

# GENDER-BASED COMPETITIVE PERFORMANCE IN BUILT ENVIRONMENT TECHNICAL RELATED COURSES IN A TERTIARY INSTITUTION: COVENANT UNIVERSITY CASE STUDY

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## Abstract

Technical Education in recent times has witnessed high patronage in term of subscription from male and female candidates; this is against the school of thought that believes that technical-based disciplines are cut out for men. However in recent times, female candidates seem to be outperforming their male counterpart breaking the norms which tends to have defied reasonable logic. It is against this background that this study carried out comparative analysis of academic performances of male and female students studying technical-based disciplines in selected tertiary institution. Covenant University in Nigeria was chosen as a location of the study. Random sampling method was used in the study, with a sample of 80 students. A structured questionnaire in Likert scale was administered on student of technical based discipline, Eighty (80) questionnaires was administered on the students to harvest their perspective. The responses were further collated, analyzed with SPSS software, processed with Mean Item Score method and presented in tables and charts.

Some factors were identified as being responsible for the trend, which includes: Age difference, emotional maturity, intelligence quotient, educational background, external interference, family problem, teachers challenge, complex curriculum, psychological problem, family problem, mode of subject delivery, attention to detail among others. Model was presented of an ideal metrics that influences higher performance of female students over their counterpart and what could be done to improve performance of all gender components.

Keywords: Gender, Compare, Performance, Discipline.

## 1 INTRODUCTION

Technical-based discipline and vocations have of recent times witnessed influx of both gender elements of the society. The technical-based vocation therefore in the past was predominantly dominated by male which poses a great challenge to the female folks. According to [1] and [2], a cross sectional survey of the technical based disciplines such as Civil engineering, Mechanical engineering, Electrical engineering, Building, estate management, Architecture, Quantity surveying among others reveals gender disparity with male students taking the lead. It was discovered that female students often subscribe more for service-based and courses. However, in a study carried out by [2], it was pointed out, that, there was undoubtedly institutional, psychological as well as organizational barrier which tend to hinder technical performance of female students in the technical based courses.

In time past, males are often favored in admission opportunities into technical-based studies when compared to their male counterpart. [1] illustrated a model accounting for female low preference in studying technical-based courses, the model suggest biological difference between male and female genetic made up that programmed male for technological related works, also, female tends to have less affinity for heavy, dirty and strenuous jobs among other things. However, in recent times the enrolment of females students for technological related courses and works has risen. [3] and [4] posited that, enrolment of female on technological related courses has increased over that past decades, also, it was in their opinion there has been attitudinal change on part of females toward technical vocations thereby breaking the jinx. It has been observed that women are now competing favorably with their male counterpart in technical disciplines and excelling. It against this background

that this study attempt at carrying out comparative analysis of academic performance of gender elements in tertiary institutions.

## 2 UNDERSTANDING THE CONCEPT OF LEARNING ENVIRONMENT

Learning environment is an important aspect of knowledge acquisition. The environment makes a lot of difference at defining the pattern and extent of knowledge impartation. There are different types of learning environment: the natural learning environment, virtual learning environment and E-learning environment [9]

### A. Natural Learning Environments

Natural environment refers to traditional family setting where a child is born, child learns in this situation by proxy, a child is tutored by parents and kindred. In natural learning environments (NLE) opportunities are created for children development, they are train as part of daily living, child and family routines, family rituals, family culture and community celebrations and traditions" [5]. NLE are critical for the growth and development of all children. Knowledge acquisition in learning environment is important in shaping life of a child even beyond parental training.

### B. Virtual Learning Environments

Virtual learning environment could be described as class without boundary, it afford distant knowledge communication. A virtual learning environment (VLE), or learning platform, is an e-learning education that is web based. It uses the system of information technology to connect teacher and students together. In this context the user(students) are allowed to access into repository containing assignment, group works, homework, grades, assessments, and other external resources. Compared to the natural environment, Virtual learning environments are the basic components of contemporary distance learning, but can also be integrated with a physical learning environment which may be referred to as blended learning, or automated learning.[10], [11]

## 3 RESEARCH METHODOLOGY

- a) Sampling Method: Samples are picked at random using Random sampling method with a sample of 80 students. The sampling was done from population frame of students offering technical-based courses.
- b) Sample size: Sample size of 80 students of technical based courses and programme was adopted in the study
- c) Data Collection Instrument: A structured questionnaire in Likert scale was administered on student of technical based discipline, Eighty (40) questionnaires was administered on the students to harvest their perspective. The responses were further collated, analyzed with SPSS software, processed with Mean Item Score method and presented in tables and charts.
- d) Methods of Data Analysis: Mean item scores was used in processing the summarized questionnaire. Simple percentages was used to present percentage composition of student performance, number of male and female graduating from programmes and percentage of male and female over the period of three years winning award in the technical related programmes. Also, academic performance index factor was processed with mean item scores. Data were presented in tables and other modes. A scale 1 to 5 was adopted for questionare calibration,

with 1 representing "strongly disagree (SD)" 2 – being disagree (D) 3 – being neither agree nor disagree (N), 5- being strongly agree (SA).

