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# Organizational Culture Re-Engineering and Service Factors Contributing to Female Students' Enrolment in Technical and Vocational Education in Nigeria

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**Abstract:** *The Polytechnic institutions that offer technical and vocational education programs focused on imparting practical and vocational education training skills to students through technical, vocational education and training (TVET) programs. It is a type of education by which an individual can acquire skills to live, learn and work as a productive citizen of a society. In Nigeria where women constitute more than half the total population, the number of women acquiring TVET is not proportional to their population. Research findings show this lop-sidedness right from point of admission into Polytechnics in Nigeria. This study is set to explore different factors contributing to female students' enrolment in North-Eastern Nigeria, specifically to determine the levels and contributions of career awareness, cultural norms and values, vocational interest, and attitudes towards TVET programs among female students' enrolment in TVET and Non-TVET programs. A total population of 6,148, comprising of 3,984 Non-TVET and 2,164 TVET, National Diploma (ND) II, female students in nine Polytechnics of North-Eastern, Nigeria. The final response rate was 92.5%, which amounted to a sample of 347 students. Quantitative research approach was employed. A structured questionnaire developed by the researcher and was used to collect data for the study. The Cronbach Alpha reliability test was carried out and a reliability coefficient of 0.85 obtained. Frequency, percentage, mean and standard deviation were used for the descriptive analysis, while Binary Multiple Logistic Regression was used to test the alternative hypothesis at 0.05 level of significance. The study found that both TVET and Non-TVET respondents have high level of career awareness, cultural norms and values, and vocational interest, which implied that these factors have a significant influence on female students' enrolment in TVET programs. Therefore, the study found that career awareness, cultural norms and values, and vocational interest have a significant contributions on female students' enrolment among TVET and Non-TVET programs in Nigeria Polytechnics. On the other hand, attitude towards TVET programs have shown no significant influence neither significant contributions to inadequate female students' enrolment in TVET programs in Nigeria Polytechnics. In view of this, the study has established important factors to be highlighted on female students' enrolment among TVET and Non-TVET programs. Government and other stakeholders in education sector should embark on awareness programmes through workshops and seminars to educate girls, women, parents and the general society on the benefits of TVET programs for women. Increase enlightenment programmes for females to overcome societal cultural norms and values is recommended. It is also recommended that affirmative action on employment of female lecturers in TVET programs employment should be emphasised so that female lecturers will serve as role model and encouragement to the female students. There should be incentives to encourage females to apply for admission into TVET programs especially in the "educationally disadvantaged" areas. The points required for admission into TVET programs should be made lower for females' student than their male counterparts.*

**Keywords:** *Technical and Vocational Education; Female Students Enrolment, Polytechnics, Nigeria*

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## Introduction

The polytechnic institutions that offer technical and vocational education programs focused on imparting practical and vocational education training skills to students through technical, vocational education and training (TVET) programs. As such, TVET programs have been recognized worldwide as a veritable instrument for addressing youth unemployment, poverty alleviation and skills development. Yet, the neglects among Nigerian populace, parents, teachers and students alike over the years still remain greatly detested to TVET programs. This appears to be one of the main reasons why female students' participation in technical and vocational education and training sectors is low in most developing countries of the world. Opatoyinbo and Babatunde, (2016) stated that TVET is a known means by which an individual can acquire skills to live, learn and work as a productive citizen of a society. In Nigeria where women constitute more than half the total population, the number of women acquiring TVET is not proportional to their population. The findings by the authors showed this lop-sidedness right from point of admission

into Polytechnics in Nigeria. Other studies by show that gender disparities with bias against women are more prevalent at the tertiary level of education particularly in developing countries which Nigeria is one.

For instance, in the late 1960's, most families in Nigeria laid emphasis on education for their male children rather than female children. The difference in educating men over women was probably inherited from the colonial masters whose aim was to train women as teachers, clerks, nurses, and traders while, disciplines like medicine, politics, engineering, law and environmental studies were purely for men (Oyitso and Olumukoro 2012). Technical and vocational education constitutes a vital tool for economic, social and all-round development of any nation. According to Akor, Bakar, Hamzah, and Mat Rashid, (2015), women constitute over half the total population in Nigeria. Economically, women contribute about 90% towards all households, 75% toward marketing, 75% towards food production, and 60% towards domestic food storage in Nigeria yet their training in TVET still lag far behind that of men. Even though there is evidence in Nigeria and other parts of Africa that there are shortages of all kinds of qualified personnel yet in the higher education, female students' enrolment in the sciences, TVET, and related programmes are low. In the same vein, Akor, et al.'s (2015) study revealed that over the past years women participation in TVET programs in institutions of higher learning in Nigeria is limited in numbers, constituting a great concern for the government of the day. Furthermore, the authors equally acknowledged the importance of women in TVET programs, not only with the increase in participation but also in terms of diversification, enhance advanced power, positive educational impact and career development of a future generation. Mat Rashid and Mansor (2013) postulated that Polytechnics, being TVET institutions have the responsibility to train and prepare a future workforce with skills, knowledge and be a good citizen. Therefore, graduates from TVET institutions should be faced with less unemployment or inability to make the decision for their future. Furthermore, the authors maintained that Polytechnic institutions have the potentials in contributing manpower for various industrial sectors' needs and the nation's long-term competitiveness.

There are many major contemporary socio-economic challenges confronted by developing countries and Nigeria in particular, this includes unemployment of women and young people which could result to high poverty rate, prostitution, drug abuse, hunger, violence, insurgency, armed robbery and other forms of social vices (Akor, et al. 2015).

