CAUSES AND EFFECTS OF BRAIN DRAIN ON THE OUTPUT OF TECHNICAL TEACHERS IN NORTH-EAST NIGERIATECHNICAL COLLEGES

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CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The development and well-being of nation depends to a great extent on the quality of its human resources, and education is the major determinant of that quality. Vocational and technical education aims at helping the society to maintain its civilization by enabling the individual to keep pace with the rapidly changing industrial and technological development (Uwaifor, 2010). This implies that vocational and technical education is an instrument for changing Nigeria's resources into finished goods and services that will promote higher standard of living. Olateju (2007), noted that the important person in the business of the imparting skill for national development is the vocational and technical education teacher. This means that the place and role of teachers are of central importance in any society whose educational orientation is development directed.

Every society's educational goals and aspirations as well as the successes or otherwise of the system depend to a great extent, on the teacher. Teachers are the ones that make or mar the growth and development of any nation through education (Tahir, 1996). They engage in critical reflection in order to improve knowledge and skills to better student and improve their learning. Teachers serve as information providers, role models, facilitators, assessors, planners, and resource developers (Harden and Crosby, 2000).

Education is one of the processes by which skills, knowledge, and attitude are acquired for performance of socio-economic responsibilities, social integration,

improving personal competence and seeking better employment opportunities. Ajayi (1998), noted that education holds the key to modernization; but the teacher holds the key to the door. This implies that teachers are the determinant of any educational outcome. Uwaifor (2010), noted that in Nigeria, the training of technical personnel has witnessed challenges, among which was brain drain.

Despite the important roles of vocational technical education in the transformation of the society, there continues to be the shortage of personnel who are supposed to be training students to acquire various skills (Dike 2006). Ashworth and Harvey (1994) noted that teachers are the most important resource in school and emphasized their maximum utilization for effective learning to take place. Higher Education and Research Policy Network [HERPNET] (2008) noted that teachers are the pivot of any educational system, and that it is upon their numbers, their quality and devotion, the success of any educational system depends. There had been the loss of these important teachers. Technical teachers trained and employed to teach in technical colleges leave teaching for other work in either public or private sectors, such as, companies, colleges, polytechnics, universities, join politics, among others. The moving out of these technical teachers from technical colleges to other jobs is known as brain drain of technical college teachers. The work of Ishengoma (2007) noted that brain-drain encompasses moon-lighting by professional teachers engaging in other activities, such as politics. Anekwe (2009), also noted that Nigerians from all works of life leave their jobs in search of better jobs. This reveals that a vital segment of Nigerian population that are required for developing Nigeria are the one's leaving the country to other countries; among the population leaving the country are teachers. The Federal and State Governments of Nigeria have been trying in employing teachers, but there continued to be the brain drain of these teachers. The brain drain of these teachers had become known that one wonders what the causes and effects of the brain drain are.

Dike (2009), noted that being a teacher in Nigeria today is increasingly becoming a curse because teachers are being treated with little or no respect. Some people think that teachers are not so important and do not deserve anything better than the shabby treatments they receive. Despite being abused, which includes non-payment of basic salaries, and working without teaching resources the teachers are expected to perform magic to improve the standards of education, nurture the youths and work for the development of Nigeria.

The National Policy on Education states that no education system can rise above the quality of its teachers (Federal Republic of Nigeria [FRN], 2013). This means that the state of education is one of the crucial indicators of the seriousness of a society in its quest for national development because the quality of education in a society determines the quality of its leaders and the pace of social development (Dike, 2006). The objective of establishing schools and investing heavily in it is to have a better student output.

The effectiveness of any educational program is reflected on the output of the system. In technical colleges, technical teacher are those that foster excellence in teaching and learning. As designers and developers of education, teachers guarantee the quality of school output (Ofojebe and Ezugoh, 2010). Technical teachers make learning to take place and the teachers determine the quality of instruction that will be given to learners. The brain drain of these technical teachers, results to a negative impact on education achievement of technical student thereby affecting technical teachers output in technical colleges.

Technical teachers are key players in training the nation's future craftsmen, but these teachers leave teaching in technical colleges to other jobs. This however made the researcher sees the brain drain of these teachers as a problem. Therefore emphasis on the causes and effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria became necessary. There is therefore need to determine the causes

and effects of brain drain of technical teachers particularly in technical colleges because the success of teaching/learning programs in technical colleges is highly dependent on them.

1.2 Statement of the Problem

Nigeria is a country blessed with both human and natural resources. Nigeria ranked the sixth producer of crude oil and also has the largest economy in black Africa. Nigeria has one of the fastest growing telecommunications markets in the world (Nathaniel, 2013). Nigerian governments have recognized the importance of education and have allocated some portions of its budget to education. The budgetary allocation of Nigeria to education in the last decade ranged between 6.1% to 13%. With all these achievements and efforts, brain drain has continued in the education sectors.

Something is responsible for the brain drain in the educational sector. The efforts made by the Federal, State, and Local Governments in Nigeria to impart vocational skills in the learners at technical colleges are being prevented from succeeding by brain drain of technical teachers in technical colleges. These teachers were trained professionals who are supposed to prepare students to the industries as craftsmen. The students if trained by the teachers will be self-reliant, but the teachers were taken away. One gets to wonder what becomes of the future of the nation. Experience shows that the problem of brain drain is known in academic literatures, since very often reference is made to these phenomena in discussing manpower problems facing developing countries (Anekwe, 2009). This is due to the fact that some Nigeria's intellectuals who were supposed to improve the quality of education in Nigeria are being taken away. This issue of brain drain has indeed been going on and only differs from country to country in degree of incidence.

The loss of skilled intellectual and technical labour through the movement of such labour to other establishments has caused developmental problems. This is revealed in the work of Idehen (2010), who noted that the effect of brain drain to Nigeria is very large. Brain drain has denied Nigeria the services and expertise that teachers would have otherwise provided (Anekwe, 2009). This implies that technical colleges are facing the challenges of loss of teachers (Association of University Teachers and National Association of Teachers in Further and Higher Education [AUT and NATFHE], 2005).

Brain drain has made technical teachers detest teaching in technical colleges in North-East Nigeria for other jobs, thereby causing shortage of technical teachers. Therefore, it is no doubt that the shortage of these resources will definitely have a negative effect on the output of the remaining teachers, which will be reflected on student performance. When qualified technical teachers leave teaching in technical colleges in North-East Nigeria, one wonders the effects of the brain drain on their output.

Students in technical colleges now find it difficult to carryout practical exercises due to the brain drain of technical teachers. The good intention and effort of Nigerian government towards enhancing the quality of education and the production of craftsmen was affected by the brain drain of technical teachers in technical colleges. Brain drain had affected the output of technical teachers' in technical colleges in North-East Nigeria. Technical teachers detest technical colleges for other jobs, which has been detrimental to both the remaining teachers, students, and the society.

1.3 Purpose of the Study

The major purpose of the study was to determine the causes and effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria. Specifically, the study was designed to:

1. Determine the causes of brain drain of technical teachers in technical colleges in North- East Nigeria.

2. Determine the effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria.
3. Determine which jobs technical teachers pick when they leave teaching in technical colleges in North-East Nigeria.
4. Determine the strategies to be used for solving the problems of brain drain of technical teachers in technical colleges in North-East Nigeria.

1.4 Research Questions

The following research questions were raised to guide the study.

1. What are the causes of brain drain of technical teachers in technical collegesin North- East Nigeria?
2. What are the effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria?
3. Which jobs do technical teachers pick when they leave teaching in technical colleges in North-East Nigeria?
4. What strategies are to be used in finding solution to the challenges of brain drain of technical teachers in technical colleges in North-East Nigeria?

1.5 Hypotheses

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

1. There is no significant difference in the mean responses of technical teachers in Adamawa, Taraba, Gombe, and Bauchi States on the causes of brain drain of technical teachers in technical colleges in North-East Nigeria.
2. There is no significant difference in the mean responses of technical teachers in Adamawa, Taraba, Gombe, and Bauchi States on the effects on the output of brain drain of technical teachers in technical colleges in North-East Nigeria.
3. There is no significant difference in the mean responses of technical teachers in Adamawa, Taraba, Gombe, and Bauchi States of Nigeria on the jobs technical

teachers pick when they leave teaching in technical colleges inNorth-East Nigeria.

4. There is no significant difference in the mean responses of technical teachers in Adamawa, Taraba, Gombe, and Bauchi States on the strategies to be used towards finding solution to the challenges of brain drain of technical teachers in technical colleges in North-East Nigeria.

1.6 Significance of the Study

The findings of this study if published would be of immense benefit to researchers, policy makers, school administrators, the society, technical teachers, and students. Researchers would benefit from the findings of this study as they would be exposed to the effects of brain drain. It would challenge them to carry out more research which will lead to finding a lasting solution to the problems of brain drain. The findings would benefit policy makers to take advantage of the strategies of solving the problem of brain drain. This would enable them to make strategic plans that would improve the standard of education, thereby reducing the problems of brain drain and then improving the quality of education students receive in schools.

The findings would benefit school administrators if they take advantage of the findings and apply necessary measures to retain their staff. This would enable school administrators' graduate competent students, and this would be credited to the school administrators. The findings would benefit the society in the future; since the findings would be tailored towards improving the quality of education. Consequently, it would result in credible performances by graduates of technical colleges in the society. Technical teachers would benefit since they train skilled men who would function effectively in the world of work. Teachers would be credited for a job well-done, and they would also benefit from the wealth of experience from their students whom will become good crafts men working and producing things in the industries. Technical

college students would benefit from the findings of the study, as there would be enough competent teachers who would effectively teach them.

1.7 Delimitation

The study covered 26 technical colleges in North-East Nigeria. The scope of the study was the Causes and Effects of Brain drain on the Output of Technical Teachers in Technical Colleges in North–East Nigeria.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Introduction

Literature review is an exhaustive search of what has been done or known about a given problem. When a researcher identifies a problem and raises a topic therefore, he is obliged to review what has been written already regarding the problem or related areas (Uzoagulu, 1998).

In this chapter, the under listed sub-headings were discussed:

i. Theoretical frame work
ii. Brief history of vocational and technical education, and its impact on national development
iii. Causes of brain drain of intellectual capital in Nigeria
iv. Effects of brain drain of intellectual capital on Nigeria
v. Rate of brain drain of intellectual capital from Nigeria to other continents
vi. Strategies for combating brain drain of intellectual capital in Nigeria
viii. Review of related empirical work
ix. Summary of the literature review

2.2 Theoretical Frame Work

All humans are rational beings. Philosophers have articulated a bit more accurately what we all know by instinct: human beings generally avoid pain while being drawn to pleasure; they move to where they will flourish (Eze, 2009). This is the

principle of existential osmosis that sends people migrating from point A to point B. Due to human nature, technical college teachers become de-motivated with the nature of their work to search for a greener pasture, which in turn results in brain drain of technical college teachers. It should be noted that a good working conditions for workers can mean the difference between a high retention rate and losing employees to greener pastures (Pell, 2012).

