which comprises the students and their research output to train and re-train the already trained academic staff periodically so as to inspire better performance and productivity of the academic staff.

By adopting these scientifically grounded recommendations, Nigerian higher institutions can enhance their human capital base, strengthen their academic competitiveness, and contribute meaningfully to national development through improved teaching and research productivity.

6.5 Limitations, suggestions for future studies and Implications of the study

This study is not without limitations, some of which include measurement error that may exist since the study utilizes self-reporting surveys. Therefore, future studies should administer their survey on multiple separate categories of respondents i.e. teaching and research productivity data from many

higher education institutions in Nigeria, so as to obtain data. This can go along in minimizing measurement error.

Secondly, this study uses questionnaire as a unit of quantitative study in gathering the data for further analysis. At times respondents may too busy to spend time answering the questionnaire with precision. They often fill the questionnaire haphazardly when the items are too much or questions are ambiguous. As such, responses provided by the respondents may not accurately measure the study's constructs. It is therefore suggested that, future studies should combine both quantitative and qualitative methods in order to investigate in-depth on the relationship between training and productivity not only in Nigerian context but in the context of other climates.

Thirdly, this study adopts cross-sectional research design to capture the responses of the respondents at a single period of time. Cross-sectional design is sometimes restricted to providing causal relationship between the study variables (Sekaran & Bougie, 2010). Since cross-sectional data is collected at a single period of time, it may not account for the long-term effect of the variables under study. Therefore, future studies should replicate this study using longitudinal data to examine the long-term effect of the variables.

The study investigates the impact of training on productivity of academic staff in Kano state, Nigeria. The training dimensions adopted in this study are restricted to learning, individual and organizational performance. There are many dimensions of training not adopted in this study such as remunerations of staff and institutional goodwill. Future studies may consider including these dimensions. Similarly, productivity is not only limited to teaching and research. Therefore, future studies can examine the relationship using other components of productivity or combining them all. In addition, the study uses only respondents from public higher education institutions within Nigerian education sector. Future study can examine both training and productivity in privately owned higher education institutions or a comparative analysis between public and private higher education institutions in Nigeria.

The following are the implications of this study for policy makers:

a. The academic environment of the 21st century is more likely to be of tremendous advantage to academic staff/ faculty members that learn fast through training and development and can quickly adapt to the dynamics of teaching and research.

b. Academic staff/ faculty members who are trained are more likely to do better and be satisfied with their jobs which influence their commitment and productivity than their counterparts who are not trained and possibly gets frustrated and dissatisfied which may result to inefficiency, lack of confidence and being less productive.
c. The findings reveal that Higher education Institutions interested in achieving high level of productivity and profitability must have an effective and efficient workforce management that lay emphasis on imparting additional knowledge, skills, competencies and modern work practices that can be gained through training and development.
d. It is important to note from the findings that Higher education Institutions investing in training and development are likely to be more valued by their workforce and have better chance of benefiting from high employee commitment, morale and high level of productivity, which is much likely to have positive effect on academic staff teaching and research productivity.
e. Training and development from the above finding is a means of strengthening the strategic capacity of Higher education Institutions through reskilling and upskilling their workforce (faculty members) to meet up with the recent technological breakthroughs, and innovations in modern work environment, these practices are likely to have much effect in real situations.

Specific future direction of the Study

The study suggests that future research should focus on refining and evaluating the Academic Staff Training and Development (AST&D) Scheme further, particularly in terms of its long-term impact on teaching and research productivity. There is a need for deeper analysis of post-training performance tracking, contextual barriers to productivity, and the integration of new technological tools in academic delivery. Additionally, comparative studies between Nigerian institutions and those in countries like India are encouraged to better understand how different socio-economic and policy environments influence the effectiveness of academic training programs.