In other to overcome some of these challenges, and social vices, developing countries such as Nigeria needs more technicians to develop her economy. Therefore, women must be fully involved and cannot be overlooked in any meaningful development. Thus, the participation of Females in TVET programs becomes indispensable. The researcher observed that several studies have been conducted on the participation of females in TVET programs in most developing countries. However, there are no studies on the effect of different factors affecting female students' enrolment in TVET programmes in Nigeria Polytechnic. This gap in knowledge could affect the adaptability and implementation of possible solutions to women enrolment in TVET programs in Nigeria. Thus, this study seeks to explore factors contributing to female students' enrolment in North-Eastern Nigeria, specifically to ascertain if career awareness, cultural norms and value systems, vocational interest, and female students' attitudes towards TVET programs student choice of enrolment among TVET or Non-TVET programs

On the contrary, Oyitso & Olumukoro (2012), stated that, prior to Nigeria independence in 1960 and some years after, most families in Nigeria laid emphasis on education for their male children rather than female children. The preference for educating men over women was probably inherited from the colonial masters whose aim was to train women as teachers, clerks, nurses, and traders while, disciplines like medicine, politics, engineering, law and environmental studies were skewed in favour of men.

Robert, Ab Rahim, Azimi, & Abdullah (2015), acknowledged the importance of women in TVET where they stated, women contribute about 90% towards all households, 75% toward marketing, 75% towards food production, and 60% towards domestic food storage in Nigeria yet their training in TVET still lags far behind that of men. Though there is evidence in Nigeria and other parts of Africa that there are shortages of all kinds of qualified personnel, yet in tertiary institutions, female students' enrolment in the sciences, TVET, and related programs remain low. Corroborating this view with Edu & Edu (2012), maintained that without women contribution, the economy of any country will continue to maintain their present low level and it will be difficult to meet the target and milestones that are constantly set by the government. Women constitute a large proportion of the national population active in

small-scale businesses, agriculture, and entrepreneur activities. As home managers, they are responsible for improving the general conditions of their families by introducing the necessary changes in food habits. Besides, they are responsible for attending to the early education of the children in the families. Despite these important roles women play in the home front and society, the chances of educating women in TVET programs seem very inadequate when compared with those of men. Accordingly, all along the opportunities in education, particularly TVET have been for men, thus creating an imbalance and inferiority complex in women. The disparity is conspicuously in certain areas like low and great inequality in students' enrolment in TVET as very few females enroll in the programs, poverty-alleviation, and unemployment.

Furthermore, Medugu and Bappah (2013), stressed that TVET is the foundation of any sustainable technological development. It helps in the human capital development of any nation and is regarded as workforce education that facilitates the adjustment of the skills and knowledge to the changing demands of the society. It is the type of education that is essential to the world of work and is an effective means of empowering the society to engage in productive and sustainable livelihoods. Unfortunately, Robert, et al. (2015) study revealed that over the past years women participation in TVET programs in institutions of higher learning in Nigeria is limited in numbers, constituting a great concern for the government of the day. Further still, a study by UNESCO (2010) concurs with this by pointing out that male students outnumber the female students in 91% of countries globally, despite increased parity in enrolment in higher education and in STEM disciplines, female students' enrolment in TVET programs in Nigeria or Africa alone; it is a worldwide problem. Huyer, (2003), indicated the percentage of technology qualified females in the USA was 34%; while New Zealand, a female undergraduate in technology account for 20% enrolment. Similarly, Rebert et al, (2015), corroborated that Female students account for 31% of STEM graduates in the UK and 33% in the USA.

In line with all these, Nigeria being a developing country needs more technicians to develop her economy. Having that woman constituting over half the population of Nigeria, and when women are marginalized, it leads to the country losing out on the possibility of utilizing the potential of this human and social capital development. It is through education and training that women' horizons are broadened, their skills improved and their ability to make plans and make decisions for themselves, their families and the nation as a whole is enhanced. Therefore, women must be fully involved and cannot be overlooked in any meaningful development. Thus, the participation of females in TVET programmes becomes indispensable.

### **1. The Need for Technical and Vocational Education and Training (TVET)**

TVET is a form of education whose purpose is to prepare individuals for employment in an occupation or group of occupations. It is a form of education whose aim is to prepare individuals for employment in an occupation or different forms of occupations. This implies that TVET is a type of education given to individuals to develop their practical skills and manipulative potentials for the benefit of mankind. This type of education which provides individuals with skills, knowledge, and attitudes for effective employment in a specific occupation. Anaele, Isiorhovoja, Dele and Asoluka (2014) stated that TVET offers leverage to improved quality of life and helps individuals to become economically productive, self-reliant, to escape poverty and marginalization in the society. In addition, the authors posit that when peoples' skills are enhanced, they become entrepreneurs, employable, self-sustained and informed citizens thereby contributing to economic development of a nation. Therefore, human resource development through TVET cannot be overemphasized in economic development, job creation and Poverty reduction. According to Adedokun, Oviawe, and Barfa, (2015), it is estimated that women constitute above 50% of the world's population, but paradoxically, earn only a tenth of the world's income. The authors further posit that women own only one-hundredth of the world's property including land though they do two-thirds of the world's work. These inequalities cannot be unconnected with unequal access to training opportunities. Similarly, a study conducted by Udeani and Ejikeme (2011), found that female participation in TVET and Science, Technology, Engineering and Mathematics (STEM) programs indicate females are still underrepresented and occupy the position of lower and middle cadre, in spite of the recent steady development over time. This is confirmed by Adedokun et al. (2015), who reported that a large number of women are found mainly in poorly paid jobs and several others go into early marriages, prostitution, child labour, drugs abuse and other social vices.

In line with all these, Nigeria being a developing country needs more technicians to develop her economy. Having that woman constituting over half the population of Nigeria, and when women are marginalized, it leads to the country losing out on the possibility of utilizing the potential of this human and social capital development. It is through education and training that women's horizons are broadened, their skills improved and their ability to make plans and make decisions for themselves, their families and the nation as a whole is enhanced. Therefore, women must be fully involved and cannot be overlooked in any meaningful development. Thus, the participation of females in TVET programs becomes indispensable.

