

**DETERMINANTS OF CARRYING CAPACITY  
OF ACADEMIC PROGRAMMES IN FEDERAL  
UNIVERSITIES IN NIGERIA**

*BY*

**TOYIN MARY ADEWALE**

*MATRIC NO: 102000*

**B.Ed., M.Ed. (Ibadan)**

**A THESIS IN THE DEPARTMENT OF EDUCATIONAL  
MANAGEMENT SUBMITTED TO THE FACULTY OF  
EDUCATION IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF  
PHILOSOPHY OF UNIVERSITY OF IBADAN, IBADAN**

**SEPTEMBER, 2011**

## ABSTRACT

Universities' inadequate provision of human resources, material resources and infrastructural facilities due to poor funding resulted in the formulation of principles of faculty carrying capacity that admission of students be based on available facilities such as classrooms, staff, equipment and materials. Admission to universities in Nigeria is highly competitive because of the increasing importance attached to university education in the development of individuals and the nation. In spite of this realisation, studies on university education have placed a great emphasis on the Joint Admissions and Matriculation Board's cut-off points without considering the carrying capacities of admitting universities and factors that determine the admission of students. This study, therefore, investigates the relationship between the number of academic staff, fund allocation, physical resources, material resources and carrying capacity in selected federal universities in Nigeria.

The study adopted the survey research design of the *ex-post facto* type. The Purposive sampling technique was used to select one federal university from first and second generation universities that have been producing graduates since 2002/2003 academic year in the six geopolitical zones in Nigeria. Five sets of checklists were used to collect secondary data. These were Academic and Non-academic Staff Data; Checklists Fund Allocation; University Student Enrolment (undergraduate); Inventory of Physical and Material Resources. Four research questions were raised and answered and five hypotheses tested at 0.05 level of significance. Data were analysed using descriptive statistics, analysis of variance and multiple regression.

Fund allocation was the major determinant of carrying capacity ( $F_{(1, 46)} = 6.58, p < 0.05$ ). There was also a positive correlation between the number of academic staff and carrying capacity ( $r = 0.55, p < 0.05$ ). The degree of contribution of the independent variables to carrying capacity was as follows: fund allocation ( $\beta = 0.95, t=2.39; p > 0.05$ ), material resources ( $\beta = -0.31, t=-1.14; p > 0.05$ ), academic and non-academic staff ( $\beta = -0.16, t=-0.39; p > 0.05$ ), physical resources ( $\beta=0.13, t=0.51; p > 0.05$ ). The result showed that each university was significantly different from the other in terms of fund allocation ( $F_{(5, 42)} = 3.59, p < 0.05$ ). There was also a significant variation in the number of academic staff ( $F_{(5, 12)} = 108.61, p < 0.05$ ). The carrying capacity of the universities was significantly different from one another ( $F_{(5, 42)} = 38.42, p < 0.05$ ). There were no significant differences among physical resources, material resources and carrying capacity and no significant difference was observed in their present enrolment and their carrying capacity. In addition, Usman Dan-Fodio had the least number of academic staff followed by Unilorin, UniMaid, UniBen and UNN with UI having the largest mean human resources.

Fund allocation and the number of academic staff had significant influence on carrying capacity in the federal universities in Nigeria. Education stakeholders should, therefore, assist in the provision of adequate funding and adhere strictly to carrying capacity principles to maintain and improve the quality of university education in Nigeria.

**Keywords:** Carrying capacity, Fund allocation, Nigerian universities' staff, Physical and material resources.

**Words'count:** 484

## ACKNOWLEDGEMENT

All praises are due to the Almighty God who made the beginning and the completion of this project possible. I express my gratitude to Him, without Him nothing begins, continues or ends successfully. The wisdom, knowledge and understanding needed to carry out this study came from Him. To Him be the glory forever. Amen.

Special thanks goes to my supervisor – Dr. S. O. Adedeji- Whose attentiveness encouraged me. Also to my husband, Hon. Ezekiel Akinlabi Adewale and my mother, Madam Alice Ayoade Adedeji and chief Benjamin Okunade Ayoade for their moral and financial support towards my academic success in life. I also express sincere gratitude to my brother- Pastor Amos Ishola and my brother in law, my confidant, Mr. Jire Popoola. I also express my sincere appreciation and gratitude to my academic father and mentor, Prof. J. B. Babalola, the immediate past Dean, Faculty of Education, University of Ibadan, whose fatherly and prayers assisted me during my Master's and Doctorate Programmes. His assistance to me in kind and cash were so enormous that only Almighty God can reward him abundantly.

I sincerely acknowledge with thanks the contributions of the H O D, Dr B.O. Emunemu and others namely, Prof. Mobolaji Ogunsanya, Prof. Kayode Ajayi, Dr. (Mrs.) Adebola Jaiyeoba, Dr Martins Fabunmi and Dr. S. F. Akinwumi towards the completion of this work.

Drs Abiodun Ayeni, and Ademola Atanda of the Department also deserve my special thanks.

I acknowledge the immense contributions of Drs. Omor, Popoola, Onuka, Raji and Olaniyan from the beginning to the end of this work. Special thanks also go to my boss, Mr. Femi Kayode.

Dr. Gbenga Adewale is a good brother to me. He made my stay in the Faculty of Education very comfortable. His brotherly care to all will be remembered forever.

I also express my profound gratitude to all the members of staff of the Department of Curriculum Studies and Management, (TASCE), Omu, for their support during my programme at the University of Ibadan, most especially the H.O.D, Dr. (Mrs.) Sheyin and my Dean, Mr Oyeyemi. I appreciate a good friend in the person of late Mr. Tunji Ogbe of the Bursary Department, Tai Solarin University of Education, TASUED. I thank the Management of Tai

Solarin College of Education, Omu, especially the provost for giving me the opportunity to pursue my postgraduate programme at the time I did.

Special thanks also go to my children- Ayodeji, Desola, Abayomi, Adebomi and Odunade for their understanding and care during my course of study.

In addition, I am grateful to many wonderful people such as:- F. M. Azeez and Alhaji A. B. Azeez, Mrs. Funmilayo Adeleke, Mr. Diyaolu and Ayodeji of P. G. School, Mr. and Mrs. Kazeem Ajayi, Mrs. Olubusayo Enikanoselu, Mr. and Mrs. Adelekan and all my family members for their support and concern during the field work and compilation of my work. May God bless them.

UNIVERSITY OF IBADAN

## CERTIFICATION

I certify that Toyin Mary Adewale carried out this work in the Department of Educational Management, University of Ibadan, Ibadan, Nigeria.

.....  
*Supervisor*  
**Dr. S. O. Adedeji**  
**B.Ed, M.Ed, Ph.D (Ibadan)**

UNIVERSITY OF IBADAN

## **DEDICATION**

This study is dedicated to God who made it possible for me to undertake the project, my children, Ayodeji, Desola, Abayomi, Adebomi, Odunade and my husband, Hon. Akinlabi Adewale.

UNIVERSITY OF IBADAN

## TABLE OF CONTENTS

	<b>PAGES</b>
Title Page	i
Abstract	ii
Acknowledgement	iii
Certification	v
Dedication	vi
Table of Contents	vii
List of Tables	ix
List of Figures	x
<b>CHAPTER ONE</b>	
<b>INTRODUCTION</b>	
1.1 Background to the Study	1
1.2 Statement of the Problem	12
1.3 Research Questions	13
1.4 Research Hypotheses	14
1.5 Purpose of the Study	14
1.6 Significance of the Study	14
1.7 Scope of the Study	15
1.8 Definition of Terms	15
<b>CHAPTER TWO</b>	
<b>REVIEW OF RELATED LITERATURE</b>	
2.1 Access to University Education in Nigeria	17
2.2 University Carrying Capacity	24
2.3 Availability of Educational Resources	42
2.4. Funding University Education in Nigeria.	58
Appraisal of Literature	67
Conceptual Framework	69

<b>CHAPTER THREE</b>	<b>74</b>
<b>RESEARCH METHODOLOGY</b>	<b>74</b>
3.1 Research Design	74
3.2 Population of the Study	74
3.3 Sample and Sampling Technique	75
3.4 Research Instruments	75
3.5 Validity of the Instruments	76
3.6 Reliability of the Instruments	77
3.7 Administration of the Instruments	77
3.8 Method of Data Analysis	77
<b>CHAPTER FOUR</b>	<b>79</b>
<b>RESULTS AND DISCUSSION</b>	<b>79</b>
Research Questions	79
Research Hypotheses	84
Summary of the study	94
<b>CHAPTER FIVE</b>	<b>96</b>
<b>SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS</b>	<b>96</b>
5.1 Summary of the Findings	96
5.2 Conclusion	96
5.3 Recommendations	97
5.4 Implications of the Study	98
5.5 Suggestions for Further Research	98
5.6 Contributions to Knowledge	98
REFERENCES	100
APPENDICES	111

## LIST OF TABLES

<b>TABLE</b>		<b>PAGE</b>
1.1.	Trends of Federal Government Funding of Education in Nigeria.	11
3.1	Summary of Nigerian Federal Universities (2002/2003-2007/2008)	74
3.2	Selected Federal Universities in Nigeria	75
3.3	Reliability Co-efficient of the Instrument Used	77
4.1	Funds Allocation to Universities	79
4.2	Prediction Equation on Funds Allocations	79
4.3	Availability of academic and non academic staff	81
4.4	Availability of physical facilities in the sampled universities	82
4.5	Adequacy of material resources for carrying capacity	83
4.6	Differences of Universities in Carrying Capacities	84
4.7	Grouping of Universities according to carrying capacities	85
4.8	Carrying Capacities of the Universities	85
4.9	Relationship between Educational Resources and Carrying Capacity	87
4.10	Factors responsible for Carrying Capacity	87
4.11	Relative Contribution of each Variable to Carrying Capacity	88
4.12	Relationship between Enrolment and Carrying Capacity	89
4.13	Differences between Enrollment and Carrying Capacities	90
4.14	Differences in term of Academic and non Academic staff	91
4.15	Grouping of Universities in terms of Academic and non Academic staff	92
4.16	Differences in terms of Financial Allocation	93
4.17	Grouping of Universities in terms of Fund Allocation	93

## LIST OF FIGURES

## PAGE

Fig 2.1: A SYSTEM MODEL SHOWING THE INTERACTION OF THE VARIOUS ELEMENTS IN A UNIVERSITY	71
--	----

UNIVERSITY OF IBADAN

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Education in general and higher education in particular are fundamental to the development and sustenance in both developed and developing countries. Universities worldwide are facing increasing pressures to produce highly proficient information technology management and financial experts' graduates to respond to competition dynamics and to increase, maintain and improve the prevailing quality of education standard. In Nigeria, there is a growing public concern on the quality of university education and the relevance of the universities' curriculum to national development. The United Nations Declarations on Human Rights observe that "..... everyone has the right to education and higher education shall equally be made accessible to all on the basis of merit (Kaplan, 2003). The demand for university education in recent times has increased globally. Millions of secondary school learners struggle to gain admission to universities as a result of an increase in the understanding of the significance of university education in the development of individuals and the nation.

The concept of carrying capacity was originally employed as a wilderness and ranch management tool in the 1950s and 1960s. Carrying capacities were used in ranch management as a mechanism for determining, for example, the maximum number of cattle or other livestock that could graze on a particular area without destroying the resources on the land. As use of park, began its dramatic increase in the late 1960s and early 1970s, park rangers and foresters extended the concept of carrying capacity to humans in an attempt to preserve natural resources as well as recreational experience. The term is used in an unusually wide range of fields but its origins are remarkably obscure. Scholars have assessed its history within wildlife management and rangeland ecologists have challenged its assumptions in relation to livestock grazing. But neither field has recognised that the origins of carrying capacity lie elsewhere. Karl (1994) asserts in passing that the concept was first established in laboratory experiments with cultured micro-organisms during the 19th century, but he provides no support for the claim. Carrying capacity seems to have an intuitive

conceptual obviousness, such that few people feel a need to scrutinise its history, assumption or coherence.

One can classify the uses of carrying capacity into four major aspects since the term was coined in the first half of the 19th century. The only definition that would capture all of them would be something like “the maximum or optimal amount of a thing or organism that can be conveyed or supported by some encompassing thing or place.” At its origins, carrying capacity referred to a *fixed quantity* of *X* that some encompassing *Y* ought to “carry” in abstraction from time or history (Karl, 1994). Since then, it has sometimes described a maximum limit and more often an optimal or normative one but it has always aspired to *idealism, stasis* and *numerical expression*. Only in the first of the four types of uses were these attributes justified and even then, only imperfectly and the smartest of its subsequent proponents by Leopold,(1993) in particular- have recognised the contradictions that arose as they extended carrying capacity to realms in which no such relation between *X* and *Y* actually existed. Each new use appropriated the basic idea and in some measure, the authority of its predecessors while overlooking and ultimately forgetting their contexts and limits. The concept has served important theoretical purposes in scientific research but when deployed by institutions of the states of any nation as has usually been the case, carrying capacity has often resulted in grievous errors of policy, administration, resource management and ethics. Since the 15th century, “tonnage” has been referred to as duties imposed on cargo by volume. It was often paired with “poundage,” a duty calculated by weight. Tonnage was not determined by measuring cargo, rather, each ship was measured from the outside and its tonnage was estimated by series of calculations. This figure became an attribute of the ship itself. Duties were imposed on the ship according to its tonnage, regardless of how much cargo it carried on any particular voyage. Over time, “tonnage and poundage” appeared to have merged into the single term, tonnage, and to have gravitated in meaning from the duty to the vessels themselves. If carrying capacity distinguished the amount conveyed by a ship from the ship itself, it was logical to extend it to other means of conveyance, especially as railroads and other systems of transport and communication were developed during the late in the 19th century. Thorstein, (1999) note that “an

increase in the carrying capacity of the Erie canal” had contributed to lower grain prices in the quarter-century up to 1892.

Eventually, the term shed its connection to the levying of duties which still attaches to tonnage and became simply a measure of how much *X* an inanimate *Y* could carry. Civilised nations have passed and left no sign but the Indian will be remembered for two things: the birch-bark canoe which no production of the white man can equal in strength, lightness, gracefulness, sea-going qualities and carrying capacity and the snowshoe, which appears to be perfect in its form and like a violin, incapable of improvement. There are three inventions which the ingenuity of man seems to be unable to improve upon, are the works of savages, namely; the violin, snow-shoes, and birch-bark canoes. In all these cases, carrying capacity is a quantitative measure of a man-made object or system; it could be calculated and predicted with certain level of (if not perfect) precision. Most of these uses of the term persist to the present, especially among engineers, although they are relatively unfamiliar to biologists and social scientists. In common parlance, this meaning of carrying capacity has migrated to the term “payload” (derived from the amount for which one is paid to haul something). Carrying capacity is a measure of how much meat the natives’ pack animals could carry back from the mountains at the end of the season. Ten years later, the same application is made to “the *genus homo*”. His carrying capacity is limited to what his/her two hands would hold. Vessels and receptacles of every kind are for the future to devise.

Carrying capacity may be the most adaptable and widely popularised concept in environmental politics today. Like sustainability which it predates and in many ways anticipates, carrying capacity can be applied to any human environment interaction at any scale and it has the additional advantage of conveying a sense of calculability and precision, something that sustainability lacks. Scientists have calculated carrying capacities for example, in Range and Wildlife Management, Chemistry, Medicine, Economics, Engineering and Population Biology. In political debates, carrying capacity serves to help justify hunting as in the figure of animals in the forest and it is also often used to support neo-Malthusian arguments regarding the of the world’s resources relative to growing human numbers. In both contexts, its

authority is buttressed by association with the work of prominent ecologists, including Aldo Leopold, Eugene Odum, Garrett Hardin and Paul Ehrlich(1954), the last two having explicitly declared that the world's carrying capacity for humans has been exceeded.

Initially, carrying capacity was thought of as a determinable number which could be set for a particular piece of recreational land. However, with experience and research, it became clear that the types of use are more important than the amount of use will determines the impact on an area. This leads to the concept of "limits of acceptable change" (LAC) as an improvement on carrying capacity. In the LAC process, park managers determine what types and amounts of change are acceptable for a particular area. Management must then monitor the area to determine if the limits are exceeded and implement whatever procedure is necessary to limit impact to acceptable levels. This can involve restricting amounts or types of use. The most important aspect of the LAC process is to determine the specific ecological and social indicators of change and to determine quantitative standard for allowable change. The carrying capacity of a park or forest is the maximum number of users that a particular area or facilities can support without causing unacceptable levels of impact to the environment or recreational experience.

Carrying capacity of universities entails the number of students and staff a university can conveniently accommodate without lowering the standard or quality of humans and material facilities on ground. Is the carrying capacity the same for all universities? How would we determine what represent the acceptable or unacceptable number? Once one has determined this number, how should it be enforced? Is it possible to from federal universities to state or private universities or vice versa? These are the types of questions that must be addressed in order to analyse the determinants of carrying capacity of federal universities in Nigeria. The carrying capacity is primarily based on the following: staffing- academic staff and non teaching staff, administration of the departments, physical facilities such as classes, lecture rooms and theatres, laboratories, workshops/ studios, staff offices, safety and environmental sanitation, funding of the programmes run by the university, library facilities and employers rating of graduates of the progammes. Facilities also include

humans and materials for management purposes. The National Universities Commission (NUC) officials did not just arrive at this concept that worked out these figures with individual universities. The carrying capacity for the federal universities range from 2233 to 2340.

The National Universities Commission (NUC) has, after investigating facilities and manpower available for each programme run by the universities, listed the carrying capacities for each programme. The NUC in 2005/2006 introduced the “carrying capacity” or approved figures for each university, after considering the infrastructures available. The quality of university education is often a reflection of the performance of university graduates in the labour market which is also dependent on the quality of academic programmes and provision of infrastructures by the various universities. Access, therefore, is viewed as the opportunity and right to receive university education. This depicts that, perhaps, people have realised the importance of university education in their lives as a means for social mobility, self-development and self-actualisation. Ehiamentor (2005) argues that there seems to be a general perception amongst Nigerians that only university degrees could ensure a good future. According to him, “the demand for university education has reached an unprecedented high level that more than double the current number of universities in the country will be required to fulfill this need”.

The Federal Government in recognising the role of universities in the production of high level human resources for the labour market, planned for equity in accessibility by enhancing the Unifying Tertiary Matriculations Examination (UTME) to provide opportunities for eligible Nigerians and to diversify the intake so as to reflect a high rate of national spread in the placement of candidates. Population explosion in our country has drastically increased the number of youths seeking admission into existing universities each year. Despite the increase in the number of universities created by approving new ones by the NUC which has increased the number of existing universities from 37 in 2002 to 76 in 2006 and 117 in 2011, the number of youths seeking admission through JAMB (Joint Admission and Matriculation Board) over the years has constantly continued to increase.

According to Ezekwesili in Adelani (2006), “In 2005, a total of 868,000 Nigerian youths sought admission to our universities out of which only 23 per cent were adjudged to have been successful (that is 200,000). Yet, according to her, our universities then had the capacity to absorb only 150,000. Over-enrollment has been a common feature in the universities today. The 2005 over-enrolment profile as recorded by the NUC reveals that out of the 25 federal universities, 18, representing 72% were over enrolled. While 13 out of 19 state universities (representing 68.4%) also over-enrolled. Only one of the seven private universities then (14%) was reported to have over-enrolled. The top ten overcrowded universities include five federal and five state universities in Nigeria as at 2004. The NUC reported the first attempt at universalisation of quality assurance in higher education across the globe in 2004. The study ranked the universities in terms of their productive functions and the relative effect on their products. None of the African universities was ranked, including those of Nigeria. Since this development, the NUC has heightened its efforts in standardising the quality of university education in Nigeria. The inability of universities to expand the existing facilities due to shortage of finance has also affected the universities carrying capacity. University limited space, equipment; lecture halls, human resources and other infrastructure have also been some of the greatest obstacles to candidates’ ambition to acquire university education. The allocated financial resources and teaching and non-teaching staff are grossly inadequate compared to the students’ enrolment. These observed problems motivated the NUC in 2005/2006 to introduce the “carrying capacity” of approved figures for each university which led to the determination of carrying capacity of federal universities in Nigeria.

The NUC in the last decade has taken the issue of students and quality seriously as the credibility of the Nigerian university system locally and internationally is at a low level. Locally, employers of labour are stressed by the re-training of some marginally employable graduates while a significant proportion of graduates of Nigerian universities have been written off as unemployable. Internationally, many universities are circumspect about admitting products of

Nigerian universities for post graduate programmes. Our elites send their children out to other countries, including Ghana and South Africa for tertiary education.

According to English Dictionary, quality means “degree of excellence, eminence, value and worth”, etc. It is the combination of all the attributes and peculiar features that makes one or an object fit for a purpose. In the simplest definition, quality is "fitness for purpose". Quality assurance is the process of maintaining standards in products or services through inspection or testing of samples. Okebukola contends that (2004) quality assurance in Nigerian universities is a process of continuous improvement in the quality of teaching and learning activities which will be achieved via pathways of employing mechanisms, internal and external to the universities. It is ensuring that at least the provision of the Minimum Academic Standards (MAS) documents are attained, maintained and enhanced. The credentialing connotes the fittings of certificates, diplomas and degrees awarded by these universities to ensure employers, Nigerian communities and international communities that graduates of their academic disciplines have attained an acceptable level of competence in their areas of specialisation and so are adequate for employment and further studies.

In the same vein, states that quality in higher education is multidimensional and embraces all functions and activities of a university including teaching, academic programmes, research and scholarship, staffing, students, buildings, facilities, equipment, services to the community and the academic environment. The quality of university graduates, according to Uvah (2005) could be measured by how well they have been prepared for life and service to the society in various spheres of human endeavour. Quality may also be considered on the basis of how good and efficient the teachers are, how adequate and accessible the facilities and materials needed for effective teaching and learning are; and how prepared the graduates are to meet the challenges of life and solving societal problems.

The quality of university education is often a reflection of the performance of university graduates in the labour market which is also dependent on the quality of academic programmes and provision of infrastructural facilities by the various universities. The “Benchmark” and Post UME (Aptitude Test) which aim at

drastically reducing the enrolment figure to a manageable size were introduced as reform initiatives. The “Benchmark” for the sciences ranges from one lecturer to between 15 and 30 students in the class and for the arts, 20 to 40 students per lecturer. One senior administrative staff to 12 teachers, one senior technician staff to 4 technical teachers (science based discipline). 1 (one) technical staff to every 20 teachers (arts based discipline) (etc)

The Obasanjo administration tried to introduce some reforms in the educational sector in an attempt to address the problems our educational institutions are facing. The advocates of the reforms clearly stated that the dilapidation of facilities, non-availability of basic amenities and mismanagement of scarce resources in the nation’s institutions necessitated the need for reforms. That is, there is no enabling environment to make the academic staff and students realise their potentials not to talk of a robust system that pushes them to edge beyond their natural abilities. It is apparent that in most of our universities that facilities put in place when they were first established were not maintained not to talk of providing modern ones. Although there are facilities maintenance centres in our universities they rarely function properly. It is unfortunate that basic facilities such as regular power supply, sufficient and decent lecture halls, basic chemicals and equipment in laboratories and properly equipped libraries are lacking.

According to Adedipe (2007), to establish and maintain high quality standards, the universities and NUC have a shared responsibility of addressing the following key areas. Indicators of MAS form the baseline for put in place quality university education since it prescribes a profile of curriculum, human resources, structures, infrastructure, equipment and pertinent facilities required for establishing, governing and managing a university. Accreditation is the process by which programmes are evaluated against set MAS and institutions’ comprehensive academic research and development activities are evaluated against stated criteria (including self-fashioned and self-produced strategic plan. The carrying capacity of a university is the maximum number of students the institution can sustain for qualitative education based on available human and material resources. Visitation to universities is a statutory requirement that empowers the proprietor to ascertain the well-being of the

university. *Research* is the driving force for human development as globally determined. Such researches should be evidenced by publications. Structures, infrastructure and utilities are an essential driving force for qualitative productivity in any organisation, particularly in the university system.

Another important indicator of good carrying capacity is the quality of the academic staff and their numerical strength. Apart from employing qualified academic staff, it is important they are well-trained while on the job. In the early years of running university education in Nigeria, many academic staff had the opportunity of studying in the universities in Europe and North America that are among the best in the world. Nowadays, very few have such opportunity due to inadequate government scholarship and intense competition for fellowships. The number of academic staff is also insufficient. The staff- student ratio in most departments in our Universities is very high to the extent that there is insufficient interaction for proper guidance and monitoring. Observably, the academic staff can still make efforts to secure fellowships and research grants from the few sources available.

In Nigeria, educational expenditure as a ratio of total expenditure from 2000 to 2009 fell short of the United Nations Educational Scientific and Cultural Organisation (UNESCO) minimum standard of 26 per cent of their annual budget. In view of the growing enrolments in Nigeria's educational institutions and percentage allocations to education in other countries, it is clear that the expenditure on education in Nigeria has been insufficient and rather small to cater for the needs of the education sector. Developments at the tertiary level of education show that total students enrolment in the Nigerian universities rose from 391,035 in 1995 to 689,619 in 1996. This later rose to 862,023 in 1997, by 1998 and 1999, jumped to 941,329 and 983,689, respectively. In 2000, it was 1.033 million while the number of universities dropped from 144 to 142 in 2001 with enrolment of 1.136 million. Nigerian government has been involved in peace keeping missions abroad and a lot of national resources are expended on supporting/sponsoring military presence in Sierra-Leone, and Liberia. It is on record that Nigerian government single handedly provided all the funds for the Economic Community of Monitoring Group (ECOMOG).

The budgetary allocation of the Federal Government for education has been on the decline. Rather than a progressive movement toward the minimum standard of 26 per cent that every developing country of the world should allocate to education annually, what we experience is a systematic reduction of the allocation to education (Dada, 2004). This poor funding is a major factor that militates against good access to academic programmes in university education. With poor funding, new facilities cannot be provided and old ones cannot be expanded.

The criteria for determining university carrying capacity in compliance with NUC directives are as follows:

**Staffing:** Academic and non-academic staff of each department.

**Financial Resources:** Funding of the programmes by the government and the university.

**Physical Resources:** These are facilities such as classes, lecture theatres, staff offices, library facilities, laboratories, workshops/studios.

**Material Resources:** Tables and chairs, electricity, fans, chemicals, projectors, safety and environmental sanitation and employer's rating of graduates of the programmes.

#### **Some NUC funding criteria**

- Ratio of personnel costs to overheads 60:40
- Library, 10%; research cost, 5%; capacity building, 1% of total recurrent minimum expenditure.

#### **Academic to non-academic funding 60:40**

- Expenditure on central administration 25% maximum
- Internally generated revenue -10% minimum.
- The funding system by direct legislation:

Currently, each university is funded through legislative appropriation by the National Assembly (NASS) upon recommendation by the NUC and consideration of same by and National Planning Commission (NPC) in a medium-term, three-year, NEEDS-based budget planning process.

