EFFECTS OF MULTI-DIMENSIONAL VARIABLES ON FEMALE ENROLMENT IN TECHNOLOGY PROGRAMMES IN FEDERAL POLYTECHNICS IN THE NORTHERN GEO-POLITICAL ZONES OF NIGERIA: IMPLICATION FOR CURRICULUM REVIEW

BY

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DEPARTMENT OF EDUCATIONAL FOUNDATION AND CURRICULUM
AHMADU BELLO UNIVERSITY, ZARIA

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN EDUCATION

DEPARTMENT OF EDUCATIONAL FOUNDATION AND CURRICULUM
AHMADU BELLO UNIVERSITY, ZARIA

DECLARATION

I hereby declare that this thesis has been written by me and that; it is a record of my own research work. It has not been presented in any previous application for a higher degree. All quotations are indicated by quotation marks or indentation and the sources of information and references have been acknowledged.

_____ _____

AMINA IDRIS DATE

CERTIFICATION

This thesis entitled "Effects of Multi-Dimensional Variables on Female Enrolment in Technology Programmes in Federal Polytechnics in the Northern Geo-Political Zones of Nigeria: Implication for Curriculum Review" by Mrs Amina Idris meets the regulations governing the award of the degree of Doctor of Philosophy (Ph.D) in Curriculum and Instruction of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated toAllah, the Almighty, without His guidance this work would not have been possible.

My late father, Alhaji Muhammad Alkali whose dream and wish was to see us through the best education possible.

My husband, Alhaji M. J. Idris and children, Aisha, Musa, Ibrahim, Yusuf and Ismail for their moral and financial support

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ABSTRACT

A study of the effects of multi- dimensional variables associated with female enrollment into technology programmes in the Federal polytechnics in Northern states was undertaken to determine its effect, so as to proffer solution to the problem in the area of research. Ex-post factor method was employed, while Likert scale and personally designed questionnaire were used as instruments to elicit relevant information sought for the study. A sample size of 1,183 students/teachers out of 35618 students/teachers selected through proportionate sampling technique participated in the study. Data were collected from the sample through a questionnaire designed by the researcher titled Effect of Multi-Dimensional Variables on Female Enrolment in Technology Questionnaire (EMDVFETPQ). The data collected were analysed with the use of simple percentages, frequency count, ranking means and coefficient of correlation statistics. Four research hypotheses were generated and tested at 0.05 alpha level of significance. The findings of the study reveal that socio-cultural value practices, parental influence on female children and socio- cultural religious affinities and practices, all have significant effect on female' enrollment into technology based - programmes in federal polytechnics in Northern states of Nigeria. The findings also, show that government support for female students, in the areas of scholarships, policies and provision of gender friendly facilities are inadequate and not directly targeted at female students offering technology programmes in federal polytechnics in the North. Furthermore, the findings indicate that location of federal polytechnics were said to be less significant to have influence on female enrolment into technology based programmes. Significantly, however the findings indicate the need for more federal polytechnics located in the rural areas for proximity to rural parents and girls. The result of the findings indicates poor response of female students' into technology programmes in the area of research. On the basis of the available results, it is recommended that effort should be made by the government, all stakeholders, parents and religious organizations to motivate and encourage female students to enroll for technology based programmes in federal polytechnics in Northern states of Nigeria.

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ABBREVIATIONS

CEDAW	Commission for Elimination of Discrimination against Women
DDT	Direct Delivery Technique
ECOSOC	Economic and Social Council
ECVFEQ	Effect of Cultural values on Female Enrolment questionnaire
EFA	Education for All
EGSEQ	Effect of Government support on Enrolment Questionnaire
EPIEQ	Effect of Parental Influence on Enrolment Questionnaire
ELEFQ	Effect of Location on Enrolment of Females Questionnaire
ESA	Education Sector Analysis
FAWE	Forum for African Women Educationists
FEMSA	Female Education in Mathematics and Science in Africa
FME	Federal Ministry of Education
GASAT	Gender and Science and Technology
GNP	Gross National Product
HND	Higher National Diploma
ILO	International Labour Organisation
JAMB	Joint Admissions and Matriculation Board
MDGs	Millennium Development Goals
NAWSTEM	Nigerian Association of women in Science Technology & Mathematics
NBTE	National Board for Technical Education
ND	National Diploma
NGO	Non-Governmental Organisation
NPE	National Policy on Education

NPR	National Public Radio
NUC	National Universities Commission
OAU	ObafemiAwolowo University
S&T	Science and Technology
STM	Science, Mathematics and Technology
TVET	Technical, Vocational Education and Training
UN	United Nations
UNECA	United Nations Economic Commission for Africa
UNDFEW	United Nations Development Fund for Women
UNESCO	United Nations Educational and Cultural Organisation
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
WITED	Women in Technical Education and Development
WM	Western Mode

OPERATIONAL DEFINITION OF TERMS

1. **Multi-Dimensional Variable** – connotes issues in learning and teaching that are more than three dimensions, i.e. relating to having or having more than three dimensions but are liable to change suddenly or unpredictably.
2. **Effect**- as used in the context of this study connotes the differences of opinion of respondents on the relationship of female enrolment in technology programmes and parental attitude, socio-cultural values, government support and the location of federal polytechnics in the area of research
3. **ND**- National Diploma -Vocational Qualification of two levels, designed to produce skilled middle level manpower in technology for both private and public sectors
4. **HND** - Higher National Diploma-Vocational Qualification that requires equivalent of two years full time study after National Diploma.
5. **Location** -Where Federal Polytechnics in Northern states of Nigeria are located whether urban or rural
6. **Polytechnic** – Higher educational Institution where National Diploma(ND) and Higher

   National Diploma (HND) courses in Technology Programmes are offered
7. **Technology based programmes**- Have to do with the usage and knowledge of tools and crafts and how it affects the ability to control and adapt to the environment.

CHAPTER ONE

INTRODUCTION

1.1 The Background to the Study

In all countries of the world, technology education is recognized as the cornerstone for sustainable development. It is the fulcrum around which the quick development of economic, political, sociological and human resources of any country revolves (Ojobo, 2008). The Federal Government of Nigeria in its National Policy on Education (2004) stated that there should be equal educational opportunities given to individuals irrespective of sex. This policy represents the expression of government's commitment to the development of all sectors of the population and to the institutionalization of processes, which will pilot the Nigerian society towards social equity, justice and a much – improved quality of life. The policy is a direct activity of section 17; subsection 2, Chapter 11 of the 1999 Constitution, which desires equality of rights, obligations and opportunities before the law.

The articulation of this policy was a major step towards bridging the gap in orientation of education and streamlining national priorities for all – inclusive policies irrespective of gender. Correspondingly, the Beijing Conference of 1995 lends credence to this policy in advocating the promotion of gender equality as enunciated in its world conference report. Substantially, this has been mainstreamed in all women development programmes in Nigeria. Unfortunately, these laudable polices have been conceived and implemented in isolation of many of the social factors that impedes female access to technology education in Nigeria. Furthermore, the International Labour Organization, I. L. O (2000) observed that both men and women should be free to develop their abilities to the

fullest without limitations set by stereotyped rigid gender roles and prejudices. Thus, different behaviours, aspirations and needs of men and women should be considered to be valued on equal terms, especially in technological advancement that is currently regarded globally to foster growth and to drive sustainable development in today's globalized economy.

Certain tasks and jobs are traditionally associated with a particular sex and thus, Plateau (1999) points out that females because of their natural feminine instinct of caring, are more inclined to domestic science programmes, while males would prefer natural science programmes because boys are more generally disposed to science and mathematics than girls. Consequently, Croxford (2002) observed that young people, particularly females opt out from technologically based programmes due largely to their perception of technology as a male domain, in addition to their anxiety and low expectation of technology courses. Evidences available suggests that women, seem to be under-enrolled into technology -based programmes, despite the government policy which encourage equal educational opportunities for both male and female students in technological programmes. For example, Kadiri (2001) found that the percentage of male student's enrolment in the polytechnics stood at 60%, while that of female students was found to be 40%. In the same vein, Education Sector Analysis (2005) confirmed too, that the enrolment in technology and art ratio in polytechnics stood at 46.54% as against policy prescription of 70:30 by the government. The 70% allocated to technology programmes has always revealed a shortfall of female applicants, paving way for male dominance in the enrolment trend. Ironically, the 30% allocation for art courses has witnessed a continuous surge of female enrolment, creating yawning gap in the enrolment trend of technology programmes in Federal

Polytechnics in Northern geo-political zones of Nigeria. Though, this number still falls short of the projected demand of female enrolment in technology programmes in the Federal Polytechnics in Northern geo-political zones of Nigeria, there was slight increase in female enrolment into technology programmes in the Federal polytechnics between 2005-2009, from 27.26% in 2005/2006 to 32.16 % in 2008/2009. (NBTE Statistics, 2005-2010).

Furthermore, from 2005 to 2010, the Applied Science programmes in the Federal polytechnics in the North have grown from 27% to 35% female intake. Science Laboratory Technology (SLT) and Computer Science are at 31% female intake, whereas Technology Programmes have grown from 14% to 33%, civil engineering has seen a minimal representation of females growing from 17% in 2005 to 31% in 2010. Electrical Engineering has grown from 13% to 31% and Mechanical Engineering 16% to 32% in the past five years. The HND in architecture has had growth ranging from 11% in 2005 to 38% in 2010 in terms of female representation.

The preceding indicates an under representation of female group which suggests that male group will continue to dominate most of the areas of technology. This under-representation has been attributed to stereotype roles for women in the society, as well as in the curriculum in the educational system. Other factors such as government's commitment and support policies have created an imbalance in the enrolment trend. Likewise, parental influence significantly influences career choices of females, and locational factors plays determinant roles in the enrolment trend. Also Huyer (2003) enthused that technology has a strongly masculine image not only because men still dominate the field, but also because they dominate the language and images found in scientific literature, hence, Hast (1981)

points out that where metal-work and wood-work were put a per with physics and chemistry which are seen as highly masculine subjects, they are usually portrayed as things which are relevant to industrial establishment and profit making and suitable for male, rather than people oriented and caring suitable for the female.

Substantially, it is also inferred that locational factors are predictive of enrolment. The perception of socio-cultural practices prevalent in Northern states can be responsible for the imbalances in the enrolment trend of technology programmes. Females in the federal polytechnics in the Northern states are guided by unmeasured multi-dimensional variables manifest in socio-cultural factors i.e early marriage, religious perception prevalent in their communities.

However, according to Kandaswamy, (2002) lack of women's visible participation in technology, and a dearth of female role models result from, and perpetuate the socio-cultural invisibility of females in this area.

Evidences abound that low female enrolment in technology programmes is not peculiar to Nigeria alone, it is a global problem. This has been confirmed in many studies including those by Billing, and Huyer (2003) which established that the proportion of technology qualified females in USA was 34%. Also, in New Zealand, female undergraduate in technology account for 20% enrolment.

The importance of technology education has been established by (Ajakaaiye, 1988; & Bodmar, 1989). The need for a scientific citizenry prepared to take advantage of a full and productive life at home, at work and at play has been aptly stated in the following words of Fraser (1986): "A country which has a minority of its population understanding

Science and Technology but with the majority not understanding, perhaps even afraid of it and hostile to it, cannot be a happy one."

In Nigeria, the awareness of the importance of technology education gave rise to a National Policy on Science and Technology which was launched on 28th July, 1987. The policy demands a re-orientation of the entire society towards scientific thinking in order to develop new technologies and adapt existing ones to improve societal well-being and security. For these requirements to be met, the technology-based programme enrolment of girls to the highest level is a logical imperative to achieve holistic development in Nigeria. Apparently, the Federal Government of Nigeria advocates for Nigerian female students to enrol in greater number for technology programmes, to enable them build the nation jointly together with their male counterpart. Proactive steps are urgently needed to redress the perceived multidimensional variables identified earlier such as socio-cultural values, government support educational policies, parental influence and locational factors and its effects on female enrolment in technology programmes.

Multi-dimensional variables in its contextual meaning refers to "having or involving or marked by several dimensions or aspects, such as "multidimensional problems"; "multidimensional proposition"; "multidimensional personality" etc. (http://www.answers.com/topic/multi-dimensional)

These variables at study having no depth and scope will be explored sufficiently to identify and investigate whether they are predictive factors that determine female enrolment or causative factors responsible for low enrolment of female in technology-oriented programmes in Federal polytechnics in Northern geo-political zones of Nigeria.

. Therefore, this study is anchored on key issues of low enrolment of female students in undergraduate technology programmes, in federal polytechnics in the Northern geo-political Nigeria. Multi-dimensional variables, such as the location of federal polytechnics, government support policy programmes and parental influence towards female education including cultural stereotyped issues are diagnosed as factors responsible for low female enrolment in technology Programmes in Nigeria's Northern federal polytechnics under study.

1.2 Statement of the Problem

The Federal Government in the Constitution of the country has clearly stated the need for gender equality in enrollment into educational institutions of which the enrollment into technological programmes in polytechnics is not an exception. This implies that both male and female should have equal opportunity at all levels of education including the polytechnic enrolment and in technology programmes without any bias. This statement forms the basis of this study, which has been designed to ascertain the effect of multi-dimensional variables of female enrolment in technology programmes in the Federal Polytechnics in the North. Therefore, it becomes crucial to examine the interplay of variables, such as socio-cultural values, location of federal polytechnics, influence of parents, and government support to students in technology Programmes, in order to establish the extent to which these variables influence enrollment of female students into technology courses. Thus, in pursuance of the set goal of technology Programmes in the polytechnics, particularly the desire for adequate enrollment of female students which is yet to be realized would be discernibly necessary.

It is believed that the low level of female enrolment in technology programme may be responsible for the crippling of technological advancement in polytechnics, especially when women are likely to constitute 50% of the population. In addition, it is believed that a large proportion of citizenry may also, be deprived of some important resources that may be needed in the communities as a result of low female enrollment in technological programmes. It has also been observed that parents may prefer their male rather than female students to choose technology-related programmes. This may be due to the fact that such parents prefer them to stay at home for domestic work, whereas, boys are given preference to enroll for technology programmes. This trend is particularly, apparent in rural areas where parents are not well informed about the worth of technology programmes

Although it has been conjectured that inadequate female enrolment for technology programmes has been a global concern to many countries of the world and not limited to Nigeria alone. Evidences available from literature attributed this inequality to Multi-Dimensional variables such as parental influence, the government support, the location of the polytechnics, and cultural values. Therefore, the study intends to dissect this pertinent question: What are the effects of these multi-dimensional variables on female enrollment in technologically based programmes in the Federal Polytechnics in Northern geo-political zones of Nigeria?

1.3 Objectives of the Study

The purpose of the study was to determine the effect of multi-dimensional variables such as socio- cultural, parental influences, religious belief, location and the government support on the female enrolment in Technology Programmes in federal Polytechnics in Northern geo-political zones of Nigeria. This study therefore, specifically seeks to:-

1. To find out the relationship between socio-cultural practices and female enrolment in technology programmes
2. Ascertain the relationship between government support and female enrolment in technology programmes
3. Determine the relationship between parental influence and female choice of technology programmes
4. Ascertain whether location of federal polytechnics in the urban or rural area affect female enrolment

1.4 Research Questions:

The following research questions have been formulated to guide the study:

1. Are socio-cultural values any effect on female enrolment in Technology based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria?
2. What are the effects of government support on female enrolment into Technology - based
3. programmes in the federal polytechnics of the Northern geo-political zones of Nigeria?
4. Has parental attitude any effect on female enrolment in Technology Programmes in Federal Polytechnics in Northern geo-political zones of Nigeria?
5. Are locational factors any effect on female enrolment in Technology courses in the Federal Polytechnics in the Northern geo-political zones of Nigeria?

1.5 The Hypotheses:

The following null hypotheses were tested at 0.05 level of significance in the course of investigation.

Ho1 There is no significant relationship between female enrolments into technology –based Programmes in Federal Polytechnics in Northern geo-political zones of Nigeria and Socio-cultural values.

Ho2 There is no significant relationship in government support given to females to enroll in Technology–based Programmes, and their enrolment into Federal Polytechnics, in Northern geo-political of Nigeria.

Ho3 There is no significant relationship between the enrolments of females into Technology based Programmes in Federal Polytechnics in Northern geo-political zones of Nigeria and parental influence.

Ho4 There is no significant relationship between female enrolments into Technologically-based Programmes in Federal Polytechnics in Northern geo-political zones states of Nigeria and location of Institutions

1.6 Basic Assumption

For the purpose of this study, the following assumptions are made:-

The basic assumption is not only to determine the effect of multi-dimensional variables such as on female enrolment in technology programmes in federal polytechnics in Northern geo-political zones of Nigeria, the influence of the effects of parental attitude on female enrolment and influence of location of federal polytechnics (urban/rural) on female students enrolment in Technology based Programmes in the Federal polytechnics in the Northern geo-political zones of Nigeria, but it is also assumed that

1. The nature of the curriculum in the polytechnics is responsible for low female students' enrollment into technology-based programmes.
2. Socio-cultural values place limitations on female enrolments in the Federal Polytechnics.
3. Lack of government support in her policies on technology based education for the women is the bane of enrolments into technologically based programme by women in the Federal Polytechnics.
4. Parental influence is a factor in enrolment into technologically based programmes in the Federal Polytechnics.

1.7 Significance of the Study

The research work is justified as it would not only provide a backcloth to the government guidelines for policy formulation on gender issues in the Federal Ministry of Education, but would be beneficial to Non- governmental organizations (NGOs) that may use the result in drawing up -oriented Programmes on gender matters. Consequently, the outcome of the study will stimulate increase in enrolment of female students, as well as making Technology more relevant to the Nigerian society. Invariably too, there will be a rise in the number of teachers specializing in Technology in the Northern geo-political zones of Nigeria.

Also, the results of the study would not only provide a forum for public enlightenment about the need for increase on the female students enrollment into polytechnic in northern states, but would serve as resource for other researchers who would like to explore further issues that are likely to improve female students enrollment into polytechnics in Nigeria. Pointedly, the findings will guide the management of the

polytechnics under study, especially in reviewing suitable curriculum that will address the issues of low female enrolment pattern in technology programmes in the Federal Polytechnics.

Besides, parents would be enlightened and would be encouraged and motivated to enroll their female students into technology programmes. Lastly, it would be used to encourage female students aspiring to study in the polytechnics and guide teachers in ensuring a gender friendly classroom management. Thus the increase in enrolment of females will not only improve the effectiveness in the delivery of technology programmes but will give rise to the number of teachers specializing in technology - based programmes.

1.8 Delimitation of the Study

This study was limited to the multi-dimensional variables such as cultural values, parental attitude, government support, location of polytechnics and their effects on female enrolment into Technology based Programmes in Federal polytechnics in Northern geo-political zones of Nigeria.

Also, it was limited to the Federal polytechnics in Northern geo-political zones of Nigeria, because the aforementioned multi-dimensional variables are likely to be found in the northern zones. Specifically, the study was carried out in Northern geo-political zones in Nigeria; namely northeast, northwest and north central. There are eleven (11) Federal Polytechnics in the geo-political zones of Northern Nigeria.

This study was carried out to establish the effect of multi-dimensional variables on female enrolment in Technology programmes in only six (6) Federal Polytechnics, two from each geopolitical zone.

Besides, the study used one –dimensional data as no collaborating data either from government policy documents and or interview of government officials was used.

1.9 Limitations

The following factors placed some limitations on the present study which were taken care of during the analysis stage:-

1. Some parents due to their religious belief, conservatisms and tradition were reserved in providing adequate and relevant information required about their daughters. Thereby limiting accurate information sought for female students' enrolment into Federal Polytechnics.
2. Not all the Federal Polytechnics under study are in the same geo-political zone, and due to logistics problems it was quite stressful getting some of the targeted subjects to respond to all the items on the questionnaire.
3. Some of the respondents did not bother to fill the questionnaire at all, while some were wrongly filled which limited the number of questionnaire available for the analysis.
4. Collating and analyzing the raw data posed some problems as the researcher had to depend on the assistance of a statistician with limited time.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Introduction

The research is aimed at ensuring that the work of scholars are adequately delved into and acknowledged in the existing body of knowledge. This to a large extent would form the basis for judgment and to make inferences that will be drawn from the research work. In this regard, there will be direct or indirect intellectual exposure to the existing body of knowledge of current and past scholars that are likely to be utilized in this study. Thus, related literature will be reviewed along the following areas:

(1) Theoretical Framework of the study

(2) The Perception of Female Student Enrolment in technology programmes

(3) Concept of Technology

(4) Challenges facing female Students' Enrolment in Technology Education

(5) Stereotyped Perception of Technology and its implication for low female students enrolment

(6) Gender Equality: Requirement for adequate female Enrolment into technology programmes

(7) Gender Mainstreaming as a catalyst for improved female Enrolment in technology programmes

(8) The negative effect of traditional and societal values on female enrolment into technology programmes

(9) The Adverse Effect of Multi-dimensional variables on female Student enrolment into Technology Programmes in the Northern geo-political zones of Nigeria

(10) The effect of Multi-Dimensional Variables

(10.1) The effect of culture on female enrollment in technology programmes

(10.2) Parental Influence on Career Choice, Associated with Female Student Enrolment

(10.3) Parental Negative Attitude towards Female Students Enrolment into Technology Programmes in Northern States, Nigeria

(10.4) Adverse Effect of Child Labour on Female Student Enrolment into Technology Education

(10.5) Location of Institutions as a Factor associated with Low Female students Enrolment into Technology Progamme

(11) The Government Support and Low Female Enrolment

(12) The Role of Teachers on gender Differential in Technology

(13) Curriculum Review: an Overview of some significant issues

(14) Empirical studies

(15) Summary .

2.2 Theoretical Framework

2.3 The Concept of Technology

Technology has been perceived and conceived variously by many writers. For example, Imhanlahimi, (1998) perceived it as the "combination of types of knowledge indispensable to carrying out the necessary operations for transforming factors of production into products; the use of that knowledge for the provision of services". In the same vein of thought Imhanlahimi, (1998) regarded technology as "the sum of knowledge, skills and methods related to production, distribution and consumption of goods and services."

(4) The aforementioned definitions depict that technology emphasises the technical capacity and expertise required for transforming inputs into outputs of individuals. Hence, Imhanlahimi, (1998) describes it as a broad science based problem solving activity; so far it involves the understanding of the basic sciences. Imhanlahimi, (1998) was more definite when he describes technology in the context and process of problem solving which could meet the daily needs of individuals in the society by raising their standard of living.

(5) The concept of technology from the preceding indicates that it is vital to the development and prosperity of any nation. Hence, the intensive nature of technology development in Nigeria has remained one of the most Herculean tasks facing the nation. It is in this regard that MaiyaShiat (2005) observed that the creation, mastery and utilization of modern Technology are basically what distinguish the developing countries from the developed nations. So far, the living standard of citizenry is dependent upon its attainment in Technology expertise.

(6) Imhanlahimi, (1998) states that Technology is said to be instrumental to the high degree of modernization, material advancement, industrialization, emergence of nuclear energy, electronic and biological revolution, and high degree of urbanization. In this regard, it could be concluded that Technology enables man to cope better with his environment and provides job opportunities particularly in the area of medicine, pharmacology and engineering. This is in addition to provision of reliable communication and transport network system, steady water supply, electricity and other forms of energy supply to the society.

(7) The importance of technology is further appraised by Imhanlahimi, (1998) that Technology provides mechanized and highly productive agriculture, dependable food processing, storage and food distribution facilities. The provision of ultra-modern buildings, broad tarred roads, solid bridges, beautiful and well equipped stadium, industrial and commercial houses are as a result of Technological advancement. Therefore, if a nation is to develop technologically it would become necessary to step up enrolment of female students in Technology programmes so as to enable women have opportunity to make positive contribution to the development of the nation in the foreseeable future.

(8) Okuwa (2004) stated that as we move forward in the 21st century our lives become more dependent on technology. To be a contributing member of society it is essential to be able to use technology to solve problems. Technology education courses teach students how to solve problems, think critically, and develop lifelong skills necessary for informed decision making in the 21st century. The International Technology Education Association (1996) stated that technology education courses should be made available to all students. Both male and female students must be prepared for a future that will greatly depend on technology. Unfortunately, most female students in Federal Polytechnics in the geo-political zones of the north due to one reason or the other, rooted in the multi-dimensional variables under study, are not enrolled in technology courses that have the potential to prepare them for the technological world in which we live. Technology education courses prepare students for the future, which is continuously evolving and driven by technological advancements. Some technology teachers are teaching students how to solve

problems and evaluate the results in a systematic fashion that is essential in today's constantly changing technological world (Bjorkquist & Zuga, 1989). Waite 111 (2003) expressed that technology education courses provide students with much more than general knowledge of small engines or how to build a wall. Technology education courses are required to become a technologically literate student, consumer, and citizen. Successful individuals within society can evaluate technical situations, make informed decisions, and evaluate their decisions. In the 21st century all members of society need to possess problem solving skills. Problem solving skills can be strengthened in technology education courses. Students in technology education courses learn to use tools and machinery, but also are introduced to hands on projects that demonstrate ways to approach new situations, apply their knowledge, and solve problems. Waite 111 (2003). Skills taught in traditional technology education courses such as metalworking, woodworking, construction and drafting are all necessary for students to compete for employment positions in the competitive and technologically driven 21st century. If these skills are beneficial to all students, why are so few female students enrolled in technology education courses? Why is it that so many female students have a reluctance to enroll in subjects such as math, science, and technology? Research of math and science courses in schools has created identifiable factors that contribute to female disinterest. The study of why almost all female students disregard enrolling in technology education courses has been given minimal attention Waite 111(2003). Even though traditional "industrial arts" programs with courses such as woodworking, metalworking, and engines were male dominated Waite 111 (2003),

technology education courses today, could and should be more appealing, interesting, and beneficial to female students. Upon conclusion of this research, strategies will hopefully be evident concerning how to improve female students' enrolment in technology programmes in federal polytechnics in Northern zones of Nigeria.

(9) The preceding numerous benefits depict various ways through which Educational Technology could bring about national development. It is therefore imperative to provide an enabling environment for equal participation of male and female students' enrolment in Technology programmes in the federal Polytechnics in Northern geo-political zones of Nigeria.

2.4 The Perception of Female Student Enrolment to Technology Programmes

It has been observed by generality of educators' world over that student's enrolment irrespective of sex differences are critical part way to promoting socio-economic development of a county. Even though there are evidences in Nigeria and other parts of Africa that there has been improvement of female students enrolment into technology programmes in polytechnics. However, female student enrolment still remains limited in the federal polytechnics in Northern geo-political zones of Nigeria. Odaga and Heneveld (1995) observed that the females students enrolled into technology programmes are likely to drop out of polytechnics than male students. Several reasons have been attributed to this, girls alienation from technology subjects early in life through the socialization process which results in lack of confidence on the part of females in their ability to learn and achieve in this area. Consequently, fewer female students opt for mathematics and science related technology programmes. Some have attributed this lack of interest in technology

programmes to the inability of females to excel in maths and sciences. Benbow, (1992) in Isa & Balarabe (2009) stated the belief is not entirely proven to be true in all findings. Although evidence from the many studies performed on gender differences in Mathematics is inconsistent, small but statistically significant differences exist in the norm. Apparently, the need to increase female enrolment has been identified as one of the most significant developmental challenges facing Federal polytechnics. This is because the participation of women in technology education is no longer simply an issue of gender equity, but also an issue that should be considered in national development. (Isa and Balarabe, 2009)

Generally, the enrolment rate of female students remain lower than that of male students, also female drop out and absenteeism rate looks higher while their achievements and performance are poorer in mathematics and science. As observed by Kahle and Meece, (1994), it is not that girls cannot and do not have the ability to succeed in science, mathematics and technology courses, but rather that obstacles arise in recruiting and retaining girls.

