

HAS THE GENDER GAP NARROWED IN STUDENT ADMISSIONS IN ENGINEERING STEM COURSES? EVIDENCE FROM NIGERIAN UNIVERSITY



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Abstract

Despite the emphasis on Sustainable Development Goals 4 and 5, which advocate for quality education and gender equity for all, the gender gap in the admission and enrolment of students in STEM fields, particularly in engineering, persists. The study, therefore, investigated the extent SDG has been achieved in the enrolment of students into Engineering courses. The Faculty of Engineering at Nigeria University was used. The population of the students admitted between the 2019/2020 to 2020/2021 academic sessions was 6,159 (5,481 males and 678 females). Documentation analysis and interview guide was used for quantitative and qualitative data collections respectively. Quantitative data were analyzed using frequency, percentages, and Chi-square (χ^2), while qualitative data were analyzed thematically. From the findings of the study, there exists a gender gap in enrolment among students admitted to Engineering courses in the university, among others. It was recommended that the government, parents, students, and teachers/lecturers have a lot of roles to play to see that this gender disparity or gap is narrowed.

1. Introduction

Science, Technology, Engineering and Mathematics (STEM) courses have been adjudged as the drivers of the world of tomorrow. This is because STEM courses will be the wheel of technological growth in the upcoming century. This presupposes that nations desirous of competing in the technological race of tomorrow's world should take STEM courses seriously. It is no longer news how cutting-edge scientific and technological exploits are shaping and continue to shape the world of today and will be a game changer in the world of tomorrow. For example, Information Communication and Technology (ICT) has changed the social, economic, political, and entire landscape of the world, making STEM unavoidable in this century. STEM is an approach to learning and development that integrates the areas of Science, Technology, Engineering, and Mathematics. The term STEM is also used as a generic label for any event, policy, program, or practice that involves one or several of the STEM disciplines (Reeves, 2013).

STEM plays a crucial role in the technological advancement of various sectors within the economy. Through STEM education, learners can cultivate essential skills such as creativity, problem-solving, communication, and digital literacy while also encouraging collaboration and teamwork. These competencies lay a strong foundation for students' success both in academic settings and in their future careers. Furthermore, STEM education fosters gender equality by providing all learners with the opportunity to enroll in STEM courses, thereby motivating children of all genders to pursue careers in these fields. A thorough assessment of the rapid pace of technological development highlights the necessity for participation from both genders, which in turn promotes gender diversity and brings diverse perspectives that are vital for driving technological progress.

Gender refers to the social attributes and opportunities associated with being male or female and the relationships between women

and men. These attributes, opportunities, and relationships are socially constructed and are learned through socialization processes [European Institute for Gender Equality (EIGE), 2023]. According to the World Health Organization (WHO, 2013), gender refers to the characteristics of women, men, girls, and boys that are socially constructed. Therefore, gender refers to the socially constructed roles, behaviours, expressions, and identities of girls, women, boys, and men. Gender norms, roles, and relations vary from society to society and evolve. They are often upheld and reproduced in the values, legislations, education systems, religion, media, and other institutions of the society in which they exist (WHO, 2013). When individuals or groups do not “fit” established gender norms, they often face stigma, discriminatory practices, or social exclusion – all of which adversely affect health (WHO 2011). To help remove these discriminatory practices that affect gender in STEM courses, Sustainable Development Goals (SDGs), particularly goals four (4) and goal five (5) were adopted in 2015 (United Nations (UN),2022).

The Sustainable Development Goals (SDGs) were adopted in 2015 by the 193 United Nations (UN) member states. 17 goals were adopted to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity (Neil, 2017). Goal 4 of the SDGs specifically focuses on education and seeks to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. One of the key targets of SDG 4 is to achieve gender equality and empower all women and girls. This is because gender inequality remains a major barrier to accessing education; access to education for girls and women can have a range of positive impacts on their lives and the wider society. The broad goals are linked, yet each has its own targets to achieve. The SDGs cover a broad range of social and economic development issues. These include poverty, hunger, health, education, climate change, gender equality, water supply, sanitation, energy, urbanization, environment, and social justice.