Furthermore, National Centre for Vocational Education Research-Australia (NCVER), 2013, Federal Government of Nigeria, (FGN), 2004., and NESCO, 2005, view TVET as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related science, the acquisition of knowledge, practical skills and attitude relating to occupations in various sectors of economic and social life. According to Osuala (2004), as contained in *National Policy on Education* (NPE revised edition), skills in building technology, electrical/electronics, motor vehicle mechanic work, motor vehicle bodywork, automobile electricity, metalwork, woodwork, drafting and designing, clothing and textile, business studies, equipment servicing, computer hard and software's among others can be acquired through TVET. TVET thus equips people not only with technical and vocational skills but with a wide-ranging of knowledge, which includes technologies and related science, the acquisition of practical skills and attitudes that are now recognized as essential for meaningful participation in work and life. Therefore, Technical and Vocational Education and Training (TVET) could, therefore, be described as (a) An integral part of general education; (b) A means of preparing for occupational fields and effective participation in the world of work; (c) An aspect of lifelong learning and preparation for responsible citizenship; (d) An instrument for promoting environmentally sound and sustainable development; and (e) A method of alleviating poverty. The National Policy on Education (2004) Revised edition stipulated the following objectives for TVET:

- (a) *To provide trained manpower in applied science, technology and commerce particularly at sub-professional level.*
- (b) *To provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development.*
- (c) *To provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man.*
- (d) *To give an introduction to professional studies in engineering and other technologies.*
- (e) *To give training and impart the necessary skills leading to the production of craftsmen, technicians, and other skilled personnel who will be enterprising and self-reliant.*
- (f) *To enable our young men and women to have an intelligent understanding of the increasing complexity of technology.*

In line with these stated objectives, Yusuff & Jumoke (2012) observed that the development of technical and vocational skills becomes indispensable to the economic development of both men and women for obvious reasons. Technical and vocational skills prepare individuals to participate in today's world of work. Technical and vocational skills are very important because it is essential for individual prosperity. Skills enable the individual to increase productivity and income. This is especially important for those who are seeking out a living in the informal sector of the economy. Technical and vocational skills are needed for enterprise productivity and profitability, as well as for national productivity, wealth creation, and national standard of living for the individual. Without the necessary technical and vocational skills, enterprise, national growth and individual standard of living can be seriously limped.

Thus, the researchers view the rate at which the population of Nigeria nowadays is growing; poverty and lack of income generating capacity and failure of graduates from schools' system to secure employment clearly highlights the importance of enrolment in TVET programs. To enable those still in tertiary institutions to be relevant to the world of work as well as to draw the majority of jobless people out of the unemployment market, there is need to encourage more female enrolments in TVET programs jointly with their men counterpart as the best options to improve economic opportunities for the teeming youths which will eventually enhance economic development of Nigeria.

Accordingly, there is a strong desire to change the state of affairs related to female students' enrolment in TVET programs in the Polytechnics. As such, this study was set to make recommendations to guide stakeholders to develop a framework conducive for improving access to TVET for all, with the accent being put on increasing the participation of females in TVET fields that have been dominated by males. Edu and Edu, (2012), disclosed that the involvement of more females in TVET programs could immensely contribute to the economic and social development of the nation. And without females' contribution, the economy of any country will continue to maintain their current low level and there will be no use to contemplate advancing to meet the target and levels that are continuously set by the government. Thus, the growth of any developing country can be influenced by a well-articulated and organized educational system, whereby Technical and Vocational Education and Training (TVET) program is paramount.

## **2. Issues of Female Students Enrolment in Technical and Vocational Education and Training (TVET) in Nigeria**

Previous studies suggest that females seldom enrol into TVET programs in Nigeria, despite the government policy which encourages equal educational opportunities for both male and female students. National Bureau of Statistics (2016), indicated that the percentage of male students' enrolment in the Polytechnics stood at 55.8%, while that female student was found to be 44.2%. This figure was confirmed in 2015 statistical report on women and men in Nigeria in collaboration with Education Sector Analysis (2005), of which the enrolment in technology and art ratio in Polytechnics stood at 46.5% as against policy prescription of 70:30 by the government. The 70% allocated to TVET programs has always revealed a shortfall of female applicants paving way for male dominance in the enrolment trend. Unfortunately, the 30% allocation for art and social science courses has witnessed a continuous surge of female enrolment, creating a wide gap in the enrolment trend of TVET programs in Polytechnics of North-East, Nigeria.

In the past decade, the National Board for Technical Education (NBTE) statistics show that from 2005 to 2010, the Applied Science programs in the Federal Polytechnics in the Northern part of Nigeria has increased from 27% to 35% female intake. The Higher National Diploma (HND) in Architecture has increased from 11% in 2005 to 38% in 2010 in terms of female representation. Electrical Engineering has increased from 13% to 31% and Mechanical engineering 16% to 32% in the past five years. Civil Engineering has increased from 17% in 2005 to 31% in 2010; Science Laboratory Technology (SLT) and Computer science are at 31% female intakes whereas Technology programs have increased from 14% to 33%. These analyses indicate an under-representation of the female group in TVET programs. In support of this observation, Ozioma (2011), opines that the Federal Government of Nigeria has tried to impose the implementation of TVET programs in our schools; Regrettably, Nigerian schools have paid little attention to the program. Parents, teachers and students alike, particularly female students seem not to understand what it is all about and consequently develop some contempt and dislike for the courses. This may be because of lack of proper understanding, scope, and content of the program or fields in (TVET) education. However, Amoor and Aliyu (2014), asserts that choice of education program in tertiary institutions is a multifaceted decision-making, needed for students since it determines the kind of vocation or occupation that they intend to pursue in life. This choice of TVET program does not only affect female students but also the entire society, including parents and government since the aim of TVET is to help the students develop skills, abilities, interest, occupational and vocational capabilities that would enable them to make suitable career choices. The choice of TVET program in the Polytechnics, with other tertiary institutions of higher learning and the subsequent pathway to follow, is always a difficult challenge which faces prospective undergraduates. As a result, female Students across the nation are usually faced with the task of academic and career decision making.

Therefore, in the quest to encourage more females in the fields of TVET programs, Federal document of Nigeria, National Policy on Education (2004), stipulates, there should be equal educational opportunities given to individuals irrespective of sex or gender. This policy represents the expression of government's commitment to the development of all segments of the population and to the institutionalization processes, which will pilot the Nigerian society towards social equity, justice and a much-improved quality of life, as contained in 1999 constitution, Federal Republic of Nigeria. The formulation and implementation of this policy was a major step towards bridging the gap in positioning education and restructuring national priorities for all-inclusive policies irrespective of gender. These were supported by the Beijing conference of 1995 which gives credibility to this policy in encouraging the promotion of gender equality as pronounced in its world conference report. Substantively, this has been

mainstreamed in all women development programmes in Nigeria. Regrettably, these creditable policies have been considered and implemented in isolation of many of the social factors that hamper female access to TVET programmes in Nigeria.