### Current Challenges

- ❖ The executive arm of government provides a budget cap (envelope) based on projected earnings to all sectors including education which largely determines the funding of the universities;
- ❖ Federal universities are not allowed to charge tuition fees;
- ❖ The institutions complain of inadequate funding.

**Table 1.1 Trends of Federal Government Funding of Education in Nigeria.**

YEAR	AMOUNT RECEIVED	Capital
	Recurrent	
2000	28,206,218,865.91	1,936,785,632.00
2001	28,419,719,502.84	4,226,691,359.00
2002	30,351,483,193.00	Nil
2003	34,203,050,936.33	Nil
2004	41,492,948,787.01	11,973,338,699.00
2005	49,453,098,168.72	8,822,869,440.00
2006	75,400,267,475.00	6,976,416,815.00
2007	81,757,053,487.00	8,808,205,850.00
2008	92,219,484,808.00	14,414,135,937.00
2009	98,028,449,198.00	10,571,861,732.00

**Source: National Assembly Library, Abuja. (2009)**

Inadequate provision of human and material resources as well as poor infrastructure due to poor funding resulted in the stipulation that admission of students should be based on available facilities, classrooms, staff, equipment and materials. This carrying capacity affects access to university education in that not all the candidates sent by JAMB to a university for admission can be offered admission because of inadequate facilities. The carrying capacity principle has made admission into universities not only difficult but also very competitive as a result of limited spaces. According to Ochuba (2001), only 21.9 per cent of students who applied for university admissions are admitted yearly.

In the 1950s, carrying capacity in the university system was not a problem. Indeed, the prevailing capacity then could be presumed to be underutilized. And, the demand was low. This perhaps explains why students from neighboring countries came to study in Nigeria during this period.

In the 1960s and 1970s, the university system carrying capacity was still adequate to absorb the growing demand for university education. Apparently, the population growth rate was stemmed by the civil war, keeping demand for university education within the limit of carrying capacity of the university education system. From early 1980s, the problem of carrying capacity surfaced, through marginally. Observably, there was a sharp rise in population and demand for university education without a corresponding rise in university system growth and/or expansion. This rising demand was not matched with rise in supply, thus, carrying capacity problem manifested. By the 1990s, and 2000s, the carrying capacity problem was full blown. Rapid population growth concomitant with unprecedented demand for university education without a corresponding rise in supply culminated in carrying capacity problem in the university system. A problem not sufficient addressed by the emergence of private universities.

## **1.2 Statement of the Problem**

The NUC reported the first attempt at universalisation of quality assurance in higher education across the globe in 2004. The study ranked the universities in terms of their productive functions and the relative effect on their products. No African university was ranked among the first in the world, Nigeria inclusive. Since this development, the NUC has heightened its efforts in standardizing the quality of university education in Nigeria.

Over-enrolment has been a common feature in the universities nowadays. The 2005 over-enrolment profile as recorded by the NUC reveals that out of the 25 federal universities, 18, representing 72%, were over enrolled while 13 out of 19 state universities (representing 68.4%) also over-enrolled. Only one of the seven private universities (14%) was reported to have over-enrolled. All these brought about accreditation exercise, MAS, carrying capacity as well as the “Benchmark” and Post

UME [aptitude test] which aim at drastically reducing the enrolment figure to a manageable size as reform initiatives.

Inability of universities to expand the existing facilities due to shortage of finance has also affected their carrying capacity. University inadequate funding, limited space, equipment, lecture halls, human resources and other infrastructure have been some of the obstacles to candidates' ambition to acquire university education. University growth rate is not commensurate with the rapid demand for university education. Rapid raising population rate which implies sustained high demand for university education and paucity of the studies in the area. Many of the school buildings are dilapidated. The allocated financial resources, teaching and non-teaching staff are grossly inadequate compared to students' enrolment. These observed problems motivated the NUC in 2005/2006 to introduce the "carrying capacity" of approved figure for each university which led to the determination of carrying capacity of federal universities in Nigeria. This study therefore seeks to find out the determinants of carrying capacity of federal universities in Nigeria.

### **1.3 Research Questions**

1. How significant is fund allocation to the carrying capacity of universities?
2. Are there enough academic and non-academic staff in the universities under investigation?
3. How adequate are the physical facilities in the universities being investigated?
4. How adequate are the material resources available in these universities compared to the benchmark prescribed by the NUC?

### **1.4 Research Hypotheses**

1. The carrying capacity of the universities is not different all over in Nigeria.
2. There is no significant relationship between human, financial, physical as well as material resources and carrying capacity in federal universities under investigation.
3. There is no significant relationship between enrolment and carrying capacity in the sampled universities

4. There is no significant difference in supply of academic and non –academic staff with respect to the carrying capacity of universities.
5. There is no significant difference between the quantity of financial resources allocated to universities and their carrying capacity.

### **1.5 Purposes of the Study**

This study investigates the availability, adequacy and condition of facilities in the universities in the six geopolitical zones in Nigeria. It also identifies the extent to which each of the resources listed will determine the carrying capacity in the selected federal universities in Nigeria.

Specifically, the purposes are to:

1. Establish the adequacy or otherwise of the availability of human, financial, physical and material resources in selected federal universities in Nigeria.
2. Affirm the nature of relationship between availability of all resources and academic programmes carrying capacity in selected federal universities in Nigeria.
3. Ascertain the impact of human and physical resources on carrying capacity (undergraduate and postgraduate)
4. Ascertain the extent to which availability of resources will determine the carrying capacity of academic programmes in the various universities.

### **1.6 Significance of the Study**

The expected findings of this study should reveal the reasons for the determinants of carrying capacity of academic programmes in federal universities in Nigeria. It should also shed light on the importance of adequate supply of educational materials to the federal universities in Nigeria. The study should reveal clearly the up-to-date information about the resources situation in federal universities in Nigeria. It will also enable educational agents and government to gear up towards the development of federal universities if the educational objectives of university are to be achieved. The study is expected to be of immense value, because it will underscore

the adequacy or otherwise of impact of educational resources on the carrying capacity of federal universities in Nigeria.

The expectation is that the information generated, expected research output and the discourse will provide useful hints to educational planners on carrying capacity and available resources in federal universities in Nigeria.

### 1.7 Scope of the Study

This study focused mainly on the federal universities in Nigeria. Carrying capacity is the dependent variable of the research while financial, human, physical and material resources represent the independent variables. The study is limited to Academic Programmes Carrying Capacity. The study was interested in financial, human, physical and material resources and carrying capacities of university education in Nigeria between 2002 and 2008. As at the time of this study, Nigeria has 25 federal universities.

### 1.8 Operational Definition of Terms.

- **Financial Resources:** *To provide university with monetary resources.* These are the fund made available for educational purposes. It refers to the subvention and donations by government or stakeholders.
- **Human Resources:** These are personnel who have gone through training in educational institutions and qualified as professional teachers.
- **Material Resources:** *These are the tools, fabric, substance, facts, notes and research needed to perform a particular task.* These are the facilities, equipment, instructional materials and other teaching/learning materials necessary for learning in universities.
- **Access:** Implies making it possible for everyone who is entitled to education to receive it. It is the provisional admission for everyone that passed relevant examinations (JAMB inclusive) and meets minimum requirement for university admission.
- **University enrolment:** This is the intake or number of all students that enroll for university educations in a session.

- ***Student/ Teacher Ratio:*** This is the number of students per teacher in the university. This can be calculated by the sum of the students divided by the number of teachers available.
- ***Carrying capacity:*** *This is the number of students a university can accommodate.* Is the maximum number of students that an institution can sustain for qualitative education to take place; based on available human and material resources.
- ***Quality of graduates:*** This could be measured by how well they have been prepared for life and for service to society in the various spheres of human endeavour.
- ***Universities Ranking:*** Ranking here was purely based on the quality of the academic staff which, according to NUC, is one of the most important indexes of university education as the academic staffs were measured by the output in research, teaching and community service.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

This chapter presents relevant literature on the carrying capacity as a determinant of access to university education in Nigeria. The literature is divided into four main parts and sub- parts

#### **2.1 Access to University Education in Nigeria**

- a. Access to University Education
- b. Supply and Demand Barriers
- c. Ranking of Universities in Nigeria

#### **2.2 University Carrying Capacity**

- a. Genesis and History of Carrying Capacity
- b. NUC Accreditation Exercise of 2005
- c. NUC Accreditation Criteria

#### **2.3 Availability of Educational Resources**

- a. Financial Resources
- b. Human Resources
- c. Physical Resources
- d. Material Resources
- f. Internal Efficiency and External Efficiency
- g. Input in Education and Output in Education

#### **2.4 Funding University Education in Nigeria**

- a. Financing University Education in Nigeria
- b. Analysis of Fiscal Allocation to Education
- c. Consequences of Inadequate Funding
- d. Uses of Funds in Education

## **2.1 Access to University Education in Nigeria**

### **a. Access to University Education**

The demand for university education in recent times has increased. University education is widening sought after in contemporary Nigeria's because many parents and their wards in fact the society as a whole have realized the key role that higher education plays in development of individuals and the society. For this to be possible, efforts are always directed to providing enough classrooms, laboratories and instructional facilities so that the obstacles that prevent applicants from taking advantages of the opportunities are removed.

Equity in education, on the other hand, implies ensuring that all the segments of the society get their share of access to whatever educational opportunities are provided. This situation should, therefore, make it possible for everyone to have equal opportunity of being educated from the primary to the university level. A rather encompassing definition by UNESCO (2003) puts "access to tertiary education" as meaning: ensuring equitable access to tertiary institutions based on merit, capacity, efforts and perseverance. This definition considers issues in life-long learning that can take place at anytime with due recognition to previously acquired skills through opportunities for adults retraining for the work force.

FGN (2004), states that university education is the education given after secondary education. It is to this end that Ehiamentalor (2005) argues that there seems to be a general perception among the Nigerian people that only university degrees can bring about a good future. According to him, the demand for university education has reached an unprecedented high level that more than double the current number of universities in the country will be required to fill this need. In 1948, when the University College Ibadan was established, the total enrolment was 210 students (Okebukola, 2004), but today, over one million secondary school graduates are seeking opportunities to enter into universities across the country. Regrettably, the available universities in the country cannot provide all the opportunities for those yearning for university education. Thus, the issue of access to and equity in university education has become a serious one (Fabunmi, 2005).

FGN (2004) in the National Policy on Education states the five national goals and philosophy of education. Some of these include:

- ❖ A land full of bright opportunities for all citizens.
- ❖ Every Nigerian child shall have a right to equal educational opportunities irrespective of any unimagined disabilities each according to his or her ability.
- ❖ The provision of equal access to educational opportunities for all citizens of the country at the primary, secondary and tertiary levels both inside and outside the formal school system.

These provisions are in consonance with the Universal Declaration on Human Rights which asserts that “everyone has a right to education”. The provisions also show government’s concern for ensuring access and equity to all levels of education in the country, including university education. Thus, Nigerian citizens who are qualified to receive university education should be provided with equal opportunities to do so without discrimination. Building a land full of bright opportunities depicts government’s intention to expand university education through the building of more universities and providing training facilities to make it progressively accessible to those who can afford it. Tonwe (2005) defines access to education to mean making education to be within the reach of every citizen of the nation. According to Dada (2004), access to education means opportunity and right to receive formal education as distinct from informal education. In the context of this research, access is viewed as the opportunity to get university education.

### ***Supply and Demand Barriers***

The rising costs of higher education seem to have taken its toll on access to higher education. Related to funding barrier is the cost-benefit of higher education. Educational planners contend that the cost of education must match its benefits so as to justify all spending on education. Amidst rising costs of higher education and provision of equal higher education to all, government had to look for ways and means of achieving both. It therefore increased cost-sharing and reduced intake into higher institutions. It was observed that Nigerians’ participation in higher education

was the lowest the world over. In 1995, higher education student's participation per 100,000 inhabitants in the world was recorded as follows:

It is unfortunate that two years after Adeniran's report, Nigeria not only lagged behind but performed less than it did in (1998/99) with a ratio of only 340 per 100,000 participant while the South African ratio was 2,500 and Asia 650 per 100,000 same year (NUC 2002 in Saint, Hartnett and Strassner 2006).

It shows that Nigeria failed to attain the average access rate for the less developed nations. This implies that access to higher education in Nigeria is very low when compared with other countries of the world. Again, following the national population census of 1991, only 8.6 million of the population was found to be within the university age of 20 and 24 years (Adeniran 2000). Out of these, only about 400,000 applied for admission each year between 1990 and 1998 (ADEA 2000) and still Nigeria, the giant of Africa, was able to admit only 15.31% in 1990, 16.71% in 1991 and 14.73% in 1992 through the JAMB (Ajayi and Alani 1996) while only 35,000 (8.15%) out of 400,000 applicants were admitted in 1998 (ADEA 2000)

Although there is an increase in demand for higher education, it is certain that the existing institutions are not enough. This was confirmed by Adeniran (2000) who laments that more and more people want to get into schools, colleges and universities and yet the spaces are not there. He further observes that the demand far outstripped the supply and so the most favourable panacea to the problem of population explosion was to expand access to higher education. *The current downsizing of class sizes in higher institutions has its merits and demerits. While it is a means of reducing government funding in higher education and improving standards, it has reduced access to higher education. A close look at Table 2.2 shows a low supply of higher education. It could be observed that between 84.69% and 91.25% of candidates who sat for the examination between 1990 and 1998 were not offered admission due to lack of space and funds. It is expected that the situation will be worse with the downsizing of class sizes in future years with the products of the UBE joining applicants into higher institutions. The deregularisation of higher education is a welcome development. The stringent requirements by the supervising bodies (NUC, NBTE and NCCE), however make it difficult for many higher institutions to be*

*approved. As a result, enhanced access to higher education which deregularisation could have provided has remained a mirage. Like other policies of government, educational policies are formulated to show the direction of the national philosophy on education. However, the policy environment has been confronted not only with frequent changes but also policy inconsistencies and lack of political will to implement accepted policies. Most policies are changed mid-stream without allowing them to run full cycle and carry out evaluations of their outcome viz – a-viz the set objectives. The situation has inadvertently reduced the efficiency ratio of resources disbursed to the education sector. There is need, therefore, to streamline these educational agencies and coordinate the functions of those that are deemed necessary.*

**b. Ranking of Universities in Nigeria**

The world university ranking recently published by the NUC in 2010 was not favourable to any of the Nigerian universities, an analysis that must have considered factors such as quality of teachers, facilities, student/teacher ratio, level of research, output contributions to international journals and number of foreign students, among others. According to the web-ranking of top 1,000 universities in the world, no Nigerian university was among the first 50 universities in Africa (not in the world). According to Okebukola, former Executive Secretary of the NUC, “the accreditation exercise involved the evaluation of 1,343 undergraduate degree programmes in 48 universities comprising 25 federal, 20 states and three private. Five colleges of education are also affected. From the memorandum, 571 (42.3%) earned full accreditation status, 670 (49.9%) earned interim accreditation while 102 (7.6%) failed to meet the prescribed minimum academic standards and were denied accreditation. The implication of being denied accreditation is that the concerned universities shall immediately cease to admit students into such programmes which failed accreditation. Universities that can earn interim accreditation shall run the programmes for two years after which such programmes will be re-evaluated. In support of this, Adeleke (2006) asserts that Nigerian universities were driven on the path of decay by the military regimes of the ‘80s and ‘90s. He adds further that “Nigerian lecturers cried as

early as the '70s that things were getting bad, facilities were getting old; funding was inadequate and many good hands were leaving the system... what we see today is the outcome of total neglect of our educational system”.

Many national and international websites and newspapers provide annual rankings of the Universities and Colleges based on several criteria. For many years, they have undertaken both statistical and reputational ratings / rankings of Colleges and attempted to provide relevant information to prospective students. Increasingly, the importance and validity of University and College rankings is a highly debated issue. Many Universities, including highly ranked ones, are beginning to question both the data and methods used by some ranking services. Of special concern are the aspects of the rankings/ratings which deal with the "difficult to measure" concept of institutional reputation. The aim of this website is to provide an approximate ranking of world-wide Universities based on the popularity of their website only. We do not claim to rank Universities by their reputation, quality of education or level of services provided.

Nigerian universities have consistently ranked very low in the global ranking of universities. For many years, no Nigerian university has made it to the list of 1000 leading universities in the world according to The Webometrics World Ranking of Universities, produced by Cybermetrics Lab, a Spain-based organisation. Only about four Nigerian universities have appeared on the list of 100 leading universities in Africa. None of them has made it to the first 40. This dismal performance of universities in Nigeria needs to be appreciated in its various dimensions in order to begin to deal with the problem of university education. Indeed, policy prescriptions to upgrade university education have tended to ignore the core elements that make for a competitive university education. To understand the nature of the current challenges of university education in Nigeria, it is important to explore the basis on which universities are ranked globally. There are many organisations involved in the ranking of universities worldwide. Some of them are national but quite a few cover the world. The data base of webometrics is the largest covering 16,000 universities. It started in 2004. The ranking is based on the web content, visibility and impact of the web publications of universities according to the number of external links they received

Webometric indicators are provided to show the commitment of institutions to web publication. What this means is that universities of high quality may be ranked lower than expected due to a restrained policy on web publication or inability to host an effective website to fully reflect their broad range of activities and publications. Other rankings are based on library holdings, academic performance, research performance, resources availability, socially significant activities of graduates, international activities of the universities, number of Nobel prize winners, field medallists, the number of publications produced and citations of the publications, student selectivity, student - faculty ratio, quality and diversity of faculty, graduation rate, alumni giving rate and so on. Some of the rankings focused on science based disciplines while others focus on the liberal arts or both. The above survey of the criteria for ranking universities shows why Nigerian universities are rated low. In the first place, most Nigerian universities do not have a good presence on the internet. Indeed, many universities with the exception of a few private and federal ones, suffer from severe problem of electricity supply which makes information and communication technology ineffective. Thus, in the webometric ranking, Nigerian universities are clearly disadvantaged. For the few up-coming universities, even their modest achievements are underrepresented because of the infrastructural problems associated with power supply. One of the greatest factors that makes Nigerian universities rank low and may continue to do so in the future is the basis on which universities are established. Many proprietors of private universities think academicians are employed in the universities to teach and do nothing more. They provide an environment that is conducive for learning and teaching but forecloses the social environment for academic research and innovation.

In some situations, students are encouraged to treat their teachers with contempt because they pay huge fees that take care of salaries and the running of the universities. Some think the greatest contribution universities can make to the moral crisis in Nigeria is to produce graduates who are saturated with religious ideas and rituals. Many new public universities are run as opportunities to provide jobs and access to higher education for indigenes. What operates in these new public universities are “localities” rather than “universities”. A situation where the faculties

and studentship of a university largely comprise of individuals from a state is unacceptable when universities are ranked on the basis of their capacity to attract staff and students from all over the world. Many university positions are no longer for the best and most competent but for indigenes and loyalists to the visitor and the ruling political party. The position of vice-chancellor is now political with requisite political remuneration that is divorced from the ability to raise funds for the universities. These trends must be reversed as Nigeria addresses the problem of infrastructure and funding if Nigerian universities are to rank among the best in the world.

## **2.2 University Carrying Capacity**

The concept of carrying capacity was originally employed as a wilderness and range management tool in the 1950s and 1960s. Carrying capacities were used in range management as a mechanism for determining, for example, the maximum number of cattle or other livestock that could graze on a particular area without destroying the resources on the land. As park use began its dramatic increase in the late 1960s and early 1970s, park rangers and foresters accepted the concept of carrying capacity to humans in an attempt to preserve the natural resources as well as the recreational experience.

Initially, carrying capacity was thought of as a determinable number which could be set for a particular piece of recreational land. However with experience and research, it became clear that the types of use are more important than the amount of use in determining the impact on an area. This led to the concept of “limits of acceptable change” (LAC) as an improvement on carrying capacity. In the LAC process, park managers determine what types and amounts of change are acceptable for a particular area. Management must then monitor the area to determine whether the limits are exceeded and implement whatever procedures are necessary to limit impact to acceptable levels. This can involve restricting amount or types of use. The most important aspect of the LAC process is to determine the specific ecological and social inductors of change and to determine quantitative standard for allowable change.

The carrying capacity of a park, forest or school refers to the maximum number of users a particular area or facilities can support without causing unacceptable levels of impact to the environment or recreational experience. But what is the right number of students in a given university. How do you determine what represents an unacceptable level of impact? Is this level the same for all parks, forests and universities? Moreover, after determining this number, how should it be enforced? Is it possible to redirect people from more popular parks or universities to less used areas or universities? These are the types of questions that must be addressed in order to analyse the determinants of carrying capacity of federal universities in Nigeria.

Carrying capacity, as Odum (1958) formulated it, expresses with precision what could be expected if a population lives without relation to its environment. This can never occur empirically, but knowledge of such a norm nonetheless allows every observed deviation from it to appear as an actual shortage of some environmental resource. In this way, Odum (1958) gives scientific expression to the so-called "principle of population" made famous by Malthus some 150 years earlier. Glacken sees its origins in the much older principle of plenitude: that life, by its (God-given) nature, is given to exuberant self-reproduction. The contradiction between this plenitude and the limitations of "environment" drove Malthus argument, both substantively and rhetorically: Life, in the absence of environmental constraints, would rapidly overpopulate the earth (and, he claims, the rest of the universe). The fact that it has not yet done so serves as an incontrovertible evidence that life is "checked" by limitations (whether misery or vice), and that the principle is therefore empirically true. Every empirical instance of misery and vice thus appears, conversely, as an instance of such checks and the growing population- if only by bringing larger numbers of victims into the path of every check appears as the root of the problem.

Vogt defines carrying capacity using a "bio-equation": " $C=B: E$ ," in which C stands for carrying capacity, B for biotic potential and E for environmental resistance. Biotic potential, Vogt writes, has "an absolute or theoretical ceiling that is never reached, except under extraordinary conditions and a very large number of practical

ceilings, which were “in most of the world dropping lower every year.... The practical ceiling is imposed by environmental resistance, which is the sum of varying but always great numbers of limiting factors acting upon the biotic potential.” The parallels with Odum’s theory are striking and it should be evident from the preceding section that Vogt’s equation” is tautology: Environmental resistance only existed by positing theoretical limit that was itself derived from carrying capacity and from which empirical reality necessarily deviated.

**a. *Genesis and History of Carrying Capacity***

Carrying capacity may be the most versatile and widely popularised concept in environmental politics today. Like sustainability which it predates and in many ways anticipates, carrying capacity can be applied to almost any human-environment interaction at any scale and it has the additional advantage of conveying a sense of calculability and precision, something that sustainability thus far lacks. Indeed, scientists of many kinds have calculated carrying capacities in range and Wildlife Management, Chemistry, Medicine, Economics, Engineering and Population Biology. In political debates, carrying capacity serves to help justify hunting as in the figure on the title page and it is also often used to support neo-Malthusian arguments regarding the finitude of the world’s resources relative to growing human numbers. In both contexts, its authority is buttressed by association with the work of prominent ecologists, including Aldo Leopold, Eugene Odum, Garrett Hardin and Paul Ehrlich, the last two having explicitly declared that the world’s carrying capacity for humans is being exceeded. But the origins of carrying capacity are not found in Malthus. He never used the term not even in debates about population (human or otherwise), unless one were to argue that the idea associated with it today is more definitive than the term itself. It is true that in 1820, William Godwin published a calculation of the number of humans the world could support. In ‘*Of Population*’, his polemical response to Malthus, Godwin took contemporary China as demonstrating the maximum of possible cultivation and population density, which he then extrapolated to the earth’s habitable area, arriving at a figure of nine billion people. Clarence Glacken states that Godwin’s was one of the earliest attempts to specify such a

number and the estimate may now appear prescient. In context, however, Godwin was mocking Malthus, and he nowhere referred to his estimate as a carrying capacity. In fact, the term was not applied to questions of global human population until the 1940s, after a century of serving various other purposes.

Where did carrying capacity come from? How was it originally conceived and to what extent have its origins shaped its subsequent history? No one has answered these questions; as far as I can tell, they have scarcely been posed. The term is used in an unusually wide range of fields, but its origins are remarkably obscure. Scholars have assessed its history within wildlife management, rangeland ecologists<sup>1</sup> and have challenged its assumptions in relation to livestock grazing. But neither field has recognised that the origins of carrying capacity lie elsewhere. Karl Zimmerer asserts in passing that the concept was first established in laboratory experiments with cultured micro-organisms during the 19<sup>th</sup> century, but he provides no support for the claim, which I have been unable to substantiate. Carrying capacity seems to have an intuitive conceptual obviousness, such that few people feel the need to scrutinise its history, assumptions or coherence.

One can classify the uses of carrying capacity into four major types since the term was coined in the first half of the 19<sup>th</sup> century.

The only definition that would capture all of them would be something like “the maximum or optimal amount of a thing or organism that can be conveyed or supported by some encompassing thing or place.” At its origins, carrying capacity referred to a *fixed quantity* of *X* that some encompassing *Y* ought to “carry” in abstraction from time or history. Since then, it has sometimes described a maximum limit and more often an optimal or normative one, but it has always aspired to *idealism, stasis* and *numerical expression*. Only in the first of the four types of uses were these attributes justified, and even then only imperfectly; only the most astute of its subsequent proponents -Leopold in particular- have recognised the contradictions that arose as they extended carrying capacity to realms in which no such relation between *X* and *Y* actually existed. Each new use appropriated the basic idea and, in some measure, the authority of its predecessors while overlooking and ultimately forgetting their contexts and limits.

The adoption of carrying capacity as the core concept of range management has been treated elsewhere; here, only a summary of key points is warranted. That such a thing as a fixed carrying capacity existed for any piece of rangeland was taken as given, although researchers in more arid areas complained that determining such a number was problematic. (Not until 1961 did range scientists publish the conclusion that “Sustained grazing capacity does not exist” on the semi-desert ranges of the southwestern US. A distinction was drawn between “original” carrying capacity (before the widespread overgrazing of 1873 to 1893) and “actual” capacity; the former was taken as fixed, whereas the latter reflected current conditions and could be increased by investments in vegetation, artificial water sources or emergency forage supplies. Definitions of carrying capacity from that time strongly resemble today’s “sustainability” use that does not result in long-term impairment and the expectation was that grazing at “actual” capacity would allow natural recovery toward “original” capacity. Even “actual” capacity was deemed to be basically stable, and it was institutionalised in leases to graze X number of livestock on Y acres of land; fences fixed to the ground and credit secured against herds rendered allotments and stocking rates largely immune to adjustment.

