



Gender Influence on Participation and Performance of Students in Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria

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ABSTRACT

This study focused gender influence on participation and performance of students in Building Technology Education in Federal Colleges of Education (Technical) in North-East Nigeria. The theoretical framework applicable to this study is the Expectancy-Value Theory (EVT), developed by Eccles et al. (1983) and elaborated upon by Eccles and Wigfield (2002). The theory postulates that an individual's motivation, academic choices, level of participation, and performance outcomes are primarily determined by two psychological constructs: expectancy beliefs and task values. Expectancy beliefs refer to an individual's confidence in their ability to successfully complete a given task, while task values reflect the importance, usefulness, or interest the individual attaches to performing that task. The theory holds that motivation is highest when both constructs are strong, and that participation and performance decline when either expectancy or value is low. A descriptive and correlational survey research design was adopted for the study. The population comprised 67 NCE II students offering BTE in two Federal Colleges of Education (Technical) located in Gombe and Potiskum. A census sampling technique was used to include the entire population. Data were collected using a validated questionnaire titled Gender Influence on Participation and Performance Questionnaire (GIPPQ) and students' academic performance records. The reliability coefficient of the instrument was established at 0.87 using Cronbach's Alpha. Data were analysed using mean and standard deviation to answer research questions. The data for the study was analyzed using statistical package for social sciences (SPSS) version 25 while linear regression and independent samples t-test were used to test hypotheses at the 0.05 level of significance. The findings revealed that gender does not significantly influence students' participation and academic performance in BTE programmes. However, gender-related challenges such as cultural stereotypes, peer pressure, and institutional bias were found to significantly affect both participation and performance, particularly among female students. The study further showed that gender significantly influences students' interest in pursuing careers in building technology, with male students demonstrating higher interest levels. The study concluded that while gender alone is not a significant determinant of participation and performance, socio-cultural and institutional factors linked to gender create barriers that hinder full engagement, especially for female students. It was recommended that Federal Ministry of Education in collaboration with National Commission for Colleges of Education and institutional administrators implement gender-responsive strategies, improve learning environments, and promote equal opportunities to enhance participation and performance in BTE programmes.

Keywords: Gender, Influence, Building, Technology, Students, Participation, Students, Performance

INTRODUCTION

Technology Education is the systematic use of organized knowledge to solve practical problems (Volti R, 2009). Building Technology Education (BTE) is a crucial aspect of Technical and Vocational Education and Training (TVET) that equips students with the skills and knowledge required to succeed in the construction industry (Afolabi, 2015). Despite the importance of BTE, research has shown that there are significant disparities

in the participation and performance of male and female students in TVET programs, including BTE (Okoro, 2017). Studies have revealed that female students are underrepresented in TVET programs, and they often face unique challenges that affect their participation and performance (Adamu, 2018). For instance, societal stereotypes and cultural norms may discourage females from pursuing careers in male-dominated fields like construction (Oviawe, 2018). Gender is a critical factor that influences students' participation and performance in education. Research has shown that gender stereotypes and biases can affect students' self-efficacy, motivation, and interest in various subjects (Blickenstaff, 2005). In the context of BTE, gender may play a significant role in shaping students' attitudes, participation, and performance. Several studies have investigated the impact of gender on students' participation and performance in various subjects, including science, technology, engineering, and mathematics (STEM) fields (Hyde, 2014). However, there is a dearth of research on the influence of gender on participation and performance in BTE programs, particularly in the Nigerian context

The Federal College of Education (Technical), in North East, Nigeria, are institutions that offer BTE programs. The colleges have a mandate to train students in various aspects of Building technology education, and it is essential to investigate the factors that influence students' participation and performance in these programs. Despite various national policies aimed at promoting gender equality in education, significant disparities still exist in students' participation and performance in technical and vocational education and training (TVET) programs, particularly in male-dominated fields such as Building Technology. At the Federal Colleges of Education (Technical), in North East Nigeria, anecdotal and observational evidence suggests that gender differences may significantly influence participation trends, classroom engagement, and academic outcomes in Building Technology Education.