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APPENDIX

RESEARCH QUESTIONNAIRE

SURVEY ON THE IMPACT OF TRAINING ON PRODUCTIVITY OF ACADEMIC STAFF OF HIGHER EDUCATION INSTITUTIONS: A CASE STUDY OF KANO STATE, NIGERIA

Dear Sir/Madam,

I am a postgraduate student of Lovely Professional University, Punjab, India and currently conducting a survey on the *Impact of Training on Productivity of Academic Staff of Higher Education Institutions in Kano State, Nigeria* as part of the requirement for the award of Doctor of Philosophy (Ph.D.). In this study, training refers to the Academic Staff Training and Development (ASTD) Scheme introduced under the auspices of the Tertiary Education Trust Fund (TETFund) with the sole aim of building the capacity of the academic staff of public Higher Education Institutions (HEIs) in Nigeria.

I am kindly appealing to you to complete this questionnaire in your capacity as an academic staff that previously enjoyed ASTD Scheme in your institution. Please note that your responses will be kept entirely confidential and will only be used for the purpose of this study. Therefore, your honest responses are needed to help me capture and reflect your views in the final analysis of this study.

This questionnaire, which is designed to solicit for honest feedback that will be used as a baseline for the study, is divided into four (4) sections. Demographic information is captured in section one, training effectiveness as a proxy of ASTD Scheme is presented in section two, research productivity is dealt with in section three while section four focuses on teaching productivity. Likert scale of 1 to 5 where 5 denote Strongly Agree (SA), 4 Agree (A), 3 Neutral (N), 2 Disagree (D) and 1 Strongly Disagree (SD) is used in this study. To complete the questionnaire, you are expected to read and then rate each statement according to the given scale. In all the statements you are required to tick [√] of circle [0] your responses in each section.

Yours Sincerely,

Abdussalam Muhammad Kani
PhD Scholar (Economics)
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Section One

Demographic Information

1. **Age**

   (a) Below 30 [ ]

   (b) 30-35years [ ]

   (c) 36-40 years [ ]

   (d) 41-45 years [ ]

   (e) 46 years and above [ ]

2. **Gender**

   (a) Male [ ] (b) Female [ ]

3. **Place of training**

   (a) Local [ ] (b) Foreign [ ]

4. **Certificate Obtained**

   (a) Ph.D. [ ] (b) Masters' Degree [ ]

5. **Name of Higher Education Institutions**

   (a)Bayero University [ ]

   (b)University of Science and Technology [ ]

   (c)Yusuf Maitama University [ ]

   (d)Federal Colleges of Education [ ]

   (e) Federal Colleges of Education, Kano [ ]

   (f) Federal Colleges of Education (Tech), Bichi [ ]

   (j) Saadatu Rimi College of Education, Kumbotso [ ]

   (h) Kano State Polytechnics [ ]

   (i)Police Academy, Wudil [ ]

6. **Area of specialization**

   (a) Science [ ]

   (b) Social Science [ ]

   (c) Arts and Humanities [ ]

7. **Duration of the training**

   (a)1 year[ ]

   (b) 1 year and 6 months [ ]

   (c) 2 years [ ]

   (d) 3 years [ ]

   (e)Above 3 years **[ ]**

Section Two

Training Effectiveness

The following statements assess the perception of the academic staff on the effectiveness of the training. Please indicate the extent of your agreement with each statement based on the scale provided below.

S/N	Statements	Level of agreement				
	Compared to pre-training period	SA	A	N	D	SD
		5	4	3	2	1
01	I can lists down all the important things emphasized during the training					
02	I know how to solve certain job problems using the skills taught during the training					
03	I know how to work more efficiently using the knowledge learned during the training					
04	I have the capability to perform the skills taught during the training					
05	The courses I covered during the training were relevant in helping me to specialize in my area of study.					
06	The learning resources I used during the training were adequate and up-to-date.					
07	The course tutors I met at the training institutions were excellent in their respective areas of specialization.					
08	My teaching subject skills and personnel competencies have improved as a result the training					
09	I am being more professional in certain tasks after attending the training					
10	My job performance has improved as a result of applying the skills acquired during the training					
11	The productivity of my department has improved due to the skills that I learned and used in the training either directly or indirectly					
12	What I learned during the training has improved my job performance and subsequently my organizational performance					
13	I have contributed to improving my organization's reputation due to the outcome of the training either directly or indirectly					

Section Three

Research Productivity

The following are statements about the level of increase in your research productivity as a result of the training. Kindly indicate the extent to which you agree or disagree with the statements below based on the scale provided.