Leopold encountered carrying capacity in 1914-15, when he worked in the Forest Service’s Office of Grazing. “The discovery would reverberate through his work for the rest of his life,” beginning with the infamous collapse of the deer population on the Kaibab plateau in the mid-1920s. After hunting was banned in the newly created Grand Canyon Game Preserve in 1905, and large predators such as wolves were systematically exterminated, the deer multiplied until they outstripped their food supply. The episode, which recurred later in Pennsylvania, Wisconsin and elsewhere, introduced an additional variable not considered in the livestock context: predators. And it provoked Leopold to take up—and in large measure create—the field of wildlife management. The Kaibab deer had increased to huge numbers and then died of starvation, but this was disputed and far from easy to explain. In a vast, rugged and nearly unpopulated area, the exact number of deaths was virtually impossible to determine and federal land managers ignored warnings about the problem for a decade—after all, this was a protected reserve, managed in large part

for the deer. Hunters would have nothing of the idea that there could be “too many deer” anywhere, and ranchers resisted the argument that predator extermination had anything to do with it.

Leopold documented different population dynamics in different species, some more stable, others highly variable, which suggested potentially different management strategies. In hoofed animals there is so far no visible evidence of any density limit except the carrying capacity of the food. A saturation point, if such a thing existed could serve as a goal, beyond which no further manipulations were worthwhile, rather like the “original capacity” of the range scientists. If saturation points did not exist, however, then understanding the factors determining carrying capacity was the key to effective management. These factors not only varied in space and time; they were affected by game populations. Overstocking range with game birds carries no invariable penalty in loss of future carrying capacity, but overstocking range with browsing mammals do. It is here that carrying capacity became a concept useful to hunting advocates:

The obvious lesson is not to let a good herd irrupt. To prevent an irruption, this herd must be kept trimmed down to a safe margin and the carrying capacity of the range built up so there is a safe margin of capacity above population. Leopold’s textbook helped launch game management on a radical new course, in which managers would treat wildlife “as a crop” that could be increased by careful observation and manipulation of environmental factors. Every range is more or less out of balance, in that some particular aspect of food or cover is deficient and thus prevents the range from supporting the population which the other aspects would be capable of supporting. Management detecting that deficiency and building it up, this is done, some other aspects will be found to be out of balance and in need of building up. Thus, one move at a time, each skillfully chosen, does the manager attack the job of enhancing productivity?

Leopold nearly achieved a complete reworking of carrying capacity, from an ideal and static norm to an inductive and dynamic guide. Working with wildlife instead of livestock, he had more latitude to accept swings in animal populations and the most vocal constituency he faced, hunters, were in support of culling in the event

of overstocking. This may explain how he could arrive at an idea of carrying capacity that would take range scientists another three or four decades to recognise. Range scientists did not embrace Leopold's use of carrying capacity, however, and when they later came to similar conclusions they instead rejected the term outright. For their part, ecologists would shortly revert to an idealist, static (or at least equilibrium-based) and quantitative conception. After all, if carrying capacity was not stable or normative, if it could not be calculated or made predictive, what did it signify?

Even Leopold seems to have fallen back into a more conventional notion of carrying capacity at times. In a lecture prepared on the eve of World War II, and not published until long after his death, he pondered what ecology could teach about politics and war. Every environment carries not only characteristic kinds of animals, but characteristic *numbers* of each. Thus the characteristic number of Indians in virgin America was small. Every animal in every land has its characteristic number. That number is the carrying capacity of that land for that species. When we arrived on the scene we raised the carrying capacity of the land for man by means of tools. He went on to venture some thoughts about human population by analogy with animals.

The approach could also be used to rationalise the wildlife impacts of large habitat alterations such as dams and irrigation projects through mitigation measures for a narrow range of target species. The unintended consequences of past management efforts based on carrying capacity constitute some of the major challenges facing today's conservation biologists. In both range and wildlife management, carrying capacity begged the question it was intended to address—that is, how many animals a given habitat could actually support *at a particular point in time*. This was the practical issue confronting managers and simply using the term implied that such a number existed and could be determined. But what if the number varied over time? Range scientists have found that many types of grassland fail to exhibit stable carrying capacities for livestock, especially in drier and more variable climates. Others have reached similar conclusions for large areas of Africa, where efforts to impose stable stocking rates have frequently backfired both socially and ecologically.

Odum extricated carrying capacity from these difficulties by collapsing the distinction that Leopold had viewed as definitive: Populations characteristically increase in size in a sigmoid or S-shaped fashion. When a few individuals are introduced into, or enter, an unoccupied area, population growth is slow at first, then becomes very rapid, increasing in exponential or compound interest fashion, and finally slows down as the environmental resistance increases until a more or less equilibrium level is reached around which the population size fluctuates more or less irregularly according to the constancy or variability of the environment. The upper level beyond which no major increase can occur (assuming no major changes in environment) represents the upper asymptote of the S-shaped curve and has been aptly called the “carrying capacity” or the saturation level.

Leopold had treated saturation points as a hypothetical possibility that awaited empirical verification (which had been achieved to his satisfaction for the bobwhite): if populations displayed the same maximum density across many different sites, then one could infer that the limit was a fixed attribute of the species. Odum asserts that such consistency had in fact “been observed again and again... regardless of whether one is dealing with fruit flies in a milk bottle or with fish in a new pond.” The universality of the sigmoid curve rested not on multiple observations of the same species but on a handful of observations of multiple species. Moreover, it was derived not from the kind of field measurements that Leopold cited “data on population growth of field populations,” Odum conceded, were “few, incompletes and hard to come by” but instead from “laboratory studies of fruit flies, flour beetles or other convenient organisms.” Convenient here referred to suitability for reproduction and observation under artificially optimised environmental conditions of temperature, food, and so forth. In such settings, “a rather sharp and definite asymptote is reached with very little fluctuation; natality and mortality being balanced so long as new media are added continually to maintain a constant environment.” Ideal and fixed environments revealed ideal, fixed carrying capacities.

Odum’s carrying capacity made it appear that the attributes of its predecessor’s concepts could be found in nature. The growth of a population in the wild could be indirectly calculated using models developed from findings produced in

laboratories, where conditions resembled those of ship-building or engineering more generally: technical control of design, inputs, execution and observation. The deer and wolves of the Kaibab, for example, could be modeled as interacting populations that rose and fell in lagged synchronicity, exhibiting a dynamic equilibrium, that is, a fixed point around which actual numbers fluctuated. The models could be modified to reflect circumstances affecting a given site and species of interest and the results could help to make decisions about management and to advance research in the new field of population biology.

Carrying capacity was now an attribute of a dynamic system rather than a ship and it was equilibrium rather than static. But it was nonetheless predetermined by its conceptual derivation to be ideal, numerical and basically stable. Dum cautioned against mistaking his model for the reality it attempted to describe. Simply “fitting” Verhulst’s differential equation was not, he acknowledged, sufficient grounds for treating the observed patterns as explained or predicted by mathematical means. It should now be emphasised that although the growth of a great variety of populations, representing microorganisms, plants and animals, including both laboratory and natural populations, have been shown to follow the sigmoid pattern, it does not follow necessarily that such populations increase according to the logistic equation. There are many mathematical equations which will produce a sigmoid curve. Mere curve-fitting is to be avoided. One needs to have evidence that the factors in the equation are actually operating to control the population before an attempt is made to compare actual data with a theoretical curve.

Environmental resistance and carrying capacity were defined tautologically; they were in fact the same concept viewed from opposite ends of an underlying, and entirely idealist, dualism of “nature” and organisms. A final irony warrants mention, since it links Odum’s carrying capacity with its antecedent use in relation to livestock grazing. “In arid areas,” he remarked in passing, “Rainfall is the chief limiting factor determining the amount of grass and thereby the number of sheep that can profitably be raised in any particular year“. This is exactly the point that more recent critics of conventional range management have made to support their contention that no such thing as an ideal, static, numerical carrying capacity exists in many rangeland settings:

Abiotic factors that are unpredictable and, therefore, effectively random (from a modeler's perspective) may override biotic interactions in determining population size at any given place and time. Odum, it seems, recognised the factual support for their point but not the point itself.

Vogt defined carrying capacity using a "bio-equation": " $C = B: E$ ," in which C stood for carrying capacity, B for biotic potential and E for environmental resistance. Biotic potential, Vogt wrote, had "an absolute or theoretical ceiling that is never reached, except under extraordinary conditions, and a very large number of practical ceilings, which were in most parts of the world, dropping lower every year... The practical ceiling is imposed by the environmental resistance, which is the sum of varying but always great numbers of limiting factors acting upon the biotic potential. The parallels with Odum's theory are striking and it should be evident from the preceding section that Vogt's "equation" was tautologous: Environmental resistance only existed by positing a theoretical limit that was itself derived from carrying capacity and from which empirical reality necessarily deviated. Vogt conceded that "the equation finds complicated expression in terms of civilised existence." But he insisted on its reality and importance and he applied it to vastly larger scales than had been attempted in range or wildlife management or in academic biology: The equation is, perhaps, oversimplified, but it expresses certain relationships, almost universally ignored, that every minute of every day touch the life of every man, woman and child on the face of the globe.

The key to understanding overpopulation is not population density but the number of people in an area relative to its resources and the capacity of the environment to sustain human activities; that is, to the area's carrying capacity. When is an area overpopulated? When its population cannot be maintained without rapidly depleting non renewable resources? (Or converting renewable resources into nonrenewable ones) and without degrading the capacity of the environment to support the population. In short, if the long-term carrying capacity of an area is clearly being degraded by its current human occupants, that area is overpopulated. By this standard, the entire planet and virtually every nation is already vastly overpopulated. Through the work of neo-Malthusian ecologists, the two post-WWII uses of carrying capacity

have blurred into one another, the more “scientific” lending academic credibility and the more popular providing political traction and hyperbole.

Determining an ideal, fixed and quantitative measure of how much X a given Y should (be able to) convey, support or produce is, it appears, an abiding aspiration for government agencies in areas as varied as taxation, resource management, planning, transportation, communications and conservation. That it has worked in certain application, generally at small spatial and temporal scales and in things or systems that are well understood and readily controlled, has ratified its use in other areas where control was desired but elusive. Even where carrying capacities have proved illusory, they have provided an appearance of objectivity, rationality and precision to policies that might otherwise have been revealed as politically or economically motivated.

Second, the history of carrying capacity sheds light on the “discursive” dimension of environmental politics. The concept has migrated through many different contexts, capitalising on the familiarity and authority of its earlier uses while apparently foreclosing scrutiny of whether the new application was appropriate or coherent. It is as though the continuity of the term itself, aided by its intuitive sensibleness, who cannot understand the idea that one’s capacity to carry something has a measurable and stable limit, has enabled its potency and persistence as it moved from one field to another. Moreover, by appearing to refer to actual relations in the world, rather than ideal constructions, carrying capacity has benefited from a kind of linguistic Pandora’s Box: Once one has used the term, one has tacitly affirmed that its referent exists, even if determining its values in a given case is a complex and difficult matter.

Third, the uses of carrying capacity have generally increased in spatial scale since the term emerged in the first half of the 19<sup>th</sup> century: from ships, to rivers and pastures, to states and continents, to the globe as a whole. Extension from one field to another has entailed expansion to larger and larger areas, or systems and the mistakes and problems created by the term whether of a practical or an ethical nature have grown correspondingly. Carrying capacity thus suggests the power of the presumption that “scientific” concepts, in this case represented by attributes of idealism, stasis and

numerical expression, are scale-independent. That a concept works at a small scale, such as a Petri dish, does not guarantee that it will work at much larger ones, no matter how scientific it may appear.

**a. Strategies for Establishing Quality Assurance in Education**

The strategies used for quality assurance in education include:

- (i) **Monitoring:** It refers to the process of collecting data at intervals about ongoing projects or programmes within the school system. The aim is to constantly assess the level of performance with a view of finding out how far set objectives are being met (Ehinder, 2001).
- (ii) **Evaluation:** This is a formal process carried out within a school setting. It is based on available data which are used to form conclusions. It could be formative or summative. The aim of evaluation, a quality assurance strategy, is to see how the system can be assisted to improve on the present level of performance (formative) (Ijaiya, 2001).
- (iii) **Supervision:** Supervision might involve inspection, but it goes beyond inspection and includes attempt at bringing about improvement in the quality of instruction. It involves staff as essential part of the process. It is a way of advising, refreshing, encouraging and stimulating staff (Onocha, 2002).
- (d) **Inspection:** Usually involves an assessment of available facilities and resources in an institution with a view to establishing how far a particular institution has met prescribed standards, it is more of an assessment rather than an improvement induced exercise (West Burham, 1994).
- (e) **Quality control:** The issue of quality control cannot be over-emphasised. It is one of the strategies for establishing quality assurance in the inferior education system at all levels. Ojedele (2007) is of the view that quality control should be of concern to the country in its drive towards technological development. For this to be successfully carried out, there is need to examine the qualification of teachers, by gender, the adequacy of the curriculum, availability of equipment in the required number as well as the proper use of the processes involved in the various skills to ensure that the finished products

are of high standard. On the qualification of teacher, ESA's (2005) findings show that about 16.7% of teachers in technical colleges for instance, in the country have B.Sc in addition to their professional qualifications in education while 22.5 and 6.5% have NCE and HND in to addition their professional qualifications in education, respectively.

- (f) **Access and equity:** Ojedele (2007) asserts that the trend of students transiting from the junior secondary school to other levels of education has not been encouraging as it has been falling short of expectation. He argues further that, the issue at the tertiary level presents a situation that calls for concern in terms of variation in access at the Universities, Polytechnics and Colleges of education and in terms of gender disparity. It is no gain saying that Universities from time have been recording higher percentage in Joint Admission and Matriculation Board (JAMB) Examination than Polytechnics and Colleges of education in Nigeria.

#### **b. Products Quality and Quality of Education**

Babalola et al (2007) considers product in industry as a definable and tangible item (output) manufactured according to specifications and ready for sale. Product, in education may be referred to as 'output', that is graduands' who are awarded certificates having fulfilled all stipulated requirements. Smith and Lusthaus (1995) view quality as excellence, which at the least is as problematic as defining equality or equity. According to them, the Shorter Oxford English Dictionary defines "quality" inter alia as "the nature, kind or character (of something); hence, the degree of excellence, etc. possessed by a thing". Therefore, if education is considered as an input-through-output system, we can begin to think about superior resources (e.g. teachers), superior processes products (e.g. graduation results) (Smith and Lusthaus, 1995). The conditionality attached to the determination of the products' quality of any educational system rests on the effectiveness and efficiency of the system. The issues of products' quality and quality of education are measurable elements that can be determined by a combination of factors. Babalola et al (2007) assert that the output indicators for measuring quality of education would be the qualifications and levels of

competence in performance of the outputs (students) using the knowledge and skill acquired. In addition, the effective performance of the outputs in the job competitive market, their impact on moral conduct and serviceability on the society are also indicators for measuring the quality of education (Babalola et al, 2007). Smith and Lusthaus (1995) state that quality or excellence is generally understood to mean attainment that is superior based on some measures. The measures stated by Nwagwu (2003) are based on:

- i. Examination results
- ii. Level of learning achieved
- iii. Quality of the facilities-number and adequacy
- iv. Quality of teachers-number, qualifications, teaching competence

Babalola et al (2007) posit that there are two broad approaches to measuring quality. One involves measuring the 'outputs' from the education system. The other involves examining the educational processes which produce these outputs. At the end, they mentioned that quality of education can be gauged through students' capacity and motivation to learn and the curriculum or the subjects to be learned. Other ways of inferring quality from the inputs side are:

- i. Teachers who know how to and can actually teach
- ii. Time for learning and
- iii. The requisite tools for teaching and learning (Babalola, et al, 2007).

The essence of the measurement is to ensure the system of education conforms to standards and the quality assurance guaranteed. Ciwar (2005) reviews quality assurance in education as involving setting standards for various processes and activities that lead to the production of graduates by the training institutions. UNESCO (1998) report that quality in education is a multi-dimensional concept that should embrace all functions and activities: teaching and academic programmes, research and scholarship, staffing, students, buildings, facilities, equipment, services to the community and academic environment.

In Nigeria, the Federal Government has established agencies to determine the quality of education at various levels. In 1985, the Federal Government promulgated

Decree No 16 on the minimum standard for primary and secondary schools nationwide. The aims of the decree are to:

- i. Provide guidelines on general and specific principles of inspection and monitoring of schools
- ii. Provide tools for evaluating the efficiency of school management
- iii. Guide proprietors in providing funds for the schools

In 1974, the National Universities Commission (NUC) became a statutory body empowered to lay down minimum and academic standards. NUC made the first attempt at setting minimum academic standards for the Nigerian Universities in 1989, followed by the first academic standard in 1990.

In order to maintain a stable and quality standard in the educational system, this body normally conducts quality assurance criteria among the existing Universities quality ranked based on the quality in each academic discipline as well as the quality of each programme. The main objective is to encourage those at the top of the table in the different disciplines to strive to maintain their level of excellence while those behind and below expectation should strive to meet up (NUC 2002).

Okebukola (2000) identifies two prominent roles being played by the NUC in conducting the quality assurance criteria in Nigeria, namely; setting of minimum academic standards for all programmes taught in Nigerian Universities and the accreditation of such programmes. The criteria for the minimum academic standard include provision of minimum floor space for lecture, laboratory facilities per student, minimum staff/student ratio for effective teaching and learning in any given discipline. It also stipulates a curriculum as well as minimum entry and graduation requirements for each discipline. The minimum academic standards documents emphasised that the 13 broad discipline areas taught in Nigerian Universities are evaluated in order to give accreditation. Progressively, the quality assurance criteria extended to the postgraduate programme in 1999. The Commission worked in collaboration with deans of postgraduate schools of Nigerian Universities to develop standards for the conduct of postgraduate programmes in the Nigerian Universities. A document titled “Guideline on Postgraduate Programmes in Nigerian Universities”

was designed primarily to ascertain quality assurance criteria for them and ensure a qualitative output from the various universities (NUC, 2004).

Educational attainment levels in Nigeria appear to be low by international and inter-temporal standards. Much of the evidence, however, comes indirectly in the form of critically low (and declining) levels of key inputs such as instructional materials (especially books, laboratory, library and technical facilities, etc), manpower (especially classroom teachers), physical infrastructure (school building and teaching aids and their maintenance) and average number of year of schooling completed per student at each level of education. The unduly high teacher/pupil ratio at all levels of education, which is below the prescribed international standards, is not because of high enrolment per se but because of inadequate supply of teaching staff in the education system. This is accounted for by poor remuneration, poor conditions of service, lack of recognition for teachers and non-professionalisation of teaching that not only discourages new entrants but also leads to high attrition rate of teachers. The distribution of the available manpower is again skewed in favour of administration duties as most teachers have abandoned classrooms for places in the education ministry, parastatals and government appointments

Quality is also undermined by inadequate surveillance by inspectorate department, as the lower levels suffer from long lags of inspection, while accreditation of courses at the tertiary level is long and far between. The low quality of learning is further exacerbated by the incessant strikes that have resulted in school closure for long periods occasioned by late/non-payment of negotiated teachers' emoluments at all levels of education and students' unrest at the tertiary institutions. For these reasons, standards are not met at each level of education to the extent that graduates of the system are being subjected to extra qualifying/remedial training before they can fit into next level of education or the industry.

### *c. NUC Accreditation Exercise of 2005*

In terms of accreditation exercise carried out by the NUC in 2005, NASFAT (2006) observes that all the private varsities licensed so far have been able to justify this approval through the accreditation of all their courses and the graduates they have

produced and the president concludes that the country requires more than the current 75 universities. Babalola (2006) maintains that the federal government alone could not shoulder the burden of education without having adverse effect on the other sectors of the economy. In his explanation, he declares that: The rot in the university system was due mainly to the severe neglect of the sector by successive administrations, adding that many of the students in the universities had no business being there. He adds that the trend all over the world today is that government alone cannot fund education and people have to pay fees... and that a situation whereby none of the nation's universities was listed among the best 200 in the world in 2005 was sad (Babalola, 2006:12).

The net effect of the various explanations above is that the nation's hope of producing globally competitive graduates is getting dimmer on a daily basis as all the public universities are approaching the brink of collapse. However, the hope of producing good and qualified candidates can be said to rest on private universities. Visits to some of these universities by Olugbile (2006) like Bowen University, Iwo in Osun State and the Covenant, Ota, Ogun State revealed that Nigerian university might one day be listed in the annual Global University Ranking. These universities, apart from having beautifully furnished physical infrastructure in serene environments, also have well-equipped laboratories, workshops and libraries. Their manageable lecturer/students ratio, the discipline of its cultured students and staff, industrial harmony and the functionality of facilities on campus are also a plus to these institutions. Though none of them writes, Olugbile (2006), "has a Nobel laureate or a Pulitzer award winner on its staff list, there are foreign lecturers on exchange programmes in these institutions". Unlike what obtains in public universities where reagents are scarce in laboratories, these universities have well-equipped laboratories (Olugbile, 2006:54).

#### ***d. NUC Accreditation Criteria***

Accreditation is an inevitable process through which minimum academic standards are attained and to globalise the academic standard being attained here in Nigeria alongside with her counterparts worldwide. By the Nigerian context, the

concept, accreditation implies a system of recognising educational institutions for an excellent level of performance, integrity and quality which enables them gain the confidence of the educational community, the public they serve and the employers of labour (NUC, 1989). Continuous improvement in the quality of teaching and learning activities is achieved through accreditation exercise which involves internal and external mechanism. The external mechanism is being represented by the NUC teams which include statutory professional bodies and colleagues from other universities while the internal mechanism is represented by academic departments, faculties, schools or colleges and the University Senate. The primary focus of the NUC is mainly to ensure that the provision of the minimum academic standards documents are attained, maintained and enhanced with the graduates assured of being adequate for employment and further studies.

The accreditation is primarily based on the following; academic content, philosophy and objectives of the programme curriculum content, admission requirements, academic regulations, evaluation of students' work, standard of tests and examinations. Student course evaluation, practical work, degree project external examination system staffing – academic staff and non-teaching staff administration of the department, staff development programme, physical facilities such as classes, lecture theatre, laboratories, workshops/studios, staff offices, safety and environmental sanitation, funding of the programme by the University, library facilities and employers rating of graduates of the programme.

The outcome of accreditation exercises can be categorised into three, namely, full, interim or denied accreditation depending on the total score. For a full accreditation status, a programme must attain a minimum of 70% aggregate score and 70% in each of the core area of academic content, staffing, physical facilities and library. Those with aggregate score not less than 60% shall be awarded interim accreditation while any programme with less than 60% is awarded denied status (NUC, 2006). Ranking of Universities is based on the academic quality of the university as an outcome of accreditation exercise.

According to NUC (2006) colleges and schools' criteria of accreditation may include evaluation of instructional delivery, adequacy of facilities and equipment,

standardised tests analysis of theses and recitals completion rates, results of admission test for students applying to graduate or professional schools, job placement rates, result of licensing examinations evaluation by employers, follow up studies of alumni and performance of student transfers at receiving institutions. Suggested criteria may be broadly grouped into five namely, academic content, management, physical facilities, equipment and funding (NUC, 2006).

### **2.3a Availability of Educational Resources**

Educational resources are the total sum of input that goes into the educational system. They are all the things that are used directly or indirectly for the purpose of supporting, facilitating, influencing or encouraging transmission or acquisition of knowledge, competence skills and essentially, training of learners.

Usually, if the input is inadequate, poor or unavailable, not only will the conversation process be defective but also the output. Conversely, if the input is available, relevant and reasonably adequate and, in addition, judiciously utilised, there is the likelihood that the output of the system will be of high standard. In other words, since a system's output is proportional to its input available for processing a school, academic carrying capacity is a function of the resources available for processing academic programmes. Academic carrying capacity is a function of the resources available for teaching-learning process in the above, that the importance of resources or input into the educational system can be understood.

Indisputable resources constitute a strategic factor in the system's functioning. They are very important in the development of quantitative education. The success of the system or otherwise depends so much on the manpower and materials made available to it. In order to achieve good academic quality, the following factors according to Nigeria Educational Research Council (2004) deserve adequate attention.

The education and training of the necessary grade of teachers with adequate knowledge of what to teach and of the methodology that is most effective followed by periods of practical experience and the time which their motivation and commitment are enhanced and they are assured of good conditions of work, regular opportunity for retraining professionals and regular job satisfaction

The quality of education will depend on the scale of equipment and how they are put to use, the equipment for the science laboratories, technological workshops, commercial and secretaries health education, music, art and drama, constitute the most important characteristics of secondary education and the creation of adequate physical facilities equipped with all the necessary books and teaching aids for the implementation of assigned educational task at appropriate levels

In the same vein, the National Policy on Education (NPE) pays considerable attention to the importance of the provision of resources. According to the policy document, education is an expensive social service and the successful implementation of educational programmes requires adequate financial provision from the federal, state and local governments. It is planned that adequate provision of equipped vocational workshops for schools and suitable textbooks, libraries and library staff in all educational institutions will be made. Also, education research centres are to be established at state and federal levels (Federal Republic Nigeria 1989).

The availability of educational resources is very important because of its role in the achievement of educational objectives and goals. The extent to which an organisation like educational institution attains her objectives is directly proportional to the educational resources available and their utilisation. Educational resources can be categorised into human, material, physical and financial. Human resources in education are the students, teaching staff, non-teaching and bursar, librarian, laboratory attendants, clerks, messengers, mail runners, gatekeepers, gardeners and cooks as well as educational planners and administrators. Material resources include textbooks, charts and maps, audio-visual and electronic instructional materials such as radio, tape recorder, television and video tape recorder. Other category of material resources consist of paper supplies and writing materials such as biro, eraser, exercise books, crayon, chalk, drawing books, notebooks, pencil, ruler, slate, workbooks and so on. Physical resources include classrooms, lecture theatres, auditoriums, typing pools, administrative block, libraries, laboratories, workshops, gymnasias, assembly halls, special rooms like sickbay, staff quarters, students' hostels, kitchen, cafeteria, lavatory and toilet.

### ***b. Financial Resources***

Financial resources are the monetary input available for and expended on the educational system. These include money allocated to education by the government such as grants, PTA levy and donations from philanthropists and internally generated funds. Individuals have perceived and acknowledged the purpose and function of resources in effective teaching and learning. Hallack (1990) emphasises that the availability, relevance and adequacy of educational resource items contribute to academic carrying capacity and that unattractive school buildings, crowded classrooms, non-availability of playing ground and surroundings that have no aesthetic beauty can contribute to poor academic performance. Fuller (1985) discovers that students who had used two or more books were almost three times better than those who had no textbooks in school.

They are usually referred to as 'cost' and "expenditure "on education.