Several factors associated with low enrolment of female students in technology programmes in the Federal Polytechnics in Northern geo-political zones of Nigeria are not far removed from socio-economic, socio-cultural, \school environment / location of the institution – government support policy/society custom and tradition, parental and family decisions especially on whether or not to invest in female education; even religious factors are all embracing in these factors. In addition, we cannot rule out pervasive gender ideologies of the household at the community level which are likely to favour male students than females that promote different opportunity for educational outcome in technology.

These not withstanding, schools are likely to be strong factors, do far the schools can promote non-participation of female students in technology programmes, especially those issues that relate to political, the institutional factors as government policies, practices that are likely to promote gender biased female student participation in the educational system.

It is important to note that adherence of children to Islamic belief and principles is very important to many parents in the Northern geo-political zone; therefore parents would prefer a combination of Islamic teaching and Western types of education. Indabawa (2004) explained that largely due to insufficient knowledge of Islam, many parents think that formal learning is not meant for Muslim girls. Therefore, they would subscribe female students to being brought up to become good house wives and mothers who are expected to become dependant housekeepers, a life mother confined to the home and economically dependent on a husband bread winner in the Nigerian culture. However, this is far from the truth. The Islamic religion demands that its followers seek knowledge even if it means travelling as far as China, and does not discriminate based on sex of the recipient of any type of knowledge, nor the level. But morality is the base of any type of education, one sets out to acquire. So the practice of depriving females from technology education intimately becomes a local tradition which is intentioned with the culture of the society which invariably has adverse effect on enrolment of female students into technology programmes in Federal polytechnics. So far the widely held belief among some parents is that it is a waste of money to educate female students, especially since they will leave their home for marriage and would not contribute much to the maintenance of her natal home. This Indabawa (2004), pointed out is most widespread among uneducated or less educated

parents in the society, and this attitude persists because there has not been a sustained effort at making people aware of the charitable normative and instrumental values of technology education, and also community mobilization has not been adequate.

One can deduce from the preceding imperatives that the low quality of female student enrolment would have adverse effect on the quality of country's future leadership and its capacity to socio-economic developmental progress and even its political stability. Thus the ability to achieve the right balance of male/female enrolment into higher institutions in Nigeria regardless of gender or ethnic background / differences in religious belief would result to an overwhelming full development of the country. This notion should induce a positive impact on females student enrolment participation at all levels of the education system. Toward this end, Saints (1992) pointed out that a women education branch was created within Federal Ministry of Education so as to promote public awareness with the hope of increasing females students enrolment in technology programmes in polytechnics. In another development, in Nigeria a National Association of Women in Science, Technology and Mathematics was established, so as to expand the scope of female students' enrolment in science based programmes by the introduction of National awards scheme and motivation "road show"

It is on this ground that Scibeci, (1985) remarked that feminism which is a social construct of the elite theory seeks to identify and support differences based on abilities and skills in an institution of learning. However, it is believed that the ideology of female subordination is strongly rooted in the erroneous belief that Technology education is masculine friendly. Some of which are obviously connected to different attitudes, values and beliefs held by female and male students respectively. In a related study by Collings

and Smithers, (1984) it was established that there is a strong evidence of perception and attitudes of female and male students about their future career in which their answers reveal that:

1. Girls seem to be more person-oriented than boys. Girls seem to value "working with people", "helping other people". Even young women who have finished an education in technology seem to differ from their male counterparts in this respect.
2. Boys, on the other hand, tend to be more oriented towards their own personal needs and have a more instrumental perception in their needs.

Head (1987) in his review of personality traits and choice of careers reveal a rather thrilling result which suggests that Technology education is not only a conventional and acceptable career choice for boys, but offer clear and firm answers to issues of life in general. Therefore, it is attractive to a considerable number of immature boys who have not yet begun to question conventional wisdom for achieving their identity".

On the other hand, girls who do choose technology education are not only likely to be more emotionally mature, but have self-knowledge which can support their choices". Thus, the preceding support the credibility to the claim that if more female students enrolled into Technology programmes, it would eliminate the social construct (class) and then different priorities and concerns about women may be given pride of place thereby giving credence to female students' enrolment in Technology programmes in the federal polytechnics of the northern geo-political zones of Nigeria

2.5 Challenges facing Female Students' Enrolment in Education Technology.

It is generally believed that the society can always reach its heights of greatness only with dedicated men and women in all field of life endeavour. It is on this note that Uyanga (1999) pointed out that the contribution of women to nation building is greatly dependent on the manipulation of their abilities and skills acquired through formal or non formal education. This statement does not only make women contribution relevant to nation building but it is accorded with the vision 2010 which specifically, calls for mass and functional Education for all Nigerians irrespective of sex differences. Supporting this view Nkong (1989) emphasized that women have equal status with men so far they seems to be the main source of human existence and their contribution in economic and socio-political life in the society where they are not marginalized. This notwithstanding, it has been observed that domestic custom and traditions are most possibly imposed on societies by men due to their physical superiority over women leading to inequality between men and women in the society. According to Jekayinfa (undated) in many developing countries and particularly in Nigeria, women have few choices in life outside marriage and child bearing. Thus, UNFPA (1993) in Jekayinfa (undated) states that women are treated differently and considered as "weaker sexes". Their rights as individuals are most often denied them because they are women. The society does not consider them in issues of decision making affecting the family, the society and the nation which they are integral part of. Therefore, following the 1967 National Curriculum Conference, the Federal Government of Nigeria considered it wise to include women in the quest for technical advancement of the nation. Hence under technical education, the government made it clear (FRN 1981) that more effort will be made to encourage women to enter into wider areas of

technical education and technical institutions which do not now have facilities for female students. Despite these efforts, there exist evidences concerning low female enrolment into technology based institutions in the northern state polytechnics.

The reason for the low female enrolments into technology programmes are not far removed from the multi-dimensional variables which are central to the present study. For example, Ehindero (1982) in his survey found that certain tasks and jobs are traditionally associated with particular sexes in the society. This can be attributed to the socialization process, which normally starts early in childhood as also confirmed by Eitzen (2000) that from infancy through early childhood and beyond, children learn what is expected of boys and girls, and they learn to behave according to this expectations. Girls and boys are perceived and treated differently from the moment of birth, wherein females are trained to go for softer and less rigorous tasks which are in line with the socialization process. But since these social roles are acquired, they are changeable with a lot of sensitization, motivation and direct policy statements. In another development, Daramola (1986) in his own research found that students, especially the female ones depend more on their parent's advice particularly on their choice of institution and courses they would like to study. This dependence has been attributed to so many factors-ranging from economic factors to the poor self-concept of females themselves. They seem to be unduly influenced by the negative impressions of the society that they cannot cope with technology programmes. A separate study of Odunmbubi and Balogun (1981) revealed that males have more favourable attitudes toward integrated science than females. In this case, there is likelihood of lower female students' enrolment into technology programme in polytechnics than male students. Furthermore, Balogun (1985) in his own study had thrilling result which affirmed

that more boys than girls opt for all the basic science and mathematics. According to Indabawa (2004), the poor females' participation in studying the sciences can be attributed to the unproved belief that females are not intelligent to cope with sciences, technology and mathematics. Unfortunately, even though this has not been scientifically proven, some females themselves believe they cannot do as well as their male counterparts. Furthermore, Unesco (1999) observed that the ability of girls and women is called into question: and these negative social attributes create a lack of self-confidence among girls and women in their ability and motivation to opt for science. This belief affects the self-esteem and confidence of women and also deprives the society of female professionals in the areas of engineering and medicine. This result suggests that fewer girls are likely to enroll for technology programmes in the Federal polytechnics; so far most technology programmes in the polytechnics are science based. Given the same encouragement and support girls will also do well.

In addition, Azikiwe (1988) in his investigation established that female student's enrolment into technology programmes are restricted by the Islamic religion and cultural beliefs of parents. Socio-cultural beliefs might have something to do with it, but certainly not Islamic religion. As mentioned earlier, lack of sufficient knowledge of Islam results in this perception. The Islamic religion encourages the acquisition of knowledge by both male and female adherents no matter the distance needed to be covered to do so (even if be as far as China), but with strict injunctions on the fear of God and morality as the base of any life endeavour.

Despite the aforementioned multi-dimensional variables militating against female students enrolment into federal polytechnics in the Northern geo-political zones of Nigeria,

the FRN (1986) in its effort therefore declared that every effort shall be made to orientate the entire society towards female education in technology within the frame work of its custom and tradition for the mass movement toward science and technology development in the country.

2.6 Stereotyped Perception of Technology and its Implication for low Female Students Enrolment

A stereotype is a standardized conception or image of a specific group of people or objects that is likely to affect female students enrollment adversely. An examination of various types of stereotype cultures indicate stereotyped characteristics such as the age, sex, vocation, nationality, places and things in the environment. While some people who hold a common cultural mindset in the society positively would regard culture as a natural function of the humanity

In this regard, culture endorses moral and immoral actions based upon beliefs and assumptions implicit in the simplifying stereotype behavior. In this case, every culture seeks to simplify a complex reality by action in any given circumstances. Low female students' enrolments into Technology programmes are likely to be traceable to cultural stereotype in in the society where parents assigned specific roles to females in homes within the community. Even though, subject areas and programmes in educational institutions in the 21st century are still subjected to feminine and masculine roles. However, it is a general consensus that both sexes are mutually complementary to each other on equal terms in biological reproduction of human beings. Unfortunately the same equal status is not accorded females in the socio-economic and political development of the nation.

In many societies of the world, even in education sector for example, women have not been discriminated against in spite of their small numbers even though more often than

not, women have accepted defeat. Heffner (1997) in his investigation on female attitudes, he found that women perceived themselves as "dependent, subjective, passive, not competitive, adventurous, lack self-confidence, and not ambitious". The assumption in this vein of thought suggest that as a person matures, he or she moves towards occupations that match his/her personal characteristics such as value, motives, needs and interests which are likely to determine their career choice.

There seems to be a research which has indicated a strong relationship between the type of school attended by individuals and consequent career choice by male and female students. For example, Gesinde (1986) in his study "found that males preferred Engineering, Agriculture, Architecture and trading or business occupations whereas, female students' preferred studying, pharmacy, law and secretarial occupations" among others. The difference in choice of career among male and female students is not peculiar to Nigeria alone but is obtainable in many other parts of the world.

Scott (1984) confirmed that despite policy changes in the curriculum development, there has not been significant change in males and females in their choice of subjects or career. As such, there seems to be a growing knowledge of understanding that technology programme can be manned by both sexes on equal basis. The connotation that males have a different perception of curriculum and career choice from their female counterparts has proved the misconception wrong from the foregoing.

Some writers like Nzewi (1996) point out that some factors, such as attitudes, culture; social roles of individuals in the community have significant influence on female and male choice of career. However, the Wenreich- Haste (1981) study on career development for male and female students found that "Metalwork and woodwork were put

at par with physics and chemistry, because they are regarded to be highly masculine subject- oriented", it was further established that "Technology is presented as a subject about things than people; so far they are relevant to industry, and profit making rather than people oriented; and this discourages females who are people oriented and caring from technology based- programmes.

Similarly, in a separate study, Tornes (1982) also found that, "Women are concerned more with caring and concluded that subject areas like technology programmes are very much at variance with personal orientation of women's culture and the "rationality of care" which direct their choices". In this regard, the problem is not that of changing women concept but that of changing the methods of presentation of technological knowledge to female students, thereby encouraging female students to enroll for technology programmes in the polytechnics.

Given that we are to ask women to abandon their logic of caring for the logic of central techniques is just like asking them to abandon their own female culture and adapt to patriarchal values. Thus, the promotion of awareness for the need to enroll into technology programmes in technological institutions would be the only tool for equal representation in the technological world that would allow the culture to be made to move with the time and the nuclear age.

2.7 Gender Equality as a Requirement for adequate Female Student Enrolment into Technology Programmes

The United Nations (2001) pointed out that during the Beijing Conference in 1995 that "gender inequality could tantamount to an element of social injustice. More so that such issues are usually based on custom, tradition, religion and culture. Thus, more often than not such issues are likely to be detrimental to women's life. The U.N. (2001), describe

gender equality as the rights, responsibilities and opportunities of individuals to be treated equally either as male or female.

Similarly, the International Labour Organisation, ILO, (2000) remarks that gender equality concept connote that all human beings, both men and women are free to develop their personal abilities to the full and they are expected to be free to make choices without the limitations sets by stereotypes, rigid gender roles and prejudices. Gender equality therefore, means that the different behaviour, aspirations and needs of men and women are considered fairly the same. Toward this end, the U.N. (2001) suggests that equality of men and women has both a qualitative and quantitative aspect. Therefore, the variables, such as culture, tradition and socio-economic needs are expected to be made to encourage female students desire to enrol into technology programmes without prejudice .Equality therefore involves ensuring that the perceptions, interests, needs and priorities of women and men are giving pride of place in life experiences equally .

For this reason, Palvic (2000) states that equality sought to promote women education for self-empowerment at all levels in the society, especially in educational Technology. Furthermore, it seeks to promote not only the attainment of gender parity, but women's full and equal participation in policy making body in education, thereby eliminating stereotyped roles likely to beset women's rights and all forms of Discrimination against Women. Thus one need to appreciate article 10 of the U.N convention which calls on all states and governments "to take all appropriate measures to eliminate discrimination against women in order to ensure equal rights with men in the field of education…" In the same vein, Palvic (2000 P. 22) emphasized that:

> Equal access to science is not only a social and ethical requirement for human development, but also essential for realising the full potential of

> scientific communities world-wide and for orienting scientific progress towards meeting the needs of humankind. The difficulties encountered by women, constituting over half of the world's population in entering, pursuing and advancing in a career in the sciences and in participating in decision making in Science and Technology should be addressed urgently

Thus, special efforts should be made by governments in different countries, educational institutions, scientific communities, non-governmental organisations and civil society with support from bilateral and international agencies to ensure the full participation of females in all aspects of Technology education. Apparently, Gender Equality should be considered to be a social construct that would encourage equal opportunities for female students' enrolment into Technology programmes in Federal Polytechnics Northern geo-political zones of Nigeria.

Equal opportunity in this regard means making a deliberate effort to ensure that diverse groups of learners, particularly female students are treated in the same way i.e. equality, as one of the three injunctions in the educational system in relation to its input, process, or outcome. Therefore, it is important for the government of Nigeria and indeed educational institutions, especially Polytechnics in the Northern geo-political zones to borrow a leaf from the U.N (2001) Declaration on Science by taking appropriate measures aimed at ensuring equality in female participation in Technology programmes irrespective of religious or cultural affinities.

2.8 The Negative Effect of Traditional and Societal Values on Female Enrolment into Technology based Programmes

Udom and Bawa (2003), remark that traditionally the birth of a girl child in a family does not bring joy as that of the boy child, because it is believed that the family name would be lost as soon as the girl gets married. Therefore the girl child is regarded as a second class citizen and a minor, inferior to the male child, because her position is

considered to be in the kitchen. It is generally assumed that women are incapable of taking care of themselves especially in child bearing and rearing. Apparently a female child is often regarded as "goods" because of her anticipated bride price which could be used to take care of the family in the foreseeable future. This view has been captured in the quote below:

> A very strong and pervasive cultural characteristic in African societies such as in Nigeria, is the place and role of women in traditional society. Consequently, there is a wide gulf between male ande female in formal school settings and achievement outcomes. Females, just like children, are to be seen and not heard and they are more often than not made subservient within the male dominated society. Their roles get reduced to household chores, child bearing and rearing and providing labour in farms especially during sowing and harvesting periods due to this society-imposed inferiority of the females, their contribution to community development and knowledge systems as well as the sorts of career and occupation they could undertake is, to say the least, very limiting and perhaps dehumanizing in some extent. Translated into classroom situation, it is not difficult to imagine how the societal views about the role, capability and capacity of females might affect their interest, achievement and attitude to Science and technology. (Jegede, O.J, Agholor, R and Okebukola P (1996)

Odaga and Heneveld (1995) noted that when non-indigenous education was introduced in Nigeria through Christianity and Islam, female education was considered only when it was used as a tool to promote domesticity. Accordingly, a limited number of women were trained to be good housewives and mothers for the emerging male clerks and church officials. In supporting the above, Odu (1986) in Boserup (1970) believes that the low level of education among women resulted from the discriminating policy in education and training given by the early missionaries, and negative attitude of the parents. Even though the Nigerian education policy never discriminated against girl's education; rather the policy emphasizes equal educational opportunity for all categories of students.

Badekale (2003) observed that during the introduction of formal education in Nigeria, efforts were made to ensure that women did not attend formal school, because it

was considered wasteful, as girls would eventually be married and to become housewives. Thus, women's education was not favoured by parents. Consequently, traditional forms of education were made available to prepare women for future roles. And most often, girls' education was terminated at the secondary school level. Thus only very few girls proceeded to higher school especially at the Polytechnic where they are made to study short-term, less difficult and unchallenging courses that would prepare them for their future career such as home management

Prah, (2000) from the Ghanaian context observed that generally, in Africa, the nature of women's education is more oriented towards teaching and women to be better housewives and mothers than equipping them with skills and training required for their future wellbeing in a rapidly changing world.

Furthermore, Badekale, (2003) points out non- attendance of girls to school and their withdrawal from school for early marriages were found to be more rampant in Northern geo-political zones than other parts of the country. For example, Islamic injunction which was invoked revealed that a girl should be married off immediately at puberty age. This is what Indabawa (2004) termed the lack of understanding of Islam. The injunction is mixed up with socio-cultural practices to deprive girls of education and meaningful contributions to the society. Rather, the injunction states that at puberty girls are ripe for marriage, but a girl should be married off immediately a parent notices that she is interested in marriage, refusing which she might be prone to waywardness, or bring shame to the family name and society at large.

Kitetu (2006) found that more boys than girls participated in education in African tradition. Because, African tradition attached higher value to the belief that girls' should

better be used in the kitchen. The imbalance of boys and girls participation in schooling was therefore linked to the age-long belief that male are superior to female students. World Bank (2005) in Nwajiuba (2011) stated that Nigeria is a highly patriarchal society, where men dominate all spheres of women's lives. Women are in the subordinate position and male children are preferred over female. This belief has adverse implication on women, because it deprives them of contributing meaningfully to the development of the society.

Odaga and Heneveld (1995) from another perspective, list the following traditional reasons why women were limited in career choice. The threat to female chastity; control over women's productive and reproductive labour; women's economic value in bride prize for wealth and child bearing; apprehension that educated girls will not make "controllable", obedient" and "subservient" wives; the widely held believe that it is a waste of money to educate a girl who will leave home for marriage and not contribute to the maintenance of her natal home; limited labour market opportunities available for their employment; and the prohibitive cost of formal education are among issues that tend to limit girl's education at the same rate with boys .

Ogunjuyigbe, Liasu & Suliman (2008) identified a wide range of reasons why women were limited in career choices to the cultural division of labour stereotypes certain careers as unfeminine and incompatible with marital demands. Largely because majority of technology-related careers have in-built inflexibility in work schedules, requiring those involved to be taken out of their homes to the laboratory or the field, they are believed to be incompatible with feminine responsibility to meet the dual-role demand of home and work. Consequently, majority of girls with potentials for technical and vocational skills, are discouraged from pursuing technology courses.

The above submissions from various experts indicate gender discrimination from traditional and societal perspectives in terms of value attached to education. It could be observed too that girls are evidently different from boys biologically speaking and such differences are attributed to physical roles they exhibit. However, sex roles are not the same as gender roles so far gender refers to the differences between men and women on the basis of socio-cultural grounds which go beyond merely physical differences. For instance, in the society, women tend to perform roles that are different from those performed by men. FAWE, (2003) describes gender roles are not natural but cultural that have been constructed or created by people in the course of time. Unfortunately these roles have traditionally been regarded as fixed and unchangeable for the sake of continuity and tradition and as a result they came to be equated with sex role. However, it could be argued from the preceding that education is a socializing agent which seeks to fit individuals irrespective of sex into society by teaching them the accepted and established norms and values, ideas and practices; which will be used for self-development and the development of the society at large. Western education according to Omirin (2006) is much valued in Nigeria and people pursued this knowledge with such fervency and vigour. Because there is need for high skilled manpower in all sectors of the country's economy which made higher education, most especially Polytechnic education more valuable by all the stakeholders and the general public.

2.9 The Effect of Multi-dimensional variables on Female Student Enrolment into Technology Programmes in the Northern states of Nigeria

Osborne, Simon and Collins (2003) stated that the immigration of students' attitude towards studying Technology education has been a substantive feature of the work of the science research community for the past 30-40 years. The importance of this investigation is stressed by a persistent decline in higher education Technology female student enrolment over the last two decades. Female student's reluctance to choose Technology Programmes as a course of study in polytechnic education has serious adverse implications not only for the health of scientific endeavor, but for the scientific literacy of future generations. Many Technology educators attribute great importance to the affective domain for example, Oh & Yager, (2004) argued that the affective outcomes of technology instructions are at least as important as their cognitive counterparts. The affective domain is characterized by a variety of constructs such as attitudes, preferences and interests. Researchers' definition of these constructs varies and consequently may be confusing.

Simpson, Koballa, Oliver and Sravley, (1994) extensive review of student's attitudes towards technology subjects established a negative attitude toward a subject that leads to lack of interest, especially, when subjects are made to be selected or are made optional, or could be avoided as a subject of study or programme. Simpson and Oliver (1990) concluded in their study that a positive attitude to technology education "leads to a positive commitment to technology programme that influence lifelong interest and learning". Hence, the major technology education reform efforts have emphasized the improvement of students' attitude in order to encourage female students enrolments I polytechnics. Several studies have identified a number of factors affecting students' attitudes to technology education in general. Gardner (1975) for example found that sex is

probably the most important variable related to pupils' attitudes to technology education. Other studies such as Sjoberg, (2002) have reported that males have more positive attitudes to technology education than females, while others found no satisfactory significant gender differences. Kalile and Meece (1994) wide-ranging review on gender issues found that students' attitudes to technology subjects; in a review of gender differences in achievement, attitudes and personalities of technology students, confirm that there were clear differences in the nature of boys and girls technology interest that boys expressed relatively greater interest in physical science activities, than girls who were found to be more interested in biological and social science topics.

Catsambis, (1995), made an ironical statement that females begin to loose interest in Technology Programmes even when they can perform as well or even better in this subject as their male classmates. According to Gardner and Tamir (1989), the term "interest" usually refers to preference to engage in some types of activities rather than others. An interest may be regarded as highly specific type of attitude. When we are interested in a particular phenomenon or activity, we are favorably inclined to attend to it by given time to it.

Osborne et al (2003) distinguished between scientific attitudes, a multifaceted combination of the desire to know and understand, an inquiring approach to all statements, a search for data and their meaning, a demand for verification, a respect for logic, a consideration of premises and of consequences and attitudes to science as a school subject, that is a set of affective behaviors towards technology education, including interest in technology programmes.

There is an extensive literature on attitudes, interest and enrolment in technology programmes (Gardner, 1975; Ormeol and Duckworth, 1975; Schibeci, 1984; Simpson et al; 1994). It seems natural to assert that female enrolment will be influenced by their interests, since enrolling for subject at a stage, when it becomes optional, is an obvious way of expressing one's interest (Gardner and Tamir, 1981) Ormerol and Duckworth (1975) pointed out that interest in technology education appears to be at an earlier age than interest in other curriculum areas. The disparity between the high and social perception of Technology held by female students in the more theoretical, de-contextualized version of school technology promulgated by teachers identifies a major gulf between teachers and their students that may impede effective communication.

In essence, the vision that Technology offers is a backward looking view of the well-established scientific landscape, whereas in contrast, what appears to excite students is the white heat of the technological future offered by Technology education. In short, to capitalize in female interest, Technology programmes need to be less retrospective and more prospective.

2.10 The Effect of Culture and Socio-Cultural Values on Female Enrolment into Technology Programmes

A culture is a complex web of information that a person learns, and which guides each person's actions, experience, and perceptions" (Campbell, 2000:38) James Banks defines culture as "the behavior, patterns, symbols, institutions, values, and other human made components of the society" (Banks, 1989:52). This definition perceives culture to have unique values, symbols, lifestyles, institutions, and other human-made components that distinguish one group from another. that complex whole which includes knowledge,

belief, at, morals, law, custom and other capabilities and habits acquired by man as a member of a society" This is to say that, culture is all encompassing. It is everything that is socially learned and shared by the members of a society and it is this shared behavior that tends to affect the ways of life of the individuals in the society. It helps a group of people develop a set of rules and procedures from their life experiences. This is because it is culture that tends to define the attitudes values and goals of people, while the individual learns this accepted behavior as unconsciously as he learns the language.

Culture beliefs and social values have far ages been having implication for the behavior and pattern of life of the people in societies. McCreary, Lewis and Walker (1999:150) as the thoughts, beliefs, practices and behaviors of people in the areas of history, religion, social organization, and collective production. It refers to the perceptions, attitudes, beliefs and assumptions that individuals and groups hold about their environment. A person's environment is informed by culture; thus individuals who belong to the same cultural group are likely to hold similar views.

Culture is further defined as the shared patterns of behaviors and interactions, cognitive constructs, and affective understanding that are learned through a process of socialization (Http://www.carla.umn.edu/culture/definitions.html). These shared patterns identify the members of a culture group while also distinguishing those of another group. Cultural beliefs and social values have far ages been having implication for the behavior and pattern of life of the people in societies, Banks, and Mc Gee, (1989) observed that most social scientist today view culture as consisting primarily of the symbolic, ideational, and in tangible aspects of human societies. The essence of a culture is not its artifacts, tools, or other tangible cultural elements, but how the members of the group interpret, use and

perceive them. It is the values, symbols, interpretations, and perspectives that distinguish one people from another in modernized societies; it is not material objects and other tangible aspects of human societies. People within a culture usually interpret the meaning of symbols, artifacts and behaviors in the same or in similar ways.

The dominant culture in Western Society is the male culture, based not on size but on male influence on society (Zuga, 1999). This also seems to be the norm in non-western societies where there is gender inequity in terms of access to opportunities. In the case of Nigerian society, male dominance is reinforced by traditions and customs, including beliefs -religious or cultural.

Cultural and attitudinal barriers, such as perceptions about the role and status of women, exist across countries, despite widely different circumstances (Huyer, 2003). In some societies these barriers are almost inseparable for women. With regards to education, this includes parent's choices to invest in boy's education at the expense of girls. Girls are required to help with domestic chores at home for all or part of the school day. The ones who do go to school often are not given the opportunity to get to tertiary levels.

According to Neito (1992), culture is neither static nor deterministic, it gives us just one important way in which to understand some differences among students' learning and this can indicate appropriate strategies and modifications in curriculum. Thus, the area of culture and cultural differences should be handled with great caution so that we as educators do not make assumptions about students because of the culture from which they come.