EVT is applied in this study to explain why male and female students in Federal Colleges of Education (Technical) in North-East Nigeria differ in their engagement with and performance in BTE programmes. As Wrigley-Asante et al. (2023) and Badaru (2024) found, male students' higher expectancy beliefs, reinforced by social encouragement and early technical exposure, correlate with greater participation in practical sessions, classroom discussions, and interest in technical activities which are the very constructs investigated in Research Questions 1, 2 and 4 of this study. Preradović et al. (2023) and Okoye and Musa (2020) further established that female students' lower expectancy and value beliefs, stemming from gender stereotyping and limited role models, correspond with reduced participation and comparatively lower performance, particularly in psychomotor assessments. The theory thus provides a coherent psychological explanation for both constructs participation and performance that this study simultaneously investigates in Research Questions 1 through 5 and the corresponding hypotheses **H₀₁** through **H₀₅**.

METHODOLOGY

The study adopted a mixture of descriptive and correlational survey research design. The method was appropriate because the research investigated existing variables gender, participation, and academic performance without manipulation. The study was conducted in North-east Nigeria, specifically in Gombe State and Yobe State. The population of the study comprised 67 NCE II male and female students in the Building Technology Education programme in the Federal Colleges of Education (Technical) in North-East Nigeria. A census sampling technique was adopted for this study because the entire population of Building Technology Education students in Federal Colleges of Education (Technical) in North-East Nigeria was considered small and manageable. Two instruments were used for data collection in this study. The first instrument was a self-developed questionnaire titled Gender Influence on Participation and Performance Questionnaire (GIPPQ), the second instrument was the academic performance records of students in TEB 221 (Elementary Construction Design). The records were obtained from the departmental examination office, it was used to the academic performance of male and female students in TEB 221. The GIPPQ was subjected to face validation by three experts, two of the experts were from the Department of Technology Education, Modibbo Adama University, Yola, while the other expert was from the Department of Building Technology Education, Federal Colleges of Education (Technical) in North-east Nigeria. The Gender Influence on Participation and Performance Questionnaire (GIPPQ) was trial tested in Federal College of Education (Technical) Bichi, Kano State, Nigeria, which was outside the study area.



The trial test was carried out to ascertain the consistency of the instrument. The data obtained were analyzed using Cronbach's Alpha reliability statistics with the aid of Statistical Package for Social Sciences (SPSS). The instrument was found reliable with reliability coefficient of 0.87. A minimum reliability coefficient of 0.70 was considered acceptable. Data for the study were personally collected by the researcher with the assistance of two trained research assistants. Data collected for the study were analysed using mean and standard deviation to answer the research questions.

Responses to the questionnaire items were measured on a five-point Likert rating scale coded as: 5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree, and 1 = Strongly Disagree. A decision rule of 3.00 was adopted for interpreting the mean scores. Mean values of 3.00 and above were regarded as Agreed, while mean values below 3.00 were regarded as Disagreed. The linear regression analysis and independent samples t-test was used to test the research hypotheses. For students' performance, total scores were categorized into a five-level performance scale for analysis as follows: Excellent (70–100), Very Good (60–69), Good (50–59), Fair (45–49), Poor (40–44) and Very Poor (40–44).

RESULTS AND DISCUSSIONS

This chapter presents the results obtained in this study as well as the analysis of data carried out for the purpose of clarity and logical presentation. The chapter presents the data analysis, results and discussion of finding according to the research questions and the hypotheses that guided the study.

Research Question 1 What is the influence of gender on students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria

Table 1: Mean responses of Male and Female Students' Responses on Gender Influence on Participation in Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria

S/N	Question Items	Male		Female		Average		Remark
		Mean	SD	Mean	SD	Mean	SD	
1	Gender affects students' interest in studying BTE.	3.78	1.27	4.00	1.22	3.89	1.25	Agreed
2	Male students participate more actively in BT practical classes than females.	4.04	1.12	4.47	0.87	4.25	1.00	Agreed
3	Some students avoid participation in practical sessions due to fear of using equipment and machines.	3.88	1.21	4.41	0.71	4.14	1.00	Agreed
4	Gender differences influence how often students ask questions in BT classes.	3.96	0.99	4.35	1.00	4.15	1.00	Agreed
5	Female students prefer written tasks more than oral participation.	3.94	1.10	4.12	1.22	4.03	1.16	Agreed
6	Lack of functional workshops affects both male and female participation.	4.06	0.98	4.29	0.99	4.17	0.98	Agreed