S/N	Compared to pre-training period	Level of agreement				
	Items Statement	SA	A	N	D	SD
		5	4	3	2	1
01	My knowledge of research methodology has significantly increased as a result of the training					
02	The training has improved my knowledge of how to apply for patents for invention and certified licenses as well as accessing research grants					
03	Number of research proposals I submitted for funding increased as a result of training					
04	Number of presentations I made at public functions, debates or professional gatherings or events have increased as a result of training					
05	The number of seminar papers I presented has significantly increased as a result of the training					
06	The number of my single-authored, co-authored or multiple-authored textbooks increased as a result of the training					
07	The quality and number of articles I published in peer-reviewed journals have increased as a result of the training					
08	The quality and number of technical reports I wrote and submitted on different research projects have significantly increased as a result of the training					
09	The number of scholarly book chapters I published in different book of readings have increased as a result of the training					
10	The quality and number of students' projects, dissertations and theses supervised by me have increased as a result of the training					

11	The number of conferences I attended increased as a result of the training					
12	Number of working papers I am personally working on or jointly increased as a result of the training					
13	The number of times my articles are cited in academic journals increased as a result of the training					
14	The number of my articles on current disciplinary topics published in national newspapers increased as a result of the training					
15	My knowledge of how to render service as book or journal reviewer increased as a result of the training					
16	My quality and number of monographs I wrote related to the field of my specialization have increased as a result of the training					
17	The number and quality of conference papers I presented increased as a result of the training					
18	Number of editorial duties assigned to me increased as a result of improvement in my research productivity after the training					

Section Four: Teaching Productivity

The following are statements about the level of increase in your teaching productivity as a result of the training. Kindly indicate the extent to which you agree or disagree with the statements below based on the scale provided.

S/N	Compared to pre-training period	Level of agreement				
	Statements	**SA**	**A**	**N**	**D**	**SD**
		5	**4**	**3**	**2**	**1**
01	The training has significantly increased my ability to explain teaching objectives in behavioural terms to the students					
02	The training has significantly increased my ability to make students understand what they are expected to learn during the lecture					
03	The training has significantly increased my ability to cover all the topics planned for the lecture session					
04	The training has significantly increased my ability to make good use of lecture time and teaching materials related to the learning					
05	The training has significantly increased my ability to present the lesson content in an orderly, clear and logical manner					
06	The training has significantly increased my ability to use relevant examples to reinforce understanding of the lecture contents					
07	The training has significantly increased my ability to define concepts and principles and linked theory and its practical application to the real work environment					
08	The training has significantly improved my ability to ensure conformity of topics to be taught with the course content/course outline as enshrined in various guidelines for higher education institutions in Nigeria					
09	The training has significantly improved my time and class management skills, questioning skills and skillful use of teaching resources					
10	My communication skills in terms of clarity and audibility of voice and appropriate use of gestures during teaching has improved as a result of the training					

11	My students' evaluation skills in terms of suitability of learning objectives and assessment of students' has improved as a result of training					
12	The training has significantly increased my ability to ensure active class participation and discussions as well as create non-teaching hours to interact with students for academic guidance					
13	The training has significantly increased my ability to update semester reading materials given to students					
14	The training has significantly increased my ability to suggest book references to students each semester.					
15	The training has significantly increased my ability to take regular attendance of students.					
16	The training has significantly increased my ability to taught at a level/speed appropriate to the students' ability					
17	The training has significantly increased my ability to frame questions covering the topics planned for the semester.					
18	The training has significantly increased my ability to timely submit exam question papers and marking schemes for external moderation.					
19	The training has significantly increased my exam marking skills.					
20	The training has significantly increased my ability to use participatory teaching approach					
21	The training has significantly increased my punctuality during lecture					
22	Excellent comments are made by external moderators on my question papers and marking scheme					
23	My professional attitude and values in terms of learner-friendliness, comportment, adaptability and appropriate dressing has improved as a result of training					