- (a) **Cost:** According to economists, is the alternative opportunities that have to be given up when a particular choice of producing goods or rendering services has to be made. The different types of cost of education are: direct social cost, indirect social cost, direct private cost and indirect private cost.
- (i) **Direct Social Cost:** It usually refers to government financial investment, both capital and recumbent on administration and inspection of school, instruction, research library services, transport e.t.c..
  - (ii) **Indirect Social Cost:** Are the forgone benefits derivable from alternative uses of the resources expended on the provision of education by the government.
  - (iii) **Direct Private Cost:** Direct private cost in education is the one borne by individuals on tuition and other fees charged by the educational institutions on books and scholarship. The average value of this must be subtracted from the amount as fees.
  - (iv) **Indirect Private Cost:** It refers to the possible investment that an individual could have undertaken other than education.

b) **Expenditure:** Another index of measuring financial resources is a term that refers to the amount of financial input directly used by a producer in the process of production of certain goods or services or by a consumer in the process of purchasing some goods or paying for certain services. Two major types of expenditure are: capital and recurrent.

(i) **Capital Expenditure:** It refers to the money spent which brings long term benefits usually for about a decade or more. For example, new buildings such as classrooms, libraries, science laboratories, technical and vocational workshops could last four to six decades or even more. The buildings are capital projects and money spent on such a venture is regarded as capital expenditure.

(ii) **Recurrent Expenditure:** This refers to money spent on goods or services that brings short term benefits for not more than a year. For example, salaries, allowances, money spent on the maintenance of buildings, classroom, libraries, science laboratories, since such money is spent regularly every year, it is referred to as recurrent expenditure i.e one that keeps recurring.

Expenditure on education could be social or private. The social expenditure refers to the one borne by the government while the private expenditure refers to the financial responsibility borne by private individuals. The government is the major financier of education. Nevertheless, individual beneficiaries of the system have always incurred some expenditure on their education including paying tuition and other fees charged by the school, buying reading and writing materials, and making provision for school kit, paying for transportation to and from school and for meals. Before and during the era of free education, individual students would still have to make provision for their school uniforms, badges, shoes, socks and bags, transportation to and from school, kitchen utensils at school and paying for meals served at school. Private expenditure is borne through one or more of the following ways: sponsorship by self, parent's marriage mate, relations and working children. Parents might also take loans from local money lenders, relatives, cooperative societies, from philanthropists and communities.

During the first four decades of education in Nigeria, (1842 to 1882), the colonial government was passive as to what was happening in the realm of education. The responsibility of financing education was heavily shouldered by the different missions and government which started to express tacit interest in funding education with the enactment of the first Education Ordinance (1882) which contained provisions for the total maintenance and finance of schools established by the colonial government and the evolution of a system of grants-in-aid to assist missions and private schools and industrial and teacher training institutions. The ordinance was later found to be unworkable and consequently of little or no financial benefit to the schools that needed assistance. Subsequent ordinance and codes, however, proved to be workable.

Constructively, government's posture toward financing education changed considerably for better from what it was during the colonial era when compared to that of the post-independence period. Since independence, each of the national development plans placed education in its first group of priorities. Education sector gulped E69.763 million, #138.893 million and #2.464 billion respectively in the first, second and third national plan periods ( FGN 1979) in (Adeniyi1982.) Worthy of note was that during the military era, (1968 to 1978), federal government resources that went to education were second only to those of defence and were more than those allocated to other social services like agriculture and health and that education was also given the highest percentage of the total expenditure allocated to the different state governments ( Ndagi 1983).

Government financial resources on education since 1960 are quite enormous and of course one of the biggest in the whole black African continent. Yet, the funding of the educational system can hardly be given a pass mark when consideration is given to rapid increase in the number of institutions. As at 1960, there were 15, 703 primary schools and by 1971, the number had increased to 153, 324 as the poor funding of the educational system is acknowledged even by people in the corridor of power. For instance, a one-time nation's Head of State, Commander-in-Chief of the Armed Forces-, General Ibrahim Babangida- when inaugurating the National Primary Education Commission in 1989 observed that poor funding led to

the collapse of the 1976 free primary education when compared to the number of institutions of learning. The problems were compounded the more in the 1990's as a result of the nation's problem of political instability, economic depression and hyper-inflation. Yet, the financial resources have not always been adequate with the attendant result of poor quality of education and poor academic performance by students.

**c. *Material Resources***

Every institution of learning that is worth its name requires material resources. These are physical facilities or items. Generally, they could be put in three different categories. The first category comprises the basic physical structures, fixtures and fittings to make the structure usable. Items under this group include classrooms, lecture theatres, typing pools, administrative blocks, libraries, laboratories, workshops, assembly blocks or halls of residence, toilet and other plant facilities. All these buildings in which teaching-learning activities are to take place should be spacious, airy and must be in a pleasing condition. Adequate consideration should also be given to the number of pupils to be enrolled while admitting them.

Equally, furniture items for each building are important. Those used mainly by learners in the classroom are desks and benches which could be individual or dual units and in the staff rooms, chairs and tables, bookshelves, file cabinet, cupboard e.t.c. In other words, all furniture items for teachers and pupils should be suitable for respective users. Other fixtures and fittings include windows, curtains, electrical wiring and fittings, bulbs and fans.

Instructional materials and equipment include: textbooks, guides, charts, maps and corner tables. Other items are audio-visual, electronic and instructional materials such as radio, tape recorder, television, video tape recorder and cine-projector machine for showing cine films on screen. While all the instructional materials and equipment mentioned so far could be used in the teaching and learning process for almost every course, each subject has specific instructional materials.

The last category of material resources consists of paper supplies and writing materials such as biros, pencil, chalk, crayon, drawing book, eraser, exercise book,

notebooks, ink bottle or inkpot, ruler and state workbooks. In determining which of the materials are to be used, there is the need to give consideration to the type of school, subject, class work or take-home assignment as well as learner class or grade, interest, age or level of maturity. Apart from all the resources or items already mentioned above, a school in the present modern time needs vehicles for the movement of all members of the academic community to and from the school premises, type-writer, photocopier, roneo machine and the necessary software to make all the hardware useful for secretarial duties as well as computers, essentially for storage of vital information. The availability and adequacy in quantity and quality of the materials and facilities make possible a school's smooth operation and enhances effective teaching /learning activities thereby resulting in achieving higher educational attainments by the learner or success.

On the issue of facilities, the NUC report (2006) admits on a comparative basis that the facilities/carrying capacity of the universities which stood at 78 per-cent in 1979 has dropped to 69 per-cent now with the worst level of 38 per-cent recorded in 1999. In fact, inadequate funding, according to the NUC report (1994), has resulted in problems such as the breakdown and deterioration of facilities, shortage of new books and current journals in the libraries, shortage of equipment in laboratories and limited funding for research. It should be recognised that the provision of a conducive environment is a precondition for attaining the best from Nigerian academics and all those who may be thinking of their businesses. It is not that Nigerian scientists and scholars are incapable or incompetent of conducting researches, but the reason for the fault is basically lack of an enabling environment and necessary incentive.

The educational system in Nigeria has witnessed tremendous expansion within the last two decades in the midst of limited resources and dilapidated educational facilities. The education sector has not enjoyed a fair share of the total recurrent and capital expenditure of the federal Government, despite the 26% recommended by the United Nations Educational Scientific and Cultural Organisation (UNESCO). The high priority accorded education according to Longe (1985), has partly been due to the view of education as an investment. The national goal of developing the educational system in such a way as to provide a satisfactory flow of men and women

capable of acquiring the skills necessary to exploit to the fullest, the natural resources of the country makes it imperative for facilities to be abundantly available in universities. Buildings are needed to shelter staff and students, laboratory facilities are needed to generate manipulative skills in students, sports/games facilities are needed to develop the mental, social and physical aspects of the students. Educational facilities could be considered as the entire scope of physical infrastructures provided in the school for the purpose of administration, teaching and learning processes. Odor (1995) describes educational facilities as physical resources which the school administrator and his/her reference group harness, allocate, utilise and maintain for the purposes of effective school administration, teaching and learning process.

Mmou (2000) quotes Olutola (1991) as defining educational facilities as the site building as well as items such as machines, laboratory equipment, the black boards and the learner's tools. Enahwo (1989) states that instructional facilities are earlier identified with direct teaching functions. He states that they serve essentially as centres for learning and teaching in the school set up. Classrooms, laboratories, workshops and teaching studios are directly relevant. Equally important are botanical and geographical gadget, museum and zoological gardens, which are essential for practical illustration of relevant issues and concepts acquired from the classrooms. Campbell (1966) states that school facilities exist to facilitate instructions and their inadequacies usually have adverse effects on teaching/learning process. According to Ogbodo (1995), educational facilities are those materials that facilitate teaching and learning processes in the school. The school, like any other productive system requires raw materials to succeed in its transformation process. Castaldi (1977) posits that educational facilities are education facilities which enable a skillful teacher achieve a level of instructional effectiveness that far exceeds what is possible when they are not provided. By nature, educational facilities have been positively linked with students' academic performance (Bloom 1978) and educational efficiency (Zymelamn, 1973, Coombs and Hallak, 1987; Mingat and Tan 1988; Osahon (1994).

The availability of educational resources is very important because of its role in the achievement of educational objectives and goals. The extent to which an organisation like an educational institution attains her objectives is directly

proportional to the educational resources available and their utilisation. Educational resources can be categorised into human, material, physical and financial. Human resources in education are the students, teaching staff, non-teaching staff, bursar, librarian, laboratory attendants, clerks, messengers, mail runners, gatekeepers, gardeners and cooks as well as educational planners and administrators. Material resources include textbooks, charts, and maps, audio-visual and electronic instructional materials such as radio, tape recorder, television and video tape recorder. Other category of material resources consist of paper supplies and writing materials such as biro, eraser, exercise books, crayon, chalk, drawing books, notebooks, pencil, ruler, slate, workbooks and so on. Physical resources include classrooms, lecture theatres, auditoriums, typing pools, administrative block, libraries, laboratories, workshops, gymnasias, assembly halls, special rooms like sickbay, staff quarters, students' hostels, kitchen, cafeteria, lavatory and toilet. Financial resources are the monetary inputs available for and expended on the education system. These include money allocated to education by the government such as grants, PTA levy, and donations from philanthropists and internally generated funds. Individuals have perceived and acknowledged the purpose and function of resource in effective teaching and learning. Hallack (1990) emphasises that the availability, relevance and adequacy of educational resource items contribute to academic carrying capacity and that unattractive school buildings, crowded classrooms, non-availability of playing ground and surroundings that have no aesthetic beauty can contribute to poor academic performance. Fuller (1985) discovers that students who had used two or more books were almost three times better than those who had no textbooks in school.

**d. Human Resources**

Human beings constitute the key development input as producers and at the same time, the key beneficiaries of economic growth. This is because natural and physical resources would lie idle and remain unexploited without man. They are processed and developed by and for the use of human beings. In line with this argument, it is believed that without labour, all other factors of production are passive. Oladeji and Adebayo (1996) further underscore the importance of human capital in

the development process. According to them, human resources are a critical variable in the growth process and worthy of development. They are not only means but, more importantly, the ends that must be served to achieve economic progress.

It is apparent that the underdevelopment and under utilisation of the skills and knowledge of the people of a country will lead to economic retardation of such a country. This is because ignoring human capital in the growth process would mean lowering the productive capacity of such an economy, hence, reducing growth. Since a healthy and well-educated people make an economy more productive and this propels growth, human capital development is imperative. In addition, investment in human capital entails equipping people through education and training not only for employment but also to enable them perceive new opportunities, initiate and organise innovative programmes. Investment in human capital creates a broad, technologically trained human capital base well suited to rapid economic growth. Therefore, human capital formation is a concomitant if not a driver of rapid economic growth. The educational system like every social organisation whether small or big, simple or complex operates through and with people.

These people who constitute human resource in education are the students, teaching personnel, supporting staff including bursar, library staff, typist, laboratory attendants, clerks, messenger, gatekeepers, gardeners and cook as well as educational planners and administrators. True to the proponents of human capital theory, the accumulation of the physical capital alone makes little or no sense except there are human beings with the necessary skills to make use of the money and machinery. All the big classrooms, libraries, laboratories, workshops, sports complexes will be of no value if there are no people to use them. Conversely, knowledge could be imparted only if human resources are present even if material resources are not available or adequate. This perhaps explains in part why it is possible for schools in rural areas without basic material resources to still manage to record reasonably satisfactory academic achievement.

Teachers are very vital in the educational system. They are the ones who interpret the aims and goals of education and ensure that the children are educated in line with them. Since the quality of any educational output depends on the quantity

and quality as well as the level of devotion of its teaching workforce, no educational system can rise above the quality of its teachers. Schools which have qualified experienced and suitable teachers usually record high educational attainments.

In the primary educational sector, the teacher plays certain roles such as:

- (a) Impacting knowledge and to be successful in doing just that, he/she is supposed to attend seminars, workshops, conferences or undergo in-service training for necessary professional efficiency, prepare his/her lessons, teach the pupils, ensure the provision of necessary guidance for effective learning activities, set examination questions, grade examination scripts and keep different records such as attendance register, diaries, student report cards e.t.c and organise educational excursions.
- (b) Teaching the children informally. The pupils regularly observe and copy his/her attitude, manners, conduct, comportment and sense of judgment.
- (c) Ensuring a conducive climate that will make the learners have a sense of belonging in the academic community and to be highly supportive of all the school programmes, thereby enhancing effective learning.
- (d) Being involved in the institution's administration. He/she conducts assembly, oversees the organisation of clubs and societies, organises sporting activities, supervises students in societies, in different assignments and at times acts as a guidance-counsellor. He/she may rise to the position of a head of department, vice-principal or principal.
- (e) Standing in loco parentis towards the students placed under his/her care in loco parentis in Latin means, in the place of natural parents.

The growth in the number of teachers, especially the trained ones, has not been impressive. The Nigerian educational system has always faced the problem of growing number of pupils without comparable increase in the number of trained teachers. Between 1842 and 1882, the teaching work force comprised mainly the missionary, his spouse, assistant or anybody hired by the mission. No attention was given to the academic qualifications of those to stand in front of the pupils to impart knowledge to them. The effect was poor quality education as the majority of the beneficiaries of the system who could hardly differentiate their right hand from the

left were neither useful to themselves, nor to the business establishment and the colonial administration. Criticisms were raised, especially by the nationalists and the press.

Consequently, the government had to introduce some sanity into the educational system by the enactment of the first two Education Ordinances of 1882 and 1887. The present ugly situation needs to be addressed. It is only when this is done that the nation can have a trained, knowledgeable and dedicated teaching work force, and with such a calibre of professionals in the country's educational system, the problem of falling standard will become a thing of the past.

The study has identified human and material resources as the variable affecting student's carrying capacity in schools and education. The greatest problem has been inadequate funding which is not in line with rising population and inflation trend. This has worsened the state of research activities in universities as put forward by Oshuntokun (2006), under-funding remains the major hindrance to the development of the nation's university sector and by extension, national development. According to him, there is a correlation between under-funding of universities in Nigeria and national development... research findings are a catalyst of development. But, sadly, Nigeria is doing little in the area of research in the universities and in institutions designated for such functions. At a forum organised by University of Lagos to raise 500 million naira for the development of the university, Chief Olusegun Obasanjo, former President of the Federal Republic of Nigeria remarked that "universities degenerated to uncomfortable levels because of inadequate funding". It became increasingly difficult for the government alone to adequately meet the financial requirements of all the sectors of the economy.

Mostly affected was the education sector which had witnessed a rapid and massive expansion in terms of student intake and infrastructural development. A noteworthy fact is that though the amount going into university education has increased nominally, in real terms, it has fallen, which implies that inflation has not been factored into the disbursement of funds to the universities.

### ***Internal Efficiency and External Efficiency***

A commendable educational system requires an efficient management of the resources at its disposal. The term efficiency usually connotes a measurable quantity. Anderson and Mary (1966) observe that the concept of efficiency is most used by physicists and engineers who define the term as the ratio of the effective work produced, to the energy expended in producing the work. To physicists and engineers, the work produced and the energy expended are measurable quantities, efficiency, in the sense in which these authors have described it is unfamiliar to education. Why is it now appealing to education sector? Why do we need to consider the ratio of output to input in the education sector?

*Internal efficiency* refers to the flow of students through the educational system with a minimum waste of student-years. An internally efficient education system is one which turns out graduates without wasting any student -year. Cumulative repetition of students will unnecessarily increase the number of student-years and premature drop-outs will reduce outputs. The system is not internally efficient when inputs (student-years) increase without a corresponding increase in output (Those who finished successfully). Put differently, a system is efficient if the repetitions and drop-outs are minimised. This means an educational system is efficient if the wastage rate of the system is low.

Efficiency is the optimal relation between inputs and outputs. An activity is efficiently performed if a given quantity of output is obtained with minimum inputs. Conversely, there is efficiency if a given quantity of inputs yield maximum outputs. Efficiency is used to analyse production – a process of transformation in which one kind of input is transformed into another, but there is production in education also. Education is a productive activity, combining various inputs of capital and to transform a set of inputs into a set of outputs.

### ***External Efficiency***

Graduates of an internally efficient educational system may be unacceptable to prospective employers; they may be bankrupt, anti-social and uncultured. Sometimes, a pupil who completes his/her education successfully is not considered suitable for the next stage of education. This is observed in the transition from primary to secondary and from secondary to tertiary. The degree to which the education of the school output is adapted to the needs of the economy and the society is what we refer to as external efficiency. This degree is, of course, difficult to measure. A system may be internally efficient but externally inefficient. For example, children who cannot speak a correct sentence of English or who cannot even write their names correctly are sometimes certified as having passed the First School Leaving Certificate Examination. They may not have acquired much useful knowledge or gained any skill, but if they pass through school successfully, with minimum waste, the system is said to be internally efficient. Educational planners distinguish between internal and external efficiencies. The layman does not.

#### ***a. Inputs in Education and Outputs in Education***

Every year a child spends in school requires inputs. There must be the physical inputs of classrooms, desks, chairs, textbooks, stationery, sport equipment, transport equipment, teaching and learning facilities and many other consumables. There also must be the human inputs in the form of teaching time, ancillary services of administrative and technical staff as well as student time and effort. All these inputs, which can be expressed in money terms, have to be supplied every year. The cost of producing a graduate, therefore, varies directly with the time spent on the production. A synthetic indicator of educational inputs is therefore the money value of all that is spent on the education of a child in a year. This expenditure per student in a year can simply be tagged as student-year. The longer a student takes to complete a cycle of education, the more the number of student-years or the input expended on him/her. The basic unit of measurement of educational input is therefore the student-year. To measure the inputs in the education of a group of children we merely count the total number of years the group has spent in the system. Please take note; the

understanding of this concept is very important for the quantitative aspect of educational planning. The input used up in the process of educating a child, who has spent 9 years to complete primary education is "9 student-years".

It is not the counting of tangible materials or consumption of financial expenses that will be considered to be inputs but the number of student-years a pupil will need to graduate. If the money value of the various inputs is considered, it would vary from place to place and from year to year. A standard unit of measure may never be agreed upon that is and much of the computation carried out in educational planners inputs used up in the process of education are measured in terms of student-years.

The objective of an educational activity varies from group to group. Students regard acquisition of certificates and testimonials as a desirable objective. Economists would consider human resource development as a worthwhile objective. Sociologists would probably be looking at the preservation of cultural heritage as the priority objective. The clergy would consider the eternal process of superior adjustment of human behaviour to the divine plan of God as an acceptable objective. Educational planners, taking a pragmatic approach regard the production of students who successfully complete given educational cycles as the objective of education. Output is therefore the person who successfully completes given educational cycles as the objective of education. Is a child who does not reach the final year in school not an educational output? If a child drops out of school, say in primary five or six (he/she has been learning in school for about 5 or 6 years), has he/she not been processed to some extent? There are two opposing schools of thought. The hypothesis of incremental gains in knowledge claims that we acquire knowledge incrementally. We gain knowledge little by little and day by day. Life itself is a school. As long as we are in it, we continue gaining knowledge till we die. We graduate from the 'school' when we die. According to this hypothesis, a child exposed to systematic learning even for a year has gained something. In other words, he/she has been educated more than he/she would be if he/she had not been to school.

There is another counter argument put forward by the hypothesis of threshold in knowledge acquisition. The hypothesis put forward that there was nothing gained that was not lost, until one reaches certain threshold of learning. This threshold is the

point at which knowledge takes root. Until you reach a threshold where you can start to apply knowledge, acquired knowledge is transient. The situation is analogous to the first stage of Bloom's taxonomy where, what you have acquired by rote, without proper understanding may fade into retroactive obliviscence before long. Learning a foreign language is a good example. If, after learning many words of a foreign language, the threshold of communicating freely in that language is not attained, there is the likelihood of forget thing every word learnt a few years after leaving the foreign country, the proponents of this hypothesis have observed "relapse into illiteracy "among rural women who had 3 or 4 years of primary education when they were young. Their home management practices, baby care and all forms of cultural practices do not differ significantly from the practices of others who had never been to school. There were no traces of school education left in them. The proponents of the hypothesis claim that the end of each cycle of education marks a threshold in learning. Until you have reached this end you have not reached the specified threshold for that stage of education. These positions are very controversial and the point here is not to take side but to point out that planners are aware of the two arguments.

They adopt the second hypothesis only for convenience. It facilitates computation. How would one compute the output of drop-outs who never complete a given cycle? The fraction of what drop-outs have gained might be assessed, but if the idea is taken, where does one draw the line? A child who spends 3 out of 6 years has scored a half. Yes, but what if a child leaves school after spending a year a month, a day, an hour, Computing fractions of output can become ridiculous and unworkable. This is why planners recognise those who successfully, only complete given cycles as output. Note that students who do not obtain a 'pass' certificate (failed candidates) are not counted as output, even if they leave the school system. Outcome is another term used to refer to the external effect of output – that is, the ability of school output to be socially and economically productive. Here, the frame of reference is external to education.

## **2.4. Funding of University Education in Nigeria.**

### **2.4a. Financing University Education in Nigeria**

Universities in Nigeria are financed by grants provided by government, with insignificant contributions collected from students as fees. For many years, budgets of universities in Nigeria have been under enormous pressure as a result of declining budgetary allocations and increase in enrolments. According to Apea (1998), higher education's share of national education budgets initially increased in the early 1990. It grew from an average of 15% between 1970 and 1974 to 19.3% between 1975 and 79 and 19.1% in 1984. It then plunged from 17.5% between 1985 and 1988 to almost 10.5% in recent times. The decline in allocation of funds to education is aptly summarized. The state budget for eight federal universities was 85 per-cent in 1991/92 and 1993/94, the figure and estimate given was 96 per-cent. In addition to the recurrent grants from NUC, the federal universities acquire minimal income from miscellaneous sources. These sources include fees paid by post-graduate students for tuition and examination and money realised from consultancy services and firms.

Universities also differ in terms of their reliance on fees as an integral aspect of their income. Universities in Jos, Abia and Benin with large sub-degree and post-graduate programmes benefit more from tuition and fee incomes. As indicated, only 44.34 per cent, which is much less than what was requested, was released for 11 years (1990 to 2001). The subvention made available for both recurrent and capital expenditure was not up to 50 per cent and it was inadequate for the needs of the universities. Subventions were needed to purchase laboratory chemicals, maintain faculties, subscribe to international journals and periodicals, finance hostel accommodation and pay staff salaries. To enable the universities perform their roles and make up the short-falls in revenue allocation, it is necessary for the universities to explore other avenues of funding through adopting new initiatives. It is also appropriate for the universities in Nigeria to ask the Federal Government to provide part of the recurrent funds in foreign currency. This request has become necessary because the recurrent expenditure of the universities entails using foreign currency to obtain foreign journals and periodicals, build laboratories and workshops, buy teaching materials, research materials, some vital examination materials, and maintain

physical structures and equipment.

The universities in Nigeria may opt for leasing equipment and materials. In this era of dwindling financial resources in the federal and state universities, leasing can be a vital source of finance for the system as the money which would have been tied down to some assets and properties are channelled to other sectors of productive services. The most appropriate lease is the service lease because of its innovative nature and saving the universities from utilising obsolete equipment and facilities. The importance of leasing is aptly discussed by Salami (1990) who stresses that if the 'universities are to remain the "citadel" of innovation in these harsh economic times, lease option may ensure that all necessary equipment are acquired without tying down their scarce resources and suffering the consequent losses, while the savings can be channelled to research and development which are necessary for university growth. Service leasing will enable the universities in Nigeria have access to sophisticated and complex equipment at a lesser cost without the need to maintain them in the future. Also, it will conserve funds that will be deployed to vital productive sectors of the universities.

#### **4b. Analysis of Fiscal Allocation to Education**

The financial commitment of government to the educational sector between 1995 and 1996 was N2, 426 million and N3, 215.7 million respectively. It hit N10, 579.3 million in 1998 before declining to N8, 516.6 million in 1999. The capital expenditure in 2000 was recorded as N10, 529.2 million.

Recurrent expenditure on education in Nigeria also followed this same trend. It rose gradually from N3.2 million in 1970 to N522.0 million in 1976 but fell to N248.3 million in the succeeding year. In 1978, the amount expended stood at N394.7 million, dropped to N360.4 million in 1979, rose almost two folds to N712.8 million in 1981, but fell again to N511.8 million in 1982. Thereafter, the figure rose to N697.2 million in 1985, before recording another decline to N354 million in 1987. In the two succeeding years of 1988 and 1989, the respective recurrent levels stood at N1, 458.8 and N3, 011.8 million. By 1990. It increased to N3, 402.8 and fell to N1,

256.3 million in 1991. By 1993 it rose to N6,034.6 million before falling sharply to N3,602.4 in 1994. Thereafter, it rose continuously and peaked at N39,034.0 in 2000.

The macro-view of educational financial, in Nigeria could be captured by relating the total expenditure on education to the Gross Domestic Product (GDP). The emerging picture reveals that between 1970 and 1973, less than 1 per-cent of the country's GDP was expended on education thereafter, the ratio nudged upwards to peak at 4.1 per cent in 1975. By 1976 and 1977, the ratios were 1.2 and 0.5 per-cent, respectively. From 1980 up to 1987, the ratio was consistently below 2 per-cent. However, it began to rise throughout the period of analysis except for 1991, 1992 and 1994. This trend portrays inadequate situation considering the enormous need for manpower development of the country's present stage of economic development.

#### **4c. Budgetary Provision**

To have a reliable and comprehensive statistics of the funds coming from governments to the education sector has not been so easy. The fact is that both at the federal and state levels, the keeping of records on expenditure has not been taken seriously and allocations sometimes come as extra budget (Okeke, 2005 quoting Hincliffe, 2002). Nevertheless, available statistics on expenditure for education by the federal and state governments which are presented here provide some insight into the realities of funding of education:

The 2004 allocation to education was said to be N93.8billion naira of which N72.2 billion was for recurrent and N21.6billion for capital expenditures, a seemingly large sum of money. When the allocation is distributed to the various arms and levels for education to meet their various needs, the amount that finally reaches each institution becomes extremely negligible.