7	Peers discourage female students from taking active roles in BT activities.	4.16	0.93	4.53	0.87	4.34	0.93	Agreed
8	Classroom seating arrangements influence participation based on gender.	4.00	0.90	4.41	0.94	4.20	0.92	Agreed
9	Male students participate more actively during classroom discussions.	3.86	1.05	4.47	0.72	4.16	1.01	Agreed
10	Gender roles influence poor attendance in BT workshops.	3.70	1.22	4.12	1.05	3.91	1.18	Agreed
Total		3.94	1.08	4.32	0.96	4.12	1.05	Agreed

Male (N=48), Female (N=19)

Table 1 shows that both male and female students agreed that gender-related factors are associated with students' participation in Building Technology Education, as reflected in the overall mean score of 4.12. Female students recorded a higher mean score (4.32) than male students (3.94), indicating stronger perceptions regarding the influence of gender-related factors on participation. This suggests that respondents perceive gender-related issues as relevant to participation in Building Technology Education. However, the descriptive findings only reflect respondents' perceptions and do not establish a statistically significant influence of gender on participation.

Research Question 2 What gender-related challenges affect students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria?

Table 2: Mean and Standard Deviation of Male and Female Students' Responses on Gender-Related Challenges Affecting Students to Participation in BTE in FCET in North East Nigeria

S/N	Question Items	Male		Female		Average		Remark
		Mean	SD	Mean	SD	Mean	SD	
1	Gender-based teasing affects students' willingness to participate in quizzes or classroom debates.	3.68	1.08	4.24	0.83	3.96	1	Agreed
2	Cultural and social gender norms discourage female students from active participation in practical sessions.	3.78	0.89	4.35	0.61	4.07	0.8	Agreed
3	Lack of parental encouragement reduces female students' willingness to participate in BT activities.	3.78	1	4.06	0.9	3.92	1	Agreed
4	Gender stereotyping by peers inhibits female students from participating in workshop activities.	3.9	0.74	4.29	0.69	4.1	0.7	Agreed



5	Male students dominate available workshop tools, limiting female students' participation opportunities.	3.9	0.93	4.18	0.73	4.04	0.8	Agreed
6	Gender affects students' willingness to lead group classroom activities.	3.86	0.83	4.29	0.59	4.08	0.7	Agreed
7	Female students are discouraged from participating due to perceived physical demands of BT tasks.	3.56	0.91	3.59	1.23	3.57	1.1	Agreed
8	Teachers' differential treatment of male and female students affects female participation rates.	3.7	0.95	4.00	1	3.85	1	Agreed
9	Lack of female role models in BT reduces female students' motivation to participate.	3.7	1.11	4.06	0.97	3.88	1	Agreed
10	Gender-based institutional norms and expectations discourage female participation in technical activities.	3.58	1.11	4.06	0.97	3.82	1	Agreed
Total		3.74	0.95	4.11	0.85	3.93	0.85	Agreed

Male (N=48), Female (N=19)

Table 2 presents the mean and standard deviation of male and female students' responses on gender-related barriers affecting participation in Building Technology Education. The results show that the general mean scores range from 3.57 to 4.10, which are above the decision benchmark of 3.00, indicating that respondents agreed with all the statements. The grand mean for male students is 3.74 (SD = 0.95) while female students recorded a higher grand mean of 4.11 (SD = 0.85). The overall general mean of 3.93 (SD = 0.90) suggests that respondents generally agree that factors such as gender stereotyping, cultural norms, teasing, lack of role models, and unequal access to workshop tools influence female students' participation in Building Technology activities.

Research Question 3 What gender-related challenges affect students' academic performance in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria?