Furthermore, Nigeria is classified as a low developed country in respect of equality in educational accessibility with female literacy rate (ages 15 and above) of 55.1% against 73.2% male, (United Nations Human Development Report 2008-2009). Females constitute over half of Nigeria's total population. However, 61% of the female population is illiterate, compared to 37.7% of the male population. In addition, National Bureau of Statistics, 2016 report shows literacy among young females 15-24 years across the six (6) states of North-Eastern, Nigeria: Adamawa State 59.40%, Bauchi state 13.60%, Borno State 21.20%, Gombe State 35.20%, Taraba State 66.00% and Yobe state 16.40%. National Bureau of Statistics, 2016 report shows literacy among young females 15-24 years across the six (6) states of North-Eastern, Nigeria: Adamawa State 59.40%, Bauchi state 13.60%, Borno State 21.20%, Gombe State 35.20%, Taraba State 66.00% and Yobe state 16.40%. This statistic indicates that North-Eastern, Nigeria lied in the regions of the most disadvantaged in terms of western education. Some reasons that could ascribe to this situation were poverty and economic issues, early marriage and teenage pregnancy and cultural and religious misinterpretation are the main issues that prevent girls from going to school (UNICEF, 2007). The National Bureau of Statistics, 2016 report also revealed that the state of gender literacy disparity stalks from low female enrolment, high female erosion from school and lack of access to education. Furthermore, Amina (2012), stressed that customs and tradition, sometimes strengthened by religious beliefs, account for differences in the ways boys and girls are educated, or the opportunities provided to them. These differences have negatively impacted women's ability to participate in TVET, especially in poorer communities, where traditional values held that girls should not take part in technical training, particularly in the technology and science fields which are practically oriented, because it would make them unfit for marriage. However, these attitudes are changing as people are realizing the economic, political and social benefits accruable to women. Unfortunately, the under-representation of women in career and Technical Education (CTE) programs has adversely affected women to earned in career with high-paying wages like Science, Technology, Engineering and Mathematics (STEM), the skilled trades, and other careers traditionally done by men (Institute for Women's Policy Research (IWPR, 2013). Plateau, (1999), points out that certain task or jobs are traditionally linked with a particular gender. Females with their natural feminine instinct of caring are more inclined to domestic science programmes while males prefer natural science programmes. The author maintained that young people, especially females, opt-out from TVET based programs because they view TVET as a male domain, in addition to their apprehension and low anticipation of TVET programs.

Other obvious reasons that obstructed female students to participate in TVET programs in North-East, Nigeria are family resources, issues of school access, coupled with cultural norms and value system. In addition, school attendance in northern Nigeria is hampered by the threat caused by the increasingly shameless extremism of Boko Haram, an Islamist militant group, and its targeting of girls' education. The April 2014 kidnapping of 217 school girls of Government Girls' secondary, Chibok in Borno state and the recent kidnaping of 110 school girls of Government girls' secondary school Dapchi in Yobe state by Boko Haram affirms the extent of risk that girls and young women endure when they attend school. While majority of the girls are still in Boko-Haram custody and the schools are still closed virtually down. This problem of safety attends great educational need in most parts of Northern Nigeria, where the female secondary school net attendance rate is far below in comparison to southern states of Nigeria. It is through education and training that women' horizons are broadened, their skills improved and their ability to make plans and make decisions for themselves, their families and the nation as a whole is enhanced. Thus, the International Labour Organization, (2000), observed that both men and women should be free to develop their abilities to the fullest without limitations established by stereotyped rigid gender roles and biases. Hence, different behaviors, ambitions, and needs of men and women should be considered to be valued on equal terms, especially in technological advancement that is presently considered globally to foster growth and to drive suitable development in today's globalized economy.

The literature reviewed indicate an under-representation of the female group which suggests that male group will continue to dominate most areas of technical and vocational education and training programs in Nigeria. In order to formulate ways to overcome this stereotype, it would be interesting to examine why females in TVET option continue to lag behind in enrolment trend in Nigeria Polytechnics, despite the importance and benefits accruable to TVET programs. Hence, this paper seeks to explore factors that contribute to female students' enrolment in TVET

programs in Polytechnics of North-Eastern Nigeria. The study examined the effect of different variables including career Awareness, Cultural norms and Value Systems, Vocational Interest and attitude of female students towards TVET programs on female students' enrolment, which may help to stem this trend.

### **3. Purpose of the Study**

In North-Eastern Nigeria, limited studies have so far examined the factors contributing to female students' enrolment in TVET programs. Hence, finding out how female students generally enrol in TVET programs in North-Eastern Nigeria's higher institution is probably not sufficient, in the sense that this information yields little understanding of the possible consequences of the different factors that affect female students' enrolment in TVET programs. This gap in knowledge could affect the adaptability and implementation of possible solutions to women enrolment in TVET programs in Nigeria.

Therefore, the purpose of the study is to determine the factors contributing to female students' enrolment in TVET programs of the North-Eastern Nigeria, specifically to determine the level of Career Awareness (CA), Cultural Norms and Values (CNV) Vocational Interest (VI), and Attitudes towards TVET (ATT) on female students' enrolment in TVET and Non-TVET programs and to determine the contribution of Career Awareness (CA), Cultural Norms and Values (CNV), Vocational Interest (VI), and Attitudes towards TVET (ATT) on female students' enrolment in TVET and Non-TVET programs.

### **4. Research Questions:**

The following research questions are formulated to guide the study:

1. What are the levels of career awareness (CA), Cultural Norms and Values (CNV), Vocational Interest (VI), and Attitudes towards TVET (ATT) among female students in TVET and Non-TVET programs?
2. What are the contributions of Career Awareness (CA), Cultural Norms and Values (CNV), Vocational Interest (VI), and Attitudes towards TVET (ATT) on female students' enrolment in TVET and Non-TVET programs?