Prosser in Okoro (2006), states that vocational education will be effective in proportion as it trains the individual directly and specifically in the thinking habits and the manipulative habits required in the occupation itself. This is in line with the work of Okorie (2001), who viewed vocational and technical education as an aspect of education designed to prepare students for industry, agriculture, commerce, home economics, which is usually provided at the senior secondary or lower tertiary level. According to FRN(2013), vocational and technical education is defined as that aspect of education that leads to the acquisition of practical and applied skills as well as basic scientific knowledge. In this sense, it forms a practical segment of education that involves skill acquisition.

However, Prosser in Okoro (2006), stated that vocational education will be effective in proportion as it enables each individual to capitalize his/her interest, aptitude and intrinsic intelligence to the highest possible degree. Based on Prosser's theory, vocational education will be effective if there are sufficient teachers who will teach thinking habits and manipulative habits, as well as the provision of availability and functional equipment/materials by the government. Prosser further noted that vocational education will not be effective if teachers were not able to make students capitalize their interest, aptitude and intrinsic intelligence to the highest possible degree due to de-motivating factors such as insufficient practical facilities, poor classroom condition, poor condition of work, low salaries, hunger, overwork, etc.

The unfair treatment of teachers has subjected the teacher's children to the ills of poverty (Dike, 2009). In organized and humane societies teachers are paid regularly like every other civil servant. For instance, in the United States, teachers do not beg for their salaries and retirement benefits because they have bills to pay and to meet other family obligations. Even the funding of education has not been commensurate with the demand of the education sector. The condition of Nigeria's education system is unfortunate given the present state of public education. The education system is characterised by poor funding. The budgetary allocation has been dwindling from 12.22% in 1985 to 8.5% in 2013. Even with the current increase of 10.7% budgetary allocation to education in Nigeria, this allocation when compared to the 26% budgetary allocation recommended by UNESCO, it becomes very clear that Nigeria Government is not really interested in funding education (Education Right Campaign [ERC], 2013). ERC further stated that the condition of the education sector becomes more pathetic when Nigeria's Gross Nation Product (GNP) allocation to education is compared with many countries with similar GDP. The budgetary allocations of these countries are as follows: Ghana (31.0%); Cote d;Ivorie (20.0%); Kenya (23.0%); Botswana (19.0%); Swaziland (24.0%); Uganda (27.0%); Morocco (17.7%); Lesotho (17.0%); Burkinafaso (16.8%); Tunisia (17.0%).

The sad treatment of Nigeria's teachers is pitiful; many of them have died of hunger, diseases, and out of frustration (Dike 2009). This system has turned many teachers into beggars and destitute! Many of the teachers who worked all their lives could not boast of a house of their own to retire into as they have joined the ranks of the working poor. Teachers, many of whom are university graduates are forced to live the life of hopeless and helpless poor workers. With the stated problems, how can the youths be motivated to become teachers when the present teachers are being treated unfairly.

Dike (2006), noted that the neglect of this sector has created many problems in the society, including cultism and cheating in examinations, poor quality graduates, unemployment, poverty and brain drain of technical college teachers. Rising moral laxity

and gross in-discipline in schools are others. With all these the students are not making maximum use of the available resources, as they are chasing the money instead of studying.

So far, Nigeria has given very little attention to conservation of human resources (Dike, 2009). Of little wonder is it that, teachers go on industrial strike actions. It is obvious that the brain drain of technical college teachers by de-motivation be largely avoided through motivation; having known its value as the education for work and self-reliance. In an attempt, Anonymous (2012), espouses that teachers should earn 27.5 per cent allowance higher in whatever salary they pay as minimum wage in every state as a way to motivate and bring them close, because it is observed that there is brain drain within the system and teachers are shunning public primary and secondary schools.

Furthermore, vocational and technical education is needed in every aspect of our national life (Zonkwa, 2010). Zonkwa further noted that, vocational and technical education is aimed at being taught in context, based on the real world, in favour of life, so as to give ethical dimension to learning. This means that, the problem of crime can be reduced if the youths are given the necessary vocational training that will keep them busy. It is believed by many people that through vocational and technical education and training, boys and girls as well as adults will be trained to acquire necessary skills that will enable them secure employments, which will be beneficial to themselves and the society (AUT and NATFHE, 2005).

The Guardian (March, 2012), noted that the absence of opportunity for works is one of the causes of much of the present social and industrial unrest. The inability of our educational system to provide the youths with the demands of industries has led to the turning out of restless and disconnected generation of youths. Moreover, vocational and technical education is needed to ensure wage- earning power of worker. Stella (2010),

noted that the practical training of workers in any pursuit brings both immediate and lasting economic returns in increased production and wage-earning capacity.

As stated earlier, the theory of existential osmosis specifies reasons why people avoid pain for pleasure. On the other hand Prosser specified some theory which stated the specific minimum standard below which effective vocational education cannot be offered (Okoro, 2006). The theory of existential osmosis and Prosser's theory are suitable for this study because ineffectiveness is failure, and every human being wants job satisfaction. This research work is therefore based upon those theory in order to find a lasting solution to the challenges of brain drain on the output of technical teachers in technical colleges in North-East Nigeria.

2.3 Brief History of Vocational and Technical Education, and its Impact on National Development

People in Nigeria had been engaged in vocational education of some sort, and they have been engaged in a variety of vocations and receiving training by observation of elders and experts. According to Thakur in Henry (2008), farming, fishing, animal care, weaving, carving, carpentry and many other vocations have been mastered through observation and on-the-job training. Such preparation was sufficient to meet the needs of simple life in the rural areas. Vocational and technical education therefore has always being the final tenable right of every child before the coming of the British Colonialists.

Okorie (2001), confirmed this by pointing a lot to the negativity of education by neglecting it. Another reason was that vocational and technical schools were more expensive to run due to cost of equipment and poor staffing position was also responsible for more problems. This is attributed to the fact that, the colonialists have occupied the mind of Nigerians with white collar job (Otubelu in Henry 2008). This leads to great turning out of grammar school leavers who were equipped with only general education

without specific technical/vocational skills, therefore held no promise for producing Nigerians with usable professional competence.

Moreover, the system encourages the dropping out of students, as entrants just have to complete the system and do so successfully or dropout with half education, or half general knowledge and with no specific vocational skills. These lead to the lack of enthusiasms on the part of parents as well as their children; partly due to wrong notion about education that any worth-while education should be of literacy type which prepares learners for office jobs. Some scholars like Udo and Bulama in Henry (2008), view Nigerian educators as those who play a significant role in nurturing the negative attitude of the public towards vocational and technical education.

Schools where technical education existed, the program are mostly placed at disadvantage position by the administrators, because most of the administrators are products of liberal education (Udo in Henry, 2008). This negative attitude developed by the public over the years led to many communities to demand for the establishment of grammar schools and vehemently oppose vocational/technical schools. According to Egwuela (1995), the public considers grammar school as the only route to professional and material success. There is great need for proper enlightenment and encouragement on the importance of technical education in technical colleges.

Education is the base upon which self-reliance stands (Agwom, 2010). Therefore education constitutes the major instrument for sustainable human development. Having recognized the important role education plays in national development, the President of Nigeria, Goodluck Jonathan stated that quality education is the key to the attainment of national development (The Punch, July, 2012). Vocational and technical education has been an integral part of national development strategies in many societies because of its Impact on productivity and economic development (Dike, 2009).

Technical colleges on the other hand are regarded as the principal vocational institutions in Nigeria. And the goals of technical colleges as stated by the Federal Republic of Nigeria (FRN, 2013) in the National Policy on Education (NPE) are to:

- Provide trained manpower in applied science, technology and business particularly at craft, advance craft and technical levels;
- Provide the technical knowledge and vocational skills necessary for agriculture, commercial and economic development; and
- Give training and impact the necessary skills to individual who shall be self-reliant economically.

The major purpose of any technical and vocational education is the vocational preparation of youth (Okoro, 1999). Technical college program consist of skill oriented subjects in which practical work constitutes the major aspect of the program. In other words, it is an education designed to develop occupational skills. Technical and vocational education gives individuals the skills to live, learn and work as a productive citizen in a global society, but Nigeria has neglected this aspect of education (Dike, 2009). Consequently the society lacks skilled technicians: bricklayers, carpenters, painters and auto-mechanics, electrical/electronic technicians, etc. Tales abound of half-baked road side mechanics in the society who cause more harm to vehicles when contracted to service vehicles, and because of poor training some of the commercial drivers have sent many people to their early death. The poor performance of Nigeria's builders (masons/bricklayers, etc) is no longer news. For that, individuals with important projects now prefer technicians and skilled workers from neighboring countries. Nigeria's spotty electricity supply is one of the greatest problems to national development; and toiling all day in the field with knives, hoes, and shovels would not feed the nation's 140 million people.

Producing more unemployables and job seekers than job creators is not what Nigerians need. The primary goal of the Nigerian educational system is to provide functional education for the nation, so that the products of the educational system can be employable or be self-employed (Obe, 2007). Technical college teachers are expected to utilize facilities in other to teach technical college students. But it is disturbing to find that many of today's teachers who are arguably the most important group of professionals for our nation's future are dissatisfied with their job (Bishay, 1996).

The design of Nigeria's educational system is flawed (Dike, 2009). No nation can fight a war without an army. In the same token Nigeria cannot develop without well-equipped vocational and technical institutions. Therefore, the nations' technical colleges should be brought to international standard by employing teachers with field experience and also retain them.

2.4 Causes of Brain Drain of Intellectual Capital in Africa

The individual reasons for brain drain are never simple, and include considerations about professional opportunities in the source organization, security and political stability, discrimination and economic necessity. In discussing this phenomenon, the contributing factors are usually divided into push and pull factors (Kline, 2003). Dovlo (2004), posited that, push and pull factors are the major causes of brain drain of skilled professionals. The push and pull factors are discussed as follows:

Push Factors:

Push factors are the attributes of the host organization that make a person think about leaving his normal residence for another. These factors are circumstances in the home environment that makes a person think about leaving his job for another in either the same part of the same country, neighboring countries, or for a more distant place like the United Kingdom or the United State (Chimanikire, 2005). Chimanikire was also of the opinion that political instability is linked to the failure of economic development. A

United Nations report stated that the failure of the postcolonial state in Africa in the 1970s and 1980s – Low morale, lack of academic freedom and collapse of tertiary education. Others includes, the rise of authoritarian regimes, hardship and paralysis ushered in by Structural Adjustment Programs (SAP) and so forth – lead to the exodus of highly skilled Africans (Idehen, 2010). Which means that the migrants' economic well-being not available in their country of origin is a major push factor in deciding to migrate.Chimanikire (2005), noted that as pressure of poverty, rapid population growth, disease and illiteracy and environmental degradation mount, they lead to insecurity; resulting in war, civil strife, state-sponsored terrorism, riots and other forms of political violence which can lead to the displacement of large numbers of people as migrants, refugees, or asylees.