Agreement index of the respondents was generated using the relation  $M.A.I = 5S.A + 4A + 3S.D + 2D + 1N/5(S.A + A + S.D + D + N)$  where  $M.A.I = \text{Mean Agreement Index}$   $A =$

$$M.A.I = \frac{1 \left( \sum A_{ij} \right)}{N \sum A_{ij}}$$

Agreement variable  $i =$  Lower boundary,  $j =$  Upper boundary

$N =$  Frequency of Variable  $\Sigma =$  Summation Notation.

#### 4 SCOPE AND LIMITATION OF THE STUDY

The study and the data used are limited to the frequency of student that graduated from the program with respect to their number, awards won and performance.

#### 5 RESULTS AND DISCUSSIONS

In this section results of the analysis is presented in tables. The following measured variables are analyzed and commented; Technical discipline enrolment and gender distribution over 3years, performance distribution of students based on gender component, Pattern of gender distribution among award recipient, factors contributing to students Academic performance and Improving students academic performance in technical disciplines.

Table 1. Technical discipline enrolment and gender distribution over 3years,

S/N	Discipline	Average Male Frequency	Female Frequency
1	Building Technology	21	7
2	Civil Engineering	35	20
3	Mechanical Engineering	15	24
4	Electrical Engineering	28	24
5	Computer Science	22	10
6	Architecture	20	23
7	Estate Management	23	28
8	Mathematics	8	18

Students enrolment and gender distribution over a period of 3years was presented in Table 1 above. There are more male enrolled in the program than male, 172 male students registered and graduated from various technical based programs, while 154 female students enrolled and graduated from the program. This trend shows female closely competing with their male counterparts in technical based programs.

Table 2. Performance Distribution of Students Based on Gender Compone

SN	Performance Cadre	Gender Frequency		Total
		Male	Female	
	First Class Honour Division	20	39	59
	Second Class Upper Division	94	137	231
	Second Class Lower Division	120	96	216
	Third Class Division	140	82	220

Performance distribution of student based on their gender composition is presented in Table 2, the performance is classified based on class honour dichotomy; the First class honour Division, Second class honour division and Third class honor division. The distribution reveals that there are more female in First Class Honour than male, 39 females belong to Firs class division, while 20 male students are in First class division. Similarly, 137 females are in Second Class Upper Division while 94 males are in Second Class Division. This indicates that more females are in Upper categories of performance; this implies that females are somehow better off in the technical-based programs in term of performance. However, more male could be found in the second class lower and third class categories respectively.

Table 3. Pattern of Gender Distribution Among Special Award Recipient.

S/N	Category of Award	Average Male (Freq)	Female(Freq)
	Best in the University	0	1
	Best in the Colleges	1	1
	Best in the Department	4	18
	Best Students in the Programmes	8	25
	Special prizes and Endowment	36	41

In a bid to situate properly the pattern of gender distribution among award recipient in Covenant University in order to establish the gender component on the leading edge, statistics was presented of the distribution of awards and endowment over a period of 3 years. It was discovered as presented In Table 3 that, average of 86 female students received one award or the other over a period of three year, while 49 male student did, which is indeed low when compared to the number of female award recipient. This statistics reveals female performing better than their male counterpart. To this end there is a need to study the factors responsible for this trend for possible correction in other to encourage the male students and enhance their performance.

Table 4. Factors Contributing To Students Academic Performance

S/N	Variables Affecting Performance	Mean Index	Ranking
1	Age Difference,	0.79	10 <sup>th</sup>
2	Emotional Maturity	0.87	8 <sup>th</sup>
3	Intelligence Quotient	0.98	1 <sup>st</sup>
4	Educational background,	0.88	7 <sup>th</sup>
5	Famliy problem,	0.77	12 <sup>th</sup>
6	Psychological problem,	0.82	9 <sup>th</sup>
7	Family problem,	0.68	15 <sup>th</sup>
8	Teachers challenge,	0.66	16 <sup>th</sup>
9	Complex curriculum,	0.78	11 <sup>th</sup>
10	Mode of subject delivery,	0.89	6 <sup>th</sup>
11	Lack of Basic Study Materials.	0.87	8 <sup>th</sup>
12	External interference	0.50	17 <sup>th</sup>
13	Emotional disturbance1	0.90	5 <sup>th</sup>
14	Social Engagement	0.76	13 <sup>th</sup>
15	Complex Course Content	0.43	18 <sup>th</sup>
16	Financial Problem	0.69	14 <sup>th</sup>
17	Course dissatisfaction	0.92	3 <sup>rd</sup>
18	Poor learning Environment	0.91	4 <sup>th</sup>
19	Attention to detail	0.95	2 <sup>nd</sup>