Reacting to the allocation to the education sector in 2004 budget, stakeholders perceived the vote as too small and insignificant to solve the problems of the sector, Alhaji Babs Animashaun expressed dissatisfaction with the allocation, stating that the vote could not adequately tackle the decay and rot of infrastructure in the system. We all know that the face-off between the ASUU and Federal Government was rooted in under-funding of education especially when compared with what obtained in other

developing countries that are even less naturally endowed. Nigeria, an oil-rich country, allocates 10.5%, 11% to education, Ghana, Namibia and Botswana allocate 26%, 22% and 21% respectively. UNESCO recommended an average of 26% of the annual budget. (Okeke, 2005).

The summary of the situation is that the education sector in Nigeria is grossly under-funded. To some extent, the Education Tax Fund has come in as a significant intervening factor, helping to provide some of the much-needed infrastructure. Education is supposed to be given the highest budgetary vote of any nation, especially where it incorporates research and development. Oluleye, (1996) stated that in the early years after independence when the regional governments were implementing educational policies in their areas, education used to get a bigger share of government expenditure, close to 50% of the budget.

The military regimes seem to have dealt the greatest blow on education in this country. During the military regime, in its erratic proliferation of higher institutions, the share of education in the national budget alternated between 20 and 25% of the national budget (Nwachukwu, 1999). At this juncture, one begins to wonder how proliferated higher educational institutions would survive and perform creditably with a dwindling budgetary share. On many occasions, some of the budgetary shares to the education sector are not met partially due to budget deficit as a result of downturn in the economy or a greater percentage of the share going to individual pockets, leaving the education sector to work with the remnants. In the policy of developed countries, provisions are made to protect education from suffocating as a result of fund either through insurance or educational reserve fund in case of budget deficit or economic mishap.

#### ***4d. Consequences of Inadequate Funding***

The present state of education in Nigeria is a regrettable one that does not cheer up anybody nor inspire one with confidence. From the primary education to the tertiary level, it is a tale of woe. The whole system has collapsed. For us to bring the picture nearest home, let us start with primary education. The pre-primary level is only available to the super rich in the urban centres. The declaration of Universal Free

and Compulsory Basic Education with advocacy programmes for enrolment has naturally increased enrolment. What do we expect? Insufficient classrooms or no classroom for pupils, no desks, no instructional materials, no learning resources such as playgrounds, limited teachers are the order of the day. The school buildings are dilapidated where they exist at all. Many children carry their desks and chairs from home to school everyday. The school facilities have decayed to a point that standard has fallen. The population of children in a class is sometimes as high as 100. Teachers are frequently owed salaries for several months hence, they are demoralised. In this type of situation, do we expect teachers to perform effectively?

Secondary education is not better in terms of problems and apathy, due of lack of finance, libraries in schools have scanty books, scientific equipment and reagents are lacking. The teachers are demoralised and discipline in many of the schools is poor. The examining bodies devised Alternative to Practical.

There are so many occurrences of examination malpractices that one cannot readily vouch for the authenticity of certificates. The quality of education on the average has fallen. Those who pass English and Mathematics at the West African Secondary School Certificate Examination for SSS 3 are on the average, much below 40% of those who put in for the subjects, so many of the students offer purely academic subjects at WASCE, simply because there are no teacher and equipment to teach the technical streams. As a result, the economy is not getting the right mix of manpower supply. Cultism is beginning to rear its ugly head even in the secondary schools. It is these students who transit into our tertiary institutions. The inadequate preparation at the primary and secondary education levels results in huge waste of funds and efforts expended on remedial programmes into higher institutions.

Omolayole (1998) asserts that tertiary education is exhausted and seems to be in a state of perpetual crises. The number of university places appears totally inadequate for those seeking admission. The facilities have decayed so much that rehabilitation is almost an impossible task given the level of the current funding, the university teachers most unhappy, dissatisfied and demoralised. Their extra-militant trade union posture has not helped matters either. The practice of two extreme types of trade union activity has produced more disaster than succour. Efforts must be made

to fashion out a level of employer relations' activity at the tertiary level that will keep the employers on their toes while not wrecking the educational system itself. A system of constant pressure could be maintained even without a strike.

The other tertiary institutions are just as badly placed as the universities. Sometimes, they are worse off in terms of funding. The polytechnics are particularly capital intensive in the Engineering disciplines. Even with 27 public universities and 57 polytechnics, the emphasis on science and technology in tertiary institutions in Nigeria is far below what is required for a technological take-off. To add to these woes, cultism is beginning to destroy the tertiary institutions. The most serious problem facing the whole educational system is a very large under-funding syndrome. Even the bitten insufficient fund made available is often mismanaged. Such is the grim state of affairs now that the future will need some drastic paradigm shift.

Tertiary institutions, where the highest manpower needs are expected to be bred, have become places of discontentment to lecturers and students. Employers describe graduates as half-baked and when they go for higher education in foreign countries, they are subjected to tests upon tests to determine the credibility of their certificates. What a shame! Can nothing be done! Should we all watch and see our educational system finally collapse? We can together examine and proffer some solutions that can at least improve the condition.

It is obvious that the level of funding in our universities is inadequate. This problem is compounded by the fact that from 1999, the federal government's budgetary allocation and provisions has been reduced from 11.12 per cent in 1999 to 1.83 percent in 2004 fiscal year. Further the NUC report (2003) indicates that for more than eleven years (1990 to 2001), no federal university was able to get 100% of the fund needed and requested for modest management.

It indicates, only 44.34 per cent, which is much less than what was requested was released for 11 years (1900 to 2001). The subvention made available for both recurrent and capital expenditure was not up to 50 per cent and it was inadequate for the needs of the universities. Subventions were needed to purchase laboratory chemicals, maintain faculties, subscribe to international journals and periodicals, hostel accommodation and staff salaries. To enable the universities perform its roles

and to make up the short-falls in its revenue allocation, it is necessary for the universities to explore other avenues of funding through adopting new initiatives.

In the bid to boost the revenue base of Nigerian universities, the government should concede lands and properties to the universities to manage and generate money. This phenomenon is not new in the world. The United States of America in 1862, through the Morrill Land Grant Act provided acres of federal land to each state for the establishment of colleges specialising in agricultural and mechanical arts. These universities were called land-grant colleges. Examples of the universities are Texas A & M University at Houston and Alabama A & M State University.

According to Anuna (2004) ,the American Federal Government offered 154 million acres of land to schools and universities. The land allocated to the states was estimated to be more than 1 billion dollars at that time. The revenue and money that accrued from selling the lands were utilised to shore-up the financial base of the universities. Units like printing press, university bookshops, bakeries, farms and guest houses subsidised from central universities funds in Nigeria should be contracted out to private management. According to Court (1998), these formerly subsidised units such as the guest houses, filling stations and farms are to be managed by the universities on commercial basis.

Another means of generating funds is to offer demand-driven academic reforms. The most effective means of attracting foreign students is to provide courses for which they are willing to pay and enroll. The universities ought to offer degree and diploma programmes in. strategic management, entrepreneurship, tourism, nursing, marine engineering, marine science, genetic engineering and many pursuits not previously available.

As Court (1998) points out, their practical and professional career purposes suggested them as an estimate of demand rather than a prescription of supply in influencing the academic curriculum. The influx of the foreign exchange paid by foreign students will boost the funds available to Nigerian universities.

To utilise available facilities and space, all Nigerian universities ought to offer courses during evenings and weekends when working people can attend. This eclecticism of course offering and flexibility of timing would attract more students.

The fees paid by the students will help in the diversification of financial resources. It is also appropriate for the universities in Nigeria to ask the federal government to provide part of the recurrent funds in foreign currency. This request has become necessary because the recurrent expenditure of the universities entails using foreign currency to obtain foreign journals and periodicals, laboratory and workshop teaching and research materials, some vital examination materials, maintenance of physical structures and equipments.

One of the fundamental funding initiatives to explore is to link the universities with the productive sector of the economy. Linkage with the productive sector of the economy include surveys, feasibility studies, logistics, advising, conducting basic research and design of prototype model of instruments, machines and equipment. It also involves a development of new technology and adaptation of old ones. Universities could also benefit from investing in equities, estates and long-term deposits. The above-highlighted initiatives of funding have been important sources of revenue in some universities. The fundamental flaw that the universities have is limited spare funds/money to invest in the economy.

The universities in Nigeria may opt for leasing equipment and materials. In this era of dwindling financial resources in the federal and state universities, leasing can be a vital source of finance for the system as the money which would have been tied down to some assets and properties are channelled to other sectors of the productive services. The most appropriate lease is the service lease because of its innovative nature and its ability to save the universities from utilising obsolete equipment and facilities. The importance of leasing was aptly discussed by Salami (1990) who stresses that if the 'universities are to remain the "citadel" of innovation in these harsh economic times, lease option may ensure that all necessary equipment are acquired without tying down their scarce resources and suffer the consequent losses, while the savings can be channelled to research and development which are necessary for university growth. Service leasing will enable the universities in Nigeria have access to sophisticated complex equipment at a lesser cost without the need to maintain them in the future. Also, it will conserve funds that will be deployed to vital productive sectors of the universities.

#### ***4e. Use of Funds in Education***

Education takes place in designated centres or schools with teachers/facilitators guiding learners through planned learning activities to achieve the stated educational goals. This can take place in a formal or non-formal school setting. There are basic requirements for the achievement of the goals stated for each level of education. These requirements include infrastructure, equipment, and instructional/teaching materials, resources for learning, personnel to implement educational programmes, teachers and support staff. Infrastructure refers to buildings, houses, classrooms, lecture rooms/halls/theatres, laboratories, workshops, administrative blocks with furniture and workbenches. Equipment includes science laboratory/workshop equipped for various forms of practical, consumable and non-consumable materials for work/skills development, computers, photocopies and communication equipment.

Learning resources include libraries, Internet facilities, and playground with standard pitches for games and sports. Personnel costs refer to emoluments for teaching and non-teaching staff of educational institutions as well as those of coordinating ministries and parastatals. These agencies are the Ministry of Education, National Universities Commission, Joint Matriculation Board and National Board for Technical Education, National Commission for Colleges of Education, Universal Basic Education Commission, and National Commission for Nomadic Education, National Mass Literacy Education and National Institute for Nigerian Languages (Okeke 2005). To meet up with all the basic needs of these agencies in the education sector, fund is needed. How do we appraise the issue of funding of education in Nigeria? Where do the funds come from? What is the mechanism for obtaining fund? We will also agree that the enormity of the funds required to keep the education sector at standard can only be imagined.

In Nigeria today, there are about 27 public universities, 57 polytechnics, 65 colleges of education, hundreds of secondary/technical schools, myriads of primary schools and non-formal education centres. All these schools require infrastructure, equipment, resources and personnel. Okeke (2005) asserts that the former coordinator of UBEC, Professor P.A.I Obanya, estimated the cost of UBE in its first nine years to

be N946, 485 billion with FGN contributing 89,297 billion naira while the states and LGAs contribute N747, 188 billion. The approved personnel costs for Federal Education Parastatals and universities were N33, 375,892.570.00 in 2004 (NUC Approp. Act, 2004). Despite what appears to be a large sum, the actual cost of meeting personnel needs of each sector is higher when we multiply the cost of the various areas of demands with existing number of educational institutions.

### **Appraisal of Literature**

The reviewed literature showed that:

- i. Resources availability are essential factors in the carrying capacity of academic programmes; Lockheed and Verspoor (1991) report that the availability of textbooks and other instructional materials has a consistently positive effect on academic carrying capacity in developing countries. According to Salisu and Olusanya (2007), the link between available facilities, the academic programme and minimum academic standard is very strong. Therefore, if we must address the issue of academic carrying capacity in the University, this link should be adequately maintained.
- ii. The quality of our graduates (products) is poor, because of the poor state of the educational resources. This is the reason why Edem (2005) advises that the quality of our products is poor and we need to get back to the drawing board.
- iii. Academic carrying capacity is highly needed in the educational system to improve the state of the system and improve the quality of our graduates. The role of the NUC in maintaining quality assurance was also reviewed.
- iv. The factors affecting academic carrying capacity include availability of adequate resource inputs and quality of human resources.
- v. Finally, the link between resource availability and academic carrying capacity in education considered in the review indicated that there is a direct

relationship between the availability of resources and academic carrying capacity from the education system.

Shelby and Heberlein (1989) outline two key components that are necessary when determining carrying capacities of universities: a descriptive and an evaluative component. The descriptive component details how a particular university works...how large is the carrying capacity of a particular university, what kind of programmes are present, how many departments are using the particular facilities, the types of activities these universities engage in and the impact of these activities. Impact can mean a various of things: the effect of the use on students, the number of departments in a given faculty or the amount of time spent waiting to use particular facilities. In the evaluative component, Shelby and Heberlein describe how a university should be managed. It is during this stage that managers determine when changes in quality of education have reached an unacceptable level. Any amount of negative change in these programmes, no matter how small, causes some damage to quality education, but when does this damage become unacceptable? It is at this point that values enter into the determination of carrying capacities.

Obanyan (1999) states that overcrowding at institutions and inadequate funding are contributing factors to the decline in the quality of higher education. In fact, inadequate funding according to the NUC report (1994) has resulted in problems such as breakdown and deterioration of facilities, shortage of new books and current journals in the libraries, shortage of laboratories and limited funding for research. The inadequate provision of resource input for the educational system has affected the productive capacity of the system and its products quality. Apart from these, there are some other factors that can contribute to the determination of the carrying capacity of any educational system. Factors such as political pressure, insufficient funds, student population explosion, and deteriorating standard of available physical facilities and students' unrest are peculiar problems in Nigeria that pose serious threats to the production of quality output in the educational system.

Akindure and Ajayi (2007) consider quality assurance as a guarantee that all necessary precautions have been taken to manufacture a certain product for the consumer. When applied to higher educational institutions, quality assurance implies

ability of the institution to meet the need, expectation of the users of main power in relation to the quality of skill acquired by their outputs.

Various scholars like Psacharopoulos, (1993); Aghenta, (1993); Adeyemi and Igbeneweka, (2000) emphasise the significance of the various categories of physical facilities towards the quality of education at the different levels of the educational system.

Hallak (1977) identifies school buildings, classroom accommodation, furniture, libraries, laboratories, recreational equipment, apparatus and other instructional materials as contributing to academic achievements. Also, Adeyemi and Igbeneweka (2000) observe that mismatch between growing enrolment and provision of facilities especially in respect of seats for students lead to overcrowding. They add that overcrowding creates undue stress on available space and results in the creation of crowd behaviour, hanging outside the classrooms and obscene activities around school premises. All these have negative effects on federal university carrying capacities in Nigeria.

Nwana (2000) opines that quality in education may simply refer to the scale of inputs (resources) in the form of funds, equipment, facilities, teachers, pupils and the like; and to the fact that the transactions and the outputs of the institutions in form of their products are acceptable, desirable, beneficial and effective from the point of view of the school stakeholders-government, society, private agencies, parents and international bodies.

Isma'll (2001) observes that the vital issue is the quality and quantity of educational system largely depend on the availability and management of the financial resources. Hans (1961:7a) has linked the quality and structure of national system to the percentage of national revenue spent on education and the system of grants adopted by the government.

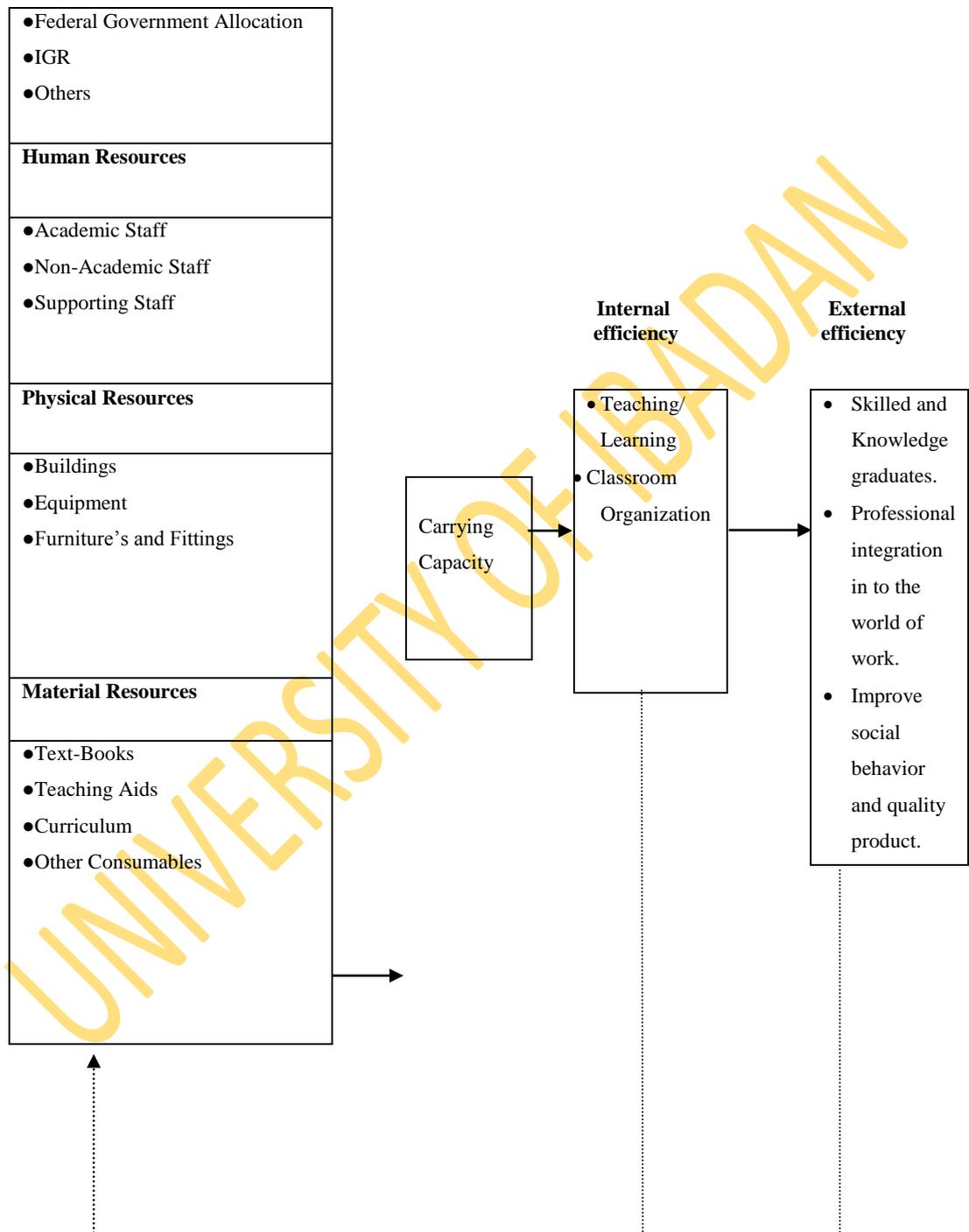
### **Conceptual Framework**

Among the major issues that are being discussed in the study are the determinants of carrying capacity of university education programme. This study was guided by principles and methodologies of resources. Resources may be classified

into four namely: financial (monetary), physical (buildings, space etc), human (academic and non-academic staff) and material (all equipment or teaching aids etc) in the university system along with programmes offered (availability of diverse programmes with up-to-date curriculum). All of these are necessary for the determination of academic carrying capacity at the university level.

UNIVERSITY OF IBADAN

**FIG 2. 1: INTERACTION OF THE VARIOUS ELEMENTS IN A TYPICAL UNIVERSITY**



Source: Adapted and modified from UNESCO 2003 and Fabunmi, 1997.

School facilities are seen in terms of permanent physical structures (from site to buildings etc) and non-permanent (Oyedeji, 1998). Campbell refers to them as consumables and non-consumables of physical plant. He states that they may be structural, motorised, typographic, natural or man-made conveniences and listed school buildings, furniture (seats, desks and chalkboards) as polities. Resources may be seen as any and all of those physical, human, financial and material resources that determine undergraduate carrying capacity of university programmes.

The basic resources are physical facilities and structures. Items under this group include classrooms, lecture theatres, typing pools, computer rooms, administrative blocks, libraries, laboratories, workshops, assembly blocks or halls of residence, toilet and other plant facilities.

Material resources are furniture, instructional materials, fixture and fitting which include windows, curtains, electrical wires, bulbs, fans, textbooks, guides, chart, radio, tape recorder, projector, television, video tape recorder, cine-projector machine for showing cine films on screen.

Financial resources are the monies available for and expended on the educational system. It usually refers to government financial investment both capital and recurrent on administration and inspection of school, instruction, research, library services and transport. e.t.c

Human resources are the people who constitute human resources in education are the academic staff, students, supporting staff including bursar, library staff, typist, laboratory attendants, computer operators, clerks, messengers, gatekeepers, gardeners and cooks as well as educational planners and administrators.

Academic staff are the cornerstone or the hub of any educational system. Inadequate teaching and non teaching staff is a bane to successful carrying capacities. Teachers are the major factors in determining universities' carrying capacities.

Physical and material resources are other predictors of carrying capacities in federal universities. Adeogun (2001) observes a significant relationship among infrastructures, instructional materials and carrying capacities.

Oni (1995) asserts that availability in quality and quantity of suitable material, physical resources and in good supply are crucial for the increase in carrying capacity.

A financial resource is the major predictor of carrying capacity. To cater for the increase in number of students and student population, there must be massive investment of resources in the form of funds to university education. Unfortunately,

all indicators point to a chronic under-funding in the university system. Nwagwu (2008) reports that this serious shortfall and inadequacies in education funding manifest in over-crowded classrooms, poorly equipped workshops, libraries and laboratories, where they exist all.

Internal Efficiency refers to the flow of students through the educational system with a minimum waste of student-years'. An internally efficient education system is one which turns out graduates without wasting any student -year. Cumulative repetition of students' will unnecessarily increase the number of student-years and premature drop-outs will reduce outputs. The system is not internally efficient when inputs (student-years) increase without a corresponding increase in output (Those who finished successfully).

UNIVERSITY OF IBADAN

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Research Design

The descriptive survey research design of the ex-post facto type was used for this study. This is because the researcher has no control or influence on the data that were used. For the research questions, simple statistics were used to determine the carrying capacities of federal universities. Regression analysis was also run on variables such as availability of fund, faculty/student ratio, faculty/teacher ratio, average number of library, book collection available per student, average number of students per seat in the classrooms and average number of students per seat in the laboratories as well as adequacy of laboratory equipment and chemicals was run. Changes in enrolment were assumed to be partially constant and directly proportional to changes in academic staff and physical facilities (especially the number of seats in the classrooms and laboratories). As a result of this, descriptive research survey was adopted to describe the status quo of determinants of carrying capacity and variables, given the state of resources in the universities.

#### 3.2 Population of the Study

The population of the study connotes the entire or sum total of the population the research covers, Bursars, Directors of Academic Planning, (DAP) Deans of Faculties and Record Officers in the 25 federal universities as at 2008. The federal universities in Nigeria that have been producing graduates at least since 2002/2003 academic year were considered in this study.

**Table 3:1 Summary of Nigerian Federal Universities (2002/2003-2007/2008)**

	S/W	S/E	S/S	N/W	N/C	N/E	Total
Conventional federal Universities	4	2	4	3	3	1	17
Specialised federal Universities	2	2	–	–	2	2	8
Total	6	4	4	3	5	3	25

### 3.3 Sample and Sampling Technique

The sampling technique was purposive in the choice of universities and stratified random sampling technique was used to select a total of six out of 25 federal universities in Nigeria on the bases of geopolitical zones. The Faculty is the most convenient academic unit for describing the variables under consideration. Provisional admissions are done by departments and within each faculty with available human and physical resources, lecturers and students are members of the various departments. A total of 70 respondents, 8 Deans of Faculties, 6 Academic Planning Officers and 56 Heads of Departments were sampled from the captive population for the study, using Stratified random sampling technique.

**Table 3.2: Sampled Federal Universities in Nigeria**

Local	Name of Federal University
NorthEast	University of Maiduguri
NorthWest	Usman Dan Fodio University, Sokoto
North Central	University of Ilorin, Ilorin
SouthWest	University of Ibadan, Ibadan
South South	University of Benin, Benin
SouthEast	University of Nigeria, Nsukka.

### 3.4 Research Instruments

The instruments used for data collected were checklists and questionnaires completed by sampled planning officers, deans of faculties heads of departments and students on university educational resources and carrying capacity.

Five instruments developed by the researcher were used for data collection in this study. These are:

- (1). Checklist on Fund Allocation.
- (2). Checklist on University Students Enrolment.
- (3). Checklist on Academic and Non -academic Staff.
- (4). Inventory on Physical Resources.
- (5). Inventory on Material Resources.

#### **3.4.1 Checklist on Fund Allocation (CFA).**

This checklist was designed to collect information on fund allocation from the bursar of the university. There are two sections in the checklist.

Section A deals with socio-demographic information such as qualification, experience, gender, name of department and faculty. Section B dwells on fund allocation to each university in a particular year.

#### **3.4.2 Checklist on University Students Enrolment (CUSE).**

This format was prepared for the university admission officer and schedule officer in the faculty/department to enter the number of (undergraduates and postgraduate) students admitted in 2008.

#### **3.4.3 Checklist on Academic and Non-academic Staff (CANAS)**

This checklist was designed to collect information on academic and non-academic staff from the Heads of Departments of the universities covered. There are two sections in the checklist. Section A deals with socio-demographic information such as highest academic qualification, experience, gender, name of department and faculty etc Section B is on staff strength.

#### **3.4.4 Inventory on Physical and Material Resources (IPAMR)**

This instrument was designed to elicit responses from the Heads of Departments of universities and students on physical and material resources. There are two sections in the checklist. Section A deals with socio-demographic information such as qualification, experience, gender, name of department and faculty. Section B dwells on physical and material resources. In this section, there are 12 items based on the Likert scale of “Available and adequate, Available but not adequate and Not adequate”. Section C centres on Material Resources, comprising 10 items based on the Likert scale of “Available and adequate, Available but not adequate and Not adequate”

### **3.5 Validity of the Instruments**

To ensure that the instruments for this study properly capture the desired items, the initial draft of the instruments was given to some members of staff and experts from the universities both in the planning and academic departments for

necessary inputs. The corrected version was vetted and necessary corrections were effected.

### 3.6 Reliability of the Instruments.

Cronbach alpha formula was used to test the reliability of the instruments. To do this, HRC, FRC, UEC and PMRC were used for various research instruments with the following reliability coefficient: human resources, 0.78, financial resources, 0.89, enrolment, 0.73; and physical and material resources, 0.86.