African professionals tend to migrate to Western Europe and North America (Daily-Snapshot, 2010). Many are discouraged from returning home by the economic and political crises that have be-devilled the continent over the last few decades. Failing economies, high unemployment rates, human rights abuses, armed conflict and the lack of adequate social services, such as health and education, are some of these factors.

Dovlo (2004), noted that push factors motivate or force professionals to leave their place of work/countries of origin against their will. Idehen (2010), noted that the reasons for brain drain usually include two aspects which respectively come from countries and individuals. In terms of countries, the reasons may be social environment. Social environment in source countries like; lack of opportunities, political instability, economic depression, health risks, etc. whereas,those in host countries includes; rich opportunities, political stability and freedom, developed economy, better living conditions, etc. Ishengoma (2007), noted that several researchers on causes of brain drain cited the following as push factors: low remuneration; poor working conditions; low job satisfaction; lack of professional and career development; and political instabilities which creates insecurity conditions for the professionals.

Other push factors include but not limited to salary and benefits differentials, large technological gaps and inadequate local technological capacity, lack of willingness to change by the home country (Idehen, 2010). Some includes the relevance and quality of foreign education, training and qualifications compared to those acquired in the home country, discrimination or the sense of not belonging, political instability. While others are lack of realistic and accurate human resources policies and plans and restrictive trade practices of the developed nations that have stopped the development of the developing nations.

Idehen (2010), noted that a United Nations report reveals that many students sponsored to do post-graduate studies in technology, science and engineering abroad have stayed away at the end of their studies. And to fill the vacuum created by the brain drain, Africa spends $4 billion annually to recruit and pay 100,000 expatriates to work in Africa when Nigeria can use a portion of that amount to recruit from the large number of equally qualified and experienced African professionals living and working outside Africa. Kyambalesa (2005) noted that there are many factors obtaining in countries which are affected by the brain drain that have contributed to the exodus of skilled talent. These salient factors includes: poor condition of service, human right abuse, misplacement of trained personnel. Others includes disregarded for local talent, scarcity of jobs, limited access to education, poor health care services, a high level of crime, and the fear of losing valued relationships developed in host countries.

In Tanzania, for example, a Commission of Inquiry against Corruption established by President Benjamin Mpaka in 1996 identified petty corruption among other forms of corruption occurring in the country (Kyambalesa, 2005). Petty corruption is the form of corruption which includes the unscrupulous practices of those who receive bribes because of their low incomes and standard of living (Amoako, 1998). Such practices can be said to be common in the socio-economic setting of countries where personal income cannot, by and large, meet the basic needs of house-holds.

The following are specific examples corrupt practices:

(a) Educational settings: Corruption is demanded and given during the registration of children in schools, to enable pupils pass examinations, to enable students obtain placement in secondary schools or colleges, to effect a transfer from one school to another, or to be afforded the opportunity to repeat a class. Moreover, teachers give bribes in other to be promoted, to be transferred or to be given placements in preferred schools.

(b) Law Enforcement: Police officers receive bribes to protect criminals, to arrest innocent people and threaten to take them to court on tramped-up charges in a deliberate effort to solicit for bribes, while traffic officers accept bribes from motorists who violate traffic rules and regulations.

(c) Passports and Immigration: Immigration officers seek or accept bribes to issue passports and visas, or residence permit to undeserving foreigners.

(d) Employment and Staffing: Personnel officers receive bribes during the recruitment of workers, or they demand bribes from junior officers so that they can promote them, assign them responsibilities, send them for training or to attained seminars, and /or allow them to take duty trips(Kyambalesa, 2005).

(e) The News Media: Reporters in media institutions accept bribes in order to publish or not to publish information which glorifies or destroys the reputation of certain individuals, groups of individuals, or institutions.

Abongo (2007), unequivocally observes that the primary causes of brain drain is unreasonably low wages paid to professionals. Other push factors include lack of technology and basic equipment to perform professional tasks. Low remuneration and poor working conditions of professionals have prominently featured as the major push factor influencing brain drain among teachers as manifested by inadequate teaching/learning facilities; large classes; inadequate office space; among others. This

view is supported by the work of Chireshe and Shumba, (2011) that the unattractive conditions of teachers include perceived low salary, unattractive work locations, unprofessional treatment of teachers, arbitrary teacher deployment systems, lack of professional development opportunities, relatively poor motivation and remuneration, and insufficient supportive supervision. It is some of these conditions of service that are likely to make teaching as a profession less attractive.

Pull Factors:

Pull factors are those factors that draw people to particular destination (Chimanikire, 2005). Pull factors includes, attractive remuneration and good working conditions which leads to job satisfaction; opportunities for professional and career development; job security; advance technology and availability of basic and necessary equipment to perform professional tasks (Ishengoma, 2007). When people leave their countries of birth to other countries, they gain many benefits including money, a better quality of life and a challenging environment in which they can thrive and fulfil their potential (Daily-Snapshot, 2010). Other pull factors in host countries includes: rich opportunities, political stability and freedom, developed economy, better living conditions, etc. Sometimes individual reasons are family influences or overseas relatives, and personal preference: preference for exploring, ambition for an improved career, etc. When a highly qualified professional chooses to leave his own country for another, he does so for one or several legitimate political or economic reasons: peace and security for himself and his family, job satisfaction, education, better pay and conditions, a higher standard of living, etc.

Daily-Snapshot (2010), noted that, throughout history, countries and centres of academic excellence which offer these attractions have received the largest numbers of professional migrants and these have, in turn, made substantial contributions, not only to the economic growth of their host countries, but also to the scientific and technological

advancement of humanity. Haque and Kim (1995) found that brain drain reduces the growth rate of the effective human capital that remains in the economy and hence, generates a permanent reduction of per capital growth in the home country. In line with other researches, Dovlo (2004), makes a valid observation that an individual's decision to migrate is a combination of push and pull factors reflected in terms of gradients in the influence of this factors between source and recipient organization. The key gradients are as follows:

a. Income gradient, that is, the difference in remuneration and living conditions between the home and recipient countries;
b. Job satisfaction gradient, which refers to, the perceptions of good working conditions and professional and technical efficiency that allows international recognition; and
c. Organizational career opportunity gradient, which reflect, how fair and accessible career opportunities for advancement and promotion are.

The causes of brain drain are the push and pull factors of technical teachers in technical colleges in North-East Nigeria. There is need to find solution to these causes of brain drain, because they have effects on the output of technical teachers.

2.5 Effects of Brain Drain of intellectual capital on Africa

Technical education is a program of courses and learning experiences that begins with explorations of career options, supports basic academic and life skills and enables achievement of high academic standards, leadership, preparation for industry-defined work, and advanced and continuing education (Dike, 2009). Education is a major tool for national socio-economic development and poverty eradication. The educational system is very vital, because it produces the personnel that are required to function in national life and development process. As the National Economic Empowerment and Development Strategy [NEEDS] document (2004), noted that the goals of wealth creation, employment

generation, poverty reduction, and value reorientation can only be effectively pursued, attained, and sustained through an efficient, relevant and functional education system.

However, if one weighs the relative progress towards the development of worldwide human resources over the past 40 years, it is impossible to ignore the fact that the continent of Africa has lagged far behind the rest of the world (Mohamoud, 2005).Furthermore, the problem of the brain drain has affected Africa more severely than any other region. This brain drain has deprived developing countries like Nigeria of valuable personnel that end up contributing to the economies of the developed nations who in turn have been accused of poaching the best and brightest highly skilled workforce from countries that desperately need them (Idehen 2010).

Idehen (2010), noted that the effects of the brain drain to Nigeria and Africa respectively is very large, resulting in more African engineers working in the USA than those in the whole of Africa. A report by the United Nations estimates that 'over the next decade Africa will need to train an additional 1 million health care professionals and find ways to retain more of the doctors, nurses, pharmacists and laboratory technicians it currently produces. The International Organization for Migration (IOM) estimates that, it would have cost the developed nations about $184,000 to train each of the estimated 3 million professionals educated in developing countries now working in the developed world, resulting in a savings of $552 billion dollars for the developed nations. In essence, developing nations like Nigeria is giving developmental assistance to the developed nations, making the rich nations richer and the poor nations poorer, an analogy of pouring water from a drum into the river' springs to mind.

Anekwe (2003), noted that the situation of brain drain in Nigeria today is pathetic because a large portion of highly trained university and other tertiary institutionsgraduates have left the country without anyone benefiting from the investment in their education. This is worrisome as this middle management constitutes the engine-

room of the economy. This goes a long way to show that the Nigerian economy needs an urgent surgical operation.

Chimanikire (2005), observed that, brain drain is usually regarded as an economiccost, since emigrants usually take with them the fraction of value of their training sponsored by the government or other organizations. It is a parallel of capital flight, which refers to the same movement of financial capital. Brain drain is often associated with de-skilling of emigrants in their country of destination, while their country of emigration experiences the draining of skilled individuals. Yaqub (2007), noted that, brain drain itself created its own harmful effects. Among these we have the Nigerian folklore of the falling standard of education. As mentioned, intellectuals, such as, teachers are some of the most expensive resources because of their training in terms of material cost and time. Brain drain of such intellectuals is a complete loss for not just the technical colleges but for the country at large. The effects of brain drain as stated earlier is attributed to several factors, including inadequate recognition for teachers; relatively poor motivation and remuneration; inadequate funding of educational institutions, etc.

Another effect of brain drain is the issue of corruption. For a country that is in dire need of foreign aid, debt relief, and/or technical assistance, a high level of corruption can prompt donor and creditor nations to be less forth coming (Kyambalesa, 2005). Besides, the country's citizens are likely to encounter problems in obtaining travel visas, and/or securing jobs or business contracts abroad. And, as Transparency International has noted, extensive research shows that foreign investment is lower in countries perceived to be corrupt. These factors listed often lead to low teacher motivation which is often reflected in teacher apathy, lack of commitment, absenteeism, relatively high labour turnover, etc (Obe, 2007). African countries have been recruiting about 100,000 non-Africa expatriates at an exorbitant cost, estimated at US $4 billion annually (Mohamoud, 2005). This is as a result of the serious skill shortage created by the loss of human capital.