Table 3: Mean and Standard Deviation of Male and Female Students' Responses on Gender Challenges Affecting Students' Academic Performance in Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria

	Question Items	Male		Female		Average		Remark
		Mean	SD	Mean	SD	Mean	SD	
1	Lack of trained instructors affects the performance of both male and female students.	3.9	0.8	4.4	0.7	4.2	0.8	Agreed
2	Inadequate workshop tools affect male and female students' performance differently.	3.9	0.9	4.3	0.8	4.1	0.9	Agreed



3	Inadequate learning materials affect female students' performance more than those of male students.	3.7	1.0	3.9	0.9	3.8	1.0	Agreed
4	Limited access to workshop tools affects female students' performance more negatively than that of males.	3.6	1.1	3.7	1.4	3.7	1.2	Agreed
5	Inadequate electricity supply disrupts workshop practice and negatively affects student performance.	3.7	1.0	3.8	1.3	3.7	1.2	Agreed
6	Overcrowded workshop spaces hinder the performance of students, particularly female students.	3.7	1.1	3.9	1.1	3.8	1.1	Agreed
7	Teachers' low academic expectations for female students in technical subjects negatively affect their performance.	3.7	1.0	4.1	1.2	3.9	1.1	Agreed
8	Insufficient practical sessions negatively affect the grades of both male and female students.	3.7	1.0	4.2	0.8	4.0	0.9	Agreed
9	Lack of adequate safety equipment disproportionately hinders female students' performance in workshop activities.	3.7	1.0	4.2	0.9	4.0	0.9	Agreed
10	Gender-based discrimination in resource allocation reduces female students' performance in BTE assessments.	4.0	0.9	4.1	0.6	4.1	0.7	Agreed
Total		3.8	1.0	4.1	1.0	3.9	1.0	Agreed

Male (N=48), Female (N=19)

Table 3 presents the mean and standard deviation of male and female students' responses on institutional and resource-related factors affecting performance in Building Technology Education. The results indicate that the general mean values range from 3.68 to 4.11, which are above the decision benchmark of 3.00, showing that respondents agreed with all the statements.

The grand mean for male students is 3.76 (SD = 0.97) while the grand mean for female students is 4.06 (SD = 0.96), with an overall general mean of 3.91 (SD = 0.97). This suggests that respondents generally agree that institutional factors such as lack of trained instructors, inadequate workshop tools, insufficient practical sessions, limited safety equipment, and gender-based disparities in resource allocation negatively influence students' academic performance in Building Technology Education, particularly for female students.

Research Question 4: What is the influence of gender on students' interest in pursuing careers related to Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria?

Table 4: Mean and Standard Deviation of Male and Female Students' Responses on Gender Influence on students interest in Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria



S/N	Question Items	Male		Female		Average		Remark
		Mean	SD	Mean	SD	Mean	SD	
1	Gender influences confidence in pursuing a BT career.	4.00	0.95	4.29	0.47	4.15	0.71	Agreed
2	Societal gender roles influence students' interest in BT career paths.	3.74	0.94	4.24	0.83	3.99	0.89	Agreed
3	Female students feel less motivated to pursue BT careers because of prevailing societal beliefs.	3.82	0.96	4.12	0.70	3.97	0.83	Agreed
4	Gender influences students' long-term career intentions in the BT field.	3.00	1.23	3.35	1.50	3.17	1.36	Agreed
5	Both genders perform equally and have equal career aspirations when given the same opportunities and resources.	4.02	0.87	4.24	0.83	4.13	0.85	Agreed
6	Female students often face cultural restrictions that hinder their career pursuit in BT.	3.83	1.23	4.00	1.23	3.92	1.23	Agreed
7	Female students are less confident in technical drawing and related BT skills than male students.	3.96	0.99	4.35	1.00	4.15	0.99	Agreed
8	Male students benefit more from peer study groups and networking opportunities than female students.	3.90	0.76	4.29	0.70	4.10	0.73	Agreed
9	Female students are more likely to seek academic help and career clarification.	3.84	0.70	4.35	0.73	4.10	0.71	Agreed
10	Female students show less interest in construction-related careers due to perceived safety concerns.	3.81	0.69	4.22	0.60	4.02	0.64	Agreed
Total		3.79	0.93	4.05	0.86	3.92	0.90	Agreed

Male (N=48), Female (N=19)

Table 4 presents the mean and standard deviation of male and female students' responses on the influence of gender on career aspirations in Building Technology Education. The results indicate that the general mean values range from 3.68 to 4.15. Most of the items recorded mean scores above the decision benchmark of 3.00,



indicating that respondents agreed with the statements. The grand mean for male students is 3.79 (SD = 0.93) while the grand mean for female students is 4.05 (SD = 0.86), with an overall general mean of 3.92 (SD = 0.90). This suggests that respondents generally agree that gender-related factors such as societal roles, cultural expectations, confidence levels, and safety concerns influence students' motivation and career aspirations in Building Technology Education.