**Table 3:3 Reliability Coefficient of Instruments used**

	Instrument	Variable	Co-efficient
1.	HRC	Human resources	0.78
2.	FRC	Financial resources	0.89
3.	PMRC	Physical & Material Resources	0.86
4.	UEC	University Enrolment	0.73

### 3.7 Administration of the Instruments

The instrument on university student enrolment was filled by the admissions officer in each of the universities and schedule officers at the headquarters of the Joint Admissions and Matriculation Board (JAMB). The Information on Financial Resources (IFR) was also filled by the bursar and schedule officer through available records in their universities and the National Assembly Library, Abuja. The Information on Human Resources {IHR} was filled by the Heads of Departments. The information on physical and material resources were also distributed to students, Heads of Departments and Deans of faculties and collected back within the period of two weeks. All activities took place simultaneously in all the universities and collection process lasted ten weeks.

### 3.8 Method of Data Analysis

Data were analysed at two levels. The first was descriptive analysis in which percentages, Tables and simple statistics were used for the research questions and for the analysis of the research hypotheses, multiple regression was adopted to determine

the contributions of each of the explanatory variables to carrying capacity of the sampled universities. Regressions were also run for each of the explanatory variables.

One way ANOVA was used to answer Research question one, while correlation was used to answer research question two and Likert scale were used to answer research questions three and four. Further, one way ANOVA was used to answer hypothesis one while regression was run for hypothesis two. T-test was used to answer hypothesis three and one way ANOVA was used to answer hypotheses four and five.

UNIVERSITY OF IBADAN

## CHAPTER FOUR

### RESULTS AND DISCUSSION

This chapter presents the results of data analysis.

Data Presentation/Analysis: Research Questions

#### 4.1 Research Question 1:

How significant is fund allocation to the carrying capacity of university.

**Table 4.1: Fund Allocation to University**

Model	Sum of Squares	Df	Mean Square	F	sig
1 Regression	4.02E+08	1	402363446.6	6.584	0.184 <sup>a</sup>
Residual	2.81E+09	46	61116683.43		
Total	3.21E+09	47			

b. Predictors: (Constant),FINANCE

c. Dependent Variable: CARRYING CAPACITY

Table 4.1 shows that funds allocations are a significant determinant of carrying capacity at 5% level of significance. (F=6.584,  $p < 0.05$ ), suggesting that finance has significant effect on carrying capacities.

**Table 4.2: Prediction Equation on Funds Allocations**

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.
	B	Std .Error	Beta		
1 (Constant)	15381.012	2275.217		6.760	.000
FINANCE	2.164E-06	.000	.345	2.566	.014

a. Dependent Variable: Carrying Capacity

The prediction equation on Table 4.2 shows that carrying capacity would rise with increase in finance ( $\beta > 0$ )

## **Discussion of Result**

Governments in the developing world generally do not see the need to put a huge proportion of their budget into tertiary education. Education is not seen as an economically and socially productive investment. The standard argument against huge investment into this sector is the competing demand from other sectors like health, defence, transportation and similar areas of services to the economy. The questions we need to ask ourselves are many. What is the value of a good, massive and well – equipped hospital without well-trained doctors? What is the essence of the diagnostic equipment in such hospitals, without competent technicians to run them? Why won't we build roads that fail every rainy season, since there are not enough highly trained engineers to supervise them and blow whistles when contractors in construction business compromise our safety? Why do we throw money into enterprises, when the people to run them are not well-trained and are half – baked? How can we sustain a good judiciary and the courts, when the lawyers we train today are not good enough to replace the lawyers of yesterday? What is the fate of our courts in future?

Where, if not tertiary institutions, have we to train bankers, lawyers, engineers, doctors, architects, agriculturists, accountants, administrators and, teachers? No wonder, UNESCO recommended as high as 26 per-cent of GDP to be devoted in the budget to the education sector. The largest and most industrialised economies put education as number one in their budgets. Japan for example currently has education as number one sector, followed by water and then electricity.

## Research Question 2:

**Are there enough academic and non- academic staff with respect to NUC benchmark in the universities under investigation?**

**Table 4.3: Availability of academic and non- academic staff**  
**Correlations**

	CARRYING CAPACITY	HUMRES
CAPACITY Pearson	1.000	.554*
Correlation		
Sig.(2-tailed)		.017
N	48	
HUMRES Pearson	.554*	1.000
Correlation		
Sig.(2-tailed)	.017	.
N	18	48

Table 4.3: shows that a positive correlation exists between carrying capacity and human resources and this is significant at 5% level ( $r=0.554$ ,  $p < 0.05$ ). This Table shows that the  $r$  value of .554 was a positive correlation with human resources. This implies that an increase in human resources would lead to a rise in carrying capacity. In other words, if access must be expanded, more resources would be required including personnel which are important to widening access.

## Discussion of Result

The responses to the availability of quality academic and non-academic staff in the six universities show there were qualified academic staff in all the six universities but they were not adequate because some are heavy at the bottom while others are lean at the top. Enough human resources were not available across all the six universities. Though academic staffs were available in some of the universities they were not in sufficient quantities to satisfy the demand for high carrying capacity.

### Research Question 3

**How adequate are the physical facilities with respect to NUC benchmark in the universities being investigated?**

**Table 4.4: Availability of physical facilities in the sampled universities**

Availability of Facilities	Positive Responses		Negative Responses	
	N	%	n	%
Classrooms	18	60.0	12	40.0
Staff offices	19	63.3	11	36.6
Departmental Library	09	30.0	21	70.0
Computer Room	06	20.0	24	80.0
Lecture Halls	05	16.6	25	83.3
Toilet facilities	13	43.3	17	56.6
Laboratories	08	66.6	04	33.3
Workshop	05	41.6	07	58.3

N = 30

Only the department offering science based courses were expected to have laboratories and workshops. Table 4.4 shows that out of eight facilities listed, only three (classrooms, staff offices and laboratories) were fairly adequate in these institutions. This was based on the 60 %, 64% and 66.6% positive responses while other facilities that scored below 50% were rated as negative responses. This implies inadequacy of physical facilities in these universities which would affect carrying capacities negatively such that the universities would not be able to admit a good number of qualified students.

### Discussion of Result

There was no significant difference in the position of physical facilities in the sampled federal universities. This finding was not surprising because the situation in all the sampled federal universities appears to be the same. Without adequate physical facilities, one begins to wonder how effective teaching and learning will take place and the issue of carrying capacity would also be at stake. For adequate carrying capacity to be realised, the essential physical facilities must be available. Without adequate physical facilities, no meaningful carrying capacity can take place. With the

tremendous increase in enrolment, one should have expected government authorities to match this large number of students with appropriate and adequate facilities. Since it appears the problem of massification has come to stay, there is urgent need for something to be done about provision of physical facilities so that quality will not be compromised. For proper carrying capacity to take place, there must be adequate infrastructure in tertiary institutions in the country, the lecture halls are overcrowded and many students stay outside because of inadequate accommodation. Even those seated inside are not comfortable because there are no air conditioners or fans and classrooms are poorly ventilated and not well lit. Infrastructure was inadequate, there were fairly well-equipped laboratories and libraries conditions of the resources were rated the lowest which suggested that available infrastructures may not always be in good condition. This implies that physical resource was available in all the six universities but not adequate in some cases and the quantity of available resources was also not up to what was required. There were generally many lecture rooms and lecture theatres but they were not adequate when compared with the number of students utilising the facilities.

#### Research Question 4

How adequate are the material resources available in these universities compared to the benchmark prescribed by NUC?

**Table 4.5: Adequacy of material resources for carrying capacity**

Material resources	Adequate		Fairly adequate		Grossly inadequate	
	N	%	N	%	N	%
Materials for teaching	06	20.0	20	66.7	04	13.3
Books for lectures' use	04	13.3	16	53.3	10	33.3
Teaching and equipment	02	6.7	18	60.0	10	33.3
Stationery for departmental use	09	30.0	15	50.0	06	20.0
Office computers for lecturers	17	10.0	10	33.3	05	16.7
Personal computers for lecturers	20	16.7	06	6.7	04	83.3

The analysis of data collected on the adequacy of materials in these universities shows that these materials are fairly adequate while office provision and personal computers for lecturers' use are adequate. Twenty of the participants Constituting 66.7% agree that provision of offices and personal computers for lecturers was adequate.

### Discussion of Result

Material resources are another predictor of carrying capacity in the federal universities in Nigeria. A positive and significant relationship between instructional materials and carrying capacity was observed. Federal universities endowed with more material resources carried more students than universities that are less endowed. It was further noted that instructional materials increase carrying capacity of academic programmes in federal universities because they complement and supplement their effort in carrying capacity. The study reveals that availability in quality and quantity of suitable materials in supply are crucial for the carrying capacity of academic programmes in federal universities in Nigeria. The study affirms that there is a direct link between material resources and carrying capacity, adequate and qualitative facilities are required for enhanced carrying capacity of academic programmes in federal universities in Nigeria. There were instructional aids, computers, drugs, chemical, well-equipped laboratory, electricity and water though the lifespan must be considered.

#### 4.6 Testing of Research Hypotheses

**Hypothesis 1:** The carrying capacity of the universities is not different all over in Nigeria.

**Table 4.6: Differences in Carrying Capacity Universities**

	Sum of Square	Df	Mean square	F	Sig
Between Groups	2.46E+09	5	527426491.7	38.418	.000
Within groups	5.77E+08	42	13728533.94		
Total	3.21E+09	47			

Table 4.6 shows that the carrying capacities of some of the universities sampled are significantly different from one another ( $F=38.41$ ,  $p < 0.05$ ). For example, University of Ibadan, University of Ilorin and Usman Dan Fodio University's carrying capacities are significantly different from one another at 5% level that of University of Nigeria was significantly different from University of Benin's.

**Table 4.7: Universities According to Carrying Capacity**

University	N	Subset for alpha = .05		
		1	2	3
UniMaid	8	9640.88		
Usman Dan Fodio	8	15721.38	15721.38	
Unilorin	8	17888.63		
UI	8	19922.25		
UniBen	8	27518.25		
UNN	8	.078	.413	32010.50
Sig.		.337		

Table 4.7 shows the grouping of sampled universities according to their carrying capacity.

UNIMAID AND USMAN DAN-FODIO

UNILORIN AND U.I

UNIBEN AND UNN

**Table 4.8: Carrying Capacities of Universities**

The carrying capacities of the universities were as follows:

Universities	Carrying Capacities
UI	25,517
Usman Dan Fodio	11,475
UNN	25,325
UNIBEN	19,475
UNILORIN	14,300
UNIMAID	18,575

Table 4.8 shows that University of Ibadan has highest carrying capacity followed by University of Nigeria and University of Benin, next to it was University of Maiduguri, University of Ilorin and Usman Dan-Fodio was the least on the list.

### **Discussion of Results**

Teaching is the bedrock of knowledge and the quality of teaching among other things depends on the quality of teachers. The quality of teachers on the other hand is influenced by their qualifications and experience. We shall examine quality of teaching in the higher institutions in terms of its inputs. The issue of brain drains is affecting the quality of teaching negatively because it is becoming difficult to get a replacement for those who will be as highly qualified and experienced as those who are leaving. This situation is worse in disciplines such as medicine, engineering and the sciences. The rise in student enrolment has not been matched by the growth in the number of teachers available. Nationwide, the number of academic staff increases by an average of 2 per cent each year between 1988 and 1994 while students' number grew at the rate of 12 percent per year. The average teacher/student ratio was 1:14 in 1988 and was 1:21 in 1994 and increased to 1:31 in 2005 (NUC, 1995; NMB, 2006). Thus over enrolment has become a common feature in Nigerian universities. Many of the facilities on ground are being overstretched. Okebukola (2005) releases the list of overcrowded universities recently where Olabisi Onabanjo University, Ago-Iwoye topped the list with excess enrolment of 24,628 students. A development that surely will affect the quality of university education, since excess enrolment usually leads to overcrowded classrooms, ineffective teaching and examination malpractices. Overcrowded universities are even noisy, they create more non-instructional duties and paperwork and without question, they hinder teaching and learning. Overcrowding, due to inadequate of physical resources affect both classroom activities and instructional techniques.

**Hypothesis 2:** There is no significant relationship between human, financial, physical and material resources and carrying capacity in federal universities under investigation.

**Table 4.9: Educational Resources and Carrying Capacity:**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843 <sup>a</sup>	.711	.480	6515.83

a. Predictors: (Constant), YM1, FINANCE, YP1, HUMRES

Table 4.9 shows that financial, human, physical and material resources accounted for over 71% of factors responsible for carrying capacity

**Table 4.10: Factors Responsible for Carrying Capacity**

Model	Sum of Square	Df	Mean square	F	Sig
1 Regression	4.02E+08	1	402363446.6	3.078	.014 <sup>a</sup>
Residual	2.81E+09	46	61116683.43		
Total	3.21E+09	47			

a. Predictors: (Constant), YM1, FINANCES, YP1, HUMRES

b. Dependent Variable: CARRYING CAPACITY

Table 4.10: Shows that financial, human, material and physical resources jointly and significantly determined carrying capacity in the sampled universities at 5% level of significance (F= 3.078, P < 0.05).

**Table 4.11: Relative Contribution of each Variable to Carrying Capacity Coefficients<sup>a</sup>**

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std.Error	Beta		
1 (Constant)	5961.985	21976.942		.271	.797
FINANCE	3.005E-05	.000	.948	2.397	.062
HUMRES	-7.855	19.940	-.159	-.394	.710
YP1	248.080	488.952	.131	.507	.633
YM1	-671.379	590.916	-.312	-1.136	.307

a. Dependent Variable: CARRYING CAPACITY

Table 4.11 shows the relative contribution of each variable and shows that financial resources (Var.1) ( $\beta = .948$ ) made the highest contribution, followed by material resources (Var.2) ( $\beta = -.312$ ) human resources (Var.3) ( $\beta = -.159$ ) and the last is the physical resources (Var.4) ( $\beta = .131$ ) in the order of decreasing magnitude of the various contribution to student's carrying capacity.

### Discussion of Result

Hypothesis 2 shows that financial, human, physical and material resources accounted for over 71% of factors responsible for determining carrying capacity, that financial, human, material and physical resources did jointly and significantly determine carrying capacity in the sampled universities at 5% level of significance ( $F = 3.078$ ,  $P < 0.05$ ). It also showed the relative contributions of each variable that financial resources (Var.1) ( $\beta = .948$ ) made the highest contribution, followed by material resources (Var.2) ( $\beta = -.312$ ) the third is the human resources (Var.3) ( $\beta = -.159$ ) and the last is the physical resources (Var.4) ( $\beta = .131$ ) in the order of decreasing magnitude of the various contributions to universities carrying capacity.

The Table above shows that the linear combination effect of Financial Resources, Physical Resources, Material Resources and Human Resources is significant ( $F(4,31) = 5.071$ ;  $R = .629$ ,  $R^2 = .396$ ,  $Adj. R^2 = .318$ ;  $P < .05$ ). The independent/predictor variables jointly accounted for a variation of about 4% while

other extraneous variables accounted for about 96%. The significant result would not have been due to chance. This indicates that while the financial resources were found significant, others were not. Financial resources, human resources, physical resources and material resources were available but not adequate in all the six Universities. It was observed; generally that provision of all these resources determined the carrying capacities of academic programmes in all the six Universities.

**Hypothesis 3:** There is no significant relationship between enrolment and carrying capacity in the sampled universities

**Table 4.12: Relationship between Enrolment and Carrying Capacity**

Carrying capacity and enrolment	Paired Differences		Standard Error Mean	T	Df	Sig.(2-tailed)
	Mean difference	Standard Deviation				
	-9404.50	11944.43	4876.29	-1.929	5	.112

Table 4.12 Shows that there is no significant relationship between enrolment and carrying capacity (t-1.929, P > 0.05). The actual enrolment deviates significantly from the expected carrying capacity.

### Discussion of Result

The National Universities Commission (NUC) argues that owing to the abysmally low level of admission into universities in Nigeria, the answer would be found in increasing the number of universities. Reference was often made to countries like Japan with a population of 127.5 million having about 1, 223 universities, why should Nigeria with a population of about 140 million not have more than Japan. It must have dawned on NUC by now that their extrapolation has not yielded any remarkable improvement in the admission of students into new and old universities. It is obvious that the NUC had consistently reveal readiness of potential proprietors in establishing new universities without taking into account other pertinent issues in planning for the establishment of new universities. Distance from home, saturation of existing (older) universities, the choice pattern of potential students, carrying

capacities, staffing, etc. are all factors that must be taken into account. Ironically it is the same NUC that sets a limit to the number of students to be admitted into each University based on their assessed carrying capacity. Meanwhile, it is the same NUC that would turn round and lament over the low enrolment of students. The number of universities in the country may be an answer to the high demand for University Education and this may be a reflection of the society's demand for higher education. However, our experience in Nigeria today seems to suggest that not much planning had gone into widespread establishment of universities in the country. The institutional carrying capacity to absorb demand is weak and many who qualify in JAMB examinations cannot be admitted, as existing enrolment levels have exceeded available facilities. Presently only 12 to 15 per-cent of those who qualify secure admissions.

For example, for the 2008/2009 admissions, about 1.3 million were reported to have sat for the JAMB examinations; a little over 900,000 results were released. The total number of students to be admitted into all Nigerian universities (federal, state and private) was given as 183,000 by NUC based on assessed carrying capacities. The worst scenario is to assume that only 450,000 passed the examinations, this implies that about 267,000 candidates will remain unplaced after admitting the NUC, figure of 183,000

**Table 4.13: Differences between Enrolment and Carrying Capacities**

Universities	Enrolment	Nos of Academic Staff	Carrying Capacity	% Over-Enrolment
Unimaid	34,549	743	18,575	47
Unilorin	20,173	572	14,300	30
Usman Dan F	16,022	459	11,475	28.4
UI	19,240	1,343	25,517	31.6 underenrolm
Uniben	29,685	779	19,475	34.5
UNN	36,051	1,013	25,325	30.2

Table 4.13 shows the carrying capacities of each of the sampled universities. It reveals that five out of six universities carried more than the expected carrying capacity. University of Maiduguri enrolled almost double the expected carrying capacity, its capacity was 18, 575, whereas enrolment as at 2008 was 34,549. It carried

additional 15,974 candidates, an excess of 47%. University of Ilorin was expected to enroll 14,300, instead their enrolment as at 2008 was 20,173 excess enrolment was 5,873, excess of 30%, Usman Dan-Fodio had an excess enrolment of 4,547, excess of 28.4%, University of Benin had over-enrolment of 10,210 an excess enrolment of 34.5%, and University of Nigeria had excess enrolment of 10,726, excess of 30.2%, whereas University of Ibadan had 6,277 more vacancies to exhaust their carrying capacity, which represented 31.6% unused vacancies.

**Hypothesis 4:** There is no significant difference in supply of academic and non-academic staff.

**Table 4.14: Differences in terms of academic and non academic staff**

	Sum of Squares	Df	Mean square	F	Sig
Between Groups	802830.0	5	160566.000	108.613	.000
Within groups	17740.000	12	1478.333		
Total	820570.0	17			

Table 4.14 shows that some universities were significantly different in terms of available academic and non academic staff (F=108.613, P < 0.05).

**Table 4.15: Grouping of universities in terms of academic and non academic staff**

University	N	Subset for alpha = .05		
		1	2	3
USMAN DAN FODIO	3	481.67		
UNILORIN	3		686.00	
UNIMAID	3		769.67	
UNIBEN	3		797.00	
UNN	3			1032.00
UI	3	1.000	.090	1115.67
Sig.				.285

The grouping on Table 4.15 shows that Usman Dan-Fodio has the least mean human resources. A positive correlation existed between carrying capacity and number of academic staff. The result shows that Usman Dan-Fodio University had the least number of academic staff followed by UNIMAID, UNIBEN and UNILORIN. UNN is in the 3<sup>rd</sup> group with UI having the largest mean human resources.

### Discussion of Result

Teachers are the cornerstone or the hub of any educational system. The National Policy on Education states: “no education system can rise above the quality of its teachers” (FGN, 2004:70). The qualifications and experience of teachers is a prerequisite to the quantity of carrying capacity. Inadequate teaching and non-teaching staff is the bane to successful implementation of carrying capacity and teachers are the major factor in carrying capacity. Teachers are the pivot of any educational system, upon their number; their quality and quantity depend on the success of any academic programme’s carrying capacity. High student-teacher ratio was observed in some of the sampled federal universities. This is as a result of non-recruitment of additional teaching staff to meet up with the increase in enrolment, which in turn affects academic programmes’ carrying capacity. One of the reasons for formulation of principles of carrying capacity in Nigerian universities is due to severe shortage of teaching staff. Report from NUC, (2006) shows that only 16,856 out of 72,704 staff in the federal universities are academic staff. Many universities in Nigeria are bottom heavy in terms of academic staff mix.

**Hypothesis 5:** There is no significant difference in financial allocations to universities.

**Table 4.16: Differences in terms of financial allocation**

**FINANCE**

	Sum of Square	Df	Mean square	F	Sig
Between Groups	2.57E+19	5	5.144E+18	3.591	.009
Within groups	6.02E+19	42			
Total	8.59E+19	47	1.432E+18		

Table 4.16 shows that at least one university was significantly different from the other in terms of funds allocation (F=3.591, P<0.05) The Table also shows that Usman Dan Fodio has the least funds allocation followed by UNIMAID, UNILORIN, UNIBEN and UNN and U.I having the largest mean funds allocations. Fund allocations are a significant determinant of carrying capacity at 5% level of significance. (F=6.584, p< 0.05) Finance had significant effect on carrying capacity

**Table 4.17: Grouping of Universities in Terms of Fund Allocation**

University	N	Subset for alpha = .05		
		1	2	3
USMAN DAN FODIO	3	481.67		
UNILORIN	3		686.00	
UNIMAID	3		769.67	
UNIBEN	3		797.00	
UNN	3			1032.00
UI	3	1.000	.090	1115.67
Sig.				.285

The prediction equation on Table 4.17 shows that carrying capacity would increase with increasing finance ( $\beta > 0$ ).

## **Discussion of Result**

The results obtained clearly revealed that adequate funding had not been provided for the universities sampled. The result showed that fiscal allocation was a significant determinant of carrying capacity and at least one university is significantly different from the other in terms of fund allocation and carrying capacity. Very little funds are allocated to capital expenditure, over 80 per-cent of funds in most cases is allocated to salaries and wages; an insignificant amount goes to overhead and much less to capital projects, training and research. Inadequate funding resulted in poor salaries and other emoluments, decayed and inadequate infrastructure facilities overstretching of services, poorly maintained and sustained municipal services and poor funding of research. All these weaken institutional carrying capacity of academic programmes in federal universities in Nigeria. There was negative significant relationship between financial resources and carrying capacity. The maximum rate at which a university can increase the carrying capacity is when financial resources are increased. Determining carrying capacity of University academic programmes were based on fiscal allocation to the University. One of the greatest challenges that appear to face the Nigerian universities is that of under funding. Finance is so crucial to any organisation as it continues to dominate discussions on state of university education in Nigeria. The establishment and running of tertiary institutions are capital-intensive. Running institutions, therefore, require significant investment in providing and maintaining a basic level of infrastructure – such as facilities, staff salaries and residential housing. Universities in Nigeria have been supported largely by government in times past but with economic downturn, Nigerian universities have been grossly under-funded and this had invariably led to the quality of university education being adversely affected. Some of the universities in Nigeria are characterised by poor infrastructures, overcrowded classrooms, incessant strike and students' unrest.

### **4.3 Summary of the Findings**

The findings of the study reveal the following:

The results obtained in Table 3.3 clearly reveal that adequate funding had not been provided for the universities sampled. There is inadequacy of fund in these universities.

The result shows that fiscal allocation is a significant determinant of carrying capacity.

The results show that at least one university is significantly different from the others in terms of fund allocation and carrying capacity.

The result shows that financial resources, human resources, material resources and physical resources jointly and significantly determined carrying capacity in sampled universities.

A positive correlation existed between carrying capacity and number of academic staff.

The result shows that Usman Dan-Fodio University had the least number of academic staff followed by UNIMAID, UNIBEN AND UNILORIN. UNN is in the 3<sup>rd</sup> group with UI having the largest mean human resources.

There is no significant difference among the universities in terms of physical resources and carrying capacities.

There is no significant difference in terms of material resources and carrying capacity.

There is no significant difference between their present enrolment and their carrying capacity. The actual enrolment did not deviate significantly from the expected carrying capacity.

The result shows that increase in carrying capacity led to increase in enrolment.

The carrying capacity of some of the universities sampled was significantly different from one another

The University of Ibadan, University of Ilorin and Usman Dan Fodio University's carrying capacity are not significantly different from one another. University of Nigeria is not significantly different from UniBen;

There are fairly adequate academic and non-academic staff in the universities investigated when compared with their carrying capacities.

The quantity of physical facilities available in the universities investigated are fairly adequate with their carrying capacity.

Material resources are fairly adequate in these universities.

Carrying capacities required enough human and material resources.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary of Discussion**

This study investigated the availability, adequacy and state of facilities in the universities in the six geo-political zones in Nigeria and direct on the determinants of carrying capacity of academic programmes in selected federal universities in Nigeria. The results obtained clearly revealed that adequate funding had not been provided for the universities sampled. The result shows that fiscal allocation is a significant determinant of carrying capacity. It also shows that at least one university was significantly different from the others in terms of fund allocation and carrying capacity. Very little funds are given to capital expenditure, over 80 per-cent of funds in most cases go to salaries and wages; an insignificant amount goes to overhead and much less to capital projects, training and research.

There is negative significant relationship between financial resources and carrying capacity. The maximum rate at which a university can increase the carrying capacity is when financial resources are increased. Determining carrying capacity of university academic programmes are based on fiscal allocation to the University.

#### **5.2 Conclusion**

The study reveals the major factors that were responsible for determining carrying capacity in Nigerian federal universities, which included adequate financial resources. It also reveals that a great deal of attention showed to be focused on our federal universities if they are to would produce the required knowledge workers with quality and quantity of teachers that Nigerian needed. Adequate lecturers needed to be recruited and better remunerated, teaching resources (physical and material) needed to be provided and constantly updated; more funds should be allocated and each department encouraged in generating funds using their specialised knowledge. If these salient-issues are properly addressed, carrying capacity and attainment of optimal results would be acquired in our federal universities.

The results of this study have shown that some of the universities did not strictly comply with the directives of the 'NUC' on "carrying capacity" and "Bench Mark" because of pressures from outside sources. Ensuring strict compliance with these directives and adequate funding are the only ways of restoring these universities

to their past slowly or even while high standard level. Generally, universities in Nigeria are losing their capacities at a fast rate and it is high time something should be done to correct the situation. The issue of poor funding, insufficient and dilapidating facilities, brain drain, and influence of politics, among others, all of which have led to poor carrying capacity should be curtailed so as to produce a conducive environment for both staff and students.