The loss of teachers undermines the ability of schools and education system to function, thus marks a potential barrier to economic growth, development and poverty reduction (Association of University Teachers and National Association of Teachers in Further and Higher Education [AUT and NATFHE], 2005). These bodies further noted that even relatively developed African States, like Nigeria, demonstrates a lack of capacity to meet demand for education. With such problems on ground, teachers can hardly give their best in this situation. This makes it difficult for the educational sector to attract and retain personnel, especially at the primary and secondary levels. The loss of technical teachers in technical colleges in North-East Nigeria is thus an acute problem because of the effects on their output.

2.6 Rate of Brain Drain of Intellectual Capital from Africa to other Continents

Mohamoud (2005), noted that the flight of the intellectual capital from Africa is alarming. The United Nations Economic Commission for Africa has also estimated that between 1960 and 1975 an estimated 27,000 highly qualified Africans left the continent for the west. This number of highly qualified Africans increased to approximately 40,000 between 1975 and 1984, and then almost doubled by 1987, respectively 30% of the highly skilled manpower stock-skilled personnel whom Africa can ill-afford to loss. Africa lost 60,000 professionals, such as, teachers, lecturers, doctors, etc between 1985 and 1990, and has been losing an average of 20,000 annually ever since.

With the rate of brain drain of such nature, the receiving countries became the beneficiaries while the countries they are leaving are on the other hand losing. The receiving countries include the United States, Australia, UK, and Germany. The losing countries include Nigeria, Ethiopia, South Africa, Kenya, Zimbabwe, and Ghana (Mohamoud, 2005).

Yaqub (2007), noted that Nigeria has more than 1,000,000 immigrants in the United States alone. In the United States, 64% of foreign-born Nigerians aged 25 and

above have at least a bachelor degree. 43% of foreign-born Africans living in the United States have at least a bachelor degree. Yaqub, further noted that Nigerians and Africans are the most educated ethnic groups in the United States. At least 60% of doctors trained in Ghana during the 1980s have left the country. In line with this mass migration, Emagwali in yakub, observes that it appears that Africa is operating one third of its universities to satisfy the manpower needs of western nations. Emagwali further states that when Zik set foot in America in 1924, the number of Nigerians in the United States was probably less than 10. By the end of the twentieth century the number of Nigerians in the United States has risen to a quarter of a million. Hence it is now believed that about 10,000 Nigerian academics are employed in the United States alone.

Nigerians from all walks of life travel in large numbers to foreign lands in search of greener pastures (Anekwe, 2009). This means that a vital segment of the population that is required by the country for national development now constitutes the large number of Nigerians leaving the country in search of better opportunities abroad. The vital segment of the population that constitutes the large number of Nigerians living the country includes young doctors, pharmacists, nurses, teachers, engineers, etc.

Since Nigeria's brutal civil war in the late 60's, the country has bounced between military governments and dictatorships, pushing out between 11 and 17 million people (United Nations Organization for Education, Science and Culture [UNESCO], 2010). UNESCO further noted that today over 2 million Nigerians live in the United States alone, and of these about 20,000 are doctors and over 100,000 are academics. According to Docquier and Marfouk in Mba and Ekeopara (2012), 10.7 percent of the highly skilled population who were trained in Nigeria ended up working abroad in 2006. On average 64 percent of the Nigerian emigrant population has tertiary education. In the medical field, 14 percent of physicians who were trained in Nigeria worked abroad and, 90 percent of whom lived and worked are in the United States and the United Kingdom. With these high rates of brain drain, one wonders what will continue to happen to these nations'

reliable technical teachers. With the stated rate of brain drain, there is need to find solution to this problems.

2.7 Strategies for Combating Brain Drain

Education generally, including technical education program has been grossly neglected in Nigeria. Uwaifor (2010),noted that technical educators have the greatest challenge of convincing law makers on why the law makers should give priority to the program in allocating resources. Many options of getting positive results have been advocated at different forum, namely, lobbying, participation of technical educators in governance, wooing, etc. Yet the government is playing a lopsided attitude to the proper development of the program in Nigeria.

Uwaifor (2010), further noted that, for progress to be made in Nigeria the challenges confronting technical education must be recognized and fought vigorously. Adequate resources should be allocated to the program in order to achieve positive outcomes; but as outlined earlier, technical education was neglected which led to the migration of teachers. Edokat (2003), explained that brain drain has been a problem to low developing countries as a whole and will remain so if some measures are not taken to check the phenomenon. There's need to increase budgetary allocations; there's need to seriously improve the conditions of work at the national level; there's need to establish some confidence in the future of the country in terms of political freedom and good governance; the educational system needs to be reformed to take into consideration national economic and social objectives.

Adegbesan (2011), was of the opinion that there's need to harmonize the internal and external criteria of quality assurance of raising the standard of excellence in the education system. That is, the full professionalization of teaching in the country to set a standard under which a qualified and well trained teacher must operate is highly imperative. Therefore, government should properly fund educational institutions in the

country to meet the expectation of the society, etc. To find a lasting solution to the causes of brain drain, a great deal of attention needs to be focused on our vocational and technical education. This can be done through improving on their salaries, working conditions and providing them with resources (Chireshe and Shumba, 2011). If these salient issues are properly addressed, quality of activities and attainment of optimal results would be achieved in our technical colleges.

The work of Obe (2007), revealed also that the factors that contribute to the problem of vocational and technical education among others is the issue of brain drain. Some strategies that can bring solution to this problem are further stated, such as, continuous review of curriculum; continuous teaching and learning improvement; staff motivation and development; increased funding by the government etc. Necessary steps should be taken to preserve our nation's reliable technical teachers in technical colleges in North-East Nigeria.

2.8 Review of Related Empirical Works

The researcher reviewed five different research works conducted by other researchers. The reviewed are stated as follows:

Mohamoud (2005), carried out a research on reversing the brain drain in Africa, with the objective to investigate the feasibility of involving African Diaspora academics and researchers in the Netherlands. A sample of 30 highly qualified African Diaspora academics was used for the study. He discovered that there are two reasons advanced by some of the interviewees to explain the limited scientific capacity in Africa. The first reason is that most of the skilled personnel have emigrated from Africa because those trained have skills which are needed and valued abroad. The second reason is the low level of enrolment in scientific and technical fields in African Universities. Thus, the study concluded that there is need to make amends on enrolment.

Nwankor and Onyali (2008), carried out a research on brain drain from school drop-out perception, with the objective of investigating the gender differences in school drop-out as to whether it varies with age, and the differences in interactions, as regards the age at which each gender exhibits school drop-out. The study was tested at $P < 0.05$ level of significance, and data were collected from sampled 30 States and Abuja in Nigeria through probability cluster technique using survey design. The survey revealed that Nigerians of both gender(s) and various age brackets exhibited similarity in drop-out of educational opportunities. He therefore recommended that mass reorientation is very necessary to stimulate Nigerians interest back to educational engagements.

A Survey by Chireshe and Shumba (2011), on teaching as a profession in Zimbabwe on 62 primary school teachers on the Bachelor of Education – In – Service Program. The survey was carried out with the objective of determining the factors that contribute to teacher de-motivation in Zimbabwe and how it can be addressed to make it attractive. Data were obtained using survey design and then analyzed using descriptive statistics. The findings revealed that poor salaries, poor working conditions, poor accommodation, lack of respect, political harassment/victimization, overworking, the HIV/AIDS pandemic, absence of refresher course, teachers not trained to cater for special need of children, and other reasons had resulted in low morale, poor delivery and brain drain in the education sector.

A study conducted by Higher Education and Research Policy Network [HERPNET] (2008), on adequacy of educational resources for quality assurance in public colleges of education with the objective of determining the adequacy of human and material resources. The method employed was the descriptive survey design with a sample of 30 heads of department and 100 (300 levels) students. Mean square rating was used to answer research questions, while Pearson's product moment correlation coefficient was used in testing hypothesis. The findings revealed among others that adequate number of lecturers needs to be recruited, and better remuneration and teaching

resources (physical and material) needs to be available and that they should be constantly up-dated.

Robinson (2004), conducted a study on, the implication of adequate motivation on workers' productivity in an organization. The study was with the purpose of determining whether there is any relationship between adequate motivating factors and productivity to work. The design of the study was ex-post factor in nature employing the use of questionnaires, refined observations and in-depth interviews. The researcher discovered that workers were positively affected towards higher productivity with the provision of regular promotion, assurance of adequate job security and bonus for excellent performance. Nevertheless monetary incentives and rewards do not exert stronger influence on workers than any form of motivation factor. Based on the related empirical works reviewed, it is discovered that motivation is the key of preserving personnel. There is brain drain of technical teachers in technical colleges in North-East Nigeria. The brain drain of these reliable personnel has to be stopped because it has an effect on the output.

2.9 Summary of the Related Literature Reviewed

The related literature was reviewed under five sub-headings. The first addressed reversing brain drain in Africa and discovered that there are two reasons. The first reason is that most of the skilled personnel have emigrated from Africa because those trained have skills which are needed and valued abroad. The second reason is the low level of enrolment in scientific and technical fields in African Universities. The second addressed brain drain from school drop-out perception.The survey revealed that Nigerians of both gender(s) and various age brackets exhibited similarity in drop-out of educational opportunities.The third addressed teaching as a profession. The findings revealed that poor salaries, poor working conditions, poor accommodation, lack of respect, political harassment/victimization, overworking, the HIV/AIDS pandemic, absence of refresher course, teachers not trained to cater for special need of children, and other reasons had

resulted in low morale, poor delivery and brain drain in the education sector.The fourth addressed adequacy of educational resources for quality assurance. The findings revealed among others that adequate number of teachers needs to be recruited, and better remuneration and physicaland material teaching resources needs to be available and that they should be constantly up-dated. The fifth addresses the implication of adequate motivation on workers' productivity in an organization. The findings revealed that workers were positively affected towards higher productivity with the provision of regular promotion, assurance of adequate job security and bonus for excellent performance.The study solely deals with finding solution to the brain drain of technical college teachers.The review has established that there is brain drain of teachers due to poor salaries, poor working conditions, poor accommodation, lack of respect for teachers, political harassment/victimization and other reasons. Research studies have attest to the fact that teachers are poorly motivated.

Related empirical works were reviewed, which serves as a guide to the study. Not much is heard of brain drain of technical college teachers in technical colleges but much is hard of brain drain of lecturers, doctors, nurses, engineers etc. In North-Eastern Nigeria records are scarce on the subject of brain drain of technical college teachers in technical colleges. A gap therefore exist which the findings of the study attempts to fill by determining the causes and effects of brain drain on the output of technical teachers in North-East Nigeria technical colleges.