SDG 5 is aimed to “achieve gender equality and empower all women and girls. It has nine (9) targets and fourteen (14) indicators. SDG 5 is focused on pursuing the main goal of real and sustained gender equality in all aspects of women and a girl child which includes ending gender disparities, eliminating violence against women and girls’ lives, eliminating early and forced marriage, securing equal participation and opportunities for leadership, universal access to sexual and reproductive rights. Prioritizing gender equality is one of the cross-cutting concerns in the 2030 agenda. Girls’ empowerment and gender equality, especially in education (studying some technical courses), is integral to all dimensions of inclusive development (United Nations Educational, Scientific and Cultural Organization

(UNESCO, 2017). There is consensus that progress on all the SDGs is realistically achieved if girls’ empowerment and equality in choosing desired courses are prioritized holistically. Education is only one of the areas of social policy behind the breaking down of gender inequalities and the empowerment of girls and women. Therefore, achieving gender parity in education is one of the aims of the Sustainable Development Goals (SDGs).

Gender parity refers to the equal representation of each gender, while equity refers to the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The terms gender parity and gender equality are sometimes used interchangeably, but gender parity differs from gender equality in that it is a descriptive measure only and does not involve value judgment or argue for policy change as gender equality does. The concept of gender equality is now reshaping knowledge production and development. It is important to link gender equality and sustainable development for several reasons. Furthermore, to be effective, policy actions for sustainability must redress the disproportionate admission processes and inequalities in procuring admission into some technical courses, like engineering.

Gender inequality in Nigeria is said to be high and cuts across different areas of economic opportunities such as political participation and representation, access to education, health, and income etc. Increasing the number of female students in engineering education has always been a colossal undertaking. The main challenge, as acknowledged by Starovoytova and Cherotich (2016), is based on a remarkable phenomenon: “when engineering -stereotype, and gender- stereotype collide head-to-head”. Engineering stereotype is whereby engineering is perceived as a “too hard”, “masculine,” and “noisy and dirty” profession, and gender-stereotype whereby females are perceived as inferior, weak, fragile, very dependent, and less intellectually capable than males. There is a common notion in society in regards to this stereotype that women’s activities should be limited to two places: the kitchen and bedroom. Furthermore, there are also numerous gender-related challenges in learning technical courses, which additionally contribute to gender under-representation in engineering education. As a result, females are driven away from engineering and technology.

Engineering is part of STEM education, which aims to engage students with science, technology, engineering, and mathematics knowledge and skills to make them functional members of society. Engineering is defined as the use of scientific principles to design and build machines, structures, and other items, including bridges, tunnels, roads, vehicles, and buildings. In most federal universities in southeast Nigeria, the common

departments in the faculty of engineering include agricultural and bioresource, civil, electrical and electronic, mechanical, computer science, chemical, material, and metallurgical. These different departments have different specialties according to the operations being carried out in the department.

Previous studies have shown that disparity exists in STEM education, particularly at the admission level. For instance, in higher education, only 35% of students enrolled in STEM-related fields are female, and recently, only 28% of all the world's researchers are women (UNESCO, 2017). According to Financial Institutions Training Centers (FITC, 2023, cited by Bunmi, 2023), a Nigerian innovation and technology-driven knowledge institution, found that females make up only 22% of Science, Technology, Engineering, and Mathematics (STEM) graduates from universities in Nigeria (Bunmi, 2023). This has been more pronounced as female enrolment into arts and commercial courses has increased exponentially than enrolment into sciences and engineering. In another study, secondary data were obtained from the Nigerian Bureau of Statistics based on the Joint Admission and Matriculation Board registrations for five years. The mean number of enrolled students in the southeast was approximately 422.613, and there was a gender parity index of about 0.63 (Bukola, 2019). The result obtained revealed that there is still a wide gap in male and female enrolment in STEM fields. Throughout the world, women are continuously less represented in every department of engineering. The number of men is more than women as students, educators, researchers, and workers in engineering. While the number of women enrolling in higher education is increasing rapidly in many countries, and some have surpassed male enrolment, men still significantly outnumber women in the engineering discipline (UNESCO, 2011). Another related study found that the number of males who are admitted to study some technical courses like physics and astronomy, chemistry, mathematics, science laboratory technology, etc. in Nigerian universities, especially in south southeast, outnumbers the females (Eze & Eze, 2021). Researchers based their arguments on the fact that more boys or males apply for the Joint Admission Matriculation Board Examination because engineering courses are primarily seen as masculine courses. However, girls are considerably less interested in engineering courses than boys, and this can be attributed to the stereotype that goes with it (Akinsowon & Osisanwo, 2014).