Preconceptions that women's responsibilities confine them to the home, and expectations that married women will not work outside the home also contribute to

restricting girls' access to education. Once girls do enter school, they are discouraged from learning and offering technology programmes which are often not considered appropriate for girls, for reasons ranging from lack of intellectual ability to expectations that the primary occupation for women is to marry, bear children and work inside the home. (Huyer, ibid). Other cultural reasons include fear of sexual harassment by other pupils or teachers, or inadequate toilet facilities. Education costs – fees, uniforms, and books – often deter parents from sending girls to school when they could be earning money for the family. Several studies (Bolarin, 1993, Danmole. 1998 & Okebukola, 1999) in Yahaya (2004) have identified the causes of low enrolment of females in technology courses as cultural barriers, community role expectation for women, the perception that technology programmes like engineering are physically demanding, early marriage, teenage pregnancy, religious beliefs, peer influence, parental pressure and negative attitude of male technology teachers to female technology students. Additionally, in some cultures the concern is that enrolment in technology programmes will in fact make women unsuitable for marriage and motherhood, and make them undesirable to potential husbands (Huyer, ibid).

Studies in both industrialized and developing countries shows that teachers tend to respond to boys more often than girls in technology classes and pay more attention to girls in "softer" classes thereby sending messages about gender capacities. Teaching materials, textbooks and lectures tend to depict technology as male domains.

In countries where it is more socially acceptable for girls to pursue independent careers outside the home, other ingrained social attitudes can restrict women's participation in technology. For example, Huyer, (ibid) explains that although girls in the (OECD)

countries may have higher rates of enrolment in technology related courses at the lower levels of education, their numbers tend to decrease at higher levels.

Studies indicate that a narrow technology focus in the curriculum, while appealing to boys alienate girls, who are more interested in understanding how the technology fits into a larger social, environmental or work context. (Ajayi and Dolly (2001); Bissell, et al (2002). There is increasing evidence that girls benefit from technology teaching curricula that emphasize hands-on activities and application to everyday life and the environment, reflecting their critical role in health, agroforestry, and natural resource management in most parts of the world.

The current generation of Nigerian parents has come to realize that the importance of educating both males and females in technology is not only for economic purposes, but also for the social and political benefits to be gained. It is important to note that about 50% of Nigeria's population is female, and if education of women for national development and technological advancement continues to be hindered, primarily by customs, early marriage and religious practices, society as a whole suffers because a significant percentage of its population is not contributing fully. Oduaran & Okukpon, (1997), Abdulrahman, (1992) and Ndahi (2002), advised that the curriculum should be modified so that female learners can have a sense of satisfaction in their own ways of learning. Teaching girls – only technology education courses have been used as an intervention program to bridge the gap between the sexes (Braundy, O'puley, Petrina, Dalley, Praxiton, 2000). The curriculum, as suggested, should also reflect the differences in students' lives and cultures and encourage open discussion about the ways in which ascribed power can influence a person's life. Teachers should take the responsibility to foster gender fair school environments (Bauer,

2000; Jones, Evans, & Boyd, 2000). A teacher's negative attitude toward a student can affect his or her self- esteem. (Barnett, 1998), but sound pedagogical practices and social organization in classrooms can promote a gender inclusive experience, where male and female can participate and perform equally well (Mayer – Smith, Pedrett: & Woodrow; (2000).

As a result of these cultural barriers, a series of disjunctions' or mismatches occur between requirements of educational programs and the situations and experiences of female students. These disjunctions apply generally to female's participation in education, but particularly to technological education.

In Africa, Williams (1987) has shown that low participation of girls in technology education is compounded by low enrolment rates, with the gap between girls and boys widening at higher levels of education. These cultural barriers include;

- Relegation of females to the home
- Parental perceptions of cost-benefits of educating girls, affecting low income families.
- Female seclusion practices and early marriage.
- Fear of cultural loss
- Conflicting demands on girls of traditional and school learning.
- Discriminating labour market practices.
- Inrelevant of curricula and technology to girls' views and experiences of the world.
- Masculine image of science projected in text-books, media and popular assumptions.

- Nature of technology occupations, which are not easily combined with child-rearing and child care.
- Lack of role models and career counseling.

Omoike (2010) also concludes that the barriers to women's entry into non-traditional subject areas include poor career advice, lack of role models, negative attitudes from families, fear of mathematics and fear of being in a minority.

2.11 Parental Negative Attitude towards Female Students Enrolment into Technology Programmes in Northern States, Nigeria

The wish to protect daughters from undesirable influences appears strongest in areas that are still very traditional. This explains why Northern geo-political zone of Nigeria stands in sharp contrast to other parts of the country when we consider the percentage of girls that are not enrolled in school. The reasons for the relative underdevelopment of education in Muslim Northern geo-political zones of Nigeria are often held to arise from the British government's laissez-fair attitude towards the region and from the resistance of the emirs to the introduction of Christian missionaries and the spread of western education. This was however refuted by Fafunwa (1974) as he confirmed that the Christian missions introduced male-oriented education when they came. In addition, Denzer (1988) and Tibenderana (1988) respectively also held a contrasting view that the lack of schooling in the north was a result of British thrift rather than the emirs' resistance. This notwithstanding, Callaway (1984) argued that the education of girls was hampered, because Northern geo-political zones of Nigeria was the only areas in sub-Saharan Africa that observed purdah, and the only areas in the world that observed it so strictly and extended it to both rural and urban women. Therefore, western education was

regarded as a threat to both Muslim and Hausa values, which was also seen as especially dangerous for women, whose duty it was to protect the tradition of the home. On the contrary, Callaway's argument cannot stand because Awe (1990), cited in Ezumah (2001) that the male-oriented education introduced by the missions had a great effect in the establishment of schools and the curricula for girls and boys. Whatever be case, Technology education has to be taught in a way that it would be relevant to the real life expectations of the people, especially the needs and yearnings of parents, families and females themselves..

Csapo (1981) reviewed a number of unpublished thesis from Ahmadu Bello University in Northern Nigeria, as well as editorials and articles from newspapers, on the subject of female education. The consensus appeared to be that it was bad for society in general, and for girls in particular, to be educated in western education system schools. Csapo's review does not, however, give any measure of the prevalence and strength of these views or of the extent to which girls and women themselves subscribed to the claim. However, Robertson (1986) points out, that Islam should not be held responsible for the low enrollment of girls in Africa. For instance, Sudan stands as a current example where the Muslim north has significantly higher school enrolment rates than the Christian south. Robertson claims that, since independence, the predominantly Muslim countries in Africa have had the highest enrollment growth rates in education.

In the Northern geo-political zones of Nigeria, parental attitudes is said to have a significant influence on education especially for girls because. It is believed that the culture, religion and attitudes that mould the society, so much so, that these determinant factors shape the way of life. Mushi and World Bank, (2002) declared that communities in

Nigeria are largely expected to do wonders in the world of knowledge and technology by keeping up with the livelihood of the family. All family development efforts, including schooling are invested on the boys because they are the makers of clans while the girls are tenderly groomed at home to be married off to husbands who will speak for them. As a result few efforts and resources are spent on girls' development in general.

In Nigeria, parental attitudes, sometimes strengthened by religious beliefs, account for the ways boys and girls are educated, by the opportunities provided to them. This attitude is held by both men and women in communities which highly contribute to the low enrolment, low participation and low performance of girls in schools. In addition Finken and Griffin, (1988) affirm that dropouts due to early marriage and teenage pregnancies are a common feature. Also lack of vision and prospects to future life reduces girls' interest to participate, perform effectively in education girls in the school system. It could be concluded as evidence from the foregoing that there is a relationship between parent's attitudes about the intrinsic value of technology programmes and their perceptions of the value of technology for women and their daughters' abilities. Although some Nigerians still believe in their traditional religion and their customs that such beliefs do not entirely guide their decision making with regard to the education of their daughters. Hence, Andre, Whigham and Hendrickson, (1999) stated that parents asked to choose subject, courses, or programs for their children have, in some cases perceived boys to be more competent than girls in technology-related fields. And this has contributed largely to gender disparity in educational enrolment in Federal Polytechnics Northern geo-political zones of Nigeria. Consequently, Hari (undated) in FEMSA 6 Project findings revealed that it is an

indisputable fact that without parents and community support, any efforts to improve females' participation in technology education will be greatly hampered.

2.12 Adverse Effect of Child Labour on Female Student Enrolment into Technology Education

McSweeney and Freedman (1980) describes mother's time as very constrained to domestic work, especially in rural areas where households commit many hours to such domestic activities such as fetching of water or firewood. The high fertility rates in Sub-Saharan Africa may be an adaptive response to the time consuming household and farming tasks that make women's time to be a scarce commodity. One of the advantages of polygamous marriage is the sharing of household tasks. Even though majority of African women are not in polygamous families, however, they do to turn to their children or other young relatives for additional help with time-intensive, low-skill jobs in the household and on the farm.

The extensive use of child labour has significant implications for school enrollment. Chernichovsky (1985) points out that the enrollment of children seemed to be influenced by the home of elderly people who are often used as substitutes for child labour. Also the household's possession of capital like livestock may be used to involve children in income producing activities. It has been observed that children were more likely to be enrolled in school if their grandparents lived in the household whereas they were less likely to remain in school if, at intermediate levels of family wealth, the household had more livestock. But boys' schooling was more affected than girls' by the household's ownership of livestock because boys' herding activities were more likely to take them away from home and school. Similarly, in rural Ethiopia labour demands, fall more heavily on boys than on girls.

Biazen and Junge 1988) in their study interviewed a sample of 576 households and found that household duties are the primary cause of school absenteeism. The result of their study revealed that 57 percent of boys were absent from school whilst 32 percent of girls were absent from school. Most of this gender gap is explained by way households treat boys and girls

On the other hand, in other areas the demand for household labour falls more heavily on girls than boys. Remy, as cited in Fapohunda (1978) point out that Muslim women who live in seclusion in Northern geo-political zones of Nigeria depend on children to help with their market activities. Ironically, being in seclusion does not exempt these women from family obligations that are involved in supporting the woman's position in her own lineage. Consequently, women in purdah engage in several kinds of production for the market, especially food preparation and handicrafts. Even though they are confined as they are to their households during daylight, they depend on daughters or young female relatives to sell their wares in the street or market place. They also rely on their children to collect raw materials and help with production and sales. Therefore, sending children to school may curtail the income generating activities of these women and ultimately reducing girls' enrollment in schools. However, Okuwa (2004) carried out a study to determine the relationship between years of schooling and earnings (rate of return) in Nigeria, and the findings reveal that the mean monthly earnings of workers increase with more years of schooling. The private rate of return is low for graduates of colleges of education, it is higher for polytechnic graduates and higher still for university graduates. Furthermore, the mean earnings increase with higher years of labour market experience and thus, the higher the level of education, the higher the rate of return to the individual. This means that if

parents and society at large can invest in the education of females and encourage them to read technology programmes in the federal polytechnics in the Northern geo-political zones of Nigeria, it will improve the general wellbeing of households and society at large.

2.13 Location of Institutions as a Factor associated with Low Female Students' Enrolment into Technology Progamme

A number of studies (Akande 1987, Assie 1983; Bedri and Burchinal 1985; Chernichovsky 1985) suggested that area of residence is predictive of enrolment and attainment at all levels of education. The mechanisms through which this factor operates are not always clear.

However, the greater availability of schools in urban areas, the higher opportunity cost of a rural girl's time, the greater wealth of urban families, the more open attitudes among urban parent towards having girls attend western schools, and the greater opportunities for girls in urban areas to obtain jobs in the modern sector may all be relevant. However, there is no evidence by which to judge the relative strength of various possible explanations to the claim. However, Okpukpara & Chukwuone (2003) in a study on Child schooling in Nigeria: The Role of Gender in Urban, Rural, North and South Nigeria, interestingly found out that location in rural or urban does not matter much in child's schooling in Nigeria, thus contradicting most of findings in other developing countries.

A recent study conducted in Ethiopia by Abraha et al (1999) on 'What factors shape girls school performance' indicate that urban girls enrolled in school are more likely to persist, both in absolute terms and compared with boys than rural girls. This is not surprising according to Okpukpara & Chukwuone (2003) urban households have easier access to school than rural households. Hence, according to Rahji (undated), the longer the

distance the lower is the likelihood of enrolment. Distance to the nearest school is used as a measure of access. Casterline (1987) in Rahji (undated). Surprisingly, the share of girls passing the national examination appears to be lower in urban areas than rural girls. The impact of urban residence is misleading; hence Abraha et al (1999) declare that once both the school and the teacher are taken into account in a multivariate analysis, the force of the community variables weakens. In addition, Chernichovsky (1985) found that when the effects of family and other factors affecting schooling are carefully considered, the correlation in between educational attainment and the size of the community vanishes. Thus, residence in larger villages primarily, affects enrolment probabilities. McCracken & Barcinas (1991) in a research on differences between rural and urban schools student characteristics, and student aspirations found out that urban and rural schools differed, as expected in size, cost per pupil, size of staff, and breadth of curricular and extra-curricular offerings.

The disadvantages facing girls are eased to some degree in urban Nigeria, but no systematic evidence emerges to the effect in rural Nigeria, especially in the Northern geo-political zones where socio-cultural and religious factors play strong roles rather than economic factors. Because Northern geo-political zone of Nigeria is predominantly Muslim area and has less co-educational institutions, especially at the tertiary levels where certain programmes in technology are gender stereotyped. So far females do not mix freely with their male counterparts in school activities.

The perception of cultural shift of females indicate more desirable educational disposition, to have greater access to the labour market, improving their life chances and

their future wellbeing. This suggest that cultural shifts can and do occur, but they take time and effort on multiple fronts to be effective.

Ojobo (2008) recommended that schools should be located closer to communities to serve as precursor to educational growth in the locality. Given that the foregoing analysis controls other socio-economic factors, it may be possible to establish that location is likely to play a role in gender imbalance in Technology programs in the Federal polytechnics in Northern geo-political zones of Nigeria. Other unmeasured socio-cultural factors may play significant roles as well.

However, the (6) six Federal polytechnics classified by zone as depicted in Tables, 2.3, 2.4 and 2.5 show that most Federal Polytechnics in the Northern geo-political zones are cited in urban areas which encourages female enrolment, because location impact is observed to determine how other variables such as interest, perception, attitude, and culture can be controlled. Although there exists no strong empirical evidence to back up this fact, however, it must be appreciated that infrastructural decline prevalent in the rural areas than in the urban areas may be a factor that can influence female enrolment into Polytechnics in the area under study. Subsequently, if these are addressed it might improve the enrolment of females in technology since the rural are devoid of the hustle and bustle of urban cities, and enjoy a serene atmosphere conducive for learning to take place.

2.14 The Government Support and Low Female Enrolment

Ogbonnaya, (2003) describes educational policy as specific goals which must be pursued through educational institutions to achieve the desired goal in education. The educational Policy is not only a goal to be attained but major decisions to be made in education. Educational institutions constitute an example of organization that is guided by

definite policy or policies. All educational institutions in Nigeria are guided by the government policy document titled National Policy on Education published in 1977, revised in 1981, 1998 and 2004. The educational goals or objectives expressed in the Federal Republic of Nigeria, National Policy on Education include;

1. The inculcation of national consciousness and national unity
2. The inculcation of the right type of values and attitudes for the survival of the individual and the society
3. The training of the mind in the understanding of the world around
4. The acquisition of the appropriate skills abilities and competences both mental and physical as equipment for the individual to live in and contribute to the development of his society

The Federal Government of Nigeria has indicated commitment in the National Policy on Education (1981) to enhance scientific literacy and technological independence. Because the development of technology are not only seen to have helped tremendously in the transformation of the society but in improving the living condition of mankind remarkably. Also, the Federal Government described the Polytechnic education, in the policy document (1998:34) with the following specific goals:

i. Provide full-time or part-time courses of instruction and training in engineering, other technologies, applied science, business and management, leading to the production of trained manpower
ii. Provide the technical knowledge and skills necessary for agricultural, industrial, commercial and economic development in Nigeria

iii. Give training and impact the necessary technologists and other skill personnel who shall be enterprising and self-reliant

iv. Train people who can apply technology knowledge to solve environmental problems for the convenience of man; and

v. Give exposure on professional studies in the technologies

In pursuance of the above goals, it is stated in the policy document (1998:35) that government shall adopt measures to develop and encourage the ideals of polytechnic education through students industrial work experience. Jenkins (1979) presents such policy as a set of interrelated decisions by a political actor or group of actors concerning the selection of goals and the means of achieving them within a specific situation where those decisions would in principle be within the powers of those actors to achieve. It recognizes in the definition that both decisions and action deliberately taken by government to solve a social problem as essential elements of the policy. It means that the decision-makers are fully aware of the choice of goals and the means to achieve them.

It can be deduced from the perception, that the National Policy on education is seen as aggregative decision-making as against single discrete decision. So far, the definition recognizes the need for availability of means to achieve given ends as well as competence of certain persons to take decisions on behalf of others. In this context educational policy as a concept serves as a blueprint for official action that has impact on all educational institutions of learning including Polytechnic education.

However, the Nigerian government at her independence in 1960 recognized education as being strategic for development and as an important variable acting for changes in demographic dynamics. However, over 300 ethnic groups and numerous

religions orientations have made the articulation of policies difficult for all sectors. The system of education in the Northern geo-political zones of Nigeria has always been associated with Islamic religion, emphasizing Koranic education, while the western mode (WM) education in the southern Nigeria, which stresses literacy in English, is associated with predominant exposure to Christianity. This dichotomy created uncertainties between the North and the South, and led to resistance toward the attainment of western mode education in the Muslim dominated areas of the North. The observed difference in education among different groups in the country has been attributed to the religious variation.

The articulation of a National Policy on Education in 1970 was a major step towards bridging this gap in orientation of education and streamlining national priorities for all-inclusive policies. The National Policy on Education therefore attempted to take into account the interests of the entire population by addressing both formal and non-formal systems, and providing parallel systems of education to include all segments of the society.

Consequent upon this development, educational standards and conditions of access are uniform and gender-neutral across the country. And they are all derived from the strategies outlined in the National Policy on Education. However, only certain aspects of the system promote access and staff development of females to education. For instance, the Business and Technical Education system promotes courses and disciplines of professions traditionally seem to favour girls, Secretarial Studies and Business Education are good examples. Given that certain schools focus on the training of professionals in female-dominated fields, then their efforts could be considered as a gender equity initiative at the basic educative stage, although it is not specified at the policy level. Also, as females have

historically dominated the teaching profession, any effort to promote teacher training institutions, such as Teacher Training Colleges and teachers institute for training of staff and student teachers, is seen as a female friendly policy.

Gender analyst like Isingo-Abanibe (1997) has critiqued the new educational system for its limited strategies for gender imbalance. This view has been re-emphasized by Adeyemi and Akpotu (2004), that the National Policy on Education (NPE) does not have provisions for priority focus of female education in tertiary institutions in Nigeria. There seems to be no strong alignment between policy discourses and organizational practices. Sustainable development is not assured in the absence of proper articulation and implementation of guidelines for female education. The institution of parallel school systems for boys and girls, at the lower levels is considered insufficient. The content of curricula, and the focus of expenditure to avoid reinforcing gender stereotypes, has yet to be addressed. Unfortunately, much of the curriculum still promotes traditional sex roles as indicated in Akanyi, Bonat and Salihu, (2003) and CEDAW (2003). If strategies and budgets do not fully reflect gender insensitivity, to what extent does the apparent gender blindness derive from policy? In considering policy guidelines for gender equity, it is most likely that the equity focus on the Nigerian federal government with regards to Technology programmes especially in the Polytechnics would quite narrow compared with that for other levels of education. The JAMB and the NUC prescribe ratio of 60% Science based courses to 40% Arts based disciplines in the admission quotas of federal institutions. This encourages interests and development of aptitudes in the science subjects, including Applied Sciences. The gendered effort is that while this lowers the cut-off for technology and raises that of Arts subjects; made girls to be restricted from benefiting from this

initiative due to pre-discrimination factors, such as cultural and parental attitude to studying vis-à-vis housework for their children.

Some reasons are due to the biased nature of science curricula, which frequently depicts males as the scientists. Alele-Williams, (1989) pointed out that economic factors at home also, affect girls more than boys. Consequently, girls have historically not performed, as well as boys in technology courses as they have in the humanities. Therefore, it has been conjectured that raising the cut-off marks for technology programmes should lead to higher access for them. The Net incremental access must, however be greater than zero before it can be concluded that the effect of this policy is not detrimental to female access. Therefore, there should be the need for empirical analysis to substantiate this position in order to reinforce female disadvantages rather than advantages that may arise thereof. In certain indirect ways, gendered outcomes are deduced from observed or implied effects of the application of certain education policies. Some of the outcomes are verifiable by available statistics. Most policies though, have not, hitherto, been systematically documented. For instance, policies that increase opportunities for students from remote parts of the country to gain access to higher education are likely to benefit female students. The widely documented phenomenon of feminized poverty, suggest that these policies focusing on economic constraints may indeed specifically affect gender equity.

A broader critique of the actual training of professionals in female dominated fields is necessary to unpack the realities of the implementation of the policies and its implications for gender balance in access in order to have to curriculum transformation, and staff development which is the main focus of the current analysis of gender imbalance in Polytechnic institutions.

Furthermore, schools of poor quality inhibit the educational attainment of girls and affect the choices they make about what to study. In Kenya Eshiwani (1982) and in Ghana Weis (1981) girls were found to be overrepresented in schools but induced low quality in their academics especially in preparing their students for the examinations that are often prerequisites for continued study or employment in the private and public sector. One of the greatest disadvantages experienced by girls was a lack of access to technology fields which are often regarded as unfeminine. Few of these schools which offered technology courses, and those that did were without the infrastructure and equipment needed to teach them effectively. In Swaziland, as reported by Wheldon and Smith (1986), girls in single sex schools were less likely to choose technology courses than were girls in mixed schools, despite the fact that the single sex schools in their sample admitted students selectively which were well equipped. The Western type of education system still in use in African countries ensures that options not taken are usually options lost for good, since changing fields of study at a later time is rarely possible even though, higher education, disparities in the fields of study chosen by men and women are glaring.

The poor quality of the institutions they attend and their constricted curriculum choices also put women at a disadvantage after leaving school, because they are less likely to have acquired permanent functional literacy and the skills that employers value in educated workers. This disadvantage is distinct from any distaste or discrimination that may have exited among employers. Evidently, Adjebeng-Asem (1988) reported that those women who did manage to complete their education successfully may have suffered pronounced discrimination on the job. Female engineers, for example, were sometimes not

allowed on construction sites or have great difficulty obtaining internships during their training.

Several authors have attributed the reluctance to send girls to school in part to a society's response to a perceived lack of fit between the vocations for which schooling is supposed to prepare students and the vocations that are regarded as suitable for girls. Csapo (1981) suggests that in Northern geo-political zones of Nigeria the only approved role for women was that of wife and mother, therefore schooling was deemed unnecessary for them. Wresinska (1980) reports that this role determines a girl's interest in the subjects of her choice at the lower levels of school.

These views are associated with two other issues namely: (1) the availability of job opportunities for women in the modern sector, (2) the segregation of gender into alternative courses of study, which often starts in the higher grades of elementary school and continues on to the secondary and tertiary institutions. In this way, Eshiwani (1982), points out that, girls are channeled into domestic science, handicrafts, and biology, whereas boys study chemistry and mathematics, or go directly into vocational subjects. Kelly (1998) points that one of the results of women not being prepared to enter the labour market may have been the drop in female participation in the labour force in sub-Saharan Africa from 45 percent in 1960 to 42 percent in 1981, despite a massive expansion in education in the same period.

The evidence reported by Eshiwani (1982) indicates that the causes for this seeming anomaly may have arisen both from the curriculum choices women were given and from the quality of the schools they attended. Consequently, neither the belief that women need only prepare to be housewives (refuted by the overwhelming evidence that most

women engaged in economically productive activities in the informal and traditional sectors) nor the assumption that girls in secondary school are predominantly interested in becoming wives and mothers since attitudes of girls are shaped by the training they are exposed to in school become useful generalization of their socialization and personal expectations of African girls. Although this assumption may not be unrealistic, therefore become difficult to provide places, as well as the demand for schooling of girls.

Thus, government support policies rarely address the factors related to improving retention and enrolment such as poverty, sexual maturation, early marriages, teenage pregnancy, etc. in addition, in most government educational plans, there is lack of specific identification of the girls' education problems to be addressed, appropriate strategies for the identified problems, budgetary allocations and appropriate monitoring and evaluation (M & E) strategies for tracking impact of implemented strategies. These are only mentioned as a cross cutting issue. In the end female education issues are forgotten and thus receive little attention. Omoike (2010) recommended that the federal government should immediately embark on reviewing the National Policy on Education, to create a section on gender education, to spell out the modalities of expanding access and equity for females' education in higher education, especially at the polytechnic level. There is need to offset the preferential treatment within households. The importance of technology education for the girl-child and its contribution to the development of the country needs to be the focus of awareness campaign in rural areas of the Northern geo-political zones.

2.15 Curriculum Review: An Overview of Some Significant Issues

A curriculum is a planned composite that attempts to communicate the essential principles and features of an education proposal to facilitate student attainment. The subject

matter for the curriculum includes the curriculum elements, as wells as a number of variables in the teaching and learning situation and related cultural issues. Consequently, the problems of the curriculum vary in significant ways according to a number of important cognate factors which include, among others, the following;

- The learner, his age and the psychological and physical background;
- The teacher, his training, qualification, exposure or experience and attitudes
- The educational institution, it type, location and the availability of equipment and resources
- The environment; this subsumes the people as well as their physical circumstances and factors.

Taking these curriculum factors into consideration with their related elements, curriculum problems assume such dimensions and complexity that make it impossible for a single curriculum theory to embrace. As posted by Oriafo, (1993), a single curriculum that would carter for curriculum problems at all times has so far not been formulated and perhaps may never be articulated. Ideally, curriculum review is a continuous exercise that is supposed to take place regularly in harmony with changing times and conditions.

However, it is to be noted that the Nigerian curriculum exercise has not been profound, consistent and extensive as in America and Britain (Nigeria's principal educational mentors). The National Policy on education (1977, revised in 1981, 1998 and 2004) are important landmarks in curriculum revision, development, implementation and evaluation.

The purpose of curriculum review can associated with dissatisfaction with the status quo. All over the world curriculum revision moves start with disapprobation or an outright

rejection of existing conditions, materials and/or programmes. However, it invariably aimed at improvement in general. Presently, the rapidity of change in technology is one of the main focuses propelling cultural change and hence curriculum revision, as stated in the National Policy on Education (NPE, 2004), the major concern of Nigeria is how to develop and implement a curriculum that assures overall social, cultural, economic, political, scientific and technological programme for progress. Thus, curriculum involves far more than the context of education; rather, it goes beyond the intellectual development of the people to include the provision of adequate facilities for human development in terms of physical, economic and spiritual improvement.

The aspiration of curriculum development appears to be an anxious dream. However, with the stature of curriculum theorists and practitioners in contemporary Nigeria, a realization of that dream is imminent. Thus, theorizing and actual practice should be going simultaneously especially, on designing, implementing and evaluating relevant and valid curriculum for life more abundant in a world of rapidly advancing Technology and overall circumstances. However, an attempt to address the multi-dimensional variables that affect female enrolment in technology can only be addressed through curriculum innovation and design i.e a cognitive design that will seek to refine the intellectual capacity of the female sex. Toward this end, Adeniyi, (2005) suggests that the major challenge of this design is to identify the most salient and efficient intellectual processes through which learning occur and to provide the setting and structure for their development. In this case, emphasis on biological differences or social construction should be ignored. Thus, Interest in this view is the belief that cognitive processes can be cultivated, that educational objectives should be derived from levels of cognitive functioning, and that test items

should be designed to assess the levels of cognitive achievement. By and large, the specific competencies or technology approach should also be adopted. So far, it draws most of its inspiration from educational technology studies, while curriculum speaks the language of production, packaging and delivery.