CHAPTER THREE

METHODOLOGY

This chapter presents the methodology for the study. It is presented under the major sub-headings which include design of the study, area of the study, population of the study, sample and sampling technique, instrument for data collection, validation of instrument, reliability of instrument, method of data collection, and method of data analysis.

3.1 Design of the Study

A multiple sample survey research design was used for the study. The design was chosen because it is convenient for capturing the opinions of the respondents on a given phenomenon (Leedy and Ormrod, 2001). It was also chosen because information was collected from multiple samples of respondents at different places at a specific time frame.

The design was also chosen because The International Honor Society in Psychology (2012), noted that, survey research is an important method of collecting data, particularly in the social sciences. The three important usages for surveys: producing quantitative or numerical descriptions of some aspects of the study population, collecting information by asking people questions and analyzing their responses, and collecting information from a fraction of the population rather than the entire population.

3.2 Area of the Study

The area of the study was North-East States of Nigeria which include Adamawa, Taraba, Bauchi, Gombe and Yobe States. The states are characterized by mountainous

vegetation having a land mass of 18,971,965 km^2(Anyaeche, 2007). The major occupation in North-East Nigeria is agriculture. The region experiences warm weather conditions which can be hot and humid. It also experiences a dusty wind in the middle of the dry season between December and May from the Sahara desert called the harmattan. In the region, rainy season lasts for only three to four months (June – September). The rest of the year is hot and dry with temperature rising as high as 40^0C. Adamawa State has population of 3, 168, 101, and a landmass of 36,917 km^2 (Information Nigeria, 2009). The state lies between 9^0 20`N and $12^0$ 30`E, with 21 Local Government areas sharing borders with Borno, Gombe, and Taraba States and The Republic of Cameroon (National Population Commission, 2006).

Taraba State has population of 2, 300, 736, with a landmass of 55, 920 km^2(Information Nigeria, 2009). The state lies between latitude 6^0 25`N and $9^0$ 30`N and between longitudes 90^0 30`E and $11^0$ 45`E, with 16 Local Government areas sharing borders with Plateau, Benue, and Adamawa States and The Republic of Cameroon (National Population Commission, 2006). Gombe State has population of 2, 353, 879, and a landmass of 18, 768 km^2. The state lies between 10^0 21`N and $11^0$ 6`E, with 11 Local Governments sharing borders with Borno, Yobe, Taraba, Adamawa and Bauchi States. Bauchi State has population of 4, 653, 066, and a landmass of 49, 119 km^2. The state lies between 9^0 3`N and $12^0$ 3`N and between 8^0 50`E and $11^0$ 0`E, with 20 Local Governments sharing borders with Kano, Jigawa, Taraba, Plateau, Gombe, Yobe and Kaduna States.

Yobe State has population of 2, 321, 591, and a landmass of 45, 270 km^2 (Information Nigeria, 2009). The state lies between 11^0 18`N and $11^0$ 22`E, with 17 Local Governments sharing borders with Bauchi, Borno, Gombe and Jigawa States and The Republic of Niger (National Population Commission, 2006). Borno State has population of 4,151, 193, and a landmass of 71, 130 km^2. The state lies between 11^0 0`N and $13.5^0$ 0`E, with 27 Local Governments sharing borders with Adamawa, Gombe and Yobe

States, and The Republics of Chad, Niger and Cameroon. These states were selected because they are in the same geo-political zone and have technical colleges within them which were studied.

3.3 Population of the Study

The population for the study was made up of 1434 technical teachers, principals and vice principals in North-East Nigeria technical colleges. There are 23 State Technical Colleges and three Federal Technical Colleges in the North-East Nigeria, making 26 Technical Colleges.

3.4 Sample and Sampling Technique

Taro Yamane formula for finite population was applied as a guide for statistically obtaining the sample for the study. The formular and processes were presented in appendix E. For the study, stratified random sampling technique was adopted, therefore each state was considered as a stratum. The states were Adamawa State having 278 technical college teachers; Bauchi State with 265 technical college teachers; Borno State with 258 technical college teachers; Gombe State with 205 technical college teachers; Taraba State with 252 technical college teachers; and Yobe State having 176 technical college teachers. For this study, 219 subjects constituted the sample as could be seen in Table 1. The sample was drawn from each stratum in the proportion that the sample existed in the finite population. The same method of sampling was used to obtain the samples from each technical college.

Table 1. Category of Respondents, Sample Drawn and Return Rate

S/N	State	population	Sample (22% of population)	Instrument administered	Instrument Returned
1.	Adamawa Sate	278	61	61	49
2.	Bauchi State	265	58	58	48
3.	Borno State	258	57	-	-
4.	Gombe State	205	45	45	40
5.	Taraba State	219	55	55	45
6.	Yobe State	176	39	-	-
Total		1434	315	219	182

Source: ***Field survey(2012)***

3.5 Instrument for Data Collection

A five point scale rating self-designed structured questionnaire named Causes and Effects of Brain Drain (CEB) was developed by the researcher to collect data for the study. Section (A) comprised two personal data requesting information from the respondent. The information's are school and state. Section (B) comprised 10 items seeking to collect data on the causes of brain drain in technical colleges in North-East Nigeria. Section (C) comprised 10 items seeking to collect data on the effects of brain drain on the output of technical teachersin North-East Nigeria technical colleges. Section (D) comprised 10 items seeking to collect data on the jobs technical teachers pick when they leave teaching in North-East Nigeria technical colleges.Section (E) comprised 10 items seeking to collect data on the strategies to be used for curbing the challenge of brain drain of technical teachers in North-East Nigeria technical colleges. This information ispresented in appendix D.

According to Cohen, Manion, and Morrison (2000), Leedy and Ormrod (2000), questionnaires are widely used in collecting survey information. Therefore, the self-designated questionnaire was used for the study to collect the needed information.

3.6 Validation of the Instrument

The instrument for data collection was subjected to face and content validation by three lecturers in the Schools of Technology and Science Education, ModdiboAdama University of Technology, Yola with two other lecturers in Technical Education Department at College of Education, Hong. The validators were requested to vet the instrument for data collection for clarity, relevance and suitability for collecting data for

the study. Their comments and suggestions were used to improve the quality of the instrument.

3.7 Reliability of the Instrument

The reliability coefficient of the instrument for data collection was estimated by applying the Kuder Richardson formular 21 Method. The K-R21 formula was given by Aiken in Uzoagulu (1998) as shown in appendix F. According to Uzoagulu (1998), for instrument developed by individuals such as questionnaires, rating scale, etc, K-R21 may be used to determine reliability coefficient. The reliability coefficient was obtained by administering 40 copies of the instrument, 20 copies each to technical teachers in Kano and Ungogo technical colleges at Kano State of Nigeria. The reliability value of the four sections of the instrument is shown as follows:

i. Section B = 0.78

ii. Section C = 0.83

iii. Section D = 0.70

iv. Section E = 0.61

The reliability index for the whole instrument was 0.73.

3.8 Method of Data Collection

Data for the study were collected by the researcher with the help of some research assistants through personal contact with the respondents. Copies of the instrument were retrieved within one week of submission after completion.

3.9 Method of Data Analysis

The statistical tools for analyzing research questions one, two, three, and four were mean and standard deviation. The statistical expression of mean was presented in appendix G. The statistical expression of standard deviation was presented in appendix H. While the statistical tool for testing hypotheses one, two, three and four was Analysis of Variance (ANOVA). It was shown in appendix I. The data obtained for the study were analyzed using mean and standard deviation to answer research questions, while the null hypotheses were tested, using Analysis of Variance (ANOVA) at 0.05 level of significance. The mean response of each item was interpreted using the upper and lower limits in accordance with the point on five point scale rating as indicated in Table 2.

For the study, items with mean responses of 3.50 and above were agreed upon, whereas items with mean responses less than 3.50 were disagreed. The decisions taken on the four null hypotheses tested were based on comparing the calculated F-value and the tabulated F-value at 0.05 level of significance. Whenever the value of F-calculated is greater than that of F-tabulated, the null hypothesis is rejected, else it is accepted.

Table 2. **SCALE RATING**

Scale	Point	Lower Limit	Upper Limit
Strongly Agreed	5	4.50	5.49
Agreed	4	3.50	4.49
Not Sure`	3	2.50	3.49
Disagreed	2	1.50	2.49
Strongly Disagreed	1	0.50	1.49

CHAPTER FOUR
RESULTS AND DISCUSSIONS

The data collected for the study were analyzed and presented to answer the research questions and to test the hypotheses.

4.1 Research Question 1

What are the causes of brain drain of technical teachers in technical colleges in North-East Nigeria?The data that answered this research question were analyzed and presented on Table 3.

Table 3 revealed that respondents have agreed with items six and eight, with grand mean values of 3.57 and 3.78. The respondents disagreed with the remaining eight items which had grand mean ranging from 1.89-3.40. These suggested that there were many factors responsible for the brain drain of technical teachers in technical colleges in North-East Nigeria.

The following were presented on tables 3-6:

$\bar{x}_1$ = Mean response of technical college teachers in Adamawa State

$\bar{x}_2$ = Mean response of technical college teachers in Taraba State

$\bar{x}_3$ = Mean response of technical college teachers in Gombe State

$\bar{x}_4$ = Mean response of technical college teachers in Bauchi State

$\bar{x}_G$ = Grand mean response of technical college teachers in North–East Nigeria

n_1 = Number of respondent in technical colleges in Adamawa State = 61

n_2 = Number of respondent in technical colleges in Taraba State = 55

n_3 = Number of respondent in technical colleges in Gombe State = 45

n_4 = Number of respondent in technical colleges in Bauchi State = 58

Table 3: Mean Responses of Technical College Teachers on the Causes of Brain Drain of Technical Teachers in Technical Colleges in North-East Nigeria.