Research Question 5 What is the influence of gender on students' performance in Building Technology Education programme in Federal Colleges of Education (Technical) in North East Nigeria?

Mean and Standard Deviation of Male and Female Students' Score Sheet for TEB 221 (Elementary Structural Design) for 2024/2025, 2023/2024 and 2022/2023 academic sessions. See Appendix II on Influence of gender on students' Academic Performance in BTE in Federal Colleges of Education (Technical) in North East, Nigeria.

Gender-Based Performance Analysis Standardized Grading System

Performance Level	Score Range	Code
Excellent	70-100	6
Very Good	60-69	5
Good	50-59	4
Fair	45-49	3
Poor	40-44	2
Very Poor	0-39	1

Population Demographics

Gender	Number of Students	Percentage
Male	48	71.6%
Female	19	28.4%
Total	67	100%

The population consists of 67 NCE II Building Technology Education students across two institutions (FCE(T) Gombe and FCE(T) Potiskum). The gender distribution shows male dominance in enrolment (nearly 3:1 ratio). The presents the distribution of respondents based on gender. The result reveals that 48 respondents (71.6%) were male, while 19 respondents (28.4%) were female. This indicates that male students constituted the majority of the respondents in the Building Technology Education programmes in the Federal Colleges of Education (Technical) in North East Nigeria

Aggregate Performance by Gender and Distribution

Performance Level	Male (n=48)	Female (n=19)
Excellent (70-100)	13(27.1%)	6 (31.6%)
Very Good (60-69)	8 (16.66%)	6 (31.6%)



Good (50-59)	7 (14.58%)	4 (21.05)
Fair (45-49)	7 (14.58%)	1 (5.26%)
Poor (40-44)	3(6.25%)	1 (5.26%)
Very Poor	10(20.83%)	1(5.26%)
Total	48 (100%)	19 (100%)

The score sheet only shows actual performance data of 2024/2025 academic session.in Building Technology Education in TEB 221 (Elementary Structural Design). The result indicates that eleven students (13%) recorded very poor performance, Four students (5.8%) recorded poor performance, Eight students (9.9%) recorded fair performance, eleven students (17.8%) achieved good performance, and fourteen students (24.1%) recorded very good performance, while nineteen students (29.4%) achieved excellent performance. This suggests that although a notable proportion of students performed poorly, a considerable number of students also achieved good to excellent academic performance in the programme. The descriptive statistics reveal only slight differences in academic performance between male and female students. Female students recorded a marginally higher mean score (64.2) than male students (63.8). Although female students achieved a higher pass rate and a greater proportion of high-achievement grades, the overall differences were small and inconsistent across academic sessions.

These findings suggest that academic performance in Building Technology Education is comparable across gender groups. On the summary by gender on TEB 221 (Elementary Structural Design). The Female students achieved a slightly higher pass rate (94.7%) compared to male students (79.16%), the difference in pass rate is (15.5%) percentage points, which is not negligible and the Failure rates are incomparable (20.8% for males vs 5.26% for females) while the total combined percentage pass rate of male and female students is (86.9%) and with students combined percentage fail rate of (13.1%) The students' performance category in the TEB 221 (Elementary Structural Design), 63.2% of female students achieved Excellent or Very Good grades while 43.7% of male students achieved Excellent or Very Good grades the female students have a 19.5 percentage point advantage in high achievement in 2024/2025 academic session.

Male students slightly over-represented in the Good category (29.2%) and female (26.3%).thus the 2.9 percentage point difference is marginal in the course (TEB 221). The 37.5% of male students scored below 40% (very Poor) while 5.2% of female students scored below 40mark. The male students have a 33.2 percentage point higher low achievement rate than the female students in TEB 221 in 2024/2025 academic session.