In spite of the robustness of the academic rationalism design, it is evident that issue of packaging and presenting a given content (educational technology), issues of personal relevance, self-activation, social reconstruction and the like are at the heart of educational theory and practice. In Nigeria presently, many of the issues classified as emerging global and national issues are being addressed through curriculum adaptation and innovation, as well as through non-curricular modes of presentation. Aguele and Agwagah (2007) enthused that efforts should be made to address the perceived lack of relevance of course work in tertiary institutions. There should be restructuring of technology curriculum to include more investigative learning, technology, laboratory experience, and collaborative work. Programmes that have provided students an opportunity to engage in hands-on, real life projects would be successful in increasing female enrolment and retention. Thus, the masculinity of technology can be demystified through well designed curricula on technology ranging from enrolment of students to practice which remains a viable strategy that can address the contending variables affecting female enrolment in Technology Programmes.

2.16 The Role of Teachers on Female Students Enrolment into Technology Programme

Gender bias is a set of beliefs or attitude that indicates a primary view or set of expectations of people's abilities and interests according to their sex behaviours. These are

on basis of deep rooted assumptions that differentiate between the appropriate behaviors, roles and job for women and men. Also, these assumptions may not even be conscious, but they result in differences in the way people are treated and the expectation of them. Beverly (1995) writing on "building gender fairness in schools, noted that the assumption of the society is that women are to be mothers, school teachers, secretaries, nurses, hair dressers, maids and social workers". He concluded that, women will not need training in calculus, physics, chemistry, auto mechanic, or welding.

Horgan, Steward and Martin (1981), expressed concern over the consequences of sex career differentiation upon the full actualization of capacities and potentials of both males and females. Hence, Federal Ministry of Education (1989) legislated against any form of sex discrimination and stereo-typing in all aspects of education, because such practice will have an adverse effect on manpower development. Invariably, Nwaokolo, (1995) points the specific area of teacher's role on gender issues, gender inequality which needs special redress. This is because, presently, the teaching profession is nose diving to a point of total collapse due to the fact that the aura usually enjoyed by teachers in the past is no longer tenable. Thus, Bryne, (1978) states that presently, the society views teaching as a career without status, reserved for the aged, the lame and socially as useless. Similarly, Obunneke, (1995) remarks that the present status quo of the teaching profession explains why men are now abandoning teaching for women, therefore, regard teaching to be career reserved for women. But so far, this has not translated to more teachers in technology fields.

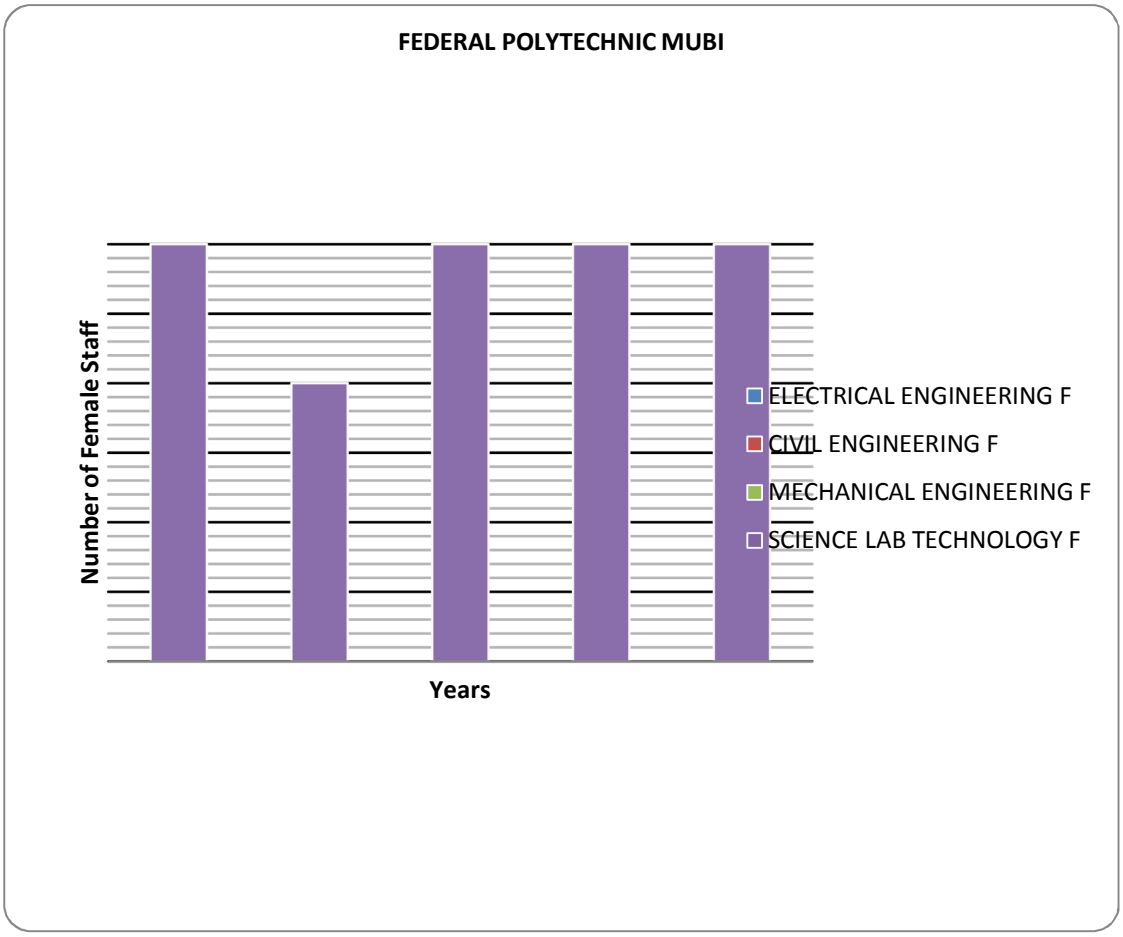
Females who are engaged in the teaching profession are shying away from technology programmes because of their sex stereotype and upbringing. This has led to

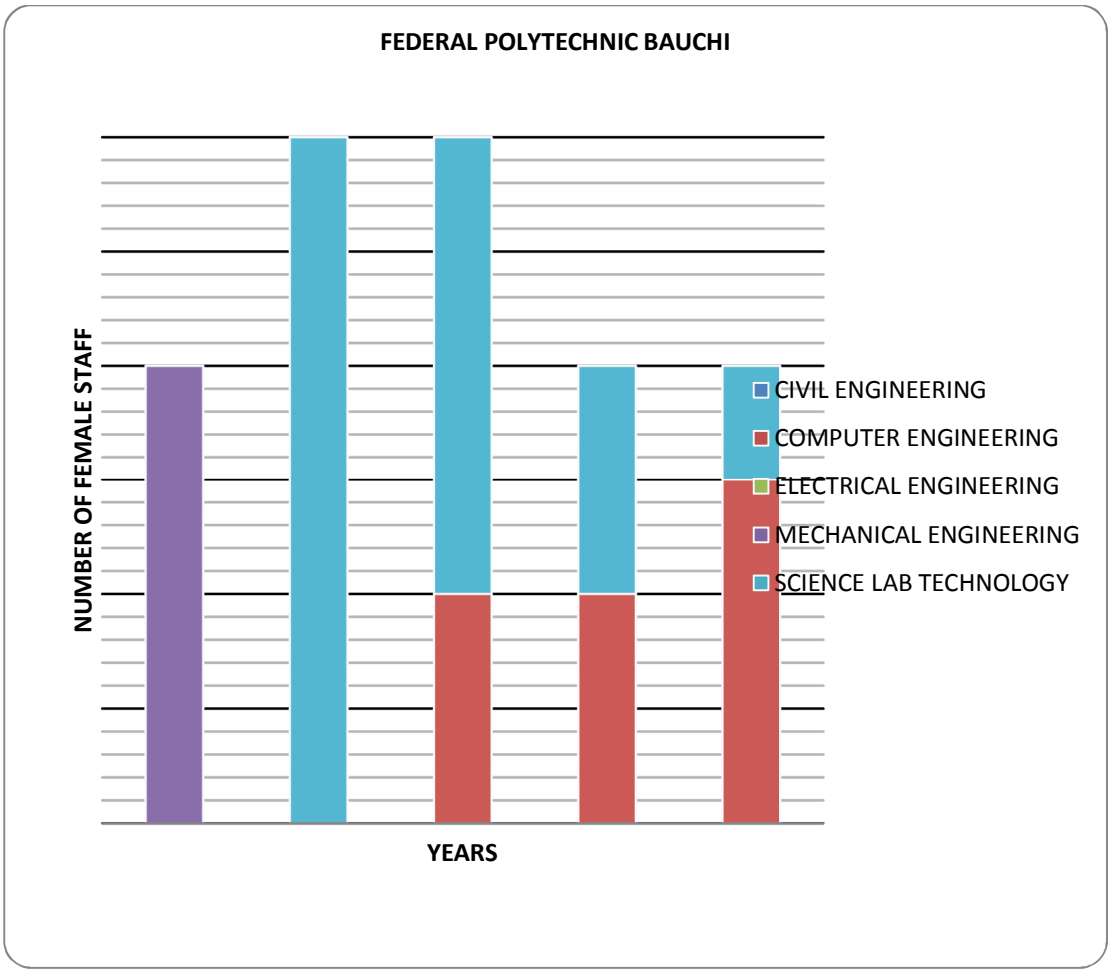
setbacks in technology education and development. Peter (1984) remarks on low income of teachers noted that those teachers who are qualified to teach are tempted to engage in other economic activities so as to supplement their income by doing unauthorized supplementary work in urban areas particularly. Ekuri and Windapo, (2000), observed that the most prevalent and easily identifiable problems found in teacher production, utilization and turnover was the shortage of teachers in some subject areas, especially in tertiary institutions, such as mathematics, physics, chemistry and technical subjects. Fields, such as social studies, biology, physics and health education were in most cases over-stocked with teachers. Nuhu, (2000) explains that gender career stereotyping is a contributory factor to this shortage in subject areas. Consequently, Aguele & Agwagwah (2007) observed that female role models are absent and difficult to find at any stage, and the problem of gender imbalance can be solved if female teachers come into technology to serve as role models for female students. The shortage of subject areas has forced government to revert the employment of untrained teachers. Also administrators would be forced either to place a person with no training or inadequate preparation in a classroom or to assign otherwise qualified teachers to subject matters or grade levels which were outside their spheres of personnel expertise and sometimes it is discovered that mathematics teachers also have to teach physics or chemistry and vice-versa.

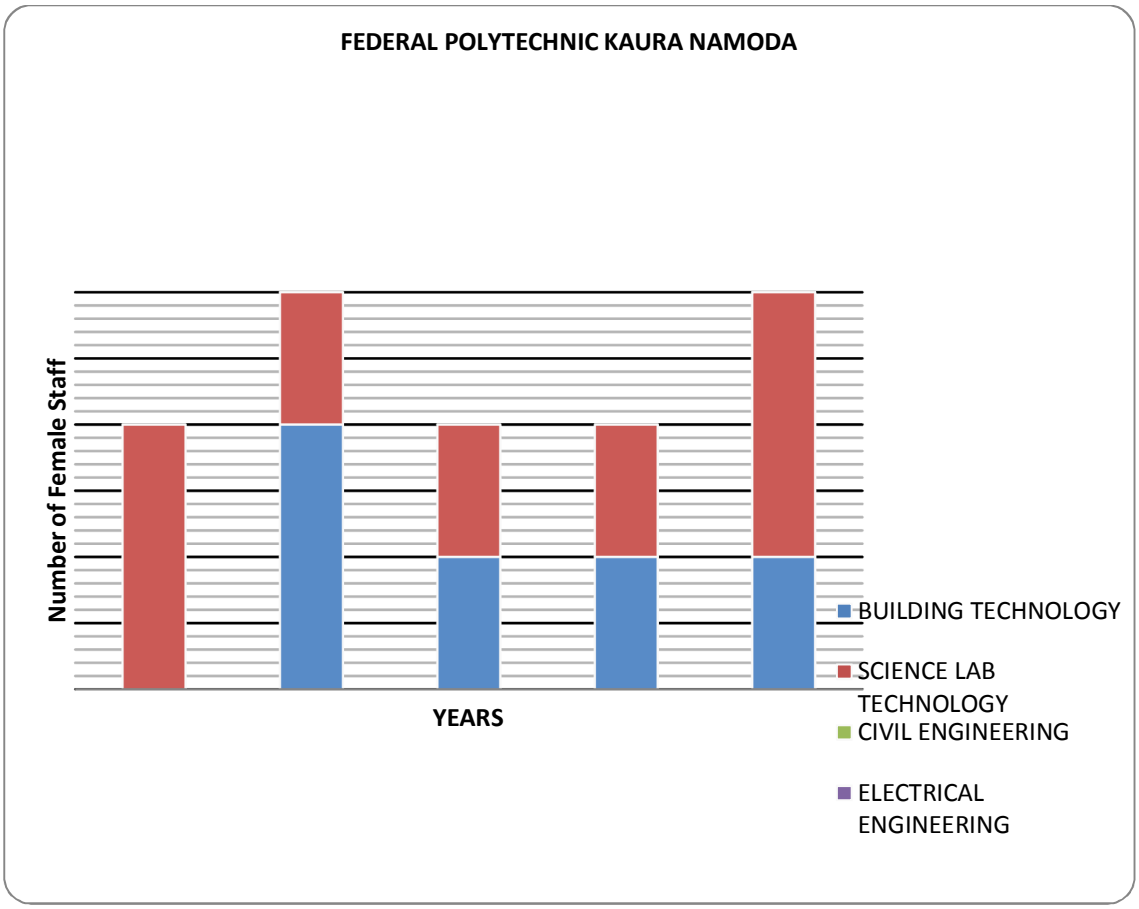
The above situation has led to dissatisfaction and lack of commitment by the teachers. So far, qualified teachers have to find alternatives or resign their jobs or be on other jobs or be on their own. These abnormally, especially at the tertiary institutions have forced the need to ascertain the extent of female participation in the teaching profession in Nigeria. Cultural assumptions have been suggested as part of the reasons for career

stereotypes because specific courses are taught to different sexes which limit both male and female exposure to various types of academic disciplines and subsequently to discriminated employment opportunities. Nuhu, Ibid, (2000) discussed the phenomenon of this imbalance structure which can only be reconstructed when more female teachers seek to dominate the Technology discipline, changing the value perceptions and checkmating other forces and considerations impinging upon and deferring their value perception. This includes bright opportunities for changing their world in an environment of gender stereotyping.

FIGURE 1




FEDERAL POLYTECHNIC BAUCHI
NUMBER OF FEMALE STAFF
YEARS
CIVIL ENGINEERING
COMPUTER ENGINEERING
ELECTRICAL ENGINEERING
MECHANICAL ENGINEERING
SCIENCE LAB TECHNOLOGY



Female Staff Distribution of Technology Teachers in Selected Programmes in Federal Polytechnics in Northern Geo-Political Zones of Nigeria (2004-2009)

Analysis drawn from (3) three sampled Federal Polytechnics in Northern geo-political zones of Nigeria on female technology staff (Figures 2.7), shows gross understaffing in core Technology programmes offered in these polytechnics. This imbalance structure has been lingering, spanning from 2004-2009. It can be imparted from the foregoing analysis that the poor enrolment and performance of female students in Technology programmes is based on the value perceptions of these courses by students, to the extent that some core courses such as Mechanical Engineering, Civil Engineering, Elect/Electronics Engineering revealed poor recorded female staffing over the years which

could be attributable to aforementioned factors like cultural values, gender stereotyping, lack of government support and locational factors.

2.17 Incident of Low Female Student Enrolment into Technology Programmes in Federal Polytechnics in Northern Geo-political zones of Nigeria

The Nigeria Millennium development goals 2005 (Federal Republic of Nigeria, 2005) report reveals that literacy level in Nigeria steadily degenerated between 15 – 24 years. Consequently, by 1999 the literacy rate generally declined to 64.1% from 71.9% in 1999. This trend also applied to male and female members of the society during this period of 15-24 years. However, the male declined from 81.35% in 1991 to 69.8% in 1999. On the other hand, the decline of females in the society was 62.49% to 59.3% during the same period.

Statistically, the fore going indicate imbalance against female students in their environment, attendance and completion rates in education particularly in technology programmes in the Northern geo-political zones of Nigeria due to factors associated with multi-dimensional variables, such as social-cultural and religious beliefs, location of the institution and parents decisions among other factors. This implies that millions of female students are deprived of enrollment into technology programmes, irrespective of their choice of course in many instances.

Igbuzor (1992) observed that different researches have shown that whenever school fees are introduced, especially for the provision of social services the rich/wealthy individuals utilizes such available chances to increase students' enrollment in institutions. Whereas, the poor people would not because they cannot afford the money and ultimately making female students from poor homes enrolment becomes lower. In Northern geo-

political zone of Nigeria for example, it was observed that some parents for religious beliefs coupled with poverty would prefer sending their daughters for marriage than their enrolment into college/ polytechnic. In 1980, Igbuzor (1992) found that in Malawi when fees were introduced into the school system, enrolment of female student fell by 5% Also, Rose, (1998) remarked that in converse when ever user fees are abolished enrollment increases.

However, in reviewing the wide range of literature on a number of indicators in the present study, the researcher discovered a greater preponderance of evidence on some issues and a much slimmer literature on others. The literature on gender, Technology, gender equality, traditional and societal values and gender disparity in Technology is fairly extensive. In some areas, the literature has emerged only in the last decade and as such, methodologies are still taking shape. For example, enrolments in polytechnics show an extensive paucity of literature on data in the Federal Polytechnics in Northern geo-political zones of Nigeria.

With the exception of studies on women's educational policies and issues of gender equality, most of the studies reviewed here were not significantly interested in the question of how women's enrolment into Technology will benefit women themselves. Rather, the central focus was on gender and enrolment mostly as a control variable. It is this gap that the study will seek to explore. How girls' enrolment in Technology programmes in Federal Polytechnics in the Northern geo-political zones of Nigeria will immensely contribute to the overall development of the country.

In contrast, the conditions for a positive relationship specified by the literature that examines the link between gender and enrolment in Technology or gender equality tend to

be broader and more structural. For instance, girls' enrolment in the Federal Polytechnics in Northern geo-political zone of Nigeria in Technology programmes reveals a significant imbalance, as the Arts and Social sciences programmes attract more girls than boys. Consequently, there exists a range of underlying social and economic conditions which need to be favorable for female education, thereby having a beneficial effect on gender equality and enrolment in Technology programmes in Federal Polytechnics in Northern Geo-political zones. Because, technology programmes such as the redesigning of educational policies, gender mainstreaming, parental influence, to name but a few need to be given pride of place. Thus, the educational curricula need to be structured to correct the multi-dimensional variables affecting female enrolment in Technology programmes.

2.18 Prospects of Female Students' Enrolment into Technology Programme.

There are prospects on the Nigerian scene which has been highlighted by the Nigerian Association of Women in Science Technology and Mathematics (NAWSTEM) which aim at encouraging learning at all levels of formal education for female students, including a culture of lifelong learning and practices among women, promoting indigenous technology, such that will improve the quality of life of female students and women in general.

In the same vein, the UNESCO 1986 in collaboration with University of Nigeria Nsukka constituted a study team for a comprehensive survey in order to identify problems and obstacles of academic, cultural, economic and social nature. The purpose was to encourage female students enrolment into scientific study and technological programmes in Universities and Polytechnic without limiting/preventing them and to formulate remedial

programmes and measure to extend access of females into technology programmes as much as possible,

On the basis of the preceding survey, project of awareness campaign in all Universities /polytechnics was inaugurated in all states of Nigeria .This inauguration was done to established ways of improving female students enrolment into technological programmes in Nigeria and other parts of the country with the view to encourage female enrolment into science related programmes such as,

- Publication of profile of successful women in technological institutions (polytechnic)
- Publication of guideline for equal treatment of sexes in Academic institutions of learning.
- The gender and science technology (GASAT) should be make to encourage women to meet and share their first hand experiences, especially for teachers of non-sexist science education, curriculum and teaching materials, sex stereo types and interaction programmes.
- Discussion of strategies and education for change to less sex differentiated science and technology and value implication to society of women's greater involvement in science and technology.
- Discussion of diversity of cultures and related science and technology issues that are likely to form barriers to full participation of women in science education careers in different cultural and exploration of gender differentiation at polytechnic level and employment in science and technology.

- Example of polices that would break barriers to female student enrolment, so as to encourage their choice of future careers in science and technology.

The present study has gone along way to proffer other measures that would improve female students' enrolment into technology programmes in Federal Polytechnics in Northern geo-political zones.

2.19 Summary

Technology presently is known to be very central to the development of any nation. Ukege (1997) observed that the development of a nation is properly accessed by the level of education of its citizens in Technology. The review of literature indicates that it is evident in the research findings that gender differentials in Technology programme enrolment was rooted in the multi-dimensional variables such as societal, religious, psychological, attitudinal, perception and low interest in Technology programmes. Some other factors that were also identified included lack of support from government, cultural values, parental influence and locational factors.

Similarly, Aguele (2004) has observed that the negative image of female towards Technology education has accounted largely for the low enrolment of females, particularly in the federal polytechnics in Northern geo-political zones of Nigeria. A further problem associated with this negative attitude was low interest of beneficiaries which also contributes to this discrepancy too.

Curriculum content perpetuates the stereotype of male domination in Technology programmes and has further posed a serious challenge to the educational policy makers especially in designing suitable curricula for technology programmes that would avert

these imbalances. It is also conjectured that curriculum review that would eliminate differentials in male and female enrolment in Technology programmes. Furthermore, specific issues that are related to female enrolment in Northern States Polytechnic, such as religion, interest and cultural values can be adequately addressed through the development of viable curricula. However, a major area of concern would be the need to formulate a comprehensive policy on education that will address the imbalances on enrolment in Technology programmes. Therefore, educational administrators and stakeholders in education should decide on the suitable curricula that would address the imbalance of male and female enrollment in technology programmes in the Federal polytechnics in Northern geo-political zones of Nigeria. It is in this regard that this study seeks not only to identify the gaps in literature that has resulted to the imbalance in enrolment of females into Technology programmes. These are traceable to the curricula content, perception, interests and a host of other variables, but fill gaps through examining the multi-dimensional variables and its causative factors that has influenced the pattern of enrolment into Technology programmes in Federal Polytechnics in Northern geo-political zones of Nigeria.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methods and procedure employed to execute the study. The description is presented under the following sub-headings: the design of the study, area of the study, population, sampling methodology, instruments for data collection, the validity of the instruments, reliability of the instruments, methods of data collection and method of data analysis.

3.2 Research Design

The research design adopted for this study was the ex-post facto design. Ex-post facto is a Latin expression meaning “from after the fact". It is a systematic empirical inquiry in which researcher does not have control over the independent variables because their manipulations have already occurred, as nature has already implemented a treatment either through differences in environments in which subjects find themselves, through differences in inheritance or through some combination of these two factors. Thus, the researcher arrives after the fact (ex-post facto) that the treatment has been imposed on the subjects. The multi-dimensional variables identified in this study are phenomena that have already occurred and manipulated by nature before the arrival of the researcher at the scene of the research hence the choice of the design.

3.3 Population

The population of this study is 48, 915 made up of 33,801 male and 15,114 female students and teachers in Technology programmes in the 11 Federal Polytechnics in the

Northern geo-political zones of Nigeria during 2008/2009 academic year, as shown in table 3.1 below

Table 3.1 Distribution of Population by Sex of Technology Students in Federal Polytechnics Northern Geo-Political Zone

S/N	POLYTECHNICS	STUDENTS		TOTAL
		MALE	FEMALE	
1.	Kaduna Polytechnic	8,422	4,966	13,388
2.	Federal Polytechnic, K/Namoda	1273	438	1711
3.	Hussaini Adamu Kazaure	466	133	599
4.	Waziri Umaru Federal Polytechnic B/Kebbi	2087	405	2492
5.	Federal Polytechnic, Mubi	2684	946	3630
6.	Federal Polytechnic, Bauchi	5784	3137	8921
7.	Federal Polytechnic, Damaturu	1409	470	1879
8.	Federal Polytechnic, Bida	2466	1177	3643
9.	Federal Polytechnic, Idah	3285	1286	4571
10.	Federal Polytechnic, Nassarawa	1948	745	2693
11..	Federal Polytechnic, Offa	2101	1097	3198
	TOTAL	**31925**	**14800**	**46725**
	%	**68.33**	**31.67**	**100**

Source: National Board for Technical Education (NBTE)

Table 3.1 shows population of students in the Federal Polytechnics in Northern geo-political zones of Nigeria by gender. The percentage of female technology students in the eleven (11) Federal Polytechnics is less than male technology students 31.67% to 68.33%

Table 3.2 Distribution of Population by Sex of Technology Teachers in Federal Polytechnics Northern Geo-Political Zone

S/N	POLYTECHNICS	TEACHERS		TOTAL
		MALE	FEMALE	
1.	Kaduna Polytechnic	598	165	763
2.	Federal Polytechnic, K/Namoda	166	21	187
3.	Hussaini Adamu Kazaure	56	3	59
4.	Waziri Umaru Federal Polytechnic B/Kebbi	153	4	157
5.	Federal Polytechnic, Mubi	110	12	122
6.	Federal Polytechnic, Bauchi	180	41	221
7.	Federal Polytechnic, Damaturu	63	5	168
8.	Federal Polytechnic, Bida	181	25	206
9.	Federal Polytechnic, Idah	195	27	222
10.	Federal Polytechnic, Nassarawa	124	9	133
11..	Federal Polytechnic, Offa	50	2	52
	TOTAL	**1876**	**314**	**2190**
	%	**85.66**	**14.34**	**100**

Source: National Board for Technical Education (NBTE)

The lecturers' population was depicted in table 3.2 below showing distribution by gender. The percentage of Male technology lecturers far outweighs that of the female technology lecturers 85.66%-14.34%

3.4 Sample and Sampling Techniques

Scientific steps were followed to ensure the technique appropriateness of the survey sample size and sampling procedure. The steps took cognizance of practical issues bordering on logistics. The sample was selected in stages, so as to get a reasonable sample size. The first stage was to cluster the federal polytechnics into geo-political zones, North-west, North East, and North- central. The second stage was using the 'hat drawn method'

of simple random sampling to select 6 federal Polytechnics out of 11 federal polytechnics in Northern geo-political of Nigeria such that from each of the three zones two (2) Polytechnics were selected. The third stage was to purposively draw a proportion of 3% from population of federal polytechnics with more than one thousand (1000) technology students for the 2008/2009 academic session, and 10% from the population of federal polytechnics with more than hundred (100) technology teachers for the 2008/2009 academic session, making a total of 1,020 male/female students and 163 lecturers in the 6 Polytechnics under study as shown in tables 3.3 and 3.4 respectively below. The adoption of proportionate random sampling is informed by the fact that the study was stratified along the number of male/female students / lecturers. Male students were also sampled in the study because according to Fagan & Brodoloni (2010), it was essential that men are involved in making the social changes needed to achieve gender equality in technology programmes, and to ascertain that Federal Polytechnics in the Northern geo-political zones of Nigeria are adequately represented by respondents

Table 3.3 Population of Federal Polytechnic Students Sampled

S/N	POLYTECHNIC	STUDENTS		TOTAL	3% OF TOTAL
		M	F		
1	Kaduna Polytechnic	8422	4966	13388	402
2	Federal Polytechnic, Bida	2466	1177	3643	109
3	Federal Polytechnic, Bauchi	5784	3137	8921	268
4	Federal Polytechnic, Mubi	2684	946	3630	109
5	Federal Polytechnic, Nassarawa	1948	745	2693	81
6	Federal Polytechnic, K/Namoda	1273	438	1711	51
	TOTAL	**22,577**	**11,409**	**33,986**	**1,020**
	%	**66.43**	**33.57**	**100**	

In table 3.3, the picture is not different in the six federal polytechnics sampled. The females record the lowest percentage in enrolment than the male, 33.57% to male 66.43%

Table 3.4 Population of Federal Polytechnics Teachers Sampled

S/N	POLYTECHNIC	TEACHERS		TOTAL	10%OF TOTAL
		M	F		
1	Kaduna Polytechnic	598	165	763	76
2	Federal Polytechnic, Bida	181	25	206	21
3	Federal Polytechnic, Bauchi	180	41	221	22
4	Federal Polytechnic, Mubi	110	12	122	12
5	Federal Polytechnic, Nassarawa	124	9	133	13
6	Federal Polytechnic, K/Namoda	166	21	187	19
	TOTAL	**1359**	**273**	**1632**	**163**
	%	**83.27**	**16.73**	**100**	

Table 3.4 shows the population of technology staff by gender in the six polytechnics sampled. The table indicates female staff in technology programmes is only 16.73%. This point to the dearth of female lecturers in the federal polytechnics

3.5 Instrumentation

A personally designed structured questionnaire titled; Effect of Multi-Dimensional Variables on Female Enrolment in Technology Programmes Questionnaire (EMDVFETPQ) was used for data collection in this study. The instrument contains five sections. The first section (section A), is titled Demographic Section. Here, demographic Information of the respondents was considered, and contains such information as name of institution, department, and sex, level of study and course of study.