S/No	Item	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_3$	$\bar{x}_4$	$\bar{x}_G$	S.D	Remark
		n_1	n_2	n_3	n_4			
1.	Salary received is an adequate reward of work done	2.05	1.95	1.95	2.28	2.06	1.20	D
2.	Teachers services are always appreciated	2.65	3.84	3.55	3.64	3.40	1.51	D
3.	Teachers' salaries are better than that of their colleagues in the industries	1.78	2.06	2.06	2.42	2.08	1.19	D
4.	Technical colleges have enough teaching aids	2.20	2.17	2.47	2.46	2.32	1.16	D
5.	Technical college have enough staff quarters	1.94	1.47	1.69	2.39	1.89	1.00	D
6.	Teaching earns teachers respect in the society	3.35	3.67	3.48	3.79	3.57	1.16	A
7.	Trade workshops supports effective training	2.56	3.52	3.67	3.90	3.39	1.05	D
8.	Technical colleges encourages teacher re-training	2.90	4.74	3.84	3.74	3.78	1.15	A
9.	Teachers' salaries are better than that of their colleagues in Para-military work	1.86	1.91	1.86	2.27	1.98	0.98	D
10.	Some teachers left teaching because of victimization	2.75	3.27	3.51	3.13	3.15	1.24	D

Source: ***Field survey (2012)***

4.2 Research Question 2

What are the effects of brain drain of on the output of technical teachers intechnical colleges in North-East Nigeria?The data that answered this research question were analyzed and presented on Table 4.

Based on the 10 items on table 4, the respondents disagreed with item eight, with grand mean value of 3.04. The remaining nine items were agreed upon by the respondents, with grand mean values of 3.63 to 4.48. This table revealed that brain drain had effects on the output of technical teachers in technical colleges in North-East Nigeria.

4.3 Research Question 3

Which jobs do technical teachers pick when they leave teaching in technical colleges inNorth-East Nigeria? The data that answered this research question were analyzed and presented on Table 5.

The responses of technical teachers on table 5 revealed that items one to 10 were agreed upon by the respondents. The grand mean values were from 3.53 to4.33. These responses revealed that technical teachers chose other jobs to teaching at technical colleges in North-East Nigeria.

Table 4: Mean Responses of Technical College Teachers on the Effects of Brain Drain on the Output of Technical Teachers in Technical Colleges in North-East Nigeria.

S/No	Item	$\bar{x}_1$ n_1	$\bar{x}_2$ n_2	$\bar{x}_3$ n_3	$\bar{x}_4$ n_4	$\bar{x}_G$	S.D	Remark
1.	Shortage of teachers leads to poor performance of students in theoretical exam	4.29	4.53	4.45	4.13	4.34	0.85	A
2.	Shortage of teachers leads to poor performance of students in practical exam	4.09	4.77	4.46	4.09	4.34	0.78	A
3.	Shortage of teachers leads to the overwork of the remaining teachers	4.35	4.77	4.51	4.32	4.48	0.70	A
4.	Shortage of teachers leads to demoralization of the remaining teachers	3.89	4.36	3.97	3.99	4.05	0.87	A
5.	Shortage of teachers leads to corruption in the education sector	3.74	4.08	3.74	3.87	3.86	1.13	A
6.	Shortage of teachers leads to employmentof unqualified teachers	3.91	4.34	4.06	4.17	4.12	1.04	A
7.	Shortage of teachers leads to examination malpractice	3.78	3.87	4.02	4.01	3.92	1.01	A
8.	Shortage of teachers leads to riots in school by students	2.52	2.43	3.74	3.56	3.04	1.21	D
9.	Shortage of teachers leads to criminal activities by students	3.51	3.64	3.80	3.60	3.63	1.18	A
10.	Shortage of teachers leads to the falling standard of education	4.12	4.67	4.38	4.11	4.31	0.91	A

Source: ***Field survey (2012)***

Table 5: Mean Responses of Technical Teachers on the Jobs they pick when they leave teaching in Technical Colleges in North-East Nigeria.

S/No	Item	$\bar{X}_1$ n_1	$\bar{X}_2$ n_2	$\bar{X}_3$ n_3	$\bar{X}_4$ n_4	$\bar{X}_G$	S.D	Remark
1.	Some teachers left teaching in technical college for other work	4.65	4.18	4.48	4.00	4.33	0.69	A
2.	Some teachers left teaching in technical college for lecturing in polytechnics	4.32	4.22	4.26	4.30	4.28	0.84	A
3.	Some teachers left teaching in technical college for lecturing in colleges of education	4.12	4.11	4.29	4.60	4.28	0.48	A
4.	Some teachers left teaching in technical college for lecturing in universities	4.12	4.46	4.22	4.14	4.23	0.81	A
5.	Some teachers left teaching in technical college for work in industries	4.25	4.12	3.94	4.03	4.09	0.94	A
6.	Some teachers left teaching in technical college to participate in politics	3.81	3.65	3.64	3.67	3.70	1.04	A
7.	Some teachers left teaching in technical college for other jobs outside the country	3.92	3.43	3.72	3.96	3.77	1.04	A
8.	Some teachers left teaching in technical college to join para-military work	3.77	3.06	3.77	3.53	3.53	1.12	A
9.	Some teachers left teaching in technical college for bank jobs	3.67	3.35	3.62	3.46	3.54	1.14	A
10.	Some teachers left teaching in technical college for personal business	3.94	3.19	3.80	3.51	3.61	1.06	A

Source: ***Field survey (2012)***

4.4 Research Question 4

What strategies are to be used in finding solution to the challenges of brain drain of technical teachers in technical colleges in North-East Nigeria?The data that answered this research question were analyzed and presented on Table 6.

Based on the items on table 6, which stated the strategies to be used to solve the problem of brain drain of technical teachers, the respondents had agreed with the stated strategies. The grand mean values of the respondents ranged from 3.92-4.64. The table revealed that the respondents have agreed that the stated strategies are the solutions to the problems of brain drain of technical teacher at technical colleges in North-East Nigeria.

4.5 Hypothesis 1

There is no significant difference in the mean responses of technical college teachers in Adamawa, Taraba, Gombe andBauchiStates on the causes of brain drain of technical teachers in technical colleges in North–East Nigeria.The null hypothesis was tested and the data summary is presented on Table 7.

The F-calculated value (1.83) is less than the F-critical value (2.84). Therefore the null hypothesis is accepted, hence there is no significant differences among the mean responses of technical college teachers on the causes of brain drain of technical teachers intechnical colleges inNorth-East Nigeria. Any observed differences could be due to sampling error.

Table 6: Mean Responses of Technical Teachers on the Strategies to be used to Arrest the Challenges of Brain Drain of Technical Teachers in Technical Colleges in North–East Nigeria.

S/No	Item	$\bar{x}_1$ n_1	$\bar{x}_2$ n_2	$\bar{x}_3$ n_3	$\bar{x}_4$ n_4	$\bar{x}_G$	S.D	Remark
1.	Teachers will continue teaching if theyare adequately rewarded	4.74	4.53	4.45	4.62	4.59	0.56	A
2.	Teachers will continue teaching if theirservices are always appreciated	4.50	4.66	4.29	4.58	4.52	0.57	A
3.	Teachers will continue teaching if teaching aids are made available	4.46	4.24	4.33	4.38	4.36	0.64	A
4.	Teachers will continue teaching if sufficient Staff quarters are made available	3.79	4.33	4.28	4.23	4.15	0.79	A
5.	Teachers will continue teaching if there's provision for professional development	4.63	4.51	4.38	4.48	4.51	0.65	A
6.	Teachers will continue teaching if theywill not be victimized	4.31	4.33	4.12	4.35	4.28	0.71	A
7.	Teachers will continue teaching if theywill serve as consultants for jobs in their schools	4.19	3.82	3.92	4.03	4.00	0.88	A
8.	Teachers will continue teaching if students will be admitted on merit	4.54	4.49	4.40	4.20	4.41	0.70	A
9.	Teachers will continue teaching if their work load is reduced	3.88	4.15	4.09	3.59	3.92	0.86	A
10.	Teachers will continue teaching if theirsalary is improved	4.66	4.78	4.46	4.63	4.64	0.57	A

Source: ***Field survey (2012)***

Table 7: Analysis of Variance (ANOVA), of the Mean Responses of Technical College Teachers on the Causes of Brain Drain of Technical Teachers in Technical College in North–East Nigeria.

Sources of Variance	Degree of Freedom (df)	sum of Squares (ss)	Mean Sum of Squares (mss)	F-ratio	Remark
Treatment	3	3.38	1.13		
				1.83	Not significant
Error	36	22.14	0.62		
Total	39	25.52			

Source: ***Field survey (2012)***

4.6 Hypothesis 2

There is no significant difference in the mean responses of technical college teachers in Adamawa, Taraba, Gombe and BauchiStates on the effects of brain drain on the output of Technical Teachers in technical colleges in North-East Nigeria. The null hypothesis was tested and the data summary is presented on Table 8.

The F-calculated value (2.04) is less than the F-critical value (2.84). Therefore the null hypothesis is accepted, hence there is no significant differences among the mean responses of technical college teachers on the effects of brain drain on the output of technical teachers in technical colleges in North–East Nigeria. Any observed differences could be due to sampling error.

4.7 Hypothesis 3

There is no significant difference in the mean responses of technical college teachers in Adamawa, Taraba, Gombe andBauchi States on the jobs technical teachers pick when they leave teaching in technical colleges inNorth–East Nigeria.The null hypothesis was tested and the data summary is presented on Table 9.

The F-calculated value (0.76) is less than the F-critical value (2.84). Therefore the null hypothesis is accepted, hence there is no significant differences among the mean responses of technical college teachers on the jobs technicalteachers pick when they leave teaching in technical colleges in North–East Nigeria. Any observed differences could be due to sampling error.

Table 8: Analysis of Variance (ANOVA), of the Mean Responses of Technical College Teachers on the Effects of Brain Drain on the Output of Technical Teachers in Technical Colleges in North-East Nigeria.

Sources of Variance	Degree of Freedom (df)	sum of Squares (ss)	Mean Sum of Squares (mss)	F-ratio	Remark
Treatment	3	1.09	0.36		
				2.04	Not significant
Error	36	6.39	0.18		
Total	39	7.48			

Source: ***Field survey (2012)***

Table 9: Analysis of Variance (ANOVA), of the Mean Responses of Technical College Teachers in North-East Nigeria on the Jobs Technical Teachers Pick when they leave teaching in Technical Colleges in North-East Nigeria.

Sources of Variance	Degree of Freedom (df)	sum of Squares (ss)	Mean Sum of Squares (mss)	F-ratio	Remark
Treatment	3	0.36	0.12		
				0.76	Not significant
Error	36	5.65	0.16		
Total	39	6.01			

Source:*Field survey (2012)*

4.8 Hypothesis 4

There is no significant difference in the mean responses of technical college teachers in Adamawa, Taraba, Gombe andBauchi States on the strategies to be used towards finding solution to the challenges of brain drainof technical teachers in technical colleges in North-East Nigeria.The null hypothesis was tested and the data summary is presented on Table 10.

The F-calculated value (1.09) is less than the F-critical value (2.84). Therefore the null hypothesis is accepted, hence there is no significant difference among the mean responses of technical college teachers on the strategies to be used towards finding solution to the challenges of brain drain of technical teachers in technical colleges in North–East Nigeria. Any observed differences could be due to sampling error.