The question that calls to mind is/are the gaps in admission as reported by previous studies still exist. The answer to this question is what the present study set out to unravel, which is to investigate the extent SDG goals have been achieved through gender parity in STEM courses, engineering courses in particular.

Based on the problem of the study, the purpose of this study was to assess the extent to which the Sustainable Development Goals are achieved through gender parity in admission among engineering students. Specifically, the study investigated:

1. The proportion of male and female students admitted between 2019 to 2021 in engineering at the University of Nigeria, Nsukka, for achieving Sustainable Development Goals (SDGs) in education.
2. The proportion of male and female students admitted in engineering between 2019 to 2021 based on departments for achieving Sustainable Development Goals (SDGs) in education.
3. Factors that influence the gender disparity (if any).

The following hypotheses were formulated to guide the study at a 0.05 level of significance.

HO₁. There is no significant difference in the proportion of male and female students admitted to the Engineering Faculty at the University of Nigeria, Nsukka.

HO₂. There is no significant difference in the proportion of male and female students admitted to various Engineering Faculty based on Departments, in the University of Nigeria, Nsukka.

2. Literature Review

Equity theory focuses on determining whether the distribution of resources is fair. Equity is measured by comparing the ratio of inputs (contributions) and outputs (benefits) for each person. Equity theory was first developed by Adams in 1963. Adam (1963) stated that fairness and equity are key components of a motivated individual. Equity theory is based on the idea that individuals are motivated by fairness, and if they identify inequalities in the input or output ratios of themselves and their referent group, they will seek to adjust their input to reach their perceived equity. Therefore, inequalities in relationships will cause those within them to be unhappy to a degree proportional to the amount of inequality. According to the Equity theory, to maximize individuals' outputs, we tend to create systems where resources can be fairly distributed among members of a group. Adams also suggested that the higher an individual's perception of equity, the more motivated they will be, and vice versa: if someone perceives an unfair environment, they will be demotivated. The researcher suggests that equity theory will go a long way in addressing the issue of inferiority complex among female students. It can also help the teachers readdress the idea of gender stereotypes among the students positively.

3. Methodology

The research design used in this study is a case study design. Nworgu (2015) defined a case study design as an intensive study geared towards a thorough understanding of a given social unit. The social unit may be an individual, a group of individuals, a community, or an institution. This type of research design was chosen because there is in-depth, comprehensive, and well-ordered information concerning the proportion of males and females admitted to the Faculty of Engineering at the University of Nigeria, Nsukka.

The researchers thought it wise to use the University given that the university serves as a baseline for other universities in the country considering that the University is one of the pioneer universities and the first indigenous university in Nigeria, and as such most faculties including the faculty of Engineering have existed for decades such that it is expected that many female students will enroll in the faculty of Engineering, hence the need for this research. The population of the study comprised all male and female students in the Faculty of Engineering of the University from the 2019/2020 to 2020/2021 academic sessions. The total number of students under study is 6,159. The number of male students is 5,481, and the number of female students is 678 (Academic Planning Unit of the University). The sample size comprised all male and female students in the faculty of Engineering of the University in two (2) years. Since all the students were included in the study; therefore, no sampling was carried out.

Two instruments, namely the Pro-forma and Interview guide, were developed by the researchers to collect data for the study. The interview guide comprises four (4) questions aimed at finding out the reasons for the disparity in admission, if any. One example of the questions in the interview guide is “With your experience as a lecturer/Dean of Faculty over the years, how can you describe the students’ undergraduate admission in your department, gender-wise?” The pro forma was used in the collection of data from the Academic Planning Unit, University of Nigeria, Nsukka, from 2019/2020 to 2020/2021. This proforma contained the students’ year of admission, department, and gender.

The pro forma and the interview guide were subjected to face validation by giving them to three lecturers in Science Education, one from Measurement and Evaluation, Chemistry Education, and Physics Education, respectively. From their validations, major critiques and corrections were directed to the research hypotheses. Based on the criticisms and corrections of the experts, the research hypotheses were revisited, and corrections were made where necessary. Since the Pro-forma and interview guide were used for the study, no reliability analysis was carried out because the Pro-forma contains demographic information and students’ admission lists, while the interview guide was made up of fewer items or questions.