Section B was titled Effect of cultural values on female enrolment (ECVFEQ). It seeks for the data on effect of cultural values on male and female students' enrolment in Technology based programmes. Section C is titled Effect of Government support on female Enrolment into Technology based programmes (EGSEQ) and it centered on the effect of government support on multi-dimensional variables that may affect female participation in

Technology programmes. Section D titled Effects of Parental influence on Enrolment of females into Technology based programmes (EPIEP). It required information on the effect of parents on gender enrolment in Technology programmes. Finally, Section F titled Location and Female Enrolment (ELEFQ). It dwells on the effect of location on enrolment of females in Technology programmes.

The entire items in sections B, C, D and E of the instrument were rated on a four-point rating scale as follows:

Strongly Agree (SA)	=	4 points,
Agree (A)	=	3 points
Disagree (D)	=	2 points
Strongly Disagree (SD)	=	1 point

Where $Z = \frac{\Sigma x}{n} = \frac{10}{4} = 2.5$ (Note: 2.5 and above-accepted, while below 2.5 rejected)

In addition, the enrolment analysis necessitates the use of statistical data obtained from National Board for Technical Education (NBTE) on Polytechnic Enrolments 2001-2010. The study also made use of data from JAMB obtained through a formal request in order to observe the application/admission of female students into Federal Polytechnics.

3.5.1 Validity of the Instrument

The content of the questionnaire was validated by experts in measurement and evaluation of the faculty of Education, Ahmadu Bello University Zaria. Thus, the validators were given a copy of the instrument each in addition to a paper containing the purpose of the study and research questions. The validators scrutinized each item to ascertain its suitability, appropriateness and clarity of statements based on the purpose of

the study as well as the research questions. The observations and recommendations of the validators were used to modify the final copies of the instruments.

The test- retest method was employed to establish the reliability of the instruments. Subsequently, the instruments was administered twice to 30 respondents, comprises male and female Technology programme students as well as their lecturers selected randomly from Waziri Umaru Federal Polytechnic, Birnin Kebbi. One common way of computing correlation values among the questions on the instruments is by using Cronbach's Alpha. The closer it is to one, the higher the reliability estimate of the instrument. The correlation analysis was carried out using the two sets of scores obtained from each administration which was used to determine the correlation coefficient of the instruments. The correlation coefficient value obtained was 0.842, which means the instrument was reliable.

3.5.2 Pilot Study

A pilot was conducted using one of the polytechnics in the North, Waziri Umaru Federal Polytechnic Birnin Kebbi in order to confirm whether or not there are any aspect of the instrument that need to be addressed, and also to determine the reliability estimate of the instrument.

Out of a total number of fifty (50) copies of questionnaire administered to the students and teachers in Waziri Umaru Federal Polytechnic, Birnin Kebbi only thirty (30) was retrieved. Of the thirty (30) returned, twenty (20) were from male students and teachers, while ten (10) were from female students and teachers.

3.6 Reliability

The data collected from the pilot study were subjected to a reliability test with the aid of the Statistical Package for the Social Sciences (SPSS). The data analyzed showed a reliability coefficient of 0.842. Those items with 0.50 ranges were retained while those with extremely high or extremely lower range than the specified range were reframed.

3.7 Administration of Instruments for Data Collection

The questionnaire was administered using direct delivery technique (D.D.T) to four degree holders of education who were trained as research assistants to assist the researcher in the administration of the questionnaire. Subsequently, the questionnaire was administered to the respondents and retrieved through personal contacts within a period of four weeks in all the polytechnics under research. In the interim, the researcher exposed the research assistants to a one day seminar where they were intimated on how to administer and answer questions on the instruments used and explanation was made to them on one to one in order to clarify some specific areas to them for better understanding during the seminar.

However, questions were entertained from the seminar participants; in addition to provision of enough copies of questionnaires and adequate money for logistics purposes.
A total number of 1,300 copies of questionnaire were given out for administration and the researcher led the research assistants to each of the polytechnics for the completion of the questionnaires sampled. A total of eight hundred and twenty three (823) representing 63.3% were returned correctly, indicating that the work of the assistants were effective. However, 36.7 percent of the questionnaires were returned incorrectly filled. During the encounter with subjects, the basic rules were discussed and the aim of the research was

emphasized, especially when the participants were expected to respond to all the items, ask questions to clarify difficult areas of the conduct of the questionnaire.

3.8 Method of Data Analysis

The descriptive statistics such as mean, standard deviation, frequency and percentages were used to analyze the research questions. For the four research questions any item with a mean of 2.50 and above were considered as accepted, whereas items with a mean of 2.49 and below were rejected. The correlation analysis was employed to test hypotheses 1, 2, 3 and 4 at 0.05 level of tolerance.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter deals with analysis of result obtained from data collected. The research questions and hypothesis designed for the study were not only tested and answered, but described the characteristics of the respondents. However, the presentation is done using statistical analysis which comprises frequency tables, and correlation tables respectively.

4.2 Presentation of Result

A total number of one thousand three hundred (1,300) questionnaires were printed and made available for the study. One thousand one hundred and eighty three (1,183) respondents participated in the study, and a total of eight hundred and twenty three (823) respondents turned in their responses. Data was collected from the six (6) Federal polytechnics under study (table 4.3) which are spread through the three (3) geo-political zones of the North. Five hundred and twelve (512) or about seventy eight (77.6%) of the respondents were male students; one hundred and forty eight (148) or less than 30% (22.4%) were female students.

Table 4:1 Demographic Information of the Respondents showing frequency Distribution by Educational Institution

	Frequency	Percent	Valid Percent	Cumulative Percent
Kaduna Polytechnic, Kaduna	281	34.1	34.1	34.1
Federal Polytechnic Mubi	71	8.6	8.6	42.7
Federal Polytechnic Bauchi	150	18.2	18.2	60.9
Federal Polytechnic K/Namoda	86	10.5	10.5	71.4
Federal Polytechnic Bida	148	18.0	18.0	89.4
Federal Polytechnic Nassarawa	87	10.6	10.6	100
Total	823	100	100	

Table 4:1 shows the distribution of respondents in the six federal polytechnics sampled. Kaduna Polytechnic has the highest number of respondents totaling two hundred and eighty one (281) representing 34.1%, followed by Federal Polytechnic Bauchi with one hundred and fifty respondents representing 18.2%. Federal Polytechnic, Bida with one hundred and forty eight respondents (18%) and Federal Polytechnic, Nassarawa, Kaura Namoda and Mubi with 87, 86 and 71 respondents representing 10.6%, 10.5% for Nassarawa and Kaura Namoda and 8.6% for Mubi respectively. This shows a fair distribution of respondents in the Federal Polytechnics sampled.

Table 4:2 Frequency Distribution by Sex of Students

Variable	Frequency	Percent
Male	512	77.6
Female	148	22.4
Total	660	100

Table 4.2 above shows the frequency distribution by sex of students. It depicts that the five hundred and twelve 512 (77.6%) of the respondents, are male students while one hundred and forty eight of the subjects (148) 22.4% are female respondents. This depicts the gross imbalance of the current enrolment in technology based programmes of the population under study.

Table 4:3 Frequency Distribution by Sex of Lecturers

Variable	Frequency	Percent
Male	121	74.2
Female	42	25.8
Total	163	100

Table 4.3 shows the distribution by sex of lecturers. The result indicates the proportion of the female lecturers in this research work represent one third of the population of the male population. This is because one hundred and twenty one (121) or more than 65% of the respondents (74.2%) were male lecturers, while only forty two (42) or less than 30%(25.8%) were female lecturers. A careful observation and deduction from this proportion shows a dearth of female lecturers in the area of technology-based programmes in the federal polytechnics in Northern geo-political zones of Nigeria.

Table 4:4 Frequency Distribution by Level of Study in Technology-Based Programmes

Variable	Frequency	Percent
ND	394	59.7
HND	265	40.3
Total	660	100

Table 4.4 shows the frequency distribution by level of study (ND & HND Programmes). It reveals that a good proportion about 60 %(59.7%) of the students are undergoing National Diploma Programmes while about 40% (40.3%) are in Higher National Programmes. Thus, it can be inferred that technology based Programmes attracts significant enrolment generally.

Table 4:5 Frequency Distribution by Programmes of Study

Programme	Frequency	Percent
(HND) Building Tech.	10	1.52
(HND) Computer Science	10	1.52
(HND) Physics Electronics	12	1.82
(HND) Chemistry	9	1.36
(HND) Food Tech.	4	0.61
(ND) Architecture	16	2.42
(ND) Printing Tech.	8	1.21
(ND) SLT	54	8.18
(ND) Building Tech.	13	1.97
(HND) Civil Engineering (Structural)	11	1.67
(HND) Civil Engineering (Transport)	13	1.97
(HND) Computer Science	53	8.03
(HND) Electrical Engineering (Power)	14	2.12
(HND) Electrical Engineering (Electronics)	16	2.42
(HND) Mechanical Engineering (Plant)	14	2.12
(HND) Microbiology	21	3.18
(HND) Statistics	10	1.52
(ND) Computer Science	70	10.61
(ND) Civil Engineering	71	10.76
(ND) Electrical Engineering	52	7.88
(ND) Statistics	71	10.76
(ND) Mechanical Engineering	32	4.85
(ND) Agric. Engineering	35	5.30
(HND) Agric. Engineering (Soil & Water)	12	1.82
(HND) Agric. Engineering (Machinery)	7	1.06
(ND) Food Tech.	10	1.52
(ND) Fashion Design	4	0.61
(HND) Architecture	8	1.21
Total	**660**	**100.00**

Table 4.5 shows the distribution of students by programmes of study in the federal polytechnics sampled. it can be deduced that there is a fair distribution of students in the technology-based programmes in federal polytechnics in Northern geo-political zones of Nigeria.

Table 4.6 Frequency Distribution of staff by Department

Department	Frequency	Percent
Building Tech.	10	6.13
Textile Technology	5	3.06
Printing Technology	6	3.68
Applied Science	34	20.86
Civil Engineering	17	10.43
Maths and Computer Science	7	4.29
Mechanical Engineering	11	6.75
Maths, Stats, and Comp. Sc.	15	9.20
Electrical Engineering	19	11.66
Maths and Statistics	6	3.68
Agric. Engineering	10	6.13
Food Tech.	11	6.75
Architecture	12	7.36`
Total	**163**	**100.00**

Table 4:6 shows staff distribution by department. It reveals that Federal Polytechnics in Northern geo-political zones cover all relevant technology Programmes

RESEARCH QUESTIONS ANSWERED

Research Question 1: Are socio-cultural values any effect on female enrolment in Technology based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria?

Table 4: 7 Responses on Effect of Socio-Cultural Values on Female Enrolment into Technology-Based Programmes.

S/N	Question Item	Sa	A	%	D	SD	%	Mean	Remark
1.(a)	Women are weak and cannot cope with the rigors of technical programmes.	511	124	77.2	74	114	22.8	3.25	Accept
(b)	Dress code of those in the technical field affect female enrolment into technology based programmes in Federal Polytechnics in the Northern geo-political zones of Nigeria.	407	133	65.6	131	152	34.4	2.97	Accept
2.(a)	Early marriage of females in the Northern geo-political zones of Nigeria prevent them from offering technical programmes;	311	156	56.7	107	249	43.3	2.64	Accept
(b)	Since their male counterparts do offer technically-based programmes, their female counterparts are equally capable of offering these programmes.	52	133	22.5	411	227	77.5	2.01	Reject
3.	The age-long belief that male students are superior to female students keeps females from technical problems.	507	172	82.5	123	21	17.5	3.42	Accept
4.(a)	In the Northern geo-political zone of Nigeria, the society believes that females are supposed to be in	226	97	39.2	311	189	60.8	2.44	Reject

	the house producing children.								
(b)	The indulgence in the practice of hawking by females in the Northern geo-political zone of Nigeria does not allow them go into technical fields.	121	101	27.0	483	118	73.0	2.27	Reject
5.	Traditionally, women are not allowed to go further in educational pursuit in the Northern geo-political zones of Nigeria.	512	60	69.5	181	70	30.5	3.23	Accept
6.	Household chores by the female child in Northern geo-political zone of Nigeria account for the imbalance in enrolment into technology based programmes .	133	207	41.3	431	52	58.7	2.51	Accept
7.	Domestic chores such as home management and personal hygiene will not allow females to offer Technology based Programmes.	101	121	27.0	480	121	73.0	2.25	Reject
8.(a)	Exclusion of females from decision making processes that directly affect their lives is responsible for low female enrollment into Technology based Programmes in Federal polytechnics.	353	96	54.6	211	163	45.4	2.59	Accept
(b)	Inclusion of females in major activities that affect their lives will improve enrolment into Technology based Programmes.	270	215	58.9	120	218	41.1	2.65	Accept

S/N	Question Item	Sa	A	%	D	SD	%	Mean	Remark
9.(a)	Socio-cultural Islamic religious practices prevent females from offering technical subjects.	212	308	63.2	66	237	36.8	2.60	Accept
(b)	Islamic religion encourages female participation in technologically-based education.	353	211	68.5	163	96	31.5	3.00	Accept

Grand Mean = 2.70

In Table 4.7, the opinion of the respondents is presented along the Likert scale in mean scores. The result in item 1[a] of Section B shows that majority of the students, six hundred and thirty five (630) representing (77.2%) agreed that technology programmes are unattractive to female students because of the rigors involved, and one hundred and eighty eight (188) or 22.8% do not share this opinion this might be because technological programmes are perceived to be energy-driven. The general perception is that females are too weak to physically handle tools, operate machinery, and spend long hours in workshops and laboratory, regarded as the preserve of the men folk

The opinion of respondents in item 1b shows that five hundred and forty of the respondents ((65.6%) affirmed that the attire worn by females in the technical field affects female perception of technology-based- programmes while two hundred and eighty three (34.4%) disagree with this. Due to the lack of straight measures on dress code, the female counterpart's views the technical field as an area that is pervasive, infringing on their culture and religion, which emphasis strict adherence to the protection of a woman's chastity and decency. Similarly, it is the view of the respondents that the prevalent practice of early marriage of females in the Northern geo-political zone of Nigeria is a barrier to

their involvement in technology education, and getting them enrolled in technology programmes in federal polytechnics. In item 2[a] above, it can be inferred that a significant four hundred and sixty seven (467) representing 56.7% affirmed that early marriage constitute a significant factor that affects female enrolment into technical fields, while three hundred and fifty six of the respondents (43.3%) disagrees on the grounds that this should not be a determinant factor.

Although this is yet to be proven, the belief continues to persist that females are by nature technologically incapable and unable to absorb scientific and technological information and acquire technical skills. The opinion of six hundred and thirty eight respondents (77.5%) corroborates the view that females are not capable to undertake technical courses like their male counterparts, while one hundred and eighty five (185) representing (22.5%) are of the view that females equally have the capability like their male folk to undertake courses in technology.

Ironically, four hundred and eighty three (483) of the respondents that is 58.7% rejected the view that domestic chores prevent females from engaging in technology programmes, while four hundred and forty (440) representing (41.3%) supported the opinion that engaging females in household chores is a barrier to their involvement in technology courses. It can be inferred that domestic activities does not significantly contribute to low female enrolment, other factors rooted in socio-cultural practices of the Northern society should be held responsible. This is the opinion of six hundred and one (601) of the respondents representing (73.0%) that even though females are principally engaged in management and personal hygiene of the home, these chores cannot prevent

them from participating in technology programmes while two hundred and twenty two (222) that is (27.0%) do not share this view.

The belief that females should only be trained for domesticity cannot be far removed from the age-long belief in superiority of males over females. Item 3 reveals that six hundred and seventy nine (679) representing (82.5%) of the respondents affirmed that the traditional belief in the superiority of males over females in the geo-political zones of Northern Nigeria influences female choice of technological programmes. Correspondingly, item 4(a) affirms that females are out rightly denied the opportunity to independently seek for their choice of career advancement and rather relegated to the house producing children. However, invariably, due to the increase in the advocacy campaigns for women development and advancement, females are not seen to concentrate their activities on household chores at the detriment of technology education. This notion is therefore rejected by five hundred (500) of the respondents as (60.8%) affirmed that this view is discarded and not tenable to discourage female enrolment into technology courses. But two hundred and three (203) representing (39.2%) still hold on to this view because it is an aged-long belief held by the society

Interestingly, while so many scholars have attributed the menace of hawking by girls as detrimental to female education, it is the opinion of respondents that hawking by the females in Northern geo-political zones of Nigeria cannot be said to be responsible for low female enrolment into technical fields as six hundred and one (601), that is (73.0%) rejected the view that this commercial activity can deny the female folks from enrolling into technical fields, while only two hundred and twenty two (222) representing (27.0%) consented to this view.

Consequently, some of these traditional socio-cultural practices like prevent females from going further in their educational pursuit, including opting for technology programmes that can advance them in life. This view was held by five hundred and seventy two (572), that is (69.5%) of the respondents while two hundred and fifty one (251) representing (30.5%) disagreed that it is a significant factor that influences the educational pursuit of women.

On the grounds of exclusion of females from important decision making processes that directly affects their lives, four hundred and forty nine (449), that is (54.6%) of the respondents are of the view that this can be responsible for few number of females in technology programmes, while three hundred and seventy four (374) representing (45.4%) affirmed that exclusion of females is not one of the socio-cultural obstacles to female enrolment. It can be inferred that the inclusion of females in major activities that will impact their lives, especially when it comes to decision making processes will improve female participation in technology -based programmes. Correspondingly, five hundred and five (515), that is (58.9%) attested to this view that inclusion of females in major activities that concerns them will improve enrolment into technology based programmes in federal polytechnics, while three hundred and thirty eight(338), (41.1%) of the respondents are not in agreement with this opinion.

Furthermore, it is the opinion of six hundred and twenty (620) respondents that socio-cultural religious practices has a part to play in the non-participation of females in technology programmes in the Federal polytechnics in Northern geo-political zones of Nigeria. It can be observed from the respondent's views (63.2%) socio-cultural religious practices influence female enrolment into technological programmes. These practices have

been attributed to the lack of understanding of Islam. This much has been attested to by five hundred and sixty four (564) of the respondents, representing (68.5%) that Islamic religion encourages female participation5 in technology-based education, while two hundred and fifty nine (259), that is (31.5%) do not share this opinion.

As the grand mean equals 2.70 which is above the 2.50 mark, it is concluded that socio-cultural

values have effect on female enrolment in Technology based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria.

Research Question 2: What are the effects of government support on female enrolment into Technology based programmes in the federal polytechnics of the Northern geo-political zones of Nigeria?

Table 4:8 Responses on the Effect of Government Support on Enrolment into Technology -Based Programmes

S/N	Question Item	SA	A	%	D	SD	%	Mean	Remark
1.	Government supports the education pursuit of females to study technologically oriented programmes by giving them scholarships.	133	207	41.3	331	52	58.7	2.51	Accept
2.	Government does not provide enough scholarship to females studying technology-basesd programmes	507	172	82.5	123	21	17.5	3.42	Accept
3.	Most of the federal polytechnics are far away from most towns and cities.	207	133	41.3	431	52	58.7	2.60	Accept

4.	Government ensures that schools for offering technology based programmes are built in towns and cities for proximity.	311	156	56.7	107	249	43.3	2.64	Accept
5.(a)	Lack of learning materials in Federal Polytechnics, affect female students' choice of Technology Based	133	207	41.3	431	52	58.7	2.51	Accept
(b)	Programmes. Lack of female teachers in technology programmes to act as role models also influence female choice of technology programmes in the Northern geo-political zones of Nigeria	311	156	56.7	107	249	43.3	2.64	Accept
6.	Government does not even lay solid foundation for females to study technology in schools.	300	218	62.9	115	190	37.1	2.76	Accept
7.	Government provides facilities for studying technology but females are not interested in the programmes.	212	310	63.4	100	201	36.6	2.65	Accept
8.(a)	If government involves parents in its sensitization plans, it will improve female enrolment in technology programmes.	311	156	56.7	107	249	43.3	2.64	Accept
(b)	Creating job opportunities for women who graduate from technology programmes like engineering will boost	353	133	77.5	110	227	22.5	2.74	Accept

	female enrolment into technology based programmes.								
9.(a)	Through poverty alleviation program, government provides good opportunity for parents to send their female children to study.	226	97	39.2	311	189	60.8	2.44	Reject
(b)	Even when females apply to read technically-based programmes, only a few of them are considered.	483	118	73.0	121	101	27.0	3.19	Accept
S/no	**Question Item**	**SA**	**A**	**%**	**D**	**SD**	**%**	**Mean**	**Remark**
10.	Curriculum should cater for the difference between males and females in Federal Polytechnics in the Northern geo-political zones of Nigeria .	416	23	53.3	69	315	46.7	2.66	Accept

Grand Mean = 2.72

The commitment by the government on policy support programmes to improve on the enrolment trend of females has paradoxically not translated into improved female participation in technology programmes. From the Table 4.8 above, it is accepted by five hundred and forty (540), that is (41.3%) of respondents that government support the educational pursuit of females to study technologically oriented programmes through awards of scholarships ,and has instituted various platforms to influence enrolment pattern but this has not improved enrolment as can be attested by 58.7% of the respondents, and it is the view of majority, six hundred and seventy nine (679) representing (82.5%) of the respondents that the government needs to do more to ensure adequate representation of

females in technology programmes in federal polytechnics in the Northern geo –political zones of Nigeria.

One of the areas where government can improve participation of females in technology programmes is by having federal polytechnics within the proximity and reach of people, so they access technology education without much stress. .it the view of five hundred and forty (540) that is (41.3%) that most Federal polytechnics are not far away from most towns and cities. However, four hundred and eighty three (483) representing (58.7%) of the respondents, disagreed with this opinion, and are of the view that most of the federal polytechnics are far away from cities and towns. This has also been collaborated in item 4 by four hundred and sixty seven (467), that is (56.7%) of the respondents that government ensures that schools for studying technologically based programmes are built in towns and cities for proximity as it will attract female participation, while three hundred and fifty six (356) representing (43.3%) disagreed.

In item 5^{a}, assessing the adequacy of learning materials, it was revealed that the respondents accepted the view that lack of adequate learning materials in Federal Polytechnics affect female students' choice of technology -based programmes. With a mean of 2.51, it is the view of respondents that lack of adequate learning materials is a significant factor that can affect female choice of programmes. Four hundred and forty (440) that is (41.3%) agreed to this, while four hundred and eighty three (483) representing (58.7%) do not share this opinion. Item 5^{b} shows this problem has been compounded by lack of female teachers to act as role models to significantly influence female choice of technology programmes; with a mean of 2.64, four hundred and sixty seven (467) representing (56.7%) agreed with this view and affirmed that the absence of female

teachers in technology influences the female enrolment trend into technology based programmes, while three hundred and fifty six (356), that is (43.3%) disagreed with the opinion that lack of female role models can be a major barrier in female participation in technological courses.

In item 6, respondents are of the opinion that government does not lay solid foundation for females to offer technical programmes. With a mean of 2.76, five hundred and eighteen (518) representing (62.9%) believe that government does not lay solid foundation for studying technical programmes. This could be attributed to the non-domestication of gender related issues, and issuance of government direct policy statements. However, three hundred and five (305) that is (37.1%) disagreed with the view that government does not lay a solid foundation for studying technology in federal polytechnics.

Furthermore, it is the opinion of five hundred and twenty two (522) representing (63.4%) that even where government provides the necessary support, females do not show interest in offering technology courses.

In another related development, it is the opinion of respondents that for the success of any government plans and programmes to improve female participation in technology programmes, parents need to be involved. This is because they have significant impact on female choice of courses of study as has been confirmed by four hundred and sixty seven (467) representing (56.7%) of the respondents, while three hundred and fifty six (356)(, that is (43.3%) disagreed, that parents can make any impact. Consequently, in item 9^{a} five hundred (500) of the respondents representing (60.8%) disagreed that poverty alleviation programmes by government will improve female enrolment into technology programmes in

federal polytechnics, while three hundred and twenty three (323), that is (39.2%) believe it would.

Similarly, it is accepted by four hundred and eighty six (486) respondents representing (77.5%) that if job opportunities are created for female graduates in technology from federal polytechnics in the geo-political zones of the North, will serve as an incentive that will boost female enrolment into technology based programmes. However, three hundred and eighty seven (387) of the respondents representing (22.5%) contradict this opinion, and do not believe creating job opportunities will translate into boosting the representation of females in technically-based programmes. This is coupled with the opinion of six hundred and twenty (620), that is (73.0%) of the respondents that even where many females applied to go into technical fields, only a few of them are considered for admission. This view is accepted from the respondents that admission processes into technology programmes are biased against females. However, two hundred and twenty (222) representing (27.0%) do not share this opinion.

On the issue of curriculum as a variable, it is accepted by the respondents that the curriculum for technology programmes should be gender friendly, such that it should be designed to favour males and females in Federal Polytechnics in the Northern geo-political zones of Nigeria. In item 10, of the table, four hundred and thirty nine (439) representing (53.3%) are of the opinion that the curriculum should address perceived lack of relevance, and also take into consideration areas of concerns for the female students. However, four hundred and eighty four (484) that is (46.7%) are of the view that the curriculum should not be tampered with.

As the grand mean equals 2.72 which is above the 2.50 mark, it is concluded that government support has effects of on female enrolment into Technology based programmes in the federal polytechnics in the Northern geo-political zones of Nigeria?

Research Question 3: Has parental attitude any effect on female enrolment in Technology Programmes in Federal Polytechnics in Northern geo-political zones of Nigeria?