Table 10: Analysis of Variance (ANOVA), of the Mean Responses of Technical College Teachers on the Strategies to be used towards finding solution to the Challenges of Brain Drain of Technical Teachers in Technical Colleges in North–East Nigeria.

Sources of Variance	Degree of Freedom (df)	sum of Squares (ss)	Mean Sum of Squares (mss)	F-ratio	Remark
Treatment	3	0.19	0.06		
				1.09	Not significant
Error	36	2.07	0.06		
Total	39	2.26			

Source:*Field survey (2012)*

4.9 Findings of the Study

i. The causes of brain drain of technical teachers in North–East Nigeria technical colleges are many. These causes include, inadequate salaries, lack of appreciation of teachers' effort, inadequate staff quarters, shortage of teaching aids and workshop facilities.

ii. The brain drain of technical teachers in North–Eastern Nigeria technical colleges has many effects on their output. The effects ranged from poor performance of students in both theoretical and practical examinations, demoralization and overwork of the remaining teachers, corruption in the educational sector, and mass employment of unqualified teachers. Others were examination malpractice, criminal activities by students, and it also leads to the falling standard of education.

iii. Technical teachers left teaching in North–East Nigeria technical colleges to other jobs, such as, lecturing in higher institutions, jobs in industries, banks, personal businesses.

iv. The strategies needed to be used to curb the challenges of brain drain of technical teachers in North–East Nigeria technical colleges ranged from appreciation of teacher's services, adequately rewarding them, provision of sufficient teaching aids and staff quarters, provision of opportunity for professional development, and that they should also serve as consultants in school matters. Others includes; admission of students on merit, reduction of workload and salary improvement.

v. There were no significant differences in the mean ratings of technical teachers in North–East Nigeria technical colleges on the causes of brain drain, the effects of brain drain, the jobs they pick, and the strategies needed to be used to solve the problems of brain drain of technical teachers in North–East Nigeria technical colleges.

4.10 Discussions of Findings

The findings of the study are discussed in accordance to the specific purposes of the study. Research question 1, table 3 seeks to determine the causes of brain drain of technical teachers in technical colleges in North-East Nigeria. Out of the 10 items, items 6 and 8 were agreed upon by the respondents. These two items revealed that technical teachers at technical colleges in North-East Nigeria were respected in their schools, and that technical colleges encourages teacher re-training. These means that, technical teachers walks' shoulders high in their societies because they are respected by the people. It also means that technical teachers enjoy re-training programs in their respective technical colleges. Items 1, 2, 3, 4, 5, 7, and 9 were disagreed upon by the respondent. These items revealed that technical teachers' salaries were an inadequate reward of their labour. The findings also revealed that technical teachers services were not always appreciated neither are their salaries better than that of their colleagues in the industries or tertiary institutions. The items revealed further that technical colleges lacks sufficient teaching aids, staff quarters, and that technical colleges workshop do not support effective teaching. Item 10, which is the last item, revealed that victimization of technical teachers is not a cause of brain drain in technical colleges in North-East Nigeria. Based on the findings of this study, it is revealed that the brain drain of technical teachers in technical colleges is due to poor condition of work, which includes poor salaries compared to their colleagues in industries or tertiary institutions. Furthermore, the causes of brain drain of technical teachers are due to poor state of the technical colleges. Thesefindings are in line with the works of Johnson (2007),Kyambalesa (2005), and Chiresh and Shumba (2011), who also observed that poor motivation and remuneration, poor condition of service, political instability and others were responsible for brain drain. These stated factors are the causes of brain drain of technical teachers in technical colleges in North-East Nigeria.

Research question 2, table 4 shows the mean responses of technical teachers on the effects of brain drain on the output on their in technical colleges in North-East Nigeria. Out of the 10 items, item 8 was disagreed upon, whereas items 1, 2, 3, 4, 5, 6, 7, 9, and 10 were agreed upon by the respondents. The response to item 8 revealed that, brain drain of technical teachers does not lead to riots in schools. The remaining nine items revealed the effects of brain drain on the output of technical teachers. These effects include poor performance of student in both theory and practical, examination malpractice, and criminal activities by students. Other effects includes the over work and demoralization of the remaining teachers, corruption in the education sector, employment of unqualified teachers to fill the gap, and it also leads to the falling standard of education. This is in line with the works of Yakub (2007), and Kyambalesa (2005)who noted that the effects of brain drain includes the falling standard of education, corruption, low teacher motivation, lack of commitment and high labour turn over. Based on these findings, brain drain has effects on the output of technical teachers in technical colleges in North-East Nigeria because it affects both the remaining teachers and students as well. As can be seen from the findings, the effects of brain drain are also detrimental to the nation because it leads to the falling standard of education.

Research question 3, table5 shows the mean responses of technical teaches on the job technical teachers chose when they teaching in technical colleges in North-East Nigeria. The table shows that all the 10 items were agreed upon. This means that technical teachers leave technical college in North-East Nigeria for other jobs, such as, lecturing in polytechnics, colleges, and universities. They also leave to work in industries, to join politics, or they go overseas. The table further revealed that technical teachers leave teaching to join uniform work, take up bank jobs, or to venture into personal businesses. Based on these findings, it is clear that technical teachers leave technical colleges for other jobs in either the private or public sectors. The findings are in line with

the work of Anekwe (2009) who confirms that there is high rate of brain drain of skilled professionals which includes teachers.

Research question 4, table 5 shows the mean responses of technical teachers on the strategies needed to solve the brain drain of technical teachers in technical colleges in north-East Nigeria. All the 10 items on the table were agreed upon revealing that, these strategies if implemented, will lead to solving the problems of brain drain of technical teachers. The strategies are to adequately reward and appreciate technical teachers, the provision of adequate teaching aids in schools, and providing sufficient staff quarters. Other strategies include making provision for professional development, stopping the victimization of teachers, and making room for technical teachers to serve as consultants for jobs. Admission of student on merit, the reduction of workload on technical teachers, and the improvement of teachers' salaries are other strategies of solving the challenges of brain drain of technical teachers in technical colleges in North-East Nigeria. The findings of these this study revealed if these strategies will be implemented, the problems of brain drain brain of technical teachers will be solved.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides the summary of the study as well as conclusions drawn from the findings of the study. Recommendations, implications of the study and suggestions for further study including limitation of the study were highlighted.

5.1 Restatement of the Problem

Teachers are the important persons in the business of the imparting skills for national development. This means that the place and roles of teachers are of central importance in any society whose educational orientation is development directed. But these nation's reliable technical teachers were been taken away by brain drain. Brain drain of these teachers, have denied the services and expertise they should have otherwise provided for the economic development of this nation. It is disturbing to find out that many of today's teachers who are arguably the most important group of professionals for our nation's future are dissatisfied with their jobs.

Having discovered that technical college teachers leave teaching in technical colleges for other jobs, the study was therefore designed to find out the causes and effects of brain drain on the output of these technical teachers. The findings will in turn aid in determining the strategies needed in solving the problems of brain drain of these teachers.

5.2 Summary of Procedure used for the Study

Brain drain has denied the service that technical teachers will render in North–East Nigeriatechnical colleges. A multiple sample survey was carried out to find out the causes and effects of brain drain on the output of technical teachers in North–East Nigeriatechnical colleges. The population of the study included all technical teachers in North–East Nigeriatechnical colleges. The total population of the study was 1434

technical teachers in North-East Nigeria technical colleges. Sample drawn from the population was 315 technical teachers in North-East Nigeria technical colleges.

A self-designed structured questionnaire consisting of five sections with a five point rating scale was used for data collection. The instrument was validated by five lecturers. Pilot study was conducted in technical colleges of Kano and Ungogo in Kano State. The data collected from Kano State by research assistants were used to determine the reliability of the research instrument. Whereas data from technical colleges in North–East Nigeria were collected by the researcher and some assistants, to determine the causes and effects of brain drain on the output of technical college teachers. Mean and standard deviation were used to answer the four research questions of the study. Analysis of variance (ANOVA) was used to test the four null hypothesesat 0.05 level of significance.

5.3 Summary of Major Findings

i. The causes of brain drain of technical teachers in technical colleges in North-East Nigeria among others are low salaries, inadequate teaching aids, insufficient staff quarters, etc.

ii. The effects of brain drain on the output of technical teachers in technical college in North-East Nigeria among others are over work and demoralization of remaining technical teachers, corruption in the educational sector, employment of unqualified teachers, poor performance of students, examination malpractice, falling standard of education, etc.

iii. The effects of brain drain on the output of technical teachers in technical college in North-East Nigeria among others are

iv. Motivation is the major strategy of solving the problems of brain drain of technical teachers in North-East Nigeria technical colleges.

v. The mean responses of technical teachers in North–East Nigeria technical colleges do not differ significantly on the causes of brain drainof technical teachers in technical colleges North-East Nigeria. This finding is in line with the stated null hypothesis and is therefore accepted.

vi. The mean responses of technical teachers in North–East Nigeria technical colleges do not differ significantly on the effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria. This finding is in line with the stated null hypothesis and is therefore accepted.

vii. The mean responses of technical teachers in North–East Nigeria technical colleges do not differ significantly on the jobs technical teachers choose when they leave teaching in technical colleges inNorth-East Nigeria. This finding is in line with the stated null hypothesis and is therefore accepted.

viii. The mean responses of technical teachers intechnical colleges in North–East Nigeria do not differ significantly on the strategies needed in finding a lasting solution to the challenges of brain drain of technical teachers in technical colleges in North-East Nigeria. This finding is in line with the stated null hypothesis and is therefore accepted.

5.4 Conclusion

The findings of this study have revealed four major aspects. Firstly, the study found out that the causes of brain drain includes inadequate salaries, lack of appreciation of teachers' efforts, insufficient staff quarters, shortage of teaching aids, and others. Secondly, the study found out that the effects of brain drain includes poor performance of students in theoretical and practical examinations, examination malpractice, corruption in the educational sector, employment of unqualified teachers, the falling standard of education, and others. Thirdly, the study found out that many technical teachers left teaching at technical colleges to other jobs. They left to lecture in higher institutions, to

work in industries, to join para-military services, etc.The last aspect highlights the strategies which if implemented will bring solution to the problems of brain drain. The strategy's includes; salary improvement, appreciation of teachers services, provision of sufficient teaching aids and practical facilities among others. The null hypotheses posed were all accepted suggesting that there were no significance differences among the mean responses of technical teachers intechnical colleges in North-East Nigeria, on the causes and effects of brain drain on the output of technical teachers in technical colleges in North–East Nigeria.