## **METHOD**

### *Participants*

The sample population of this study was 6,148 comprised of 3,984 Non-TVET and 2,164 TVET, ND II, female students in 9 Polytechnics of North-Eastern Nigeria. A sample size of 375 female students was selected using a simple random sampling technique to participate in the study. The final response rate was 92.5%, which resulted in a sample of 347 students.

### *Measures*

Quantitative research approach was employed. A structured questionnaire developed by the researchers and was used to collect data for the study. The female students' enrolment was measured using 54 items and was face-validated by experts in Research Methodology/TVET field in the Faculty of Educational Studies, Universiti Putra Malaysia, vetted the instrument. His/her observations and possible corrections were made as directed by the experts be incorporated in the instrument thereby making it valid for use for the study (see the instrument attached below). It consisted of 4 factors; career awareness, cultural norms and value systems, vocational interest and attitude towards TVET programs. A brief presentation of the study was made to the students by the researcher, they were informed of the purpose of the study. The researcher and research assistants administered the instrument for the respondents. The students were requested to answer the questionnaire by ticking in the appropriate box given to them based on five-point (5) Likert Scale with 5 "Strongly Agree" (S.A.), 4 "Agree" (A.), 3 "Moderately Agree" (M.). 2 "Disagree" (D.) and 1 "Strongly Disagree" (S.D).

Procedures

Pilot testing was conducted in one Polytechnic which was not included in the sample schools for the main sampling. This was done in order to confirm whether or not there is any aspect of the instrument that needs to be addressed, and also to determine the reliability estimate of the instrument. The data were collected by the researcher and research assistants in the zone covered by the study. Test for reliability using Cronbach Alpha and reliability estimates of each construct ranged between 0.82 and 0.88, and reliability estimate for the complete study was 0.85 which is acceptable for research instrument. Frequency distributions and descriptive statistics were done. Frequency tables and descriptive statistics were constructed to display results with respect to each of the research questions. The research questions were analysed using frequency, mean and standard deviation, while Binary Multiple Logistic Regression was used to test all the alternative hypotheses at 0.05 level of significance.

5. RESULTS

The findings were presented by analyzing the research questions and testing of the alternative hypothesis. The research questions were analyzed using mean and standard deviation using a five-point Likert scale ranging from 1 to 5, a cut off-point of 3.0 was used for descriptive analyses. Any mean scores less than 3.0 denoted that majority of the respondents “disagreed” (Low-level) while mean scores 3.0 and above indicate that the majority of the respondents “agreed” (High-level) with the construct under study.

Tables 1: present the result of the data used to answer research questions 1 - 2.

Research Question One:

What are the levels of career awareness (CA), Cultural Norms and Values (CNV), Vocational Interest (VI), and Attitudes towards TVET (ATT) among female students in TVET and Non-TVET programs?

Table 1: Level of Career Awareness (CA), Cultural Norm & Values (CNV) Vocational Interest (VI) & Attitude to TVET (ATT) among female students in TVET Programs (n = 347)

Constructs	TVET (n=128)					Non-TVET (n=219)				
	Level	Freq.	%	Mean	SD	Level	Freq.	%	Mean	SD
Career Awareness	Low (1-2.99)	1	0.8			Low (1-2.99)	35	16.0		
	Moderate(3.00-3.50)	9	7.0			Moderate(3.00-3.50)	72	32.9	3.50	0.57
	High(3.51-5.00)	118	92.2	3.91	0.34	High(3.51-5.00)	112	51.1		
Cultural Norms & Values	Low (1-2.99)	20	15.6			Low (1-2.99)	22	10.0		
	Moderate(3.00-3.50)	11	8.6			Moderate(3.00-3.50)	40	18.3		
	High(3.51-5.00)	97	75.8	3.60	0.74	High(3.51-5.00)	157	71.7	3.61	0.48
Vocational Interest	Low (1-2.99)	2	1.6			Low (1-2.99)	50	22.8		
	Moderate(3.00-3.50)	10	7.8			Moderate(3.00-3.50)	98	44.7	3.30	0.65
	High(3.51-5.00)	116	90.6	3.93	0.44	High(3.51-5.00)	71	32.4		
Attitude towards TVET	Negative	2	1.6			Negative	25	11.4		
	Positive	126	98.4	3.81	0.31	Positive	194	88.6	3.74	0.54

Table 1: presents the data analysis to determine the levels of career awareness (CA), cultural norms and value (CNV), vocational interest (VI) and attitude toward TVET (ATT) among female students in TVET. A total of 347 respondents participated in the study comprises of 128 (36.9%) TVET and 219(63.1%) Non-TVET female students. The result revealed that out of 128 TVET respondents in the programs, 1 (0.8%) TVET female student was reported

to have a low-level of career awareness, 9 (7.0%) female students were reported to have a moderate-level, and 118(92.2%) to have a high-level of career awareness. On the other hand, out of 219 Non-TVET respondents in the programs, 35(16.0%) were reported to have-low level of career awareness, 72 (32.9%) have a moderate-level, and 112 (51.1%) have shown high-level of career awareness. Based on the  $M = 3.91$  and  $SD = 0.34$  for TVET, and  $M = 3.50$  and  $SD = 0.57$  for Non-TVET respondents, the result revealed that both TVET and Non-TVET respondents have a high and moderate-level of career awareness than the other categories. Therefore, career awareness, have a significant influence on female students' enrolment in TVET programs in Polytechnics, North-Eastern Nigeria. Thus, it could be deduced that female students that enrolled in TVET programs and embrace TVET pathway have higher prospects in their future career.

In the same vein, to determine the level of cultural norms and values among female students in TVET and Non-TVET programs. The result revealed that out of 128 TVET respondents in the programs, 20 (15.6%) TVET respondents were reported to have a low-level of cultural norms and values, 11 (8.6%) of them were reported to have a moderate-level, and 97 (75.8%) have a high-level of cultural norms and values. In the Non-TVET programs, 219 respondents participated in the study, where 22(10.0%) were reported to have-low level of cultural norms and values, 40 (18.3%) reported to have moderate-level, and 157 (71.7%) have shown high-level of cultural norms and values. Considering the  $M = 3.60$ , and  $SD = 0.48$  for TVET respondents, and  $M = 3.61$ , and  $SD = 0.48$  for Non-TVET respondents, the result shows that both TVET and Non-TVET respondents have high-level of cultural norms and values. Thus, it could be deduced that cultural norms and values have a significant influence on female students' enrolment in TVET programs in Polytechnics, North-Eastern Nigeria.