Table 4:9 Responses on the Effect of Parental Influence on Enrolment of Females into Technology- Based Programmes

S/N	Question Item	SA	A	%	D	SD	%	Mean	Remark
1.	Parents desire to have females around them all the time rather than enroll in technology programmes.	501	124	75.9	76	122	24.1	3.23	Accept
2.	Early marriage is a strong factor used by parents to influence their ward's choice of technology programmes.	227	225	54.9	153	218	45.1	2.56	Accept
3.	Female students from privileged homes enroll into technology programmes than those from poor homes.	416	23	53.3	69	315	46.7	2.66	Accept
4.	The overbearing influence of parents in career choices of females is responsible for low female enrolment in Technical-Based Programmes.	212	310	63.4	100	201	36.6	2.65	Accept
5.	If mothers encourage their female children it will improve the enrolment of females into Technology-Based Programmes in Federal Polytechnics.	300	218	62.9	115	190	37.1	2.76	Accept

6.	Educated female parents encourage their female children to offer Technology-Based Programmes than the uneducated ones.	227	225	54.9	153	218	45.1	2.56	Accept
7.	Parents who are educated encourage their female children to offer Technology-Based Programmes than the uneducated ones.	125	327	54.9	153	218	45.1	2.43	Reject
8.	Parents prefer male children to enroll in technical programmes than female children because of the cost.	212	310	63.4	100	201	36.6	2.65	Accept
9.	Parents do not believe Technology based programmes are important to females.	363	191	67.3	92	177	32.7	2.90	Accept

Grand Mean = 2.71

Table 4.9 shows that parental influence affect female enrolment pattern into technology-based programmes. In Nigeria, parental influence is strengthened by several factors such as religious, cultural etc. such that these factors influence the choice of their children's careers. With a mean of 3.23, it is the opinion of six hundred and twenty five (625), representing (75.9%) of the respondents that the desire to have female children around them all the time is a barrier to female participation in technology programmes. However, one hundred and ninety eight (198) that is (24.1%) do not share the opinion that parents always want to have female children around them all the time.

Furthermore, the traditional practice of early marriage by parents to protect the chastity of their female children is a strong factor used by parents to influence their ward's choice of programmes to pursue in the polytechnics. This has been corroborated by four hundred and fifty two (452) with a mean of 2.56, representing (54.9%).

In addition, four hundred and thirty nine (439) of the respondents, representing (53.3%) are of the opinion that female students from privileged homes are more encouraged to enroll in technology programmes than those from poor homes. Laying credence to the opinion that economic position of parents may have something to do with it. However, three hundred and eighty four (484), that is (46.7%) disagreed that being from privileged background have anything to do with enrolment of females into technology programmes in Federal Polytechnics in the Northern geo-political zones of Nigeria. Nevertheless, empirical studies has affirmed that parental influence is a significant factor that influences the choice of career of females, as can be attested by five hundred and twenty two (522) of the respondents representing (63.4%) with a mean of 2.65 in item 4..

Currently, the development of women has received urgent attention their female children to enroll in technology programmes through the proper encouragement. In the data presented in item 5, it is revealed that majority of the respondents, five hundred and eighteen (518), representing (62.9%) accepted the view that mothers can encourage their female on the national and international scene, and it is on this light, that it is believed mothers can influence children to enroll into technology based programmes, while three hundred and five (305), that is 37.1% do not share this opinion. Correspondingly, educated female parents are considered to value education more, and be more encouraged to influence their female children to opt for technology based- programmes than uneducated ones. This is the opinion of four hundred and fifty two (452), representing (54.9%) agreement response and a mean of 2.56; it is evident that this view was accepted by the respondents. However, three hundred and seventy one (371) that is (45.1%) are not in agreement with this view.

Relatedly, in item 7, it is also the opinion of four hundred and fifty two (452) respondents, representing (54.9%) that educated parents encourage their female children to offer technology programmes, while three hundred and seventy one (371) respondents representing (45.1%) are not in agreement with the opinion that educated parents encourage their children to opt for technology programmes.

However, in item 8, it is the opinion of five hundred and twenty two (522) respondents representing (63.4%) that when it comes to choice in terms of the cost attached to technical programmes, parents would still prefer their male children enrolled in technical programmes than female.. Relatedly, in item 9, it is believed that parents do not generally believe that technology education is important to females due to their feminine disposition, which might not allow them to cope with the demands of technological programmes. This much has been confirmed by five hundred and fifty four (540) respondents with a mean of 2.90 representing (67.3%). Incidentally, two hundred and sixty nine (269) of the respondents, representing (32.7%) hold a contrasting view since technology programmes, are perceived by parents to be male-inclined, they would rather the male rather than female offer it.

As the grand mean is 2.71 which is above the 2.50 mark, it is concluded that parental influence has effects of on female enrolment into Technology based programmes in the federal polytechnics of the Northern geo-political zones of Nigeria?

Research Question 4. Have locational factors any effect on female enrolment in Technology Courses in the Federal Polytechnics in the Northern geo-political zones of Nigeria?

Table 4:10 Responses on the Effect of Location on Enrolment of Females into Technology-Based Programmes in Northern State Polytechnics.

S/N	Question Item	SA	A	%	D	SD	%	Mean	Remark
1.	The federal polytechnics located in the urban areas attract more female students than those in rural areas.	52	133	22.5	411	227	77.5	2.01	Reject
2.(a)	The dress code difference in urban federal polytechnics can influence female enrolment in Technology programmes in Federal Polytechnics in Northern geo-political zones of Nigeria	125	137	54.9	153	218	45.1	2.43	Reject
(b)	The dress code difference in rural federal polytechnics can influence female enrolment in Technology programmes in Federal Polytechnics in Northern geo-political zones of Nigeria.	101	134	28.6	503	85	71.4	2.30	Reject
3.	Female students prefer federal polytechnics located in the urban areas because more programmes are available than the rural polytechnics.	363	191	67.3	92	177	32.7	2.90	Accept
4.	Better facilities in urban federal polytechnics than the rural federal polytechnic increase female enrolment.	363	191	67.3	92	177	32.7	2.90	Accept

5.	There is wide gap in enrolment of females in technology programmes in the Urban and Rural federal polytechnics in the Northern geo-political zones of Nigeria.	300	218	62.9	115	190	37.1	2.76	Accept
6.	The urban female students are greater in number than the rural female students who enroll in Technology Programmes in Federal polytechnics in the Northern geo-political zones of Nigeria.	133	207	41.3	431	52	58.7	2.51	Accept
7.	Female students prefer enrolling for technology programmes in rural environment than urban environment in federal polytechnics in Northern geo-political zones of Nigeria.	416	23	53.3	69	315	46.7	2.66	Accept
8.	Greater support by government to Urban polytechnics than rural ones is responsible for low female enrolment in the federal Polytechnics in Northern geo-political zones of Nigeria.	52	133	22.5	411	227	77.5	2.01	Reject

Grand Mean = 2.50

Location impact has been observed to play a decisive role in the enrolment trend of Federal polytechnics in Northern geo-political zones of Nigeria. In item 1, it is revealed that the location of federal polytechnics does not attract female student enrolment as both

urban and rural locations are not predictive of increasing female enrolment. Therefore, locations do not play a decisive role in the enrolment of females in technical institutions. This is the opinion of six hundred and thirty eight (638) respondents representing (77.5%). However, one hundred and eighty five (185) respondents, that is (22.5%) do not share this opinion.

In the Northern geo-political zone, strong affinities are attached to the dress code for females, to safeguard their chastity and decency. In items 2a and 2b, the results have revealed there is no dress code difference between urban and rural federal polytechnics in the North to influence female enrolment in technology programmes. This view was rejected by respondents in item 2^{a} & $2^{b}$with a mean of 2.43 and 2.30 respectively. In a bid to assess female student preference of Federal Polytechnics, it can be deduced from the table in item 3, that five hundred and fifty four respondents (554) representing (67.3%) are of the opinion that female students prefer urban centered Federal polytechnics. This is obvious of the fact that urban facilities are more attractive to the females than rural. However, two hundred and sixty nine deviate from this view on the attraction of female students to urban federal polytechnics.

Correspondingly, five hundred and fifty four (554) respondents with a mean of 2.90, representing (67.3%) in item 4, accepted that better facilities can attract female participation in technology programmes. Invariably, this can create wide gap between Rural and Urban Federal Polytechnics in Northern geo-political zones of the Nigeria. This view is clearly corroborated in item 5, by five hundred and eighteen (518) respondents, with a mean of 2.76 representing (62.9%).

It is however, the view of three hundred and five, that is (37.1%) of the respondents that such gap does not exist. In Item 6, respondents further corroborated the result in item 5, that the urban federal polytechnics are more populated with female students than rural centres. This over concentration of female students can be attributed to the quest for better learning environment. With a mean of 2.51 in item 6, it can be inferred female urban are attracted to enrolment in technology programmes, than female rural based. Paradoxically, technology programmes in rural environment are more attractive to females than urban environment. This is because the rural environment is seen to be conducive for learning and closer to their respective homes. In item 7, four hundred and thirty nine (439) of the respondents with a mean of 2.66, agreed with this view, while three hundred and eighty four, that is (46.7%) are not in agreement. It is the opinion of respondents that with improved facilities in the rural environment, there will be improved female attraction into technology programmes in these areas.

In another light, the findings have shown that government gives equal support to both urban and rural federal polytechnics. Therefore low female enrolment is traceable to the choice of candidates based on the area he intends to pursue his/her educational career. With a mean of 2.01 in item 8, majority of the respondents, six hundred and thirty eight (638), representing (77.5%) disagreed that government gives greater support to urban than rural Federal Polytechnics in Northern geo-political zones of Nigeria. however, one hundred and eighty five, representing (22.5%) strongly hold this opinion.

With a grand mean 2.50, the findings have shown that locational factors have no significant effect on female enrolment in federal polytechnics in the Northern geo-political zones.

4.3 Hypotheses Testing

Four (4) hypotheses were formulated in relation to the objectives of the study. These concern the correlation between the multi-dimensional variables of socio-cultural values, government support educational policies, parental influence and location of federal polytechnics and there effect on female enrolment into technology-based programmes in federal polytechnics in northern geo-political zones of Nigeria. The hypotheses are as follows:

Hypothesis 1: There is no significant relationship between female enrolment into technology –based programmes in federal polytechnics in Northern geo-political zones of Nigeria and socio-cultural values.

Table 4:11 Pearson Product Moment Correlation (PPMC) Statistics between effect of socio-cultural values and female enrolment in Technology based programmes in Federal Polytechnics in Northern Geo-Political Zones of Nigeria.

Variable	N	Mean	s.d	Corr. Index (r)	Critical r	Df	P
Effect of Socio-cultural Values	823	37.830	5.356	.779	.195	821	.026
Female Enrolment	823	25.477	3.671				

Table 4.11 indicates that there exists a strong positive correlation between effect of socio-cultural values and female enrolment ($r = 0.779$ since $P= 0.026 < 0.05$. Hence we conclude that socio-cultural values have significant relationship on female enrolment in the Federal polytechnics in Northern geo-political zones of Nigeria. This is manifest in traditional/socio-cultural practices of early marriage, patriarchy, male chauvinism, socio-cultural religious practices, sex stereotyping of female choice of programmes, and

exclusion of females from major activities that concern them. Culture is one basic assessment of whether a society is either developing slowly or rapidly.

Rapid development of a society is dependent on the quality of human resources which is also determined by the quality of education obtained by them. Disparity in enrolment trend of technology programmes in Federal Polytechnics is traceable to socio-cultural practices prevalent in the Northern communities. Table 4.11 clearly demonstrates that there is strong relationship between socio-cultural values and low female enrolment in federal polytechnics. Hence, it can be inferred that socio-cultural values directly impinges on female enrolment in technology –based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria.

Hypothesis 2: There is no significant relationship between government support given to female enrolment in Technology –based programme, and their enrolment into Federal Polytechnics, in Northern geo-political zones of Nigeria

Table 4:12 Product Moment Correlation (PPMC) Statistics between effect of government supports and female enrolment in Technology based-programmes in Federal Polytechnics in Northern Geo-political zones of Nigeria.

Variable	N	Mean	s.d	Corr. Index (r)	Critical r	Df	P
Effect of government supports	823	35.400	2.886	.812	.195	821	.018
Female Enrolment	823	25.477	3.671				

Table 4.12 shows that there exists a strong positive correlation between effect of Government support and female enrolment ($r = 0.812$ since $P=0.018< 0.05$) as could be seen in the table, hence the null hypothesis was rejected. The result implies that Government support has significant relationship on female enrolment in the Federal polytechnics in Northern geo-political zones of Nigeria. Government support to technology

education has been observed to be the catalyst to improve female enrolment into technology-based programmes in federal polytechnics in Northern geo-political zones of Nigeria. Government educational policies have been gender friendly to encourage female enrolment. This is manifest in the National policy on education which encourages equal opportunities for all, and government National policy on technology targeted to enhance scientific literacy and technological independence.

Because encouraging both sexes for technology education will guarantee the transformation of the society. In pursuance of these goals, government support is deployed in forms of adequate facilities both human and material, creating a conducive environment for learning to take place, by providing gender friendly curriculum and direct policy statements. From Table 4.12, it is evident that there is direct correlation between government support educational policies and female enrolment in technology programmes. This correlation proves that government support policies remain a critical factor to spur up female enrolment in technology based programmes in federal polytechnics in Northern geo-political zones of Nigeria.

Hypothesis 3: There is no significant relationship between the enrolment of females into technology based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria and parental influence

Table 4:13 Product Moment Correlation (PPMC) Statistics between effect of parental influence and female enrolment in Technology based-programmes in Federal Polytechnics in Northern Geo-political Zoness of Nigeria

Variable	N	Mean	s.d	Corr. Index (r)	Critical r	Df	P
Effect of Socio-cultural Values	823	24.400	5.251	.754	.195	821	.007
Female Enrolment	823	25.477	3.671				

Table 4.13 indicates that there exists a strong positive correlation. This is because with ($r = 0.754$ since $P= 0.007< 0.05$) which was found to be better than the critical value of $.195 < 0.05$ a significant relationship was established between effects of parental influence and female enrolment. Hence we reject the null hypothesis and conclude that parental influence have significant relationship on female enrolment in the Federal polytechnics in Northern geo-political zones of Nigeria.

Societal perceptions of parental influence on their wards career development has been well documented in social research. Otto (2000) investigated young people's perceptions of parental influence on their career development and found that both boys and girls look to their parent's advice whenever they make career choices. Lack of interest in technology programmes by girls is traceable to parental influence which directs their career choice to the Arts and Humanities. Most girls acknowledged the support of their families in their career choices. The findings indicate a positive influence of educated parents in encouraging their female wards towards technology programmes. This is evident in the data analysis as there exists a significant relationship between parental influence (1) and female enrolment in technology programmes (.754)

Hypothesis 4: There is no significant relationship between effect of locational factors and female enrolment in Technology based- programmes in Federal Polytechnics in Northern geo-Political Zones of Nigeria.

Table 4.14 Product Moment Correlation (PPMC) Statistics between effect of locational factors and female enrolment in Technology based-programmes in Federal Polytechnics in Northern Geo-Political Zones of Nigeria

Variable	N	Mean	s.d	Corr. Index (r)	Critical r	Df	P
Effect of Socio-cultural Values	823	22.480	3.483	.261	.195	821	.052
Female Enrolment	823	25.477	3.671				

Table 4.14 shows that there exists a weak relationship between correlation effects of locational factors and female enrolment ($r = 0.261$ since $P=0.052 > 0.05$) hence we accept the null hypothesis and conclude that locational factors are not related to female enrolment in the Federal polytechnics in Northern Geo-political zones of Nigeria.

A number of studies on location as a factor suggest that area of abode is predictive of enrolment. Federal Polytechnics in urban areas indicate increased female enrolment in technology programmes than those in rural areas. For example, Kaduna polytechnic in an urban setting has 4,966 female enrolment in technology–based programmes, in 2008/2009 while Federal polytechnic, Kaura Namoda in a rural area recorded 438 female enrolment. However, from the findings the disparity in female enrolment cannot be attributed to location of the federal polytechnics in either urban or rural areas, but to other factors. Evidently most Federal Polytechnics in Northern states are sited in rural areas. However, the results show that there exist a negative correlation between location and female enrolment. Table 4.14 shows a significant 2-tailed test, which affirmed that there was significant relationship between location of Federal Polytechnics and female enrolment into

technology –based programmes in Northern states. However, because location as a factor determines other factors such as interest, perception and availability of facilities, it must be appreciated that if conducive environment is provided for learning it will also impact on female enrolment.

Table 4.15 Summary Analysis of Data Related to Research Questionnaire

S/N	FACTORS	MEAN WEIGHTING: MAXIMUM=2.72
1	Socio-Cultural Values	2.70
2	Government Support	2.72
3	Parental Attitude	2.71
4	Locational Factors	2.50

Table 4.15 depicts the summary of analysis on the variables studied. The data analysis table indicate socio-cultural factors, government support policies & parental attitude, have effect on female students' enrolment in technology based programmes in the Federal Polytechnics in Northern states. The mean weighing for each of the three factors was 2.70, 2.72 & 2.71 respectively. The respondents perceived locational factors as less significant. So far mean weighting of the respondents was found to be 2.50

Table 4.16: Show Summary Analysis of Data of Four Factors Concerning Female Enrolment in Six Sampled Federal Polytechnics

S/N	FACTOR	PERCENTAGE OF RESPONSE		
		SA/A	D/SD	TOTALS
1	Socio-Cultural Values	53.18%	46.82%	100
2	Government Support	49.60%	50.40%	100
3	Parental Attitude	61.21%	38.79%	100
4	Locational Factors	46.73%	53.27%	100

Table 4.17: Ranking of the Four Factors in Low Female Enrolment in the Federal Polytechnics under study

S/N	FACTORS	PERCENTAGES	RANKING	REMARKS
1	Socio-Cultural Values	53.18%	2	
2	Government Support	49.60%	3	
3	Parental Attitude	61.21%	1	
4	Locational Factors	46.73%	4	

Tables 4.16 and 4.17 shows the ranking of factors associated with low female students enrolment in Federal Polytechnics in Northern geo-political zones. Of the factors, parental influence is ranked number one, with 61.21 % followed by socio-cultural values 53.18% and government support 49.73%; even though locational factor was ranked to be the least (46.73%) but it was viewed as a factor associated with low female enrolment in technology programmes in the Federal Polytechnics in Northern geo-political zones of Nigeria.

4.4 Discussion of Findings

Effect of Socio- Cultural Values on Female Enrolment

Socio-cultural values were generally reported in table 4.17 ranking by approximately 53% (53.18%) of the respondents as being the cause of low female enrolment in technology–based programmes in Federal polytechnics in Northern geo-political zones of Nigeria. These socio-cultural beliefs are rooted in practices such as early marriage, patriarchy, exclusion of women, and mode of dressing, socio-cultural religious practices and the society's perception of women as the weaker sex, thus relegating them to domestic chores of the home. A clinical examination of the relationship between female enrolment into technological-based programmes in federal Polytechnics in Northern states

of Nigeria and socio – cultural values, reveals a strong positive correlation indicating a presiding trend of male dominance.

Various studies -Sanders, (2005), Aguele & Agwahgwah, (2007), Ogunjuyigbe, Liasu & Suleiman, (2008) have established that girls have obstacles in many ways to utilize their educational and intellectual capabilities. Females are considered physically weak and it is believed they cannot cope with the rigors of technology which involves handling of tools and machinery, considered to be energy –driven, and involving long hours of standing for practical work which are detrimental to the interest, attitude and abilities of female learners. This has thus reinforced the findings of previous researches by Erinosho (1994), Eitzen (2000) & Ogunjuyigbe; Liasu & Suleiman (2008) that our socialization processes inculcated gender biases through the different roles and responsibilities assigned to girls and boys. Education for girls' right from the very beginning was designed to make them primarily effective mothers and housewives. Hence girls were brought up in the traditional family set-up to be passive, obedient, "lady like" and always submissive to men. Boys on the other hand, were encouraged to be aggressive, competitive and independent.

The most damaging effect of this differential treatment accorded to the sexes was the denigration of the so-called female's roles. Women were thus seen as nurturers and mainly as providing support for men who worked to provide for the family. Furthermore, the basic socialization process still presents marriage as an unequal relationship between men and women, while preference is still placed on the 'male child'. In some part of the country, particularly in the North, early marriages are a permanent feature and females are brought up to see marriage as the ultimate goal and ambition.in which case, girls are given in marriage at the age of between twelve and thirteen years. This condition can lead to

serious health hazards. In such an unequal gender relationship, a woman's desire to improve herself through higher education and specialization in technology subjects may be undermined by the husband in order to maintain the traditional power structure in the home. The girls are reported to be more affected by socio-cultural factors, which result in lateness, persistent absenteeism, poor performance and higher dropout rates. Although the socio-cultural constraints vary in content and scope across the country, to a great extent they determine the attitude of families and society towards technology education.

Findings revealed from this study supported the findings by Bedakale (2003) and Ojobo (2008) that non-attendance of girls to schools and their withdrawal from school is traceable to the culture of early marriage prevalent in Northern geo-political zones of Nigeria, which was a major disincentive and invariably affects their enrolment trend in technology programmes. This calls for strong legislation from the government to address the problem of early marriage.

Furthermore, import from the study reveals that utmost importance is attached to female dressing, especially, in public as this signifies purity and chastisement of womanhood. For this reason, the western culture of dressing that characterizes most technical students such as wearing of the lab coats and workshop attires/ apparels does not appeal much to the female folk especially those religiously /culturally inclined. Islamic injunctions requires adequate coverage of the body for females whereby dresses are designed to be "free –style" not tight –fitted dresses. These unwholesome acts are considered to be foreign and places low value on women and this may eventually deny them the opportunity of a potential suitor in the environment they live.

Thus, results from the findings affirmed that lab coats and workshop attires is a contributory factor that has discouraged a significant number of female enrolment in technology courses offered in Federal Polytechnics in Northern geo-political zones in Nigeria, thus confirming the findings of Ajayi and Ahbor cited in Huyer (2003) & Gloeckner & Knowlton (1996) in which women opposed ICT study because it overexposed young women to western lifestyle, thus endangering their chances for marriage, and the observation that in most technology education classrooms and laboratories, the protective gears are more suited for males instead of all students.

However, in spite of the increasing rate of females' involvement recently in the male dominated professions, there is still a relatively high level of disparity in the enrolment trend. It is the opinion of majority of the respondents that females are not as capable as males to offer technology programmes. This in line with the findings of Walton (1986) and Masanja (2006) that society does not expect women to become technologist, and those that do are seen to have stepped out of line. But we all know that when given the right opportunity and encouragement, women can and will excel and that fewer girls select technology courses, and the overall performance of girls are much worse than that of the boys, consequently, resulting into very low enrolment rates in Engineering and Technology based subjects at tertiary level, especially those requiring mathematics and physics knowledge skills".

Similarly, the dimension of patriarchy which limits women's economic and educational activities is the prejudice of female exclusion whereby women are confined to the house undertaking menial jobs and are denied access by tradition and culture to participate in the socio-political development of their society. Of particular is a way of life

in which men are believed to be superior to women. The findings of the study further corroborates in World Bank (2005) in Nwajiuba (2011) that Nigeria is a highly patriarchal society, where men dominate all spheres of women's lives. Women are in the subordinate position and male children are preferred over female. This belief has adverse implication on women. For instance, female children are undervalued in most parts of the world where there is a greater preference for male children. In some communities in Nigeria particularly in the Northern part of the country many girls below 15 years are given out in marriage or withdrawn from school for many reasons - hawking to complement the family's economic position, domestic chores and protecting their virginity, thus moving the male to dominate and explore adventurous fields such as technology..

Evidently, certain socio-cultural traits are considered pervasive and to a large extent infringing on the fundamental rights of females especially in the Northern environment. These practices deny females opportunity to further their educational pursuit. However, currently advocacy groups have risen to these challenges through enlightenment, workshops, campaigns and the domestication of international laws. Because of this there is slight improvement in the way society views women. But because there are no direct policy pronouncements targeted at females in technology programmes in federal polytechnics, their participation in the field has not been very encouraging to warrant any significant changes in enrolment in technology based programmes when compared to the male ratio.

According to the findings of Indabawa, (2004), and Oluwabamide & Akpan (2010), the menace of hawking and child labour which is prevalent in the Nigerian society is an inhibiting factor to female participation in any type of education, including technology education. Interestingly, the findings of the study disapprove view of these researchers that

hawking could be a key inhibiting socio-cultural factor that prevents females from furthering their education and consequently, involvement in technology programmes in federal polytechnics. What is needed is strong government legislation against any form of child labour, including providing more employment opportunities so that parents who engaged their children in hawking will have reliable sources of income, thus improving on their economic position to give equal opportunities to both male and female children in terms of technology-based education.

Traditionally, household chores are attractive cultural activities for the female group. As such the non-participation of females in technology programmes are culturally–bound activities which limit the time females have to engage in technology programmes. This was upheld and thus confirms the findings of Jegede, Agholor & Okebukola (1996) that women's roles get reduced to household chores, child bearing etc in the home.

Furthermore, the socialization process entrenches the lack of decision making powers on females, thus contributing to their non-involvement in decision making across all levels of society-family, communities and institutions. The findings also indicate that socio-cultural religious practices rather than Islamic religion contribute to the non-participation of females in technology programmes in the Northern geo-politiical zones of Nigeria. This result is in accordance with the findings of Indabawa (2004) that lack of knowledge of Islam, as well as socio-cultural religious beliefs could be held responsible for such practices.

Islamic religion predominantly practiced in the northern part of Nigeria, demands that all its followers seek for knowledge even if it be as far as China, and it does not discriminate on what type of knowledge, nor does it state to what level one must acquire it,

neither does it demand such knowledge to be availed a particular sex. What this means is that there are no barriers (islamically) to any type of education females aspire to have, rather, what is the religion preaches is that "the fear of God" and "Morality" should be the base of any activity to be undertaken by a believer..

Drawing inferences from the major import of the study, it could be concluded that there is significant correlation between female enrolment into technology-based programmes and socio-cultural practices of religion, early marriage, and exclusion of girls which limit their enrolment into technology-based programmes in federal polytechnics in Northern geo-political zones of Nigeria.

Effect of Government Support policies:

The effect of government support policies as a contending variable on enrolment of female students into technology based programmes in the Federal Polytechnics in Northern geo-political zones were perceived by about 49% (49.60%) in table 4.17 ranking to be the cause of low female enrolment in technology based programmes. Similarly, evidently, table 4.12 shows a strong relationship between government support educational policies and female enrolment. Though Odebode (2001) confirmed that the government policy on education emphasizes equal and accessible education to sexes yet there are no explicit policies to target female participation in technology programmes in Federal Polytechnics in Northern geo-political zones of Nigeria.

Government commitment and support is critical to the success of the integration of women's concerns into national plans. In recent past, efforts by the government towards rectification of this imbalance were limited because correct state or index of female enrolment in the field could not be established. It is thus imperative that action be set in

motion for in depth assessment of the multi-dimensional variables, (as undertaken in this study) responsible for this unwarrantable situation, in order to formulate potent strategies for increasing female enrolment into technological- based programmes. And in order to generalize initiation of policy to achieve the growth.

. Educational incentives to females to encourage enrolment into technology courses in the form of scholarships have been well advocated by many researchers, and the findings of this study has confirmed that in recent times, the provision of scholarship facilities has been limited, and not targeted at females in technology programmes in federal polytechnics to make an impact. If government can directly target females offering technology programmes in federal polytechnics, it will further boost their morale and encourage them to opt for technology courses.