5.5 Implication of the Findings

The study revealed that there's brain drain of technical teachers intechnical colleges in North–East Nigeria. The implication of these findings is that there will continue to be brain drain of these technical teachers due to de-motivating factors such as; low salaries, insufficient staff quarters, and shortage of teaching aids. Other implications of the findings is that brain drain will continue to lead to poor performance of students in both theoretical and practical examinations, examination mal-practice and the falling standard of education.

To achieve a positive change, the federal and state governments, business organizations, communities, and other establishments should motivate the teachers by paying adequate salaries, and making the schools to be a conducive teaching and learning environment. These will no doubt motivate the technical teachers to remain and continue teaching, which in turn will bring an end to the problems of brain drain of technical teachers in technical colleges in North–East Nigeria.

5.6 Recommendations

The following recommendations were made based on the findings of the study:

i. Having discovered the causes of brain drain of technical teachers in technical colleges in North-East Nigeria; government, business organizations, communities, and other establishments should make the welfare goals of technical teachers a key area of their project proposals. They should ensure adequate provision of accommodation, and teaching and learning resources, else brain drain will continue.

ii. Having discovered the effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria; government, business organizations, communities, and other establishments should make necessary plans to avoid this effects. Else, there will continue to be shortage of teachers, poor performance of student, falling standard of education among others.

iii. Having discovered that technical teachers leave teaching in technical colleges in North- East Nigeria for other jobs; government, business organizations, communities, and other establishments should make teaching jobs lucrative for technical teachers. If teaching jobs become lucrative, technical teachers will not be leaving their jobs.

iv. Having discovered the strategies of solving the problems of brain drain of technical teachers in technical colleges in North-East Nigeria; government, business organizations, communities, and other establishments should implement this strategies. This will aid in solving the problem of brain drain on the out of technical teachers in technical colleges in North-East Nigeria.

5.7 Limitation of the Study

The study area includes all the 26 technical colleges in Adamawa State, Taraba State, Gombe State, Bauchi State, Yobe State, and Borno State. But due to security

reasons, neither the researcher nor his assistants were able to administer questionnaires in Borno and Yobe States. So therefore, only four states were covered in North-East Nigeria as can be seen in table 1 page 33.

5.8 Suggestions for Further Studies

The following suggestions were made for further studies on brain drain:

i. Causes and effects of brain drain on the output of technical teachers in technical colleges in North-West and North-Central Nigeria.
ii. Causes and effects of brain drain on the output of technical teachers in colleges of education (technical) in Northern Nigeria.
iii. Reversing brain drain of technical man–power in Nigeria.

5.9 Contribution to Knowledge

The following are the contributions of this study to knowledge:

i. It provided information on the causes of brain drain of technical teachers in technical colleges in North-East Nigeria.
ii. It provided information on the effects of brain drain on the output of technical teachers in technical colleges in North-East Nigeria.
iii. It provided information on the where about of technical teachers after leaving technical colleges in North-East Nigeria.
iv. It provided information on the strategies of solving the problems of brain drain of technical teachers in technical colleges in North-East Nigeria.
v. It provided information which reveals that the opinions of technical teachers in technical colleges in North-East Nigeria are the same on the causes and effects of brain drain.

This study will be useful because it has provided information on the causes and effects of brain drain on the output of technical teachers in technical colleges in North-

East Nigeria. The results of this study will aid in solving the problem of brain drain technical teachers if put to use.

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APPENDIX B

REQUEST FOR ASSISTANCE TO VALIDATE MY INSTRUMENT

Department of Technology Education,

School of Tech. and Sci. Education,

ModibboAdama Univ. of Tech.Yola

October 13th, 2012.

Dear Sir,

REQUEST FOR ASSISTANCE TO VALIDATE INSTRUMENT

I am carrying out a research work entitled, " *Causes and Effects of Brain Drain on the output of technical teachers in Technical Colleges in North-East Nigeria".* Attached is the instrument designed to collect data needed for the study. You are requested to access the clarity, relevance and suitability of the instrument. Your observations and suggestions towards improving the quality of the items are highly required.

Thanks.

Yours sincerely,

Henry MinjuWandiya

(M.TECH/TE/09/0029)

APPENDIX C

REQUEST FOR COMPLETION OF INSTRUMENT

Department of Technology Education

School of Tech. and Sci. Education

ModibboAdama Univ. of Tech. Yola

November 6th, 2012.

Dear Respondent,

REQUEST FOR COMPLETION OF INSTRUMENT

I am undertaking studies in Industrial Technology Education. The attached is an instrument intended to collect data for the study.

The main purpose of the research work is to determine the causes and effects of brain drain on the output of technical teachers inTechnical Colleges in North-East Nigeria. Kindly respond to each item on the instrument objectively. Any information given by you will be held in strictest confidence and be used for the intended purpose.

Thanks.

Yours sincerely,

Henry MinjuWandiya

(M.TECH/TE/09/0029)

APPENDIX D

CAUSES AND EFFECTS OF BRAIN DRAIN INSTRUMENT

Section (A): Personal Data

i. Name of School:-……

ii. State:-……..……

Please tick (√) the desired option to each statement.

Strongly Agree	(SA)	5
Agree	(A)	4
Moderately Agree	(N)	3
Disagree	(D)	2
Strongly Disagree	(SD)	1

Section (B): The causes of brain drain of technical teachers inTechnical Colleges in North-East Nigeria

S/No	Research Question	SA	A	M	D	SD
1.	Your salary is an adequate reward for your job					
2.	Your services are always appreciated					
3.	Your salary is better than that of your colleagues in the industries					
4.	Your school have enough teaching aids					
5.	Your school have enough staff quarters					
6.	Your job earns you respect in the society					
7.	Your trade workshop supports effective training					
8.	Your school encourages teacher re-training					
9.	Your salary is better than that of your colleagues in the para-military					
10.	Your colleagues left teaching because of victimization					

Section (C): The effects of brain drain on the output of technical teachers inTechnical Colleges inNorth-East Nigeria

S/No	Research Question	SA	A	M	D	SD
1.	Shortage of teachers leads to poor performance of students in theoretical examination					
2.	Shortage of teachers leads to poor performance of students in practical examination					
3.	Shortage of teachers leads to overwork of the remaining teachers					
4.	Shortage of teachers leads to demoralization of the remaining teachers					
5.	Shortage of teachers leads to corruption in the education sector					
6.	Shortage of teachers leads to employment of unqualified teachers					
7.	Shortage of teachers leads to examination malpractice					
8.	Shortage of teachers leads to riots in schools by students					
9.	Shortage of teachers leads to criminal activities by students					
10.	Shortage of teachers leads to the falling standard of education					

Section (D): The jobs technical teachers pick when they leave teaching inTechnical Colleges inNorth-East Nigeria

S/No	Research Question	SA	A	M	D	SD
1.	Some teachers left teaching in technical colleges for other work					
2.	Some teachers left teaching in technical colleges for lecturing in polytechnics					
3.	Some teachers left teaching in technical colleges for lecturing in colleges ofeducation					
4.	Some teachers left teaching in technical colleges for lecturing in universities					
5.	Some teachers left teaching in technical colleges for work in industries					
6.	Some teachers left teaching in technical colleges to participate in Politics					
7.	Some teachers left teaching in technical colleges for other jobs outside the country					
8.	Some teachers left teaching in technical colleges to join para-Military					
9.	Some teachers left teaching in technical colleges for bank jobs					
10.	Some teachers left teaching in technical colleges for personal Business					

Section (E): Strategies for combating the brain drain of technical teachers inTechnical Colleges inNorth-East Nigeria

S/No	Research Question	SA	A	M	D	SD
1.	You will remain on your job if you are adequately rewarded					
2.	You will remain on your job if your services are always appreciated					
3.	You will remain on your job if teaching aids are made available					
4.	You will remain on your job if sufficient Staff quarters are made Available					
5.	You will remain on your job if there's provision for professional Development					
6.	You will remain on your job if you will not be victimized					
7.	You will remain on your job if you will be allowed to serve as consultant for jobs in your school					
8.	You will remain on your job if students will be admitted based on merit					
9.	You will remain on your job if your work load is reduced					
10.	You will remain on your job if your salary is improved					

APPENDIX E

SIZE FOR THE STUDY

Taro Yamane formular for finite population

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

n = the sample size

N = the finite population

e = level of significance (0.05)

1 = unity

% = percentage

$$n = \frac{1434}{1 + 1434(0.05)^2}$$

$$n = \frac{1434}{1 + 1434(0.0025)}$$

$$n = \frac{1434}{4.585}$$

n = 313

$$\text{Sample (\%)} = \frac{313}{1434} \times 100\%$$

Sample (%) = 21.83%

The sample size is approximately 22% of the total population, which also means the 22% of each state population.

APPENDIX F

KUDER RICHARDSON FORMULAR 21

Kuder Richardson Formular 21Method is denoted by:

$$\text{K -R21} = \frac{k}{k-1}\left[1 - \frac{\bar{x}(k-\bar{x})}{ks^2}\right]$$

Where:

k = the total number of items in the test, this can be represented by N or n

$\bar{x}$ = the mean of the scores

s^2 = the variance of the test

APPENDIX G

❡☛☛✋

❡⚘❦⑤ ⓪⑩ ❧⚘⑤⑥⓿⚘❧ ☙❺✍

$$\bar{x} = \frac{\sum x}{n}$$

Where:

$\bar{x}$ = Mean

Σ = Summation of

χ = Observation

n = Total number of observation

APPENDIX H

The standard deviation is denoted by:

$$SD = \sqrt{\frac{\sum (x - \overline{x})^2}{N}}$$

Where:

S.D = Standard deviation

$\overline{x}$ = Mean

Σ = Summation of

χ = Observation

N = Total number of observation

APPENDIX I

☚⑤ଔ③❺⑩⓪⑩ ⑥ର ❷ଔ⑨⓪ଔ⑤ଊ ⓪⑩ ଋ⑤⑥⓿ଋ ଌ❺

Sources of Variance	Degree of Freedom (df)	Sum of Squares (ss)	Mean Sum of Square(mss)	F-ratio	F_{tab}
Treatment	K -1	Trss	MST = Trss/(K - 1)		
				MST/MSE	$F_{(k-1), k(n-1)}$
Error	K(n -1)	ESS	MSE = ESS/K(n - 1)		
Total	Kn - 1	TSS			

Where :

TSS = Total Sum of Squares

Trss = Treatment sum of square

ESS = Error Sum of Square

MSE = Mean Sum of Square Error

(K – 1), K(n - 1), Kn – 1 = Degrees of freedom

F = Represent the corresponding table of F-distribution.