### **5.3 Recommendations**

Based on the findings, it was recommended that:

If carrying capacity must continue to rise rather than decline, the funding of federal universities should be improved and proper consideration should be given to the provision of educational resources in the annual budget by the government.

Attention should be given to the provision of facilities such as conducive offices, instructional materials, classrooms, laboratories, electricity, water, road network and information services.

There must be cost sharing among stakeholders. The three stakeholders we have to address directly are.

- a. The government
- b. The parents
- c. The university authorities

Starting from the government, what proportion of the cost should the government fund? It is clear that the answer cannot and will not come readily. This is the point where dialogue and peaceful negotiation are crucial. This exercise is important and should not be left to the workers' unions or students' unions. It is the business of the entire citizenry to be carried out by their accredited representatives. It is one negotiation where every interest group must see itself demanding for better education for the society and the future of this country.

Workshops are to be organised for administrators of these universities on the importance of strict compliance with the NUC directives on carrying capacity. The NUC should enforce compliance with the minimum academic standard (MAS) specifying the quantity and quality of staff, students and facilities

If universities must prosper and meet the challenges of the 21<sup>st</sup> century, carrying capacity must be taken serious through appropriate planning and evaluation. Paying lip service to university education must be discouraged in all its ramifications.

#### 5.4 Implication of the Study

The implication was that the money voted for university education is not adequate to provide necessary facilities. It means inadequacy of any category of educational resources (human, financial, material or physical) could lead to overcrowding, stress, unruly behaviour, distractions and low quality of educational products. Universities may not strictly comply with, the directives of NUC on “carrying capacity” and “Bench Marks” because of inadequate funding and serious pressures from outside sources. Ensuring strict compliance with these directives and adequate funding are the only ways of restoring these universities to their past level.

#### 5.5 Suggestions for Further Research

1. This study was carried out in only six federal universities in the six geopolitical zones, further studies could be carried out in all the federal universities in Nigeria.
2. A comparative study of this kind can be conducted in both state and private universities.
3. This study could also be carried out in the developed parts of the world for comparative analysis, and to understand how these countries progress with their carrying capacity.

#### 5.6 Contributions to Knowledge

The study used system model to explain the relationship among carrying capacity, internal and external efficiency in federal universities in Nigeria.

The study has determined the carrying capacity of Universities sampled as follows:

Universities	Carrying Capacities
1. UI	25,517
2. Usman Dan Fodio	11,475
3. UNN	25,325
4. UNIBEN	19,475
5. UNILORIN	14,300
6. UNIMAID	18,575

The study observed that fiscal allocation is the major determinant of carrying capacity and there is inadequacy of funds in these universities and out of all the resources, financial resources are needed most.

The variables that determined the carrying capacity of federal universities academic programmes are stated in this order, the first of all is the financial resources followed by human resources next to it is the physical resources and lasts is the material resources

UNIVERSITY OF IBADAN

## REFERENCES

- Adedeji, S. O. and Bamidele, R. O. 2003. Economic impact of tertiary education on human capital development in Nigeria. In Human Resource Development in Africa. Ibadan: The Nigerian Economic Society, Selected Paper for 2002 Annual Conference.
- Adedipe, N.O. 2007. University quality assurance, funding strategy and task allocation being paper presented at the workshop on Tertiary Education Financing, University of Lagos on April 23-24.
- Adeogun, A. A. 2001. The principal and the financial Management of public secondary schools in Osun State. Journal of Educational System and Development. 5(1), pp. 1 - 10.
- Adeogun, A. A. and Osifila, G. I. 2008. Adequacy of education resources for quality assurance in public college of education in Lagos State. In Towards quality in African higher education. Babalola J. B., Labode Popoola, Adams Onika, Soji Oni, Wole Olatokun and Rosemary Agbolahor Eds. Ibadan: Ibadan: Herpnet pg 59-75.
- Adeyemi, J.K. and Iginekweka, V.O. 2000. Sitting space utilisation in Nigeria universities: a case study of the University of Benin. J. Tech. Educ.4(1) : 12-23
- Agwaranze, N.D.I. 2007. Administering curriculum in higher education towards balanced development in Nigeria. Rationale and Challenges. In Access, Equity and quality in higher education. Babalola, J. B. Akpa, G. O.; Ayeni, A. O. and Adedeji S. O. Eds. NAW Publication. Pg 233-240.
- Ajayi T. 1999. Sustaining education at all levels in the 21<sup>st</sup> century! Meeting the needs for Human and material resources. In Enhancing quality education in Nigeria. Oderinde B. B. and Okunneye R. O, Eds. Ibadan, Gabester Educational Printers.

- Ajayi, T. and Adegbesan, S.O. 2007. Quality assurance in the teaching profession. Paper presented at a forum on Emerging Issues in Teaching Professionalism in Nigeria (14-16 March) Akure, Ondo State.
- Akindutire, I. O. and Ajayi, I. A. 2007. The unresolved issue of quality assurance in Nigerian universities. Journal of Sociology and Education in Africa. Vol. 6 Nos.1. Pg 13-26.
- Akinwumi, F. S., Isuku, E. J. and Nze, D. I. 2005. University education deregulation in Nigeria: pros and cons. In *Deregulating the provision and management of education in Nigeria*, Akpa G. O., Udo S. U. and Fagbamiye E. O. Eds Jos. The Nigerian Association for Educational Administration and Planning (NAEAP).
- Akumah, E. 2005. Deregulating the Provision and Management of Education in Nigeria. In Akpa G. O., Udo, S. U. and Fagbamiye (Eds) *Deregulating the Provision and Management of Education in Nigeria*. The Nigerian Association for Educational Administration and Planning (NAEAP), Jos.
- Alele Williams, G. 2004. Shaping a new action for a more functional and qualitative education in Lagos State. A paper delivered at Excellence Hotel on 6<sup>th</sup> July/ Planning, Awka.
- Apea, E. 1998. *The State of Education in Nigeria*. Lagos, UNESCO Lagos Office.
- Arikewuyo, M.O. 2004. Effective funding and quality assurance in the Nigerian education system. A paper presented at the 1st National Conference of the Institute of Education, Olabisi Onabanjo University, Ago-Iwoye Jan. 12-15.
- Babalola, J.B. 2006. Babalola canvases differential fees in varsities. *The Punch Newspaper*, March 14.
- Babatope, B. A. 2010. Problems of facilities in south-west and Nigerian universities and the way forward. Journal of Education Administration and Policy Studies. Vol. 2(2) pp 039-043.

- Baiki, A 2009. The evolving crises in the credibility of Nigeria's ivory towers. The National Scholar. March.ISSN: 1596-4868.
- Behinke, R.S., Cooners, I. and Kerven, C. Eds.1993. Range economy at disequilibrium: new models of natural variability and pastoral adaptation in African Savanna, London: Overseas Development Institute
- Bello, M. 2009. The state of the Nigerian public universities. A publication of the office of the NUC.htm pg 1-5.
- Bogue, E. and Hall, K. 2003. Quality and accountability in higher education. Routledge, London.
- Ciwar, A. M. 2005. Teachers registration council of Nigeria and quality assurance in teacher education. Paper presented at the Committee of Deans of Education in Nigerian Varsities, University of Ilorin.
- Court, D. 1998. *Financing Higher Education in Africa. Makerere, the Quiet Revolution*. The World Bank and Rockefeller Foundation Washington, DC. Current Collapse, Future Potential. Educational Research 57, 3, Pg 255 - 295.
- Dada, J. A. 2004. Access to education in democratic Nigeria: issues and problems. In *Education for sustainable democracy: the Nigerian experience*, Uya, O. E. Denga D., Emeh, J. and Okoro, J. (Eds) Calabar University of Calabar, Press.
- Deji- Folutile, B. 2006. Education: panacea for decay. *The Punch Newspaper*. March 14.
- Dimson, J. N. 2007. Assuring quality in assessment of students' learning in university. In Babalola, J. B.; Akpan, G. O.; Ayeni, A. O. and Adedeji, S. O. Access, Equity and Quality in Higher Education, NAEAP Publication Pg 263-269.
- Edem, N.J. 2005. It's a Shame that Our Graduates cannot defend their Certificates. *The Punch Newspaper*, December 4.

- Edwards, R.Y. and Fowler, C.O. 1955. The concept of carrying capacity. Twenty North American Wildlife Conferences.
- Ehiametalor, E. T. 2005. Issues of Access , Equity. and private sector participation in the deregulation of education. *Deregulating the provision and management of education in Nigeria*. The Nigerian Association of Educational Administration and Planning, (NAEAP). Jos.
- Ehinderu, S. 2004. Accountability and quality assurance in Nigerian education. Paper presented at the International conference of the Institute of Education, Olabisi Onabanjo University, Ago - Iwoye. (Jan 12th - 15th).
- Ehrlich, P. R. 1990. The population explosion New York. Simon and Schuster, PP.38-39 (emphasis in original)
- Ekaette, U. 2006. Ekaette tasks varsities on quality graduates. The Punch Newspaper, February 12.
- Ezekwesili, O. 2006. Improving quality of our universities. A Publication of the Office of the Executive Secretary, Federal Ministry of Education, Abuja.
- Fabiyi, A. and Uzuka, N. 2008. State of physical facilities in Nigerian universities: implication for repositioning tertiary institutions for global competition. In J. B. Babalola; Labode Popoola; Adams Onuka; Soji Oni; Wole Olatokun and Rosemary Agholahor. Eds.
- Fabiyi, A. I. and Oladipo, S. A. 2008. Resource and policy as determinants of access to university education in Nigeria. Journal of the World Universities Forum. Vol 1 Nos. 4
- Fabunmi, M. 2005. Trade-off issues amongst access, equity, autonomy, quality and sustainability in deregulated Nigerian University Education. In *Deregulating the provision and management of education in Nigerian*, Akpa G. O. Udo, S. U. and Fagbamiye, E. O. Eds. Jos. Nigerian Association for Educational Administration and Planning (NAEAP).

- Fadokun, J. B. 2005. Educational assessment and quality assurance implication for principal instructional leadership roles. Paper presented at the 31st annual conference of International Association for Educational Assessment 4-9 September, Abuja.
- Fafunwa, A.B. 1991. Financing Nigerian universities. *Sunday Times*. October 24.
- Federal Republic of Nigeria. 2002. Approved minimum academic standard in science for all Nigeria universities. October.
- NUC. 2002 Approved minimum academic standard in engineering and technology for all Nigerian universities. October.
- Federal Republic of Nigeria. 1987. *Report of political bureau*. Abuja: MAMSER Production.
- Federal Republic of Nigeria. 1996. *The Federal character official gazette*. Abuja: FGN.
- Federal Republic of Nigeria. 2004. *National Policy on Education*. Lagos; NERDC Press.
- Frashuddin, M. 2005. Accreditation for quality assurance in higher education. Panorama Internet edition: The independent.
- Getz, D. 1987. Capacity to absorb tourism concepts and implication for strategic planning. *Annals of Tourism Research*. 10(2), 239-261.
- Glover, J. 1863. On the statistics of tonnage during the first decade under the navigation law of 1949. *Journal of the Statistical Society of London* 26 (1) 1863, D, 17.
- Hallak, J. 1997. Investment in future: setting educational practice in developing world. Paris UNESCO, International Institute of Educational Planning
- Harold, A., Dawlsen, J. R. and Fred, N. Ares. 1961 Trends in carrying capacity and vegetation on South-Western Range. *Journal of Range Management* 14(2)

Hinchliffe, K. 1987. *Higher education in Sub-Saharan Africa*. London: Croom-helm Pub.

Ijioma, M.E. and Osagie, R. O. 2005. Strategies for CPA in higher education. Nigerian Journal of Educational Administration and Planning. NAEAP, 5 (2), July.

International Colleges and Universities. 2010. *Colleges and universities in Nigeria*.

Isuku, E.J. 2007. Providing an enabling framework for increasing access to higher education in Nigeria: the evolving role of government In Access, equity and quality in higher education. Babalola, J.B; Akpa, G.O; Ayeni, A.O. and Adedeji S.O. Pg. 121 – 130.

Iyaiya, Y. 2001. From quality control to quality assurance: a panacea for quality assurance in Nigeria, in Current issues in education management in Nigeria, Nwagwu, N. A.; Ehiamentor, E. T.; Ogunu, M. A. and Nwadiani, M. NAEAP Publication.

Jaiyeoba, A. O. and Atanda, A. I. 2007. Enhancing the quality of graduates of colleges of education: a means to achieve effect of nation building in Nigeria, in Babalola, J.B, Akpa, G. O., Ayeni, A. O. and Adedeji, S. O. Access, equity and quality in higher education. NAEAP Publication Pg 296-314.

Jega, A. M. 2009. Towards resolution of the crisis in the Nigerian university system. The National Scholar. March. ISSN: 1596-4868.

Jhingan, M. L. 2000. The economics of development and planning. New Delhi. Vrinda Publications Ltd.

Jimoh, B. O. 2007. The need for quality assurance in university education in Nigeria. In Access, equity and quality in higher education. Babalola J. B., Akpa, G. O, Ayeni, A. O. and Adedeji, S. O. Nigeria Association for Educational Administration and Planning (NAEAP) Publication, Pg 335-342.

- Kaplan, D. 2003. Education is not a commodity. A Paper presented at the international conference against Deregulation held in Berlin, February, 2002. The State of University Education in Nigeria, Abuja.
- Karl, S., 1994. Human geography and “new ecology” the prospect and promise of integration. Annals of the Association of American Geographers 84 (1) Logan: Utah State University Press.
- Leopold. 1993. Game Management, New York: Charles Scribner sons,
- Longe, R. 1985. Factors influencing current cost of secondary education in Oyo State of Nigeria. Unpublished Ph.D thesis, University of Ibadan.
- Maduwesi, E. Y. 2005. Benchmarks and global trends in education. Benin City: Zekol Graphics. Mission World Declaration on Higher Education for the 21<sup>st</sup> Century and Framework for Priority Action, for Change and Development in Higher Education, UNESCO Paris.
- Makoju, G.A.E, Nwangwu, R, Abolade, J. and Newton, P. 2004. Towards improved quality assurance system for Nigerian schools. Federal Ministry of Education, Abuja.
- Meine, C. 1988. His life and work. University of Wisconsin press, p. 136 Michigan Department of Natural Resources Website ([http://www.michigandnr.com/publicactions/pdfs/wildlife/viewingguide/image/eco carrying capacity. Jpg](http://www.michigandnr.com/publicactions/pdfs/wildlife/viewingguide/image/eco_carrying_capacity.jpg)).
- Mingat, A and Tan, Jee-Peng. 1988. Analytical tools for sector works in education. Baltimore: The Johns Hopkins University Press.
- Mmou, R. and Olutola, A. 2000. Supervision, utilisation of facilities in vocation education. London: Macmillan Press limited.
- Mohammed, M.O.B and Gbenu, J.P 2007. Public universities on the brink of collapse in Nigeria : private sector participation as a way out. In Access, equality and quality in higher education. Babalola, J. B, Akpa, G.O, Ayeni, A.O. and Adedeji S.O. NAEAP, publication.

- Mohammed, N. S. 1998. Equality of educational opportunities as a critical factor in national development: problems and prospects, In *Gombarau*, 2, (1), Mohammed B, Obi, E. O. Gayus, B. J, Kastina, M. N. and Agbo, J. A. Eds Katsina.
- NASFAT Society. 2006. Comments on the state of the nation for the first quarter. *The Punch Newspaper*, March 20.
- National Universities Commission. 2003. *Annual Statistical Reports (1990-2001)* Abuja.
- NUC. 2006. List of Nigerian universities. September.
- NUC. 2004. The role of national university commission in quality assurance in Nigerian universities. *Nigerian University System* 12 (1):2.
- NUC. 2006. Webometric Ranking of World Universities: Matters Answering, *Monday Memo NUC*. Abuja, Vol. 5 (11); 1-10.
- NUC. 2006. Counting the blessings of the Obasanjo administration to the Nigerian university system. *A Memo*.
- NUC. 2006. Varsity student enrolment grows by 1200 per-cent in 27 years. *The Punch Newspaper*. March 28.
- Nwawenda, T. S. and Nwawenda, B. B. 1987. School facilities and pupils' academic achievement *Comparative Education*. 23, 225-235.
- Obayan, P. A. I. 1999. Higher education for an emergent Nigeria. 50th Anniversary Lecture, Ibadan: University of Ibadan.
- Ocho, L. O. 1988. *The philosophy of education for Nigeria*. Enugu: Harris Printing and Publishing Company, Ltd.
- Odum, E.P. 1953. *Fundamentals of Ecology*. first edition. W.B Sannders Company, P.T 122-125

- Ojedele, P.K. 2007. Vocational and technical education in Nigeria: Issues and challenges. Paper presented at the international conference of the Nigerian Association for Educational Management Administration and Planning (NAEAP) held at University of Lagos (24- 27 Sept.).
- Okebukola, P. 2004. Essential features of the Nigerian university system. A paper Presented at the workshop for New Governing Councils of Federal Universities. Abuja 1<sup>st</sup> June.
- Okojie, J. A. 2010. System and strategies for funding Nigerian universities. National Universities Commission, Abuja Nigeria. NAPE 2010.
- Okudola, P. O. and Nwaoku, N. A. 2008. Quality assurance in Nigerian universities. In Towards quality in African higher education. Babalola J. B.; Labode Popoola; Adams Onuka; Soji Oni; Wole Olatokun and Rosemary Agbolahor. Ibadan: HERPNET Pg 255-261.
- Oladipo, S.A. 2001. Maintenance of school plant: a vital strategy of achieving efficiency in the universal basic education scheme. African Journal of Educational Management. 9(2): 185-195.
- Oni, B. and Dabalén, A. 2000. Labour market prospect for university graduates in Nigeria. Mimeograph Report of World Bank/NISER.
- Onocha, C.O. 2002. Quality assurance in teacher education. A discussion paper presented at the NTI's 25th anniversary celebration, Kaduna.
- Onuh, U. R. 2007. The administrative issues for quality assurance of higher education service delivery in Nigeria. In Babalola, J. B., Akpa, G. O., Ayeni, A. O. and Adedeji S. O. Eds. Access, equity and quality in higher education. NAEAP Publication, Pg. 329-333 pp. 50-57
- Onye, C. O. and Okeke, F. N. 2008. Managing enrolment figure in higher education in Nigeria: reform initiatives. In reforming higher education in Nigeria. Babalola J. B., Labode Popoola; Adams Onuka; Soji Oni; Wole Olatokun and Rosmary Agholahor. Ibadan. HERPNET Pg 58-70.

- Oyebade, S. A. 2005. Privatisation of university education in Nigeria: implication for education management. In *Deregulating the provision and management of education in Nigeria*. Akpa, G. O.; Udoh, S. U. and Fagbamiye, E. O. Jos: NAEAP.
- Oyebade, S. A., Oladipo, S. A. and Adetoro, J. A. 2008. Determinants and strategies for quality assurance in Nigeria university education. In Babalola J. B., Labode Popoola; Adams Onuka; Soji Oni, Wole Olatokun and Rosemary Agholahor Eds. *Towards quality in African higher education*. Ibadan: HERPNET Pg 330-347.
- Saint, W., Hartnett. T.A. and Strassner, E. 2004. Higher education in Nigeria: a status report. World Education News and Review.
- Salami, C.G.E. 1990. Financing Nigerian universities in a period of economic exigency: the lease option. In *Management for quality education in Nigeria*. Udoh, S.U. and Akpa,G.O. Eds, Jos. Nigerian Association for Educational Administration and Planning.
- Salisu, R. A. and Olusanya, S. O. 2000. Quality assurance in colleges of education. In *Access, equity and quality in higher education*. Babalola, J. B., Akpa, G. O., Ayeni, A. O. and Adedeji, S. O. NAEAP Publication. Pp 361-371
- Sayre, N. F. 2007. Carrying capacity: genesis, history and conceptual flaws. Department of Geography, 507 McCone Hall #4740, Berkley CA, 94720-1440.
- Shelby, B. and Heberlin, T A. 1989. Carrying capacity in recreational settings. Oregon State University Press PP. 164.
- Shelby, B. and Heberlin, T.H. 1984. A conceptual framework for carrying capacity determination. In *Leisure Science* Vol. 6, No 4, PP 433- 451.
- Smith, W. J. and Lusthaus, C. 1995. The nexus of equality and quality in education: a framework for debate. Canadian Journal of Education, 20:3.

- Stankley, G. H. 1984. Carrying capacity in recreational setting: evolution appraisal and application. In Leisure Science Vol. 6, No 4, PP 453-473.
- Stankley, G.H. 1974. Criteria for the determination of recreational carrying capacity in the Colorado river basin. In Environmental management in the colorado river basin. Crawford, A. B and Peterson, D.F Eds.
- Tonwe, U.A.C. 2005. Accessibility and equity in secondary education in Delta State in a deregulated school system. *Deregulating the provision and management of education in Nigeria*. The Nigerian Association for Educational Administration and Planning NAEAP Publication
- UNESCO, 2002. The State of Education in Nigeria. October. Abuja: Nigeria.
- UNESCO, 2003. Education Webmaster. World Conference on Higher Education Framework and Action. [www.jyu.fi/unesco2003/conference.htm](http://www.jyu.fi/unesco2003/conference.htm).
- University Ranking. 2010. The Tribune Newspaper. September 13.
- Urwick, J. and Junaidu, S.U. 1991. The effects of school physical facilities on the processes of education: a qualitative study of Nigeria primary schools. International Journal of Educational Development. 11, 1, 19-20. USDA Forest Service Research Paper/ NT- 284. Ogden
- Vogt, W. 1948. Road to survival. New York: Williams Sloane Associates, PP.16-17, 22-23.
- Omole, W. 2009. Rethinking tertiary education financing in Nigeria. The National Scholar, March.
- World Bank, 1998. Nigeria costs and financing of universities. Report No. 6920 – UNI Washington, D C. World Bank, Project.
- World Bank, 2004. Determinants of Primary Education Outcomes in Developing Countries. World Bank, Washington. D C.

**APPENDICES**

**APPENDIX 1**

**DETERMINANTS OF CARRYING CAPACITY OF ACADEMIC PROGRAMMES CHECKLIST (DCCAPC)**

**CHECKLIST ON FUND ALLOCATIONS FOR THE BURSAR (CFATB).**

Dear Sir/Madam,

This checklist is to collect information on Fund Allocation to federal universities in Nigeria. This is required exclusively for academic purpose and any information provided will be treated with utmost confidentiality. I will be grateful if you could please supply all the information requested from you on educational resources available in your institution.

Thanks you for your anticipated co-operation.

**Section A: - Socio-demographic Data.**

- 1). Name of University:
- 2). Location:
- 3). Year Established:

**Section B: - Information on Fund Allocation**

Fund Allocation to Sampled University (#Billion)

University	2000	2001	2002	2003	2004	2005	2006	2007	2008

## CHECKLIST ON ACADEMIC AND NON ACADEMIC STAFF

Dear Sir/Madam.

This checklist is to collect information on academic and non-academic staff in the federal universities in Nigeria. This is required exclusively for academic purpose and any information provided will be treated with utmost confidentiality. I will be grateful if you could please supply all the information requested from you on educational resources available in your institution.

Thanks you for your anticipated co-operation.

### Section A: - Socio-demographic Data.

1). Name of University:

2). Location:

3). Year Established:

4). Faculty (Mark the appropriate box as√)

i. Administration

ii. Agriculture

iii. Arts

iv. Education

v. Engineering Technology

vi. Environmental Sciences

vii. Science

viii. Social Sciences

5). Name of Department.....

### Section B Staff Strength

1. 1). Numbers of academic staff in the department.

I. Number of Professors.

II. Readers/Associate Professors.

III. Senior Lecturers.

IV. Lecturer I.

V. Lecture II.

VI. Assistant Lecturers.

VII. Graduate Assistants.

- 2). i. Number of Lecturers with Ph.D
- ii. Masters
- iii. First Degree
- 3). Numbers of Non-academic staff in the department

### Checklist on University Student Enrolment

This format was prepared for the university admission officer and the schedule officer in the faculty/department to enter the number of newly admitted students in 2008, undergraduate and postgraduate as at 2008.

Dear Sir/Madam,

This checklist is to collect information from the university admission officer and the schedule officer in the faculty/department in the federal universities in Nigeria. This is required exclusively for academic purpose and any information provided will be treated with utmost confidentiality. I will be grateful if you could please supply all the information requested on educational resources available in your institution.

Thanks you for your anticipated co-operation.

#### SECTION A: General Information

1. Name of University:
2. Location:
3. Year Established:
4. Proprietor (Mark the appropriate box as √)
  - i. Federal
  - ii. State Government
5. Type of University (Mark the appropriate box as √)
  - i. Conventional
  - ii. Technology
  - iii. Agriculture
6. Faculty (Mark the appropriate box as √)
  - i. Administration
  - ii. Agriculture
  - iii. Arts

- iv. Education
- v. Engineering Technology
- vi. Environmental Sciences
- vii. Science
- viii. Social Sciences

7. Department.....

**Section B: Enrolment in the Sampled University as at 2008.**

University	Number of newly admitted	Undergraduate	Postgraduate	Total Enrolment
U.I				

UNIVERSITY OF IBADAN

## CHECKLIST ON INFORMATION ON PHYSICAL RESOURCES

This format was prepared for the students and the schedule officer in the faculty/department to enter the number of physical resources on ground as at 2008.

Dear Sir/Madam,

This checklist is to collect information from the students and the schedule officer in the department in the federal universities in Nigeria. This is required exclusively for academic purpose and any information provided will be treated with utmost confidentiality. I will be grateful if you could please supply all the information requested on educational resources available in your institution.

Thanks you for your anticipated co-operation.

### Section A: - Socio-demographic Data.

1). Name of University:

2). Location:

3). Year Established:

4). Faculty (Mark the appropriate box as√)

i. Administration

ii. Agriculture

iii. Arts

iv. Education

v. Engineering Technology

vi. Environmental Sciences

vii. Science

viii. Social Sciences

5). Name of Department.....

**Section B: Information on Physical Resources**

S/N		Available and adequate	Available but not adequate	Not adequate
1	Lecture rooms			
2	Staff offices			
3	Library			
4	Library furniture			
5	Comfortable desks and chairs for students.			
6	Resource centre			
7	Games facilities			
8	Computer room			
9	Geographical garden			
10	School clinic			
11	Laboratory			
12	Student accommodation			

## CHECKLIST ON INFORMATION ON MATERIAL RESOURCES

This format was prepared for the students and the schedule officer in the faculty/department to enter the material resources on ground as at 2008.

Dear Sir/Madam,

This checklist is to collect information from the students and the schedule officer in the department in the federal universities in Nigeria. This is required exclusively for academic purpose and any information provided will be treated with utmost confidentiality. I will be grateful if you could please supply all the information requested on educational resources available in your institution.