While it is generally agreed (82.5%) that government scholarships are not targeted at females studying technology-based programmes in federal polytechnics in Northern geo-political zones of Nigeria, this might be justified on the grounds that even when it does, the females have low interest in the field. This apparent lack of interest have been attributed to the lack of self-confidence and self-esteem on the part of female students themselves to undertake technology programmes due to socio-cultural beliefs and practices which reinforces the society's stereotyped perception that females cannot cope with technology courses. This has further confirmed the findings of UNESCO (1999) that the ability of girls and women is called into question: and these negative social attitudes create a lack of self-confidence among girls and women in their ability and motivation to opt for science.

It is also indicative that distance plays a major role in enrolment trend and this variable affects female enrolment. The findings have shown that most Federal polytechnics

are not far away from towns and cities and so are not in close proximity to the rural areas, where these socio-cultural practices are predominant. This is line with the findings of Rahji (undated) that the longer the distance the lower is the likelihood of enrolment.

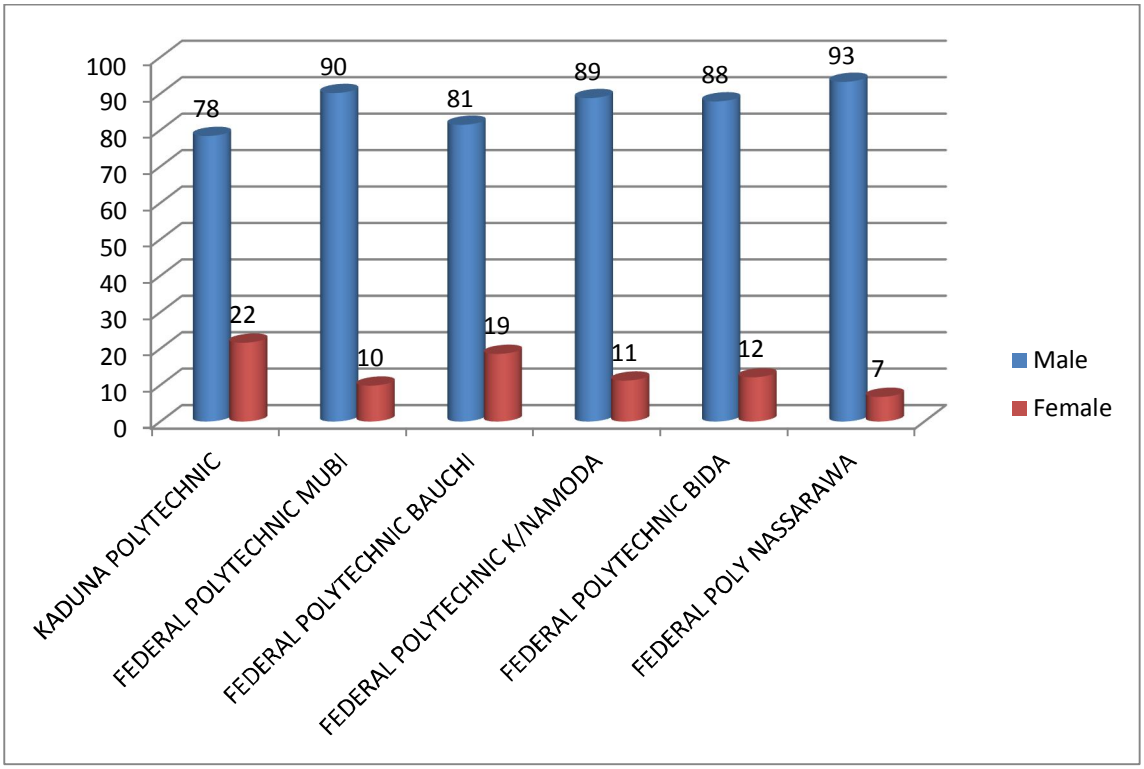
Hence, it is recommended that more federal polytechnics should be located as near as possible to the users if the rate of enrolment is desired to be increased and the gender gap reduced. Similarly, Ojobo (2008) & Okpukpara and Chukwuone (undated) stated that schools should be located closer to communities to serve as a precursor to educational growth in the locality since urban households have easier access to schools than rural households.. Technology education is what drives this growth. This is will also assuage the fears of those parents that are concerned about the security of their daughters having to travel long distances to access technology based-programmes in the federal polytechnics. Presently, of the eleven federal polytechnics in the Northern geo-political zones of Nigeria, six are located in the urban areas, while five are in the rural areas. There is need for more federal polytechnics in the rural areas to improve female enrolment in these areas.

Interestingly, learning materials are common features in all educational reforms, yet they remained insufficient and obsolete. This factor discourages females whose attraction to learning is facilitated by instructional aids and adoptive facilities that suit their learning skills. The findings have clearly accepted this opinion. The inadequacy of learning materials prevalent in most Federal polytechnic institutions is also a contending variable which calls for adequate support in this area.

However, technological and scientific equipment have been provided by various interventionist programs of the government and non-governmental organizations (NGOs). The recent, in such interventionists policy, the Federal Government through the Education

Trust Fund (ETF) approved the supply of laboratory and workshop equipment to 51 polytechnics and Monotechnics, including the six federal polytechnics under study (NBTE, Bulletin 2011), but how far do they conform to the standards of being user friendly to female technologist?, since it may require them to wear protective coverings like (gloves or helmets) and this standard practice does not conform with the cultural/religious practice in the Northern geo-political zones of Nigeria.

Figure II



Female Technology Staff Distribution in Federal Polys in the Northern geo-Political Zones

Correspondingly, there is also the inadequacy of female teachers to serve as role models to encourage the female students on the choice of studying technology courses by is also a contending factor. This in line with the findings of Aguele and Agwagwah, (2007),

Waite 111 (2003) and Nuhu ibid (2000) that female role models are absent, and difficult to find at any stage, and the problem of gender imbalance can only be solved if more female teachers come into technology programmes, to serve as role models for the female students. The result of the study clearly accepts this position. This inadequacy of female teachers as role models is further confirmed in figure 1 above, which shows in all the federal polytechnics sampled, male technology staff far outweighs female staff in technology –based programmes.

Instructional aids handled by female teachers can motivate female students to generate interest in the field of technology, so also if females are made aware of contributions and successes of women in technological fields. Both internationally and nationally, we have many women achievers, successful women from various technological fields could be invited by female teachers to visit and speak to their classes, this will boost the self-confidence, inspire their interest and enrolment into technology programmes. The dearth of female instructors in technology demotivates female students such that the demonstration of instructional aids puts fear, timidity and inferiority complex on the female learner.

. It is evident that the educational policy does not clearly provide gender friendly policy for female enrolment in technology programmes. Consequently, it means government does not lay a solid foundation for females to study technology programmes. This view is clearly supported by the findings confirming the views of Adeyemi & Akpotu (2004) & Omoike (2010) that the National Policy does not have provision for priority focus of female education.no corresponding policies or enactments or even pronouncements from governments have been made and consciously pursued with regard to female involvement

in technology education in the Federal Polytechnics. This inattention has resulted in low production of female graduates that are plowed into productive and some sectors of the economy. Government's palliative measures to address gender inequality in enrolment trend should be strengthened to include direct policy ratio for enrolment into technology courses such as a 60:40 ratio for female and male enrolment into technology programmes, which can adequately address the disparity in the enrolment trend and also discourages the erroneous belief that technology programmes are a male – dominated course.

The findings have also shown that for government to succeed in improving the enrolment of females in technical subjects in federal polytechnics in the Northern geo-political zones, it has to mobilize the support of all concerned in any sensitizing plans, especially parents, who are the most influential people, and role models in the lives of their children. This is in consonance with the findings of Hari (undated) in FEMSA 6 Project and Lee (1984) in McCraken & Barcinas (1991) that it is an indisputable fact that without parents and community support; any efforts to improve females' participation in technology education will be greatly hampered, and that parents regardless of their racial background need to be fully aware of their influence on the aspirations and expectations of young men and women

Other incentive areas government support can exploit include the need to create automatic job opportunities for female graduates in technology. If government can create job opportunities and offer automatic employment for female students that graduate from technology courses in federal polytechnics in Northern geo-political zones of Nigeria, female enrolment in technology will receive tremendous boost. Several studies by Erinosho (1994), Kahle and Meece (1994) and Ogunjuyigbe, Liasu and Suleiman (2008) have given

credence to the findings of this study that females are underrepresented in technology educational programmes as well as related jobs, and that creating job opportunities for female graduates in technology will improve female participation in technology programmes. .

Furthermore, the findings have shown that even though government provides a good opportunity for parents to send their children to school through several poverty alleviation programmes, this is not making the needed impact. Research evidences have confirmed that the poverty impact on children's education is felt more by the girl child (Indabawa, 2004). For any plans of the government on improving female participation in technology programmes to have the needed impact, it must be targeted directly on the females to boost technology education. For example, the Media Trust Female Scholarship for Medical students in 200 levels from identified Federal Universities in Nigeria. Such affirmative actions will go a long way in motivating female students and parents.

The findings have shown that even where females show willingness to participate in technology programmes, only few gain admission for such courses. Evidence of this can be seen from JAMB admissions for 2003/2004-2008/2009 which shows male admissions to federal polytechnics is far more than female admissions for these years (67%-27%). The lack of maths/science prerequisites for entry to technology programmes is often perceived as a barrier, especially when it comes to admissions into technology programmes, coupled with stereotyped traditional roles that lower the self-esteem and self-confidence of females in opting for technology programmes. The findings of Omoike (2010) is in line with this when he concludes that barriers to women's entry into non-traditional subject areas include

poor career advice, lack of role models, negative attitudes from families, fear of mathematics and fear of being in the minority.

The findings have also shown the need for a more gender sensitive curriculum, which will take into cognizance the existing needs and concerns of females, so as not to channel them away from courses traditionally regarded as masculine. It is the view of respondents that the curriculum should address the educational differences for male and female in the Northern geo-political zones of Nigeria. The findings have buttressed that of Aguele & Agwagwah (2007) that the curriculum should address the perceived lack of relevance in the curriculum to include more investigative learning, technology laboratory experience and collaborative work. Programmes that have provided students an opportunity to engage in hands –on, real life projects would be successful in increasing female enrolment and retention. Instructional aids, facilities and language illustrations must be gender sensitive, and include specific activities and experiences for females in order to boost their confidence and encourage their interest in the subject.

Curriculum review must assure that course objectives and learning experiences are directed towards male and female students. Textbooks that are gender-biased should be replaced with gender-neutral materials. Pictures in texts showing women handling tools and technological devices to solve problems, women in laboratories and practical workshops can go a long way in inspiring female students into technology programmes. Female students by their natural instincts of caring, like working with partners to solve problems and achieve common goals; they are also interested in aesthetics and detail-oriented characteristics, so learning activities must allow for student creativity and require aesthetic qualities to be evident on finished products.

Effect of Parental Influence on Female Enrolment

The study has confirmed the findings of researchers that parental attitude has a great deal of influence on female participation and success in technology education programmes. This is because it always the desire of parents to have their female wards around them all the time. Parents' preferential treatments are targeted at influencing career choices for their female wards. This is in line with the findings of Otto's (2000) that parental attitude, rather than occupational choice had great influence on female enrolment. Parental influence could be utilized positively to improve female enrolment in technology programmes in federal polytechnics in Northern geo- political zones of Nigeria. Parents must be fully involved in sensitization and advocacy programmes targeted at addressing low female enrolment in technology education, because they can positively encourage their wards towards technology education.

Sometimes, because of the fear of the security of their female children, some parents prefer to marry off them early, rather than allow them long years in tertiary institutions like the polytechnics, that sometimes exceed the graduating standard of 4 years reading technology programmes. Consequently, this reduces the number of students in technical fields. Therefore, when some families are faced with the option of choosing between sons' and daughters' education, the daughters are always the victim. The findings corroborates the findings of Indabawa (2004), that though marriage institution is vital in any society, yet the timing and the resultant impact of early marriage is a source of concern for many who cherish the equitable participation of females in modern education. When girls are married at ages 10 to 14, their educational careers are disrupted especially if an avenue for second chance learning is not provided.

Furthermore, the findings have also shown that those from privileged homes assess technology programmes than those from poor homes. This is in line with the findings of Biraimah (1987) who affirmed that women technologists in Nigeria have been drawn dis-proportionately from more privileged families. It is preferable that females should opt for 'soft' courses with little duration. This however, is a strong factor in Nigeria where per capital income does not match family's disposal income from all indication, it is deduction that the overbearing influence of parents directs the career choice of their female wards

The findings indicate that mothers and educated females parents can significantly contribute to encourage their female wards into technology courses due to the inherent potential in such programmes, and also by virtue of their being the closest to female children. This has been corroborated by the findings of Okpukpara & Chukwuone (undated) and Kortrik and Harrison (1989) in McCraken & Barcinas (1991) that though education of the father has almost equal influence on male and female child education, education of the mother has stronger effect on school attendance of girls, and is more important in sending girls to school than boys in rural Nigeria; and that students perceive that their parents influence their career choice more than any other person, and the mother is more influential than the father. This contrary to the findings of Rahji (undated) that mother's education variable though positive is not significant. However, encouragement by educated parents though positive would have to be guided as well, since they are also prone to influencing their children to opt for courses that are not technologically inclined, depending on what may be the interests. This is not in line with the findings of Okpukpara and Chukwuone above that educated parents have a role to play. However, educated parents do better in terms of encouraging their female children to opt for technical courses

than uneducated ones. This is in line with the findings of Rahji (undated) that the father-mother education variable is positive and significant in both cases, and acts as complement in school enrolment of the children. It thus has a significant complementary impact on enrolment.

On the whole it can be imported that male preference to studying technology can also be considered on the lines of cost-effectiveness. For economic reasons, many parents, especially in the rural areas of the north consider female education as a waste of funds since she will soon marry into her husband's family, thus leaving only boys in their original family to cater for their parents. This is in line with the findings of Igbuzor (1992) that whenever school fees are introduced, especially for the provision of social services the rich/wealthy individuals utilizes such available chances to increase students' enrollment in institutions. Whereas, the poor people would not because they cannot afford the money and ultimately making female students from poor homes enrolment becomes lower. This has further confirmed the findings of Rahji (undated) that the probability of enrolment decreases as cost increases and there is need to reduce this cost to reach the desired level.

MaiyaShiat (2005) observed that the creation, mastery and utilization of modern Technology are basically what distinguish the developing countries from the developed nations. So far, the living standards of citizens of a nation are dependent upon its attainment in Technology. The importance of preparing today's students to be competitive in a technology-based society is apparent. Their future success in the job market or in higher education is directly correlated to the student's capability to use and understand technology. It focuses on problem solving and preparation for the future. However, from the findings, it is evident that many parents are ignorant of the importance of technology

education in improving the living standards of their families, the society and the world at large.

However, some parents do encourage their female children to opt for technology programmes, because they realize its importance in improving the living standards of all citizens. Myra Sadker, the late gender equity advocate was quoted by Sanders (2005) that "if the cure for cancer is in the mind of a girl, we might never find it" This is because the person who finds a cure will need a solid background in technology. What can the society, the government, and parents do to make sure it becomes possible for that female to find the cure someday.

From the statistical evidence obtained in table 4.17 ranking it is affirmed, (61.21%) that there is substantial effect of parental influence on female enrolment in technology-based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria. The result from these variables has further confirmed the findings of Otto (2000) that young people look up to their parents in making career choices. Thus, it could be generalized that there is a positive correlation between parental attitude and technological-based programmes of their daughters and their abilities.

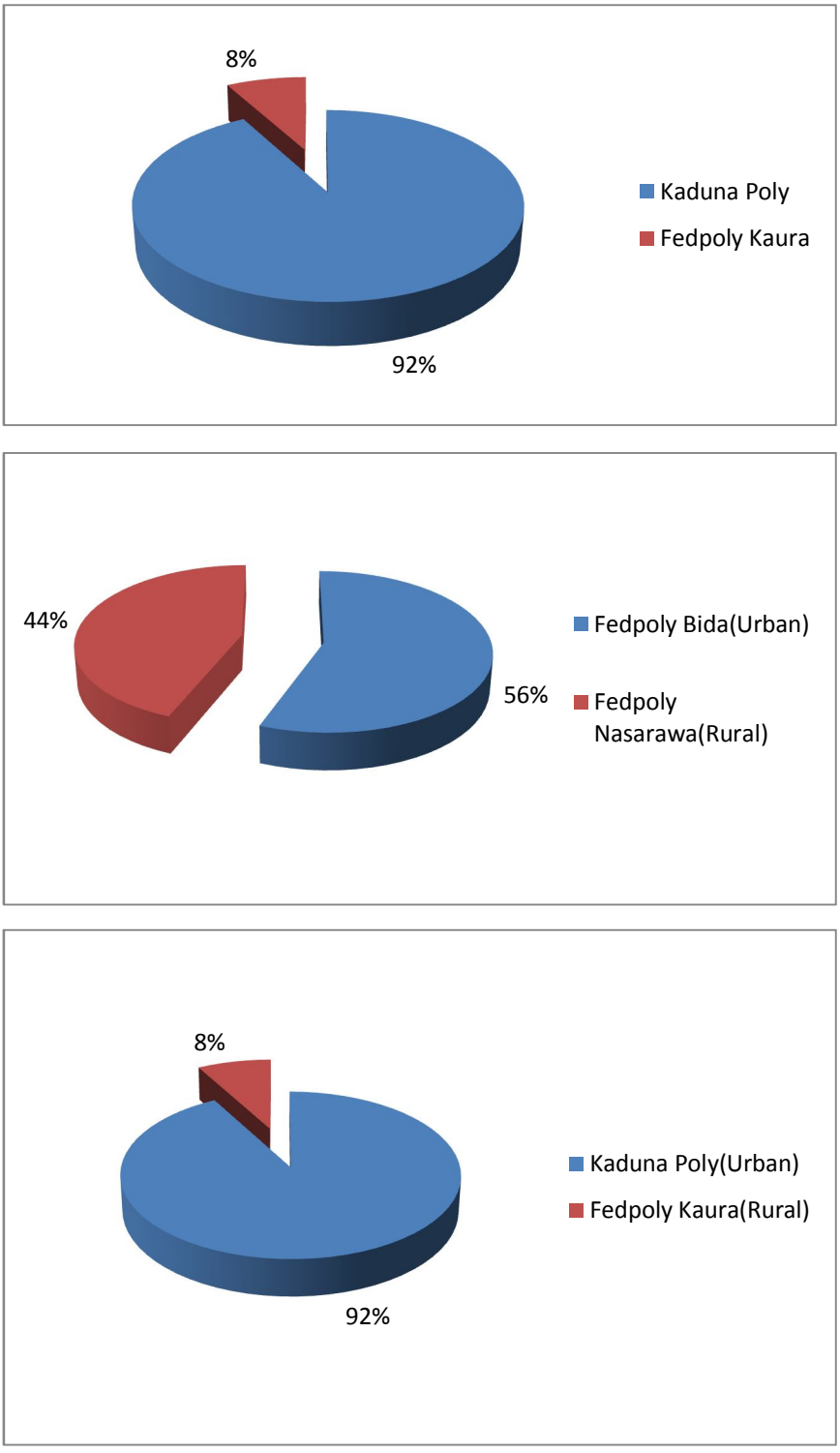
Effect of Locational Factors on Female Enrolment

A number of studies had affirmed that location is a significant variable that is predictive of the female enrolment trend. But interestingly, the findings of the study show that location of federal polytechnics either in rural or urban setting is less significant in terms of enrolment of female students in technology-based programmes. This has further confirmed the findings of Okpukpara & Chukwuone (undated) that location in rural or urban does not matter much in child schooling in Nigeria, thus contradicting most of

findings in other developing countries. Though differences in both urban and rural settings persist, what seems to be important is access to the Federal polytechnics. It can be deducted that environment is not predictive of the enrolment of females in technology courses.

The findings also reveal that there is no dress code difference between rural and urban federal polytechnics. Thus it is the view of respondents that this variable cannot influence female enrolment trend in the federal polytechnics. But relatedly, the findings have shown that the reason why female students prefer to enroll in urban based polytechnics than in the rural –based ones is because of the availability of variety of accredited programmes and probably more facilities which attract higher enrolment. The findings is line with that of McCracken & Barcinas (1991) urban and rural schools differed, as expected in size, cost per pupil, size of staff, and breadth of curricular and extra-curricular offerings.

Figure III **Female Enrolment in Technology between Urban and Rural Federal Polys in the North**



The respondents 63.9% have attributed the enrolment gap in urban and rural federal polytechnics to the fact that the urban federal polytechnics are better equipped in terms of facilities than the rural polytechnics. This attraction to the urban areas create gap in enrolment in technology fields. Table 3.8 shows the gap between Kaduna polytechnic in the North- west geo-political zone in an urban town (93%) female representation in technology programmes for the 2008/2009 session as against Federal polytechnic, Kaura Namoda in a rural area in the same session is a disappointing (8%). Similarly, in the North-east geo-political zone, Federal Polytechnic, Bauchi in an urban setting records (77%), while Federal Polytechnic, Mubi in a rural area trails behind with (23%) for the same session. The Federal polytechnics in the North-central zone have 56% and 44% respectively. From the findings, the gap is definitely not that of location, but of availability of programmes and facilities. The findings have also shown that the rural federal polytechnics can equally attract improved female participation with more facilities and increased accredited programmes. This is because they enjoy a more serene, more adaptive and supportive environment. Additionally, the findings have confirmed that government does not discriminate in the provision of facilities to urban and rural federal polytechnics. The recent federal government approved supply of equipment to 51 Polytechnics and Monotechnics supplied to both urban and rural polytechnics, including the six federal polytechnics under study based on accredited programmes they offer and revised curricula.

Summarily, it can safely be said that girl's interest, perception, attitude and culture can be controlled by location. It must be appreciated that the area under study requires infrastructural development especially in rural areas of Northern geo-political zones of Nigeria in order to encourage female enrolment. This calls for a deliberate effort to woo

girls in rural and urban centres in Northern geo-political zones of Nigeria to embrace enrolment into technology programmes. It is therefore clear that the influence of these variables on female enrolment into technology based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria is statistically significant.

However, the findings from the propositions tested in the pilot study conducted corroborated with the major findings of the study show that there are proven relationship between multi-dimensional variables (such as socio-cultural values, government support, parental attitudes and locational factors) and female enrolment. It can be imported from the empirical test that unless there is a general commitment to control these variables identified, in order to make technology 'a shared asset' for benefiting both male and female on a basis of solidarity. There will continue to be an imbalance in the enrolment of students in technology programmes.

4.5 Summary of Major Findings

The general conclusions that can be drawn from the available information of the result of the findings of the study indicate that the respondents are convinced that:

1. Cultural and socio-cultural values and practices (early marriage, misconception on the roles and capabilities of females in the society, socio-cultural religious practices, and exclusion of women from major activities) still have significant influence on female enrolment into technology based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria.
2. Besides the result also reveals that the support given to female education by government in terms of provision of facilities both human and material, including incentives such as scholarships for female students in technology are inadequate.

Moreover such indirect policies do not specifically target females. The findings also brought to light the need for direct policy statements specifically targeted at females, and the need for government to establish more federal polytechnics in the rural areas for proximity.

3. Further insight into the results also revealed that parents are vital to the success of any plan or programme for improving enrolment of females in the area of technical programmes in the federal polytechnics. This is because they can influence the female students' positively towards technology based programmes.
4. On the other hand, the location of federal polytechnics were said to have less significant influence on female student enrolment into technology based programmes in the area of research. So far the perception of respondents indicate that environment is not predictive on female enrolment, rather the availability of facilities influences enrolment.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The knowledge-based economy reveals that human resources are the key elements of growth, creative, scientific and technical men. Thus, women are indispensable not only to fuel innovation and development but to underpin sustainable industrial productivity and to improve the quality of life. In contrast, the results of this study have averred that female participation in technological-based programmes of Federal Polytechnics in Northern geo-political zones of Nigeria has very poor response. While polytechnics and other bodies in the developed countries make special efforts to attract female enrolment, the Federal Government of Nigeria have not issued any special releases on admission policy to attract the female gender into technological based -programmes.

5.2 Summary

This study examined the effect of multi-dimensional variables of socio-cultural values, government support, parental influence and locational factors on female enrolment in technology-based programmes in Northern geo-political zones of Nigeria using six (6) Federal polytechnics from the 3 zones in the Northern geo-political zones of Nigeria out of a total of eleven (11) Federal polytechnics.

Competent research assistants were actively engaged from Kaduna Polytechnic to assist in administering and collecting data for the researcher. The purpose of the study was designed to: (a) establish the extent to which socio-cultural values influence female

enrolment in technology based-programmes in Federal polytechnics in Northern geo-political zones of Nigeria

(b) establish government support and its influence on female enrolment in technology based - programmes in Federal polytechnics in the Northern geo-political zones;

(c) to ascertained whether or not parental influence affect female enrolment in technology-based programmes in Federal polytechnics in Northern geo-political zones of Nigeria;

(d) establish whether location of Federal polytechnic factors (urban/rural) affect enrolment of female students in technology-based programmes in Federal polytechnics in Northern geo-political zones of Nigeria; and

(e) confirm the extent to which the effect of socio- cultural values, government support, parental influence and locational factors on female enrolment in technology programmes can be controlled by proffering solutions that will improve enrolment into technology programmes in| Federal polytechnics.

A forty-three point item questionnaire was administered to the samples chosen. The Likert attitude scaling technique was used in addition to observation techniques. The questionnaires were validated by experts in Measurement and Evaluation from the faculty of Education, Ahmadu Bello University, and (ABU) Zaria.

A pilot study was conducted in Waziri Umaru Federal Polytechnic in order to validate and enhance the quality of the questionnaire and other related variables in order to determine the estimate of its reliability coefficient. The reliability coefficient of the questionnaire was 0.8042 and it is statistically significant at 0.05 level.

The study is made up of a total of five (5) chapters. Chapter one encapsulates the problem that needs to urgently address the imbalance that exist between male and female students enrolment in technology-based programmes in Federal polytechnics in Northern geo-political zones of Nigeria. Some identified multi-dimensional variables like socio-cultural values, government support, parental influence and locational factors have been fingered to play a role in this anomaly, thereby threatening female contribution to national development, especially, in priority areas of the economy.

To address these problems, four hypotheses were formulated. In addition, the chapter includes the delimitation of the study and those who stand to gain from it.

Chapter two takes a look at the concept of technology, the sole purpose of which is to solve practical needs of a society, increase productivity and raise the living standards of people. This chapter brought to the fore the various findings on gender differentials in technology programmes that are deeply rooted in societal and cultural practices. And the curriculum content stereotypes that contribute to the negative attitude and low interest of parents and female students in opting for technology programmes in the federal polytechnics. It also conjectured the curriculum review that would take into consideration gender concerns i.e. gender mainstreaming to eliminate the differentials in male and female enrolment.

Chapter three, deal with instruments for gathering data which was a pilot-tested instrument that contained forty -three items. This chapter includes a concise description of the research design, the area of study, the targeted population, as well as sample population. An introductory letter was attached to the questionnaire to facilitate data gathering. Likert scale instrument was used to elicit relevant information because of its

effectiveness and wide coverage of usage. In addition, the federal polytechnics under study were zoned, two from each geo-political zone in the North to ease data gathering and effective coverage. One thousand three hundred (1,300) questionnaires were administered. Eight hundred and twenty three (823) were returned and scored and interpreted indicating 63.3% response rate.