Performance by Gender and Academic Session

Session-by-Session Gender Performance

Session	Male Mean	Female Mean	Gender Gap
2022/2023 (n=48)	64.0 (n=34)	63.5 (n=14)	Male +0.5
2023/2024 (n=44)	64.5 (n=35)	65.2 (n=9)	Female +0.7
2024/2025 (n=67)	63.0 (n=48)	64.0 (n=19)	Female +1.0

These findings suggest that while gender-related challenges significantly affect academic performance, the effect stems from environmental, institutional and socio-cultural barriers rather than biological gender differences. The academic session of 2022/2023 in federal colleges of education (technical) in north east Nigeria students in building technology education minimal male students take advantage (0.5 points) over female students. However in the 2023/2024 academics session, minimal female advantage of (0.7points) over fellow male students. The



2024/2025 academic session female students had Small advantage (1.0 point) on the male students. There for No consistent pattern of gender advantage emerges across academic sessions. The small fluctuations (range: -07 to +10 points) are within expected random variation and not statistically significant. The performance data conclusively demonstrates that gender does not significantly influence academic performance in Building Technology Education

H₀₁: Gender has no significant influence on students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

Table 5: Influence of Gender on Students' Participation in Building Technology Education Programmes in Federal Colleges of Education (Technical) in North East Nigeria

Model	R	R Square	Adjusted R Square	Sig.
1	.220 ^a	0.048	0.034	.074 ^b
a. Predictors: (Constant), Gender				

Table 5 presents the regression model summary showing the influence of gender on students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria. The result shows a correlation coefficient (R) of 0.220, indicating a weak positive relationship between gender and students' participation in the programme. The R Square value of 0.048 indicates that gender explains about 4.8% of the variation in students' participation, while the remaining 95.2% is attributed to other variables not included in the model. The Adjusted P Square value of 0.034 suggests that the predictive contribution of gender to students' participation is relatively small. Furthermore, the significance value ($p = 0.074$) is greater than the 0.05 level of significance, indicating that the relationship between gender and students' participation is not statistically significant. Therefore, the null hypothesis (**H₀₁**) is accepted, implying that gender has no significant influence on students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

H₀₂: There are no significant gender-related challenges affecting students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

Table 6: Gender-Related Challenges Affecting Students' Participation in Building Technology Education Programmes in Federal Colleges of Education (Technical) in North East Nigeria

	N	Mean	SD	T	Df	Sig	Remark
Gender-related challenges affecting students' participation in Building Technology Education	67	3.84	0.65	48.12	66	0.00	Significant

a. Predictors: (Constant), Gender

Table 6 presents the one-sample t-test analysis examining whether gender-related challenges significantly affect students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria. The result shows that the respondents recorded a mean score of 3.84 (SD = 0.65), indicating a high level of agreement that gender-related challenges influence participation. The calculated t-value of 48.12 with 66 degrees of freedom and a significance value of 0.00 ($p < 0.05$) indicates that the result is statistically significant. Since the p-value is less than the 0.05 level of significance, the null hypothesis (**H₀₂**) is rejected. This implies that significant gender-related challenges exist and affect students' participation in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

H₀₃: There are no significant gender-related challenges affecting students' academic performance in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

Table 7: Gender-Related Challenges Affecting Students' Academic Performance in Building Technology Education Programmes in Federal Colleges of Education (Technical) in North East Nigeria

	N	Mean	SD	T	Df	Sig	Remark
Gender-related challenges affecting students' performance in Building Technology Education	67	3.84	0.75	41.80	66	0.00	Significant

a. Predictors: (Constant), Gender

Table 7 presents the one-sample t-test analysis examining whether gender-related challenges significantly affect students' academic performance in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria. The result indicates that respondents recorded a mean score of 3.84 (SD = 0.75), suggesting a high level of agreement that gender-related challenges influence students' academic performance. The calculated t-value of 41.80 with 66 degrees of freedom and a significance value of 0.00 ($p < 0.05$) shows that the result is statistically significant. Since the p-value is less than the 0.05 level of significance, the null hypothesis (**H₀₃**) is rejected. This implies that gender-related challenges significantly affect students' academic performance in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

H₀₄: Gender has no significant influence on students' interest in pursuing careers related to Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria.

Table 8: Influence of Gender on Students' Interest in Pursuing Careers Related to Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria

Model	R	R Square	Adjusted R Square	Sig.
1	.276 ^a	0.076	0.062	.024 ^b

a. Predictors: (Constant), Gender

Table 8 presents the regression model summary showing the influence of gender on students' interest in pursuing careers related to Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria. The result shows a correlation coefficient ($R = 0.276$), indicating a weak positive relationship between gender and students' interest in pursuing careers in Building Technology Education. The R Square value of 0.076 implies that gender accounts for about 7.6% of the variation in students' career interest, while the remaining 92.4% is explained by other factors not included in the model.