Structured questionnaires were distributed to randomly selected students in technical based program, their response was processed with mean item scores method the summarized index value is as presented in table 4. Intelligent quotient with mean index value 0.98 was ranked first, followed with Attention to detail (0.95) was ranked second, Dissatisfaction of students with the course (0.92) was ranked third. Similarly, poor learning Environment according to the analysis was rated fourth while Emotional disturbance was ranked fifth. Intelligence quotient is often determinant factor in education performance, thus, the females intelligent quotient should have been higher than those of their male counterpart to have excelled more than they are. Also, attention to detail is also necessary for high

academic performance in technical education, it is the same for all technical vocations and programs, and this may have accounted for being ranked second among other factors. Dissatisfaction with course or program being offered also affects academic performance, when a student is offering a course not satisfied with, performance of the student in it would not be satisfactory.

Table 5. Model for Improving Students Academic Performance in Technical Disciplines.

Variables	F1	F2	F3	F4	F5	F6	F7M	F8	F9	F10
AGE DIFF	1.00									
EMOTMAT		1.00								
INTELQUOTIENT	1.00		1.00							
EDUBACK	1.00		1.00	1.00						
FPROB					1.00					
PSYPROB		0.43					1.00			
FAMILYPROB								1.00		
TCHERCHALL		0.43						0.87	1.00	
CMPLEXCURRI									0.91	1.00
	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20
MODEOF SBJDEL	1.00									
ATTNTO DETAIL		1.00								
EXT INTERFERE			1.00							
EMOTDISTURBANCE	0.52		0.91	1.00						
SOCIENGAGMT					1.00					
FINC.PROBLEM	0.74		0.91			1.00				
COURSEDISSATIF	0.82						1.00			
COMPLEX COURS				1.00	1.00			1.00		
LEARNGENVIRON	1.00	0.52	0.91			0.82			1.00	
LACK OF BASC MATRL			0.49	0.82			0.82	0.93	0.82	1.00

## 5.1 Factor Extraction

Factor rotation was used to extract representative factors here, this toes the line of submissions in [6]. Percentage of total variance obtained from each of the independent variables of factors that affects academic performance. Each variable was standardized to have variance of 1, while total variance was given by the sum of each variable which totaled thirty-nine (39). [7], [8] adopted two approaches to determine the factors to be included in the model. They used Screeplot and Eigen value approach, [7] submitted that in Eigen value approach, only variable with Eigen value greater than one (1) should be included in the model formation. In screeplot approach, there is differential relationship pattern among variables; there is always a distinct demarcation between large variables on steep slope and gradual trailing off scores of the rest variables. This usually occurs at the variable, where K is the true number of variables [7]. In this study, therefore, Eigen value and regression coefficient approach was adopted as shown in Table 5 and Table6. Eighty-two percent of (82%) the total variance is attributed to the first 20 variables where these variables have an Eigen value greater than 1. Other twelve (12) variables account for only about 38.25% of the total variance. This shows that a model with 20 factors should be robust enough to represent the factors being considered. Seven factors were identified as representative factor representing a model that could help in predicting good academic performance if followed.

Table 6. Coefficient of Extracted Factors

Factors	Parameter with Coefficients	
F14	Lack of Basic Material (0.82)	
F9	Complex Curriculum (0.91)	
F11	Learning Environment (1.00)	
FI	Intelligent Quotient (1.00)	Educational Background (1.00)
F13	Emotional Disturbance (0.91)	Financial Problem (0.91)

## 6 CONCLUSION

From the results analysis, it was discovered that female students generally outperformed their male counterpart at the technical-based courses. Representative factors were identified that could help in improving the performance of male students, the factors include the following, providing basic learning materials, provision of good learning environment, High intelligent quotient should be developed, through intelligence sharpening skills, demystifying complex curriculum for easy understanding, avoiding emotional disturbance among others. The factors according to the research outcome could help in improving males' student performance.

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