Chapter four is contained the analyzed data in segments. First is the demographic data which includes the responses of the subjects. The nominal data was interpreted using percentages, frequencies, and correlation analysis. Of the four hypotheses tested to throw light on the study, the first three null hypotheses were rejected and the alternative hypotheses were retained and the fourth null hypothesis was retained

The chapter dealt with the extent to which respondents perceive the role played by socio-cultural values, government support, parental influence and locational factors on female enrolment in technology–based programmes in the Northern geo-political zones of Nigeria. The analyzed data was summarized according to percentage of response and ranked based on the four factors under study i.e socio-cultural values, government support, parental influence and locational factors. The factors were also ranked. Based on the findings of the research, some recommendations were proffered.

Chapter five summarizes the study and also gives recommendations while also directing attention to areas for further research. The government needs to do more in the area of sensitization and advocacy to enhance female enrolment in technology programmes, and in also building gender concerns into its educational policies and programmes.

5.3 Summary of Major Findings

Technology determines many of the orientations and mutations of the present era and yet female's role as stakeholder and their contribution to the fields of technology and research are still largely ignored or not sufficiently recognized especially in Nigeria. This remains glaring from the import of this study which reveals that low enrolment into technological based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria are traceable to a host of multi-dimensional variables, such as socio-cultural values, inadequate government support, parental influences, and locational factors etc.

In the study's procedure, these variables were carefully examined, structured into the research questions as a deliberate measure to determine the interplay of these variables as they affect female enrolment in Nigeria's Federal Polytechnics in the Northern geo-political zones of Nigeria. In this survey, the questionnaire as major instrument was designed to capture the responses of all these variables. The efficacy of the questionnaire generates maximum responses on key issues at stake.

The design of the study shows that the multi-dimensional variables under study were structured into various related questions as a deliberate measure to elicit desired responses from the respondents. The responses were analyzed on the degree of percentage responses drawn from the total responses.

Imports from the major findings reveal that the effect of socio-cultural values is among the causative factors that impinge on female enrolment into technological based programmes in Federal Polytechnics in Northern geo-political zones. It is believed that girls are the weaker sex and in a core traditional setting of Northern geo-political zones of Nigeria, the female students are pampered into soft courses of study such as social science

courses and the humanities. Even though the results of the finding have shown that it is no more generally believed that girls should be trained informally to become good wives and mothers in future, this is still regarded as the traditional role of women, especially in the rural areas.

Many parents consider a girl's education unnecessary as she would be married off sooner or later. Thus, in the correlation analysis, it was proved beyond reasonable doubt that there exists a significant relationship between female enrolments in technology based programmes in the federal polytechnics in Northern geo-political zones of Nigeria and socio-cultural values. The socio-cultural values attached to girls appears to be a mental construct that is deeply embedded in the religious and traditional practices of the environment, which can be changeable to encourage female participation in technical related courses.

On the perception of government support on female enrolment into technology-based programmes, it is indicative that technical educational policies are discriminative as the contents are not gender sensitive. On the whole such government policies lack articulation towards bridging the gap in educational standards for male and female as a deliberate measure to boost enrolment. Hence, there is need for direct policy statements on females in technology in federal polytechnics from government to address this. Similarly, there is need for a review of curriculum to accommodate gender concerns, and introduce flexible learning skills to empower women.

Examining the effects of parental influence on female enrolment, it is affirmed that parents significantly influenced career choices of female children. They are therefore key to the success of any plans by government to address the perceived low enrolment of

females in technology programmes in federal polytechnics in the Northern geo-political zone of Nigeria.

In the findings of this study, location of federal polytechnics as a factor on female enrolment has proved to be less significant. This is predictive such that other variables such as religion, culture, interest, attitude and perception are strongly controlled in the Northern setting. Also the difference in rural and urban setting reflects the enrolment pattern of females into technology-based programmes.

On the whole these causative factors has been diagnosed and its outcomes are anchored in and perpetuated in the multidimensional variables (socio-cultural values, government support, parental attitudes, locational factors etc) identified. Thus, further efforts are required to eliminate all variables impinging on female enrolment into technological based programmes. This can be done to consider gender aspects in technology courses in order to consolidate female enrolment in technology-based programmes in Nigeria's Northern State Polytechnics.

Thus, the methodology of the study proved to be effective, as the validity of study elicits empirical evidences that supports or rejects the stated hypothesis. This further enhances the study's reliability, for its findings so far they are empirically tested.

Furthermore, the study has become a resource source for generating data on federal polytechnics in Northern geo-political zones of Nigeria that are representative of other polytechnics, especially, the information which reveal the low enrolment rate of technology-based courses. The data are adequate enough which enabled the researcher reach conclusions on vital issues. The study showed and confirmed the low rate of female enrolment attributable to multi-dimensional variables It also revealed practices in Federal

Polytechnic institutions in the geo-political zones of the north, and in society that discourage female students from staying in technology fields. Though societal beliefs and practices seem entrenched, hence, concrete efforts must be made to alleviate the barriers.

5.4 Conclusions

One of the greatest obstacles to women's progress in many parts of the world is inadequate opportunities for education. It has been established in this study that certain factors are attributed to low female enrolment in technology-based programmes in Federal polytechnics in Northern geo-political zones of Nigeria ranging from socio- cultural values, government support policies, parental attitudes towards female technology education, and locational factors e.t.c. Apparently, there is need to understand more under-representation of females in technology-based courses which need drastic solutions. Women now see it as injustice towards them generally, and are now clamoring for opportunity and support to get into technical-oriented fields as well as high-powered positions.

The world is witnessing the close of a century of tremendous achievements in science and of a proliferation of technologies which have had a far-reaching impact on every aspect f human lie. This is indeed o particular interest in the context of gender equality in enrolment for technology-based programmes. All indications are that twenty-first century will see an even greater global interdependence, especially when polytechnics in Northern geo-political zones of Nigeria and other parts of the country develop or consolidate their capacities for technological innovation that will embrace female representation.

The accelerated scientific and technological progress characteristic of the 21st Century is now facing a crucial challenge: to contribute to a sustainable, equitable and

integral human development based on equal gender opportunities, recognition of cultural and ethnic diversity, environmental protection, reinforcement of democracy and the satisfaction of natural growth needs. To realize this goals call for concerted efforts channeled on the delivery points (enrolment) of more females into technological based programmes in order to create gender equity based programme that could harness these lofty goods.

From the standpoint of this study, the effect of socio-cultural values, parental influence, government support and locational factors on female enrolment into technology-based programmes hinges on divisions based on stereotypes such as the one on 'soft' and 'hard' sciences, which have hindered interchange and the development of broader and more sensitive approaches to grasp the complexity of the phenomena under study.

Drawing inferences from the coverage of this study, it can be asserted that enrolment into technology-based programmes is skewed in favor of males while reflecting a historical accumulation of socio-cultural stereotypes. It has been commonly observed that traditional family and cultural values do not support female's participation in technology-based programmes, especially in Federal Polytechnics in Northern geo-political zones of Nigeria. This is principally responsible among other factors, for the generally low female enrolment. The multi-dimensional variables identified are causative factors responsible for low female enrolment. It reveals a frightening dimension in Federal Polytechnics in Northern geo-political zones of Nigeria with marked differences of enrolment in technology-based programmes due to the predominance of traditional attitudes.

Developing technology for the future requires a rethinking for a multidisciplinary approach that will address gender gaps in order to ensure the transferal of specific

technology-based knowledge that will enhance a new cultural understanding of the role of technology in our society today. The holistic approach in this line needs to incorporate a gender vision for its actualization. In the changing understanding of scientific and technological progress, females in technology will contribute crucially to a different understanding of the social image, content and the role of technology. The changing paradigms in technology understanding require the incorporation of the diverse expression of women's voices, concerns and expertise. Thus, encouraging enrolment into technology-based programmes is the starting point that will address the anomaly in technological education.

However, the extent to which the effect of socio-cultural values, government support, parental influence and locational factors on female enrolment can be controlled by effective planning and monitoring through improved data. Establishment of associations, groups and organizations for the enlightenment, development of gender sensitive curricula for technology-based programmes, encouragement and education of females in the Northern part of the country (Nigeria), on the importance of technology education and its relevance to National and technology education and its relevance to National and technological development is another one. Onocha (1998) opines that it is necessary to mobilize all agents of mindsets towards eradication of all barriers to female participation and representation in technology. It must be stressed that this calls for remedies or strategies for improvement rather continuing debate on causes. Against this backdrop, the pilot study conducted corroborated with this view affirming that there is a wide gap in enrolment of girls into technology-based programmes.

Considerable attention needs to be directed at girls' participation and performance in Federal Polytechnics in Northern geo-political of Nigeria with a view to strengthening enrolment policy that could guarantee access to technology due to interest, perception, parental influences, attitudes, locational factors e.t.c in favor of males will be removed through campaigns to change mentalities and targeting girls through technology initiatives. Thus, the effect of the aforementioned variables on female enrolment can be sufficiently curtailed to reverse the dangerous trend of female technical education in Federal Polytechnics in Northern geo-political zones in Nigeria.

Although the preceding statements are doubtlessly valuable steps to improve female enrolment into technology based programmes, the whole issue of female's access to technology education could be further reaffirmed through a stronger, interdisciplinary (or multidisciplinary) arrangement, which would also establish clearer links between females' access to technology education at the lower level of schooling primary and secondary school) and, subsequently, female access to technology as part of higher education and as a career.

5.5 **Recommendations**

Probably, the successful enthronement of democracy in Nigeria is the biggest boost required to propagate a new action plan for a gender sensitive technology education in Federal Polytechnics in Northern geo-political zones of Nigeria. Earlier discussions have shown that the problem of low enrolment and inequity in technology-based programmes in Federal Polytechnics in Northern geo-political zones of Nigeria are essentially socio-cultural, due to parental influence, inadequate government support and locational factors e.t.c.

It is also important to note that globalization has stimulated a new thrust in our vision and action as it brings us into active competition with other nations of the global village (Okebukola, 2000). Technology education is an area with high impact on globalization. Technology is unarguably the major pillar of the economic enterprise of nations such as Nigeria. The new thrusts proposed by this study to boost female enrolment in technology-based programmes from a gender sensitive perspective are as follows;

i. Education policy makers should devise strategic policy initiatives to specifically address cultural and gender values targeted at improving female enrolment in technology-based courses in Federal Polytechnics in Northern geo-political zones of Nigeria. Therefore, planning, programming and budgeting officers must include specific and concrete measures to close gender gaps in technology based programmes.

ii. The low level of female enrolment and the crippling effect of technological advancement in Federal Polytechnics in Northern geo-political zones of Nigeria can be addressed through government support in terms of provision of gender sensitive facilities in federal polytechnics, direct policy statements targeted at females in technology programmes, establishment of more federal polytechnics in the rural areas to address the problems of proximity to rural households where socio-cultural practices are concentrated and monitoring and evaluation of success and progress in this areas.

iii. Quantitative data (sex-disaggregated statistics) and qualitative data (information, in particular research findings about causes of existing gender gaps in enrolment) as undertaken in this study, must be used to access the differential impact on female

and male of existing policies on technology, plans and programs which contain measures to close gender gaps in enrolment and promote gender equality and justice throughout the entire stages of activities for the development and application of technology for human-centered sustainable development.

iv. There is need to access how practical is the philosophy for equal education opportunities in Nigeria as it relates to gender equality in technology based plans and policies to determine whether they are truly reflected in the objectives of the existing national plans and programs. If not, their objectives should be formulated in such a way as to comply to those commitments in order to stem the tide of the frightening dimension in terms of low enrolment, attrition and performance of females.

v. As revealed from the study, male students' enrolment clearly accelerates and dominates the enrolment trend consistently in technology-based courses in Federal Polytechnics Northern geo-political zones of Nigeria making technology profession "a male quasi-monopoly". To reverse this dangerous trend there is an urgent need to develop a strategic-mix of policies to address the problem of dearth of skilled manpower, attitudinal changes at all levels - teachers, gender mainstreaming in technology, parents of students, education policy makers, administrators and field operators, in order to reposition them in line with the current global trend for technological advancement.

vi. Mentoring programmes that help socialize students in technology fields, which are another form of support for female students, should be established. As the presence and guidance of counselors have shown to positively affect retention and interest,

they should be encouraged. Mentors can help to provide a support network that would increase female students' self-confidence and feeling of worth in the field. As a follow-up, deliberate employment policy in favour of females particularly as lecturers in technology subjects/courses to enable them act as role models to the upcoming ones should be implemented. There is still a lot of room for promotion of awareness in the society. Nation-wide campaigns should be made now for the training of female technologists. Presently, the campaign should be made now for the training in technology fields by integrating the cultural and traditional values of the society in its content and delivery. Such campaigns should be targeted towards disabusing the minds of people from labeling technology as "masculine".

vii. As a follow-up, legislation should be used to prevent discrimination in staff hiring practices. This supports the view of Rathgeber (1995) that "……governments have emphasized the importance of technology policy without recognizing the inherent gender biases in their own systems". Federal polytechnics institutions in the geo-political should be encouraged to hire female technologists and make special provisions to exploit their potentials that could be used to attract female enrolment. As Davis (1996) argues, some of these barriers would be relatively simple to remove, if those concerned want them removed.

From the foregoing, it is evident that intervening measures have to be taken to redress the multi-dimensional variables inherent in enrolment trend.

5.6 Recommendation for Further Research

1. A study to examine the effect of the multi-dimensional variables identified as causative factors responsible for low-female enrolment in technology based programmes Federal Polytechnic in Northern geo-political zones needed to be identified and articulated in order to understand the interplay of the variables is desirable..
2. Further research is required to be made on variables, such as early marriage, poverty and religious inclinations that are likely to have adverse effect on girl-child education.
3. There should be more research on areas of sensitization likely to motivate girls to enroll in technological programmes in Federal polytechnics
4. There should be research into likely provisions for adequate opportunities for female/girl education.
5. Further research is necessary for technological programmes vis-à-vis multi-dimensional approach that will effectively address gender gap in education system.
6. Further research is needed to devise strategies and initiatives that would address gender issues in the education system.
7. Further research would be necessary into the difference between the IQ of boys and girls, so as to ascertain the extent to which sex affect their choice to study technological programmes.

It is hoped that the following will serve as guidelines for the actions to be implemented and stimulate areas for further research especially in states and private polytechnics in the Northern geo-political zone.

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APPENDIX 1

Department of Planning, Research & Statistics
National Board for Technical Education (NBTE)

Dear Lecturer/Student,

QUESTIONNAIRE ON EFFECT OF MULTI-DIMENSIONAL VARIABLES ON FEMALE ENROLMENT IN TECHNOLOGY PROGRAMMES IN POLYTECHNICS IN NORTHERN STATES OF NIGERIA: IMPLICATIONS FOR CURRICULUM REVIEW

I am a PhD student of the Ahmadu Bello University (ABU), Zaria undertaking a research on the topic 'Effect of Multi-Dimensional Variables on Female Enrolment in Technology Programmes in Northern states polytechnics'.

Multi- dimensional variables in the context of this study could be defined as the aspects that affect enrolment of females in technology programmes. Technology on the other hand refers to course of study in the polytechnic that deals with application of scientific theory or process to fabrication of artifacts or operation.

I will appreciate your support and honest response to the attached questionnaire which is aimed at eliciting information that would encourage more female enrolment in technology programmes in the Northern States Polytechnics. Your input could assist in addressing some of the problems affecting female enrolment in technology programmes in the polytechnics in the north.

I assure you that the information given will be used for research purposes only

Amina Idris (Mrs)

SECTION A: DEMOGRAPHIC DATA

RESEARCH QUESTIONNAIRE

Note: Please Tick or Fill as appropriate [✓]

1. **Educational Institution**:
   - **a.** Kaduna Polytechnic [ ]
   - **b.** Federal Polytechnic, Mubi [ ]
   - **c.** Federal Polytechnic, Bauchi [ ]
   - **d.** Federal Polytechnic K/Namoda [ ]
   - **e.** Federal Polytechnic, Bida [ ]
   - **f.** Federal Polytechnic, Nassarawa [ ]
2. **Department**:

   ……

   ……

   ……
3. **Sex: Student**
   - **a.** Male [ ]
   - **b.** Female [ ]
4. **Lecturer**
   - **c.** Male [ ]
   - **d.** Female [ ]
5. **Level of Study:**

   ND [ ]

   HND [ ]
6. **Programme**:

SECTION B: EFFECT OF CULTURAL VALUES ON FEMALE ENROLMENT INTO TECHNOLOGY BASED PROGRAMMES (ECVFEQ)

S/NO.	QUESTION ITEM	SA	A	D	SD
1a 1b	Women are weak and cannot cope with the rigors of technical programmes Dress code of those in the technical field affect female enrolment into Technology based Programmes in Federal Polytechnics in the Northern geo-political zones of Nigeria				
2 a b	Early marriage of females the Northern geo-political zones of Nigeria prevent them from offering Technical programmes; Since their male counterparts do offer technically-based programmes, their female counterparts are equally capable of offering these programmes.				
3	The age-long belief that male students are superior to female students keep females away from technical programmes				
4 a b	In the Northern geo-political zone, the society believes that females are supposed to be in the house producing children The indulgence in the practice of hawking by females in the Northern geo-political zone of Nigeria does not allow them to go into technical fields				
5	Our tradition does not allow women to go further in education pursuit				
6	Household chores by the female child in the Northern geo-political zones of Nigeria account for the imbalance in enrolment into Technology based Programmes.				
7	Domestic chores such as home management and personal hygiene will not allow females to offer Technology based Programmes.				
8	Exclusion of females from decision making in the North affect female enrollment into Technology based Programmes in Northern Nigeria. Inclusion of females in all activities in the North will improve enrolment into Technology based programmes.				
9a b	Socio-cultural religious practices in the North prevent females from offering technical subjects. Islamic religion encourages female participation in technologically-based education.				

SECTION C: EFFECT OF GOVERNMENT SUPPORT ON ENROLMENT INTO TECHNOLOGY BASED PROGRAMMES (EGSEQ)

S/NO.	QUESTION ITEM	SA	A	D	SD
1	Government supports the education pursuit of females to study technologically oriented programmes by giving them scholarships				
2	Government does not provide enough scholarship to females studying technology-based programmes				
3	Most of the federal polytechnics are far away from most towns and cities				
4	Government ensures that schools for offering technologically based programmes are built in towns and cities for proximity				
5a b	Lack of learning materials in Federal Polytechnics affect female students' choice of Technology based Programmes. Lack of female teachers in technology Programmes to act as role models also influence female choice of technology programme in the North				
6	Government does not even lay solid foundation for females to study technology in schools				
7	Government provides facilities for studying technology but females are not interested in the programme				
8a b	If government can involve parents in its sensitization programmes, it will improve female enrolment in technology programmes in federal polytechnics in the Northern geo-political zones of Nigeria Creating job opportunities for women who graduate from technology Programmes like engineering will boost female enrolment into Technology based Programmes				
9a b	Through poverty alleviation program, government provides good opportunity for parents to send their female children to study Even when females apply to read technically-based Programmes, only a few of them are considered				
10	Curriculum should cater for the difference between males & females in federal polytechnics in the Northern geo-political zones of Nigeria				

SECTION D: EFFECT OF PARENTAL INFLUENCE ON ENROLMENT OF FEMALES INTO TECHNOLOGY BASAED PROGRAMMES (EPIEP)

S/NO.	QUESTION ITEM	SA	A	D	SD
1a	Parents desire to have females around them all the time rather than enroll in technology Programmes.				
2	Early marriage is a strong factor used by parents to influence their ward's choice of technology programmes				
3	Female students from rich homes enroll in technology programmes than those from poor homes				
4	The overbearing influence of parents in career choices of females is responsible for low female enrolment in Technical-based Programmes				
5	If mothers encourage their female children it will improve the enrolment of females into Technology -based Programmes in Federal Polytechnics in Northern geo-political zones of Nigerria				
6	Educated female parents encourage their female girls to offer Technology based Programmes than uneducated ones				
7	Parents who are educated encourage their female children to offer Technology based Programmes than uneducated ones.				
8	Parents prefer male children to enroll in technical programmes than female children because of the cost				
9	Parents do not believe Technology based programmes are important to females				

SECTION E: THE EFFECT OF LOCATION ON ENROLMENT OF FEMALES IN TECHNOLOGY BASED PROGRAMMES IN POLYTECHNICS IN NORTHERN STATE POLYTECHNICS (ELEFQ)

S/NO.	QUESTION ITEM	SA	A	D	SD
1	The federal polytechnics located in the urban areas attract more female students than those in the rural areas				
2a	The dress code difference in urban federal polytechnics in the Northern geo-political zones of Nigeria influence female enrolment in Technology programmes.				
b	The dress code difference in rural federal polytechnics in the Northern geo-political zones of Nigeria influence female enrolment in Technology programmes.				
2	Female students prefer federal polytechnics located in the urban areas than the rural areas and this affect enrollment of female students in technology programmes.				
4	Better facilities in urban federal polytechnics than the rural federal polytechnics increase female enrolment				
5	There is wide gap in enrolment of females in technology programmes in the Urban & Rural Federal polytechnics in the Northern geo-political zones of Nigeria				
6	The urban female students are greater in number than the rural female students who enroll in Technology Programmes in Federal Polytechnics in Northern geo-political zones of Nigeria				
7	Female students prefer enrolling for technology Programmes in rural environment than urban environment in federal polytechnics in Northern geo-political zones of Nigeria.				
8	Greater support by government to Urban federal polytechnics than rural ones is responsible for low female enrolment in federal polytechnics in Northern geo-political zones of Nigeria.				

APPENDIX II

Department of Planning, Research & Statistics

15/11/2009

The Registrar,

Joint Admissions and Matriculations Board (JAMB)

Abuja

REQUEST FOR STATISTICAL DATA FOR A DOCTORATE RESEARCH PROGRAMME

Mrs Amina Idris is a Chief planning officer and staff of the National Board for Technical Education (NBTE). She is currently undergoing a doctorate programme at the Ahmadu Bello University Zaria; and would highly appreciate if you could assist her with the following poly jamb statistical data to aid her research work:

1. 03/04, 04/05, 05/06, 06/07, 07/08 and 08/09 POLY JAMB yearly admission requests (Male/Female) in Technology programmes in the Northern States Polytechnics (Federal/State);
2. Number that gain admission for the above years (Male/Female)
3. Admission as percentage of application for the years under request (Male/Female).

The information needed would be used strictly for research purposes.

High regards

Arch. A. O Aimola

Director, Planning, Research & Statistics

APPENDIX III

TECHNOLOGY PROGRAMMES AVAILABLE IN THE FEDERAL POLYTECHNICS SAMPLED

N/W	KADUNA POLYTECHNIC URBAN	FEDERAL POLYTECHNIC, K/NAMODA RURAL
	PROGRAMMES	
1	ARCHITECTURAL TECH	ARCHITECTURAL TECH
2	BUILDING TECHNOLOGY	BUILDING TECHNOLOGY
3	CARTOGRAPHY	CIVIL ENGR
4	CHEMICAL ENGR	ELECT/ELECTRONICS ENGR
5	CIVIL ENGR	FOOD TECHNOLOGY
6	COMPUTER ENGR	MATH/STATISTICS
8	COMPUTER SCIENCE	MECHANICAL ENGR
9	ELECT/ELECTRONICS ENGR	QUANTITY SURVEY
10	ESTATE MGT	SCIENCE LAB TECH
11	FASHION DESIGN & CLOTH TECH	
12	FOOD TECHNOLOGY	
13	HOTEL & CATERING MGT	
14	LIBRARY SCIENCE	
15	MASS COMMUNICATION	
16	NUTRITION AND DIETETICS	
17	PHOTOGRAMMETRY	
18	PRINT TECH	
19	QUANTITY SURVEY	
20	SCIENCE LAB TECH	
21	STATISTICS	
22	SURVEY AND GEOINFORMATICS	
23	TOURISM	
24	URBAN AND REG PLANNING	
25	ENV. ENGR. TECH.	
26	MECHANICAL ENGINEERING & CRAFT PRACTICE	
27	PRODUCTION MGT	
28	PRODUCTION MGT	
29	MINING ENGINEERING	
30	Office Technology and Management	
31	Office Technology and Management	
32	SCIENCE LAB TECH(MICROBIOLOGY)	
33	AGRIC ENGR	

N/E	FEDERAL POLYTECHNIC, BAUCHI URBAN	FEDERAL POLYTECHNIC, MUBI RURAL
	PROGRAMMES	
1	AGRIC & WATER RESOURCE	AGRIC ENGR
2	AGRIC ENGR	BIOCHEMISTRY
3	AGRIC TECH	BUILDING TECHNOLOGY
4	ARCHITECTURAL TECH	CIVIL ENGR
5	SLT BIOLOGY/MICROBIOLOGY	COMPUTER STUDIES
6	CATERING & HOTEL MGT	ELECT/ELECTRONICS ENGR
8	CIVIL ENGR	FOOD TECHNOLOGY
9	COMPUTER SCIENCE	HOTEL & CATERING MGT
10	ELECT/ELECTRONICS ENGR	LAND SURVEY
11	FOOD TECHNOLOGY	LIBRARY SCIENCE
12	HOTEL & CATERING MGT	MASS COMMUNICATION
13	MASS COMMUNICATION	MECHANICAL ENGR
14	MATH/STATISTICS	MICROBIOLOGY
15	NUTRITION AND DIETETICS	SCIENCE LAB TECH
16	QUANTITY SURVEY	Office Technology and Management
17	SCIENCE LAB TECH	CHEMICAL ENGR
18	SURVEY AND GEOINFORMATICS	TOURISM
19	TOURISM	COMPUTER ENGR
20	AGRIC. FARM MGT.	ARCHITECTURAL TECH
21	ELECTRICAL (POWER)	URBAN AND REG PLANNING
22	ELECTRONICS & TELECOMS	
23	AGRIC MECHANISATION	
24	MECH. ENGR. CRAFT PRACTICE	
25	Office Technology and Management	
26	Mechanical Engineering Technology	
27	BUILDING TECHNOLOGY	
28	ESTATE MGT	
29	MECHANICAL ENGR	

N/C	FEDERAL POLYTECHNIC, BDA URBAN	FEDERAL POLYTECHNIC,NASSARAWA RURAL
	PROGRAMMES	
1	AGRIC ENGR	AGRIC ENGR
2	ARCHITECTURAL TECH	ARCHITECTURAL TECH
3	BUILDING TECHNOLOGY	BUILDING TECHNOLOGY
4	CHEMICAL ENGR	CHEMICAL ENGR
5	CIVIL ENGR	COMPUTER SCIENCE
6	COMPUTER SCIENCE	ELECT/ELECTRONICS ENGR
7	ELECT/ELECTRONICS ENGR	ESTATE MGT
8	ESTATE MGT	MATH/STATISTICS
9	HOTEL & CATERING MGT	MECHANICAL ENGR
10	MASS COMMUNICATION	QUANTITY SURVEY
11	NUTRITION AND DIETETICS	SCIENCE LAB TECH
12	PUBLIC ADMIN	TOWN AND REG PLANNING
13	QUANTITY SURVEY	
14	SCIENCE LAB TECH	
15	SECRETARIAL STUDIES	
16	STATISTICS	
17	SURVEY AND GEOINFORMATICS	
18	URBAN AND REG PLANNING	
19	MECHANICAL ENGINEERING & CRAFT PRACTICE	