Furthermore, out of 128 TVET respondents participated in the study, 2 (1.6%) TVET female student was reported to have a low-level of vocational interest, 10 (7.8%) female students were reported to have a moderate-level, and 116 (90.6%) to have a high-level of vocational interest. Similarly, in the Non-TVET programs, 219 respondents participated in the study, where 50 (22.8%) were reported to have low-level of vocational interest, 98 (44.7%) reported to have moderate-level, and 71(32.4%) have shown high-level of vocational interest. Based on the  $M = 3.93$ , and  $SD = 0.44$ , TVET respondents demonstrate high-level of vocational interest, while a  $M = 3.30$  and  $SD = 0.65$  of Non-TVET respondents demonstrated a moderate-level of vocational interest. Thus, Non-TVET respondents almost shared the same opinion with the TVET respondents. Therefore, it could be deduced that vocational interest have a significant influence on female students' enrolment in the Polytechnics Nigeria.

The result revealed that attitude towards TVET programs among female students respondents in TVET programs revealed that 126 (98.44%) were report to have positive attitude towards TVET programs, while the remaining 2 (1.56%) have a negative attitude towards TVET programs. Based on the  $M = 3.81$ , and  $SD = 0.31$ , majority of respondents were above the mean score (3.0). Thus, the result shows that attitude towards TVET programs have no significant influence on female students' enrolment in north-Eastern Nigeria. Therefore, it could be concluded that female students with high-level positive attitudes towards TVET programs are capable of enrolling in any programs of their choice. Therefore, enrolment in TVET programs in the tertiary institutions are purely based on individual interest.

In the same vein, 219 Non-TVET respondents participated in the study, then 25 female students representing 11.42% had reported to have negative attitude towards TVET programs. While majority 194 representing 88.58% had Positive attitude towards TVET programs. Since majority of the respondents have shown positive attitude towards the programs. It could be concluded that attitude towards TVET Programs have no significant influence on female students' enrolment in TVET programs.

Thus, the findings revealed that career awareness (CA), cultural norms and values (CNV), and vocational interest had a significant influence on female students' enrolment in TVET programs in North-Eastern Nigeria. Therefore, it could be deduced that female students that enrolled in TVET programs and embrace TVET pathway have higher prospects in their future career than their female students in Non-TVET programs.

In order to achieve the Objectives of the Study in Research Question Two:

**What are the contributions of Career Awareness (CA), Cultural Norms and Values (CNV), Vocational Interest (VI), and Attitudes towards TVET (ATT) on female students’ enrolment in TVET and Non-TVET Programs?**

**Table 2: Contributions of Career Awareness (CA), Cultural Norms & Values (CNV), Vocational Interest (VI), and Attitude towards TVET (ATT) among Female Students in TVET and Non-TVET programs using Binary Multiple Logistics Regression.**

Step1 <sup>a</sup> Variables	B	S.E	Beta	wald	df	sig	ExpB
Career Awareness	1.25	.385	.212	10.61	1	.001	3.51
Cultural Norms & Values	-.62	.254	-.176	6.08	1	.014	.53
Vocational Interest	2.09	.314	.461	44.65	1	.000	8.16
Attitude towards TVET	-.79	1.09	-.040	.530	1	.466	.450
Constants	-6.14	1.85		10.99	1	.001	.002

(Cox and Snell R<sup>2</sup> = 0.336) and (Nagelkerke R<sup>2</sup> = 0.459)

Variable(s) entered on step 1: Career Awareness, Cultural Norms and Value System, Vocational Interest, Attitude towards TVET. **Note:** B: Unstandardized Coefficient, SE- Standard Error, Df- Degree of freedom, Sig-P-Value, Exp(B):- Odd ratio, C.I.- Confidence interval.

Table 2: presents the analysis of the contribution of career awareness (CA), cultural norms and values (CNV), vocational interest (VI) and attitude toward TVET (ATT) among female students enrolment in TVET and Non-TVET programs in Nigeria, Polytechnics in North-eastern geo-political zone. From the analysis shown in table 2., Vocational interest (VI) contributed most at beta [(β) = .461, p = .000], followed by then career awareness (CA) at beta [(β) = .212, p = .001], and cultural norms and values (CNV) at beta [(β) = -.176, p = .014], With the analysis shown in Table 2; attitude towards TVET programs (ATT) have no significant contribution to female students’ enrolment at beta [(β) = -.040, p = .466], among female students’ enrolment in TVET and Non-TVET programs. Therefore, it could be concluded that career awareness (CA), cultural norms and values (CNV), and vocational interest (VI) has contributed to low enrolment in TVET programs among female students in TVET and Non-TVET in Polytechnics of the north-eastern geopolitical zone in Nigeria. On the other hand Attitude towards TVET programs (ATT) has no significant contribution to students’ enrolment among female students in TVET and Non-TVET programs. Thus, students’ enrolment in TVET programs is based purely on individual interest in the program.

**6. Discussion of Findings**

The findings show that both TVET and Non-TVET level of career awareness, are high (M= 3.91, SD= 0.34) for TVET and (M= 3.50, SD= 0.57) Non-TVET respectively. Thus, the results indicated that career awareness have a significant contribution to female students’ enrolment in TVET programs in North-Eastern Nigeria. In addition, the result indicate that both TVET and Non-TVET level of cultural norms and values, are high (M= 3.60, SD= 0.74) for TVET and (M= 3.61, SD= 0.48) Non-TVET. This implied that cultural norms and values have a significant contribution to female students’ enrolment in TVET programs in Polytechnics Nigeria.