Thanks you for your anticipated co-operation.

### Section A: - Socio-demographic Data.

1). Name of University:

2). Location:

3). Year Established:

4). Faculty (Mark the appropriate box as√)

i. Administration

ii. Agriculture

iii. Arts

iv. Education

v. Engineering Technology

vi. Environmental Sciences

vii. Science

viii. Social Sciences

5). Name of Department.....

**Section B: Information on Material Resources**

S/N		<i>Available and adequate</i>	<i>Available but not adequate</i>	<i>Not adequate</i>
1	Library (a) Recent books (b) Borrowing service			
2	Computer			
3	Drugs			
4	Chemical			
5	Instructional aids			
6	Well-equipped laboratory			
7	Projectors			
8	Internet facilities			
9	Electricity			
10	Pipe borne water			

## APPENDIX II

### *Academic Content*

#### **(a) Academic Staff**

They must be adequate in number and with requisite criteria to perform. To measure the quality includes the following:

- Teacher-student ratio
- Structure of staff
- Competence in academics
- Professional training
- Diversity of background and foreign content of staff
- Number of staff with outstanding academics
- Number of publications
- Citation index
- Adequate/minimum teaching load
- Qualification to teach core courses
- Staff development
- Research grants
- Number of professional libraries

#### **(b) Non-teaching Staff**

Must be adequate in number and quality criteria for measuring may include:

- Adequacy in number and quality
- Structure of non-teaching staff
- Adequate training for the job

#### **(c) Financial Management**

Close monitoring to ensure both horizontal and vertical balance of the financial operations. The criteria are as follows;

- Allocation to salaries versus goods and services
- Allocation to direct teaching
- Allocation to academic units/ administrative units
- Allocation to library books/journals
- Allocation to research
- Allocation to staff development
- Allocation to maintenance

- Allocation to health
- Allocation to retirement benefits

**(d) Personnel Management**

Human resources available to an institution need to be carefully managed.

Criteria for management are the following:

- Allocation of staff to teaching and non-teaching units
- Regularity and timeliness of payment
- Vacancy rates
- Staff retention
- Staff turnover rates
- Industrial peace
- Existence of health centre
- Existence of staff schools
- Existence of staff club
- Insurance scheme

**(e) Materials Management**

Must ensure proper control over purchasing and inventory management.

Criteria for the evaluation

- Inventory
- Stock-taking exercise
- Frequency of replenishment

**(e) Physical Facilities**

This can be evaluated with these criteria:

- Lecture rooms, seminar rooms
- Theatres
- Laboratories and workshops
- Office space for staff
- Library space
- Residential space and policy for staff and students
- Furnishing
- Recreational/communal/social

**Information on Financial Resources**  
**Fund Allocation to Sample Universities (Billions)**

University	2000	2001	2002	2003	2004	2005	2006	2007
U.I	1,004	1,806	2,878	3,690	4,015	4,403	5,924	5,412
UNN	1,079	1,567	3,325	3,484	3,865	4,260	6,092	6,184
Uni Ben	963	1,074	1,896	2,497	2,797	2,687	4,194	4,286
Uni Ilorin	654	913	1,556	1,856	2,260	2,860	3,354	3,715
Uni Maidu	394	808	1,470	2,331	2,349	2,445	2,039	3,443
Usman Dan fodio	351	494	925	994	1,276	1,491	1,885	2,441
	14	17	34	42	47	49	74	77,5

**Information of Human Resources as at 2008**

Number of Lecturers in the sampled in universities between 2007/2008						
Rank	U .I	UniMaid	UsmanDanFodi	UNN	UniBen	Unilorin
Ass. Lecturer	290	158	54	159	146	43
Lecturer II	226	74	78	141	149	115
Lecturer I	232	223	120	160	143	115
Snr. Lecturer	327	161	107	329	181	165
Reader/Ass. Prof.	35	45	31	18	51	17
Professor	233	82	69	206	109	117
Total	1343	743	459	1013	779	572

**Enrolment in the sampled University as at 2008**

<b>Universities</b>	<b>Undergraduate Enrollment</b>	<b>Post graduate</b>	<b>Total enrollment</b>
Unimaid	33,382	1,167	34,549
Unilorin	19,724	1,206	20,930
Usman Dan fodio	8,880	745	9,625
U. Ibadan	11,333	5,885	17,218
UNN	26,328	4,238	30,566
Uniben	28,338	1980	30,310

**Admission into university education programmes in Nigerian Universities as at 2008**

<b>Year</b>	<b>Number of applicants</b>	<b>Number admitted</b>	<b>Number admitted as % of applicants</b>
1999	537,226	64,176	11.9
2000	501,424	70,532	14.1
2001	550,399	60,718	10.7
2002	842,072	95,199	11.3
2003	1,039,183	98,423	9.5
2004	838,051	110,500	13.2
2005	935,522	114,190	12.2
2006	629,600	75,884	11.9
2007	911,679	123,626	13.5
2008	1,054,043	200,000	19.0

### APPENDIX III

#### Correlations

	CCAPACITY	HUMRES
CAPACITY Pearson	1.000	.554*
Correlation		
Sig.(2-tailed)	.	.017
N	48	
<hr/>		
HUMRES Pearson	.554*	1.000
Correlation		
Sig.(2-tailed)	.017	.
N	18	48

#### Regression

##### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843 <sup>a</sup>	.711	.480	6515.83

a. Predictors: (Constant), YM1, FINANCE, YP1, HUMRES

##### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.23E+08	4	130675669.5	3.078	.125 <sup>a</sup>
	Residual	2.12E+08	5	42456075.13		
	Total	7.35E+08	9			

a. Predictors: (Constant), YM1, FINANCE, YP1, HUMRES

b. Dependent Variable: CCAPACTY

##### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5961.985	21976.942		.271	.797
	FINANCE	3.005E-05	.000	.948	2.397	.062
	HUMRES	-7.855	19.940	-.159	-.394	.710
	YP1	248.080	488.952	.131	.507	.633
	YM1	-671.379	590.916	-.312	-1.136	.307

a. Dependent Variable: CCAPACTY

## Regression

### Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	FINANCE <sup>b</sup>	.	Enter

- a. All requested variables entered.  
 b. Dependent Variable: CCAPACTY

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.354 <sup>a</sup>	.125	.106	7817.72

- a. Predictors: (Constant), FINANCE

### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.02E+08	1	402363446.6	6.584	.014 <sup>a</sup>
	Residual	2.81E+09	46	61116683.43		
	Total	3.21E+09	47			

- a. Predictors: (Constant), FINANCE  
 b. Dependent Variable: CCAPACTY

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15381.012	2275.217		6.760	.000
	FINANCE	2.164E-06	.000	.354	2.566	.014

- a. Dependent Variable: CCAPACTY

## One-way

### ANOVA

#### CCAPACTY

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.64E+09	5	527426491.7	38.418	.000
Within Groups	5.77E+08	42	13728533.94		
Total	3.21E+09	47			

## Post Hoc Tests

### Multiple Comparisons

Dependent Variable: CCAPACTY

Scheffe

(I) university	(J) university	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UI	Unilorin	2033.63	1852.60	.942	-4434.17	8501.42
	UNN	-12088.25*	1852.60	.000	-18556.05	-5620.45
	Unimaid	10281.38*	1852.60	.000	3813.58	16749.17
	Uniben	-7596.00*	1852.60	.012	-14063.80	-1128.20
	Uthmandanfodio	4200.88	1852.60	.413	-2266.92	10668.67
Unilorin	UI	-2033.63	1852.60	.942	-8501.42	4434.17
	UNN	-14121.88*	1852.60	.000	-20589.67	-7654.08
	Unimaid	8247.75*	1852.60	.005	1779.95	14715.55
	Uniben	-9629.63*	1852.60	.001	-16097.42	-3161.83
	Uthmandanfodio	2167.25	1852.60	.925	-4300.55	8635.05
UNN	UI	12088.25*	1852.60	.000	5620.45	18556.05
	Unilorin	14121.88*	1852.60	.000	7654.08	20589.67
	Unimaid	22369.63*	1852.60	.000	15901.83	28837.42
	Uniben	4492.25	1852.60	.337	-1975.55	10960.05
	Uthmandanfodio	16289.13*	1852.60	.000	9821.33	22756.92
Unimaid	UI	-10281.38*	1852.60	.000	-16749.17	-3813.58
	Unilorin	-8247.75*	1852.60	.005	-14715.55	-1779.95
	UNN	-22369.63*	1852.60	.000	-28837.42	-15901.83
	Uniben	-17877.38*	1852.60	.000	-24345.17	-11409.58
	Uthmandanfodio	-6080.50	1852.60	.078	-12548.30	387.30
Uniben	UI	7596.00*	1852.60	.012	1128.20	14063.80
	Unilorin	9629.63*	1852.60	.001	3161.83	16097.42
	UNN	-4492.25	1852.60	.337	-10960.05	1975.55
	Unimaid	17877.38*	1852.60	.000	11409.58	24345.17
	Uthmandanfodio	11796.88*	1852.60	.000	5329.08	18264.67
Uthmandanfodio	UI	-4200.88	1852.60	.413	-10668.67	2266.92
	Unilorin	-2167.25	1852.60	.925	-8635.05	4300.55
	UNN	-16289.13*	1852.60	.000	-22756.92	-9821.33
	Unimaid	6080.50	1852.60	.078	-387.30	12548.30
	Uniben	-11796.88*	1852.60	.000	-18264.67	-5329.08

\*. The mean difference is significant at the .05 level.

## Homogeneous Subsets

### CCAPACTY

Scheffé<sup>a</sup>

university	N	Subset for alpha = .05		
		1	2	3
Unimaid	8	9640.88		
Uthmandanf odio	8	15721.38	15721.38	
Unilorin	8		17888.63	
UI	8		19922.25	
Uniben	8			27518.25
UNN	8			32010.50
Sig.		.078	.413	.337

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 8.000.

## Oneway

### ANOVA

FINANCE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.57E+19	5	5.144E+18	3.591	.009
Within Groups	6.02E+19	42	1.432E+18		
Total	8.59E+19	47			

## Post Hoc Tests

### Multiple Comparisons

Dependent Variable: FINANCE

Scheffe

(I) university	(J) university	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UI	Unilorin	1.496E+09	6.0E+08	.304	-593616609	3584885692
	UNN	1.095E+09	6.0E+08	.649	-994554499	3183947802
	Unimaid	1.697E+09	6.0E+08	.179	-391939802	3786562499
	Uniben	1.095E+09	6.0E+08	.649	-994554249	3183948052
	Uthmandanfodio	2.415E+09*	6.0E+08	.014	326220377.3	4504722678
Unilorin	UI	-1.50E+09	6.0E+08	.304	-3584885692	593616608.7
	UNN	-4.01E+08	6.0E+08	.993	-2490189041	1688313260
	Unimaid	201676806	6.0E+08	1.000	-1887574344	2290927957
	Uniben	-4.01E+08	6.0E+08	.993	-2490188791	1688313510
	Uthmandanfodio	919836986	6.0E+08	.795	-1169414165	3009088137
UNN	UI	-1.09E+09	6.0E+08	.649	-3183947802	994554499.3
	Unilorin	400937891	6.0E+08	.993	-1688313260	2490189041
	Unimaid	602614697	6.0E+08	.960	-1486636454	2691865848
	Uniben	250.00	6.0E+08	1.000	-2089250901	2089251401
	Uthmandanfodio	1.321E+09	6.0E+08	.445	-768476274	3410026027
Unimaid	UI	-1.70E+09	6.0E+08	.179	-3786562499	391939802.3
	Unilorin	-2.02E+08	6.0E+08	1.000	-2290927957	1887574344
	UNN	-6.03E+08	6.0E+08	.960	-2691865848	1486636454
	Uniben	-6.03E+08	6.0E+08	.960	-2691865598	1486636704
	Uthmandanfodio	718160180	6.0E+08	.917	-1371090971	2807411330
Uniben	UI	-1.09E+09	6.0E+08	.649	-3183948052	994554249.3
	Unilorin	400937641	6.0E+08	.993	-1688313510	2490188791
	UNN	-250.00	6.0E+08	1.000	-2089251401	2089250901
	Unimaid	602614447	6.0E+08	.960	-1486636704	2691865598
	Uthmandanfodio	1.321E+09	6.0E+08	.445	-768476524	3410025777
Uthmandanfodio	UI	-2.42E+09*	6.0E+08	.014	-4504722678	-326220377
	Unilorin	-9.20E+08	6.0E+08	.795	-3009088137	1169414165
	UNN	-1.32E+09	6.0E+08	.445	-3410026027	768476273.9
	Unimaid	-7.18E+08	6.0E+08	.917	-2807411330	1371090971
	Uniben	-1.32E+09	6.0E+08	.445	-3410025777	768476523.9

\*. The mean difference is significant at the .05 level.

## Homogeneous Subsets

## Oneway

### ANOVA

HUMRES

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	802830.0	5	160566.000	108.613	.000
Within Groups	17740.000	12	1478.333		
Total	820570.0	17			

UNIVERSITY OF IBAL

## Post Hoc Tests

### Multiple Comparisons

Dependent Variable: HUMRES

Scheffe

(I) university	(J) university	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UI	Unilorin	429.67*	31.39	.000	305.95	553.38
	UNN	83.67	31.39	.285	-40.05	207.38
	Unimaid	346.00*	31.39	.000	222.29	469.71
	Uniben	318.67*	31.39	.000	194.95	442.38
	Uthmandanfodio	634.00*	31.39	.000	510.29	757.71
Unilorin	UI	-429.67*	31.39	.000	-553.38	-305.95
	UNN	-346.00*	31.39	.000	-469.71	-222.29
	Unimaid	-83.67	31.39	.285	-207.38	40.05
	Uniben	-111.00	31.39	.090	-234.71	12.71
	Uthmandanfodio	204.33*	31.39	.001	80.62	328.05
UNN	UI	-83.67	31.39	.285	-207.38	40.05
	Unilorin	346.00*	31.39	.000	222.29	469.71
	Unimaid	262.33*	31.39	.000	138.62	386.05
	Uniben	235.00*	31.39	.000	111.29	358.71
	Uthmandanfodio	550.33*	31.39	.000	426.62	674.05
Unimaid	UI	-346.00*	31.39	.000	-469.71	-222.29
	Unilorin	83.67	31.39	.285	-40.05	207.38
	UNN	-262.33*	31.39	.000	-386.05	-138.62
	Uniben	-27.33	31.39	.976	-151.05	96.38
	Uthmandanfodio	288.00*	31.39	.000	164.29	411.71
Uniben	UI	-318.67*	31.39	.000	-442.38	-194.95
	Unilorin	111.00	31.39	.090	-12.71	234.71
	UNN	-235.00*	31.39	.000	-358.71	-111.29
	Unimaid	27.33	31.39	.976	-96.38	151.05
	Uthmandanfodio	315.33*	31.39	.000	191.62	439.05
Uthmandanfodio	UI	-634.00*	31.39	.000	-757.71	-510.29
	Unilorin	-204.33*	31.39	.001	-328.05	-80.62
	UNN	-550.33*	31.39	.000	-674.05	-426.62
	Unimaid	-288.00*	31.39	.000	-411.71	-164.29
	Uniben	-315.33*	31.39	.000	-439.05	-191.62

\*. The mean difference is significant at the .05 level.

## Homogeneous Subsets

### HUMRES

Scheffé<sup>a</sup>

university	N	Subset for alpha = .05		
		1	2	3
Uthmandanf odio	3	481.67		
Unilorin	3		686.00	
Unimaid	3		769.67	
Uniben	3		797.00	
UNN	3			1032.00
UI	3			1115.67
Sig.		1.000	.090	.285

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

## Oneway

### ANOVA

YP1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	83.400	4	20.850	.858	.546
Within Groups	121.500	5	24.300		
Total	204.900	9			

## Post Hoc Tests

### Multiple Comparisons

Dependent Variable: YP1

Scheffe

(I) university	(J) university	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Unilorin	UNN	6.50	4.93	.780	-15.97	28.97
	Unimaid	7.50	4.93	.692	-14.97	29.97
	Uniben	8.00	4.93	.647	-14.47	30.47
	Uthmandanfodio	6.00	4.93	.821	-16.47	28.47
UNN	Unilorin	-6.50	4.93	.780	-28.97	15.97
	Unimaid	1.00	4.93	1.000	-21.47	23.47
	Uniben	1.50	4.93	.999	-20.97	23.97
	Uthmandanfodio	-.50	4.93	1.000	-22.97	21.97
Unimaid	Unilorin	-7.50	4.93	.692	-29.97	14.97
	UNN	-1.00	4.93	1.000	-23.47	21.47
	Uniben	.50	4.93	1.000	-21.97	22.97
	Uthmandanfodio	-1.50	4.93	.999	-23.97	20.97
Uniben	Unilorin	-8.00	4.93	.647	-30.47	14.47
	UNN	-1.50	4.93	.999	-23.97	20.97
	Unimaid	-.50	4.93	1.000	-22.97	21.97
	Uthmandanfodio	-2.00	4.93	.996	-24.47	20.47
Uthmandanfodio	Unilorin	-6.00	4.93	.821	-28.47	16.47
	UNN	.50	4.93	1.000	-21.97	22.97
	Unimaid	1.50	4.93	.999	-20.97	23.97
	Uniben	2.00	4.93	.996	-20.47	24.47

UNIVERSITY

## Homogeneous Subsets

YP1

Scheffé<sup>a</sup>

university	N	Subset for alpha = .05
		1
Uniben	2	21.50
Unimaid	2	22.00
UNN	2	23.00
Uthmandanfodio	2	23.50
Unilorin	2	29.50
Sig.		.647

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 2.000.

## Oneway

ANOVA

YM1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	43.000	4	10.750	.465	.761
Within Groups	115.500	5	23.100		
Total	158.500	9			

**Post Hoc Tests  
Homogeneous Subsets**

YM1

Scheffé<sup>a</sup>

university	N	Subset for alpha = .05
UNN	2	14.50
Uniben	2	17.00
Unimaid	2	17.50
Uthmandanfodio	2	17.50
Unilorin	2	21.00
Sig.		.766

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 2.000.

**T-Test**

**Paired Samples Statistics**

Pair		Mean	N	Std. Deviation	Std. Error Mean
1	CCAPACTY	16995.33	6	8957.21	3656.77
	enlorment	26399.83	6	6842.63	2793.49

**Paired Samples Correlations**

Pair		N	Correlation	Sig.
1	CCAPACTY & enlorment	6	-.127	.810

**Paired Samples Test**

Pair		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
1	CCAPACTY - enlorment	-9404.50	11944.43	4876.29	-21939.41	3130.41	-1.929	5	.112

**Descriptive**

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
FINANCE	48	3.0E+08	5.9E+09	2.3E+09	1351770425
CCAPACTY	48	4397	37772	20450.31	8269.05
HUMRES	18	469	1171	813.67	219.70
YP1	10	19	36	23.90	4.77
YM1	10	14	27	17.50	4.20
enlorment	6	17218	34649	26399.83	6842.63
Valid N (listwise)	5				

### Access to undergraduate education in Nigerian Universities

Year	Number of applicants	Number admitted	Number admitted as % of applicants
1999	537,226	64,176	11.9
2000	501,424	70,532	14.1
2001	550,399	60,718	10.7
2002	842,072	95,199	11.3
2003	1,039,183	98,423	9.5
2004	838,051	110,500	13.2
2005	935,522	114,190	12.2
2006	629,600	75,884	11.9
2007	911,679	123,626	13.5
2008	1,054,043	200,000	19.0

Source: JAMB/UTME. (2008)

### University Ranking

#### *Universities*

	Location
1 University of Lagos	Lagos
2 Obafemi Awolowo University	Ile-Ife
3 University of Ilorin	Ilorin
4 University of Ibadan	Ibadan
5 University of Benin	Ugbowo and other locations
6 Lagos State University	Ojo
7 University of Port Harcourt	Port Harcourt
8 Covenant University	Ota
9 Federal University of Technology, Akure	Akure

<b>10</b>	University of Nigeria, Nsukka	Nsukka and other locations
<b>11</b>	Ladoke Akintola University of Technology	Ogbomoso and other locations
<b>12</b>	Babcock University	Iisan-Remo and other locations
<b>13</b>	University of Jos	Jos
<b>14</b>	Ahmadu Bello University	Zaria
<b>15</b>	University of Uyo	Uyo
<b>16</b>	University of Agriculture, Abeokuta	Abeokuta
<b>17</b>	Redeemer's University	Mowe
<b>18</b>	Bayero University Kano	Kano
<b>19</b>	Olabisi Onabanjo University	Ago-Iwoye
<b>20</b>	American University of Nigeria	Yola
<b>21</b>	Kwara State University	Ilorin
<b>22</b>	Bowen University	Iwo
<b>23</b>	Federal University of Technology Minna	Minna
<b>24</b>	Lead City University	Ibadan
<b>25</b>	University of Calabar	Calabar
<b>26</b>	Adekunle Ajasin University	Akungba Akoko and other locations
<b>27</b>	Nnamdi Azikiwe University	Awka and other locations
<b>28</b>	Abubakar Tafawa Balewa University	Bauchi
<b>29</b>	Benson Idahosa University	Benin City

<b>30</b>	Imo State University, Owerri	Owerri
<b>31</b>	Federal University of Technology, Owerri	Owerri
<b>32</b>	Renaissance University	Enugu
<b>33</b>	Federal University of Technology, Yola	Yola
<b>34</b>	Ambrose Alli University	Ekpoma
<b>35</b>	Kaduna State University	Kaduna
<b>36</b>	Usmanu Danfodio University	Sokoto
<b>37</b>	Bells University of Technology, Ota	Ota
<b>38</b>	Tai Solarin University of Education	Ijebu-Ode and other locations
<b>39</b>	Micheal Okpara University of Agriculture, Umudike	Umuahia
<b>40</b>	Niger Delta University	Wilberforce Island Yenagoa
<b>41</b>	Rivers State University of Science and Technology	Port Harcourt
<b>42</b>	Enugu State University of Science and Technology	Enugu
<b>43</b>	Abia State University	Uturu
<b>44</b>	Pan African University	Lagos
<b>45</b>	University of Ado-Ekiti	Ado-Ekiti
<b>46</b>	University of Mkar	Mkar
<b>47</b>	Igbinedion University Okada	Okada and other locations
<b>48</b>	Ajayi Crowther University	Oyo Town
<b>49</b>	Crawford University	Igbesa

<b>50</b>	Obong University	Obong Ntak
<b>51</b>	Gombe State Univeristy	Gombe
<b>52</b>	Caleb University	Ikosi
<b>53</b>	Anambra State University	Uli
<b>54</b>	Joseph Ayo Babalola University	Ikeji-Arakeji
<b>55</b>	Osun State University	Oshogbo and other locations
<b>56</b>	Katsina University	Katsina
<b>57</b>	Kogi State University	Anyigba
<b>58</b>	University of Maiduguri	Maiduguri
<b>59</b>	Delta State University, Abraka	Abraka
<b>60</b>	Salem University	Lokoja
<b>61</b>	University of Abuja	Abuja
<b>62</b>	Adamawa State University, Mubi	Mubi
<b>63</b>	University of Agriculture, Makurdi	Makurdi
<b>64</b>	Nasarawa State University	Keffi
<b>65</b>	Ebonyi State University	Abakaliki
<b>66</b>	Ibrahim Badamasi Babangida University	Lapai
<b>67</b>	Wukari Jubilee University	Wukari
<b>68</b>	Novena University	Ogume
<b>69</b>	Benue State University	Makurdi
<b>70</b>	Fountain University Oshogbo	Oshogbo
<b>71</b>	Madonna University	Okija

Source: Universities and Colleges in Nigeria (2010).

**Federal Government Expenditure Shared by levels of Education,  
1996-2000 (in millions of Naira)**

Year	1996	1997	1998	1999	2000	2001	2002
Tertiary	79.9	78.9	68.4	69.0	75.8	68.1	76.9
Universities	52.5	44.6	39.4	39.9	49.2	39.6	51.2
Polytechnics	16.2	23.2	17.0	18.5	17.0	16.6	16.0
Colleges of Education	11.2	11.1	12.0	10.6	9.6	11.9	9.7
Secondary	10.4	11.3	14.6	18.7	15.3	15.5	15.6
Primary	9.7	9.8	16.9	12.2	8.9	16.4	7.5

**Source:** Federal Government of Nigeria Annual Budget (various years)  
Reported by Okeke in Herbert (2002).

**Table 2:3 ETF Funding of Higher Education, 1999-2002 (in millions of Naira)**

Sub-Sector	1999	2000	2001	2002
Universities	2,125.0	1,080.0	1,794.0	2,080.0
Polytechnics	1,087.2	450.0	967.5	1,125.0
College of Education	1,099.1	450.0	967.5	1,125.0
Monotechnics	-	225.0	352.5	456.0
Inter-Universities government Agencies Various Parastatals Law Schools	304.0	162.0	1,879.5	362.2.

**Source:** ETF, 2003 (as at March, 2003) Report by Okeke (2005)

**Disbursement of Allocation to Various Sub-Sectors, 1992-2002 (in millions of Naira)**

Education	Funds	Allocation in			
		1999	2000	2000	2001
Sub-Sector					
Primary	3,1176	1,010.6	1,111.9	572.0	5,812.2
Secondary	657.0	1,010.6	1,111.9	277.2	2,350.3
Tertiary	4,291.8	1,876.1	1,624.3	1,587.4	10,372.9
Other education	532.0	588.2	252.9	1,405.4	2,778.5
Total	8,598.5	4,165.1	4,688.2	3,842.1	21,314.0

**Source:** Adopted from ETF Reports, Annual 2002 and March 2003, Reported by Okeke (2005).

**Level of Funding in the Nigerian University System, 1990-2001.**

<i>Year</i>	<i>Total Amount Requested by Universities (in Naira)</i>	<i>Total Amount Received by Universities</i>	<i>Amount Received as % of Amount Requested</i>
1990	1,216,601,329.90	734,770,950.00	60.40
1991	1,453,291,051.00	783,816,895.00	53.93
1992	3,663,212,945.00	2,985,237,346.00	81.49
1993	5,075,859,925.00	3,801,529,278.00	74.89
1994	7,342,861,713.00	4,370,880,770.00	59.53
1995	11,328,520,905.00	6,056,784,806.00	59.53
1996	12,442,699,358.00	7,535,594,529.0	53.46
1997	15,820,155,501.00	5,348,173,942.00	60.56
1998	22,767,530,158.00	8,974,631,294.62	39.42
1999	40,884,109,125.00	11,831,930,271.93	28.94
2000	65,579,997,692.00	30,143,004,497.91	45.96
2001	68,911,759,219.11	31,170,080,668.17	45.23
Total	256,486,598,921.11	113,736,435,248.68	44.34

**Source:** National Universities Commission Report (2003).