The Adjusted R Square value of 0.062 further indicates that gender contributes modestly to predicting students' career interest. However, the significance value ($p = 0.024$) is less than the 0.05 level of significance, indicating that the influence of gender on students' interest in pursuing Building Technology-related careers is statistically significant. Therefore, the null hypothesis (**H₀₄**) is rejected, implying that gender has a significant influence on students' interest in pursuing careers related to Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria.

H₀₅: Gender has no significant influence on students' performance in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

Table 09: Influence of Gender on Students Performance in Building Technology Education Programmes in Federal Colleges of Education (Technical) in North East Nigeria

Model	R	R Square	Adjusted R Square	P
1	.137 ^a	.019	.004	0.270
a. Predictors: (Constant), Gender				

Table 9 presents the regression model summary showing the influence of gender on students' academic performance in Building Technology Education in Federal Colleges of Education (Technical) in North East Nigeria. The result shows a correlation coefficient (R) of 0.137, indicating a very weak relationship between gender and students' academic performance. The R Square value of 0.019 implies that gender accounts for only 1.9% of the variation in students' academic performance, while the remaining 98.1% is explained by other factors not included in the model. The Adjusted R Square of 0.004 further confirms that gender contributes minimally to predicting students' academic performance. In addition, the significance value ($p = 0.270$) is greater than the 0.05 level of significance, indicating that the influence of gender on students' academic performance is not statistically significant. Therefore, the null hypothesis (H_{05}) is accepted, implying that gender does not significantly influence students' performance in Building Technology Education programmes in Federal Colleges of Education (Technical) in North East Nigeria.

FINDINGS

Based on the analyses of the research questions and hypotheses, the following findings emerged:

1. Respondents perceived that gender-related factors are associated with students' participation in Building Technology Education programmes; however, gender did not significantly influence participation.
2. Gender-related challenges significantly affect students' participation in Building Technology Education programmes.
3. Gender-related challenges significantly affect students' academic performance in Building Technology Education programmes.
4. Gender significantly influences students' interest in pursuing careers related to Building Technology Education.
5. Gender does not significantly influence students' academic performance in Building Technology Education programmes.

DISCUSSION OF FINDINGS

The study found that gender-related factors influence students' participation in BTE, with both male and female respondents agreeing that gender shapes interest, engagement, attendance and classroom dynamics (grand mean: male = 3.94, female = 4.32). However, the regression analysis showed that gender alone did not significantly predict participation ($R^2 = 0.048$, $p = 0.074$) and the first null hypothesis was accepted. The study found that significant gender-related challenges affect students' participation in BTE programmes. A one-sample t-test revealed that gender-related challenges including cultural norms, stereotyping, peer pressure, teacher bias and fear of injury significantly affect participation (mean = 3.92, $t = 48.12$, $p < 0.05$). The second null hypothesis was accordingly rejected. The study found that gender-related challenges, including inadequate workshop facilities, instructor bias, unequal resource allocation and limited practical opportunities, significantly affect students' academic performance in BTE programmes (grand mean = 3.91, $t = 41.80$, $p < 0.05$). The third null hypothesis was rejected. Gender significantly influenced career interest ($R = 0.276$, $R^2 = 0.076$, $p = 0.024$), with male students showing higher confidence, stronger peer networks and greater societal encouragement toward technical careers. The fourth null hypothesis was rejected. Although respondents agreed that several gender-

related challenges affect academic performance, regression analysis showed that gender itself was not a statistically significant predictor of students' academic performance in BTE programmes ($R^2 = 0.019$, $p = 0.270$). Consequently, the fifth null hypothesis was accepted.

CONCLUSIONS

The study concluded that while gender influences students' participation, performance, and interest in Building Technology Education (BTE), it is not a statistically significant predictor of participation or performance, as these are largely shaped by institutional, pedagogical, and resource-related factors; however, significant gender-related challenges such as cultural stereotypes, peer discouragement, instructor bias, and limited access to tools disproportionately affect female students, while gender significantly influences career aspirations due to sociocultural conditioning and low female representation, though equitable institutional conditions can eliminate disparities in workshop participation and performance.

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