Similar result have shown that the level of vocational interest among TVET respondents are high (M =3.93, SD =0.44), while Non-TVET respondents are moderately high (M=3.30, SD =0.65). As such vocational interest have a significant contribution to female students’ enrolment in TVET programs in North-Eastern Nigeria. On the other hand, TVET and Non-TVET respondents have shown high positive attitude towards TVET programs (M= 3.81, SD= 0.31) and (3.74, SD= 0.54) respectively. Therefore, there was no significant influence of attitude towards TVET on female students’ enrolment in TVET programs in North-Eastern Nigeria. In this case, it could be concluded that both TVET and Non-TVET shared the same opinion on that career awareness, cultural norms and values, and vocational interest have significant contribution to female students’ enrolment in Nigeria Polytechnics in the North-eastern geopolitical zone.

Furthermore, a strong relationship was found between career awareness and female students’ enrolment in TVET programs. In other words, those that are enrolled in TVET programs and embrace TVET pathway have higher prospects in their future career. It is on this note that both TVET and Non-TVET female students shared the same opinion on the career opportunities in TVET fields. Therefore, career awareness is one of the factors that impinge

on female students' enrolment among TVET and Non-TVET programs in Polytechnics of North-Eastern Nigeria. The findings of this study was in agreement by study report of Igbinedion and Ojeaga (2012).

The study carried out in Nigeria, disclosed that, in order to increase more female students participation in technical and vocational education programs, career education and occupation information services should be made available at the end of secondary education. The authors argued that students who were adequately aware of available careers and future prospects in different fields of study were able to enrol in the TVET programs because of the accruable benefits, while those who were not aware of their career paths had difficulty in making choice and pathway to follow. This finding was also in agreement with previous studies conducted by Rebert et al. (2014), and Igbinedion and Ojeaga (2014). Specifically, Igbinedion and Ojeaga (2014) reported that female students enrolled in a program of studies in tertiary institutions without a proper understanding of their abilities, interests, attitudes, and values. This is consistent with the findings of Jeremy (2014), Ayonmike (2014), Samulewicz (2012), and International Rescue Committee (2009). Jeremy, (2014) observed that one of the important factors in professional goal setting and related aspirations with career awareness is the transition to post-secondary education. Therefore, the researcher is of the view that school counselors and teachers should strive hard to make information available to students' pathway to follow. In addition, Igbinedion and Ojeaga (2012), suggested that by using seminar, field trips/work visit, Audio-Visual Aids etc. as a means for students to make informed career choices.

Overall, women expressed their views on TVET programs based on information often obtained from the media which portrays that technical and vocational education fields are meant for males only. Similarly, apart from information obtained from the media, females grow up to learn of the societal norm that the field of technical and vocational education and training (TVET) is meant for only males. As a result, female students tend to select disciplines because of the positions and prestige attached to the job and not necessarily as a result of the conscious assessment of the individual's interests and abilities. Thus, this study revealed that career awareness has a significant contribution to low female students' enrolment in TVET programs.

The present study found that cultural norms and values had a significant influence on female students' enrolment. This can be largely attributed to socio-cultural beliefs and religious inclination of parents and the communities. The result of this study was in agreement with previous studies carried out by Sulieman et al. (2015); Adelakum et al. (2015); Rebert et al. (2014). These authors revealed that females are seen as wives and they are expected to be the homemakers and caring of the children. They posit that Cultural norms and values coupled with traditional practices advocated for females by the societies and families stem from the belief that these females are inferior, and must be controlled as well as prepared for domestic work. The scholars stressed that traditions and cultures in Northern-Nigeria are believed to affect female's mentality towards education. The most traditional belief held within the communities restrained female students from enrolling in any program of their choice. Undeniably, based on tradition and culture of uneducated people in rural areas, women are expected to entirely assume the role of motherhood and wives in their homes. Other scholars, Amina (2012) and Badekale (2003), observed that girls' access to education was a waste of time and money, as the girl will be married off at an early age, hence no need for education. That is why investment in girls' education is considered irrelevant to the everyday life, meaningless and lost to the families. Based on these, many parents and community members decisions, which play a significant role in the cultural norms and values in Nigeria has contributed immensely as an obstacle to women participation in TVET programs.

Furthermore, the study found that cultural norms and values have contributed immensely to limitation and unintentional discrimination of female students' participation in TVET programs and other educational issues. This finding could be corroborated with UNESCO, (2006); Badekale, (2003); and Moses, (2007), whose study found that cultural practices such as early marriage and purdah were more pronounced in the Northern states where Islamic religion permits women to be married very early in life and to be confined to purdah. Such religious practice has led to high rate of drop-out and low enrolment in schools by girls. However, their finding contradicts Indabawa, (2004) who termed that as lack of understanding of Islam. The Islamic injunction is mixed up with socio-cultural practices to deprive girls of education and meaningful contributions to the economic development of the nation and society. Rather, the injunction states that at puberty, girls are ripe for marriage, but a girl should be married off immediately a parent notice that she is interested in marriage, refusing which she might be likely to waywardness, or bring shame to the family name and society at large.

Bedakale (2003) demonstrated that non-attendance of girls to schools and their withdrawal from school can be linked to the culture of early marriage prevalent in North-Eastern Nigeria, which is a major hindrance and always affects their enrolment trend in TVET programs. In the same vein, a study conducted by Edu and Edu (2012), revealed that the TVET of women serves as a support for many societies as well as national development. It is important to know that such desired development could be achieved through TVET vested both on men and women as they posed to be an indispensable actor of societal development. Therefore, the authors believed that women should be encouraged to participate in the field of TVET for a better development. Their study was corroborated by Keller (2010), who clearly revealed that TVET should be made more relevant to the needs of the female students for national development. It is on this note that parents should encourage and give free hands for their daughters to select or enrol in TVET programs in institution of higher education without hindrance.

Furthermore, Okoye and Maxwell (2016), and Nworlu-Elechi (2013), observed that Nigeria cultural norms and values, particularly in the northern part of Nigeria, have an adverse effect on enrolment trend in Polytechnic institutions which is consistent with the present study. Therefore, urgent steps must be taken to involve school administrators, TVET stakeholders, government, voluntary agencies/women groups to organize regular sensitization programme and workshop/seminars to educate parents, communities and female students on the myth of restraining females to enroll in TVET programs. Women should be made to realize the benefits and importance of TVET in this present dispensation where the whole world is moving technologically.

The study found that vocational interest contributed most significant to low enrolment among female students' in TVET programs in North-Eastern Nigeria. Based on the study report, the choice of options among TVET and Non-TVET programs in the Polytechnics is entirely based on the vocational interest students have. Apparently, whenever this vocational interest is lacking, no amount of motivation increases the student's performance in the program. Thus, the choice of TVET programs should entirely base on vocational interest among female students.

Therefore, it is important for a school to create an enabling environment that is conducive for students to develop an interest in the programs, teachers with skills who can blend theoretical and practical work in the teaching of courses as to arouse students interest more especially in TVET courses are highly needed. This finding was in agreement with that report by Ozioma (2011) who demonstrated that the level of students' vocational interest was aroused through the practical aspects that were being carried either in the workshops or laboratories. Vocational interest in TVET programs provides many opportunities that enable students to acquire skills, abilities essential for independent life met up with personal and family needs, more especially in this period of economic difficulties.

Furthermore, in spite of the improved level of interest for TVET programs, still the number of female students that study TVET option was lower compared with a Non-TVET option. This may not be unconnected with female student's perception of a more career advancement in Non-TVET programs than the TVET option study found. Similar findings have been reported by Akinsowon and Osisanwo (2014), whose study shows that female students are still insignificantly under-represented in science, engineering, and TVET related programs. Their studies were corroborated with the study report by Ramlee and Fouzail (2010), and Amoor (2014). Students who are interested in a vocation may work hard to achieve their dream. The event where the intrinsic vocational interest is lacking, no amount of motivation increases the student's performance. Therefore, the researcher is of the opinion that the involvement of women in TVET towards national development should not be ignored. Female teachers and support staff will be employed to serve as a role model for female students studying in TVET programs.

In addition, this study found that attitude towards TVET programs had no significant influence nor contribution to low enrolment among female students in TVET programs in North-Eastern Nigeria. It was revealed that majority of the respondents both in TVET and Non-TVET were seen to have high positive attitudes towards TVET programs. This was in agreement with studies reports by Odaga and Heneveld (1995), Yusuff and Ajibola (2012), Osuala (1992), and Ramlee, (2013) studies found that female students enrolled in TVET programs are likely to drop out of the polytechnics than Non-TVET due to disaffection from technology subjects early in life through socialization process which results in lack of confidence on part of females' ability to achieve in Science, technology and Mathematics (STEM). They maintained that at the heart of society and economic problem is a national attitude, which implies that TVET programs are for less privileged people in the society, as such same attitude is shared by female students. Some authors have attributed this to lack of interest in TVET programs due to inability of females to excel in mathematics

and science courses. Their report also indicate that there is discrimination against labor market from graduates of Polytechnics and Universities.

Another study found by Amina (2012), report that there is the prevailing attitude of aggression and sarcasm towards girls who are interested in taking up science and technology professions. The author maintained that female students studying in higher institutions of learning particularly at postgraduate level endanger women's chances of getting married. While marriage is regarded by society as a woman's ultimate achievement in life for women. Hence this negative social attitude creates a lack of self-confidence and ambition among women.

Accordingly, Ramlee (2013) findings were in agreement with the current study, which revealed that women assumed not to be suitable to do work associated with workshops and other field works because women required less rigor, physical strength, working hours, temporary working place, negative image, and residence. Therefore, this study revealed that attitude towards TVET programs have on significant contribution to female students' enrolment among TVET and Non-TVET programs in Polytechnics of North-Eastern, Nigeria. Enrolment into any program study was purely based on interest female students have.

### **7. Conclusion**

This study established that technical and vocational education and training (TVET) is recognized as a bedrock for human, economic, and social capital development of any nation. Also it is important to acknowledge the role of female participation in TVET programs in Nigeria being the main contributing factors to social and economic development of a nation. The enrolment of female students in TVET is critical since it will determine their future. Amoor and Aliyu (2014), assert that female students' choice of education program in tertiary institutions is a difficult task for students since it will determine their future. Hence, there are factors that could determine female students in TVET programs.

The main findings from the study show that there is no significant difference for enrolling into TVET programs among TVET and Non-TVET female students. The study found that the interest shown by TVET and Non-TVET female students towards TVET programs is relatively high. However, the main factors that influence them to enrol in TVET programs is the exposure to information regarding TVET fields. Accordingly, the study found that established Career awareness, cultural norms and values, and vocational interest are among factors that have significant contribution to low enrolment of female students in TVET programs. Therefore, teachers, parents and all stakeholders in education are critical in giving appropriate advices and encouragements to the female students. However, attitude towards TVET does not hinder female students from enrolling into TVET programs. A high percentage of the respondents indicated high positive attitude towards TVET programs that they are capable of enrolling into any program of their choice.

### **8. Recommendations**

Based on the findings of this study, the researcher recommends that:

1. All the six states selected for this study in collaboration with Federal Government of Nigeria should as a matter of urgency establish more Girls' Technical Secondary Schools/ Girls' Technical Colleges in the zone.  
Also, Vocational Counselling units should be established in all these schools to help the students on course selection.
2. Government and other stakeholders in education should embark on awareness programmes through workshops and seminars to educate girls, women, parents and general society on the benefits of TVET education for females.
3. There should be amendments to the admission policies to accommodate more females under the "educationally disadvantaged" set up in the TVET programs.  
This will increase the number of females that may be admitted into tertiary institutions in these courses. The points required for admission into tertiary institutions for TVET programs should be made lower for female students than their male counterparts.

4. All harmful cultural, religious and social-based institutional practices associated with the position of girl-child education should as a matter of urgency be stopped or discouraged in the society. Thus, religious and traditional leaders should be involved in education policy making at state levels.

Government and other stakeholders in education should embark on awareness programmes through workshops and seminars to educate girls, women, parents and general society on the benefits of TVET education for women.

6. Female Lecturers employment should be increased most especially in courses with limited female enrolment like TVET programs. Female Lecturers should be encouraged to serve as role model to the female students.
7. Female students should make course selection personally based on their vocational interest, attitude, abilities, interest, values and not be coerced into any program.

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