Verbal consent was sought and obtained from all the respondents, and the responses of the respondents were anonymized. The researchers visited the Dean of the Faculty and Heads of Department and obtained the needed information firsthand and on the spot, and equally interviewed the relevant individuals, like the lecturers, using the interview guide. The admission lists were categorized according to the different departments under the faculty of Engineering, concerning the number of males and females. The lists were the primary and supplementary lists of students admitted from the 2019/2020 to 2020/2021 academic sessions. Frequency and percentage were used to analyze the data obtained. Also, the data obtained from interviews were analyzed qualitatively. Similarly, the hypotheses were tested using Chi-square (χ^2). The choice of frequency, percentages, and Chi-square(χ^2) was because the data is a nominal scale (i.e., it can be counted).

4. Empirical Findings

Below are the findings of the study, in line with the purpose of the study

Quantitative Data Analysis

The quantitative data collected were analyzed

1: Proportion of male and female students admitted between 2019/2020 to 2020/2021 in the faculty of Engineering at the University of Nigeria, Nsukka

Table 1: Frequency and percentages of the students in the faculty of Engineering of the University of Nigeria, Nsukka, from 2019/2020 to 2020/2021 academic sessions

Gender	Sessions		Total
	2019/2020	2020/2021	Freq. (%)
	Freq. (%)	Freq. (%)	
Male	2687 (88.8)	2798 (89.4)	5,485(89.1)
Female	338 (11.2)	333 (10.6)	671 (10.7)
Total	3025 (49.1)	3131(50.8)	6156(100)

Table 1 revealed the total number of male and female students admitted in each session of the study. It revealed that 3,025 (49.1%) students were admitted in 2019/2020, and 3131 (50.8%) students were admitted in the 2020/2021 academic session. From the table, it could also be seen that the number of students increases as the progress. It also revealed that there is a gender disparity among students in the Faculty of Engineering. The

number of male students admitted is far more than that of female students.

Hypothesis 1: There is no significant difference in the proportion of male and female students admitted to the Engineering Faculty in the University of Nigeria, Nsukka.

Table 2: Chi-square (X^2) test analysis of students admitted to the Faculty of Engineering from the 2019/2020 to 2020/2021 academic sessions.

			Values	Df	Asymp. Sign (2-sided)
Pearson Chi-Square	26.555 ^a	7	.000		
Likelihood Ratio	27.194	7	.000		
Linear-by-Linear Association	148	1	.701		
N of Valid Cases	3025				

2 cells (12.5) have an expected count of less than 5. The minimum expected count is 2.12

Table 2 shows $X^2(7)$ is equal to 26.555, and the probability of 0.00 is less than the 0.05 level of significance. The probability value is less than 0.05 level of significance set for the testing of the hypothesis; therefore, the null hypothesis was rejected in favor of the alternative which means that there is a significant difference in the admission ratio of students admitted to the faculty of

Engineering of the University of Nigeria, Nsukka from the year 2019/2020 to 2020/2021 academic sessions.

2. Proportion of male and female students admitted between 2019/2020 to 2020/2021 academic sessions in the Faculty of Engineering based on departments

Table 3: The proportion of male and female students admitted in 2019/2020 in the Faculty of Engineering based on Departments

Gender	Agric. and Bio-resour. Engr. Freq. (%)	Electrical Engr. Freq. (%)	Civil Engr. Freq. (%)	Electronic Engr. Freq. (%)	Mat.&Meta.Engr. Freq. (%)	Mechanical Engr. Freq. (%)	Bio-Medical Engr. Freq. (%)	Mechatronics Engr. Freq. (%)	Total Freq. (%)
Male	265 (87.1)	474 (90.1)	541 (91.0)	520 (84.4)	300 (87.7)	542 (92.1)	14 (73.6)	31 (86.1)	2687 (88.8)
Female	39 (12.8)	52 (9.8)	53 (8.9)	96 (15.5)	42 (12.2)	46 (7.8)	5 (26.3)	5 (13.8)	338 (11.1)
Total	304	526	594	616	342	588	19	36	3025

Table 4: The proportion of male and female students admitted in 2020/2021 in the Faculty of Engineering based on Departments

Gender	Agric. and Bio-resour. Engr. Freq. (%)	Electrical Engr. Freq. (%)	Civil Engr. Freq. (%)	Electronic Engr. Freq. (%)	Mat.&Meta.Engr. Freq. (%)	Mechanical Engr. Freq. (%)	Bio-Medical Engr. Freq. (%)	Mechatronics Engr. Freq. (%)	Total Freq. (%)
Male	251	506	594	538	297	555	18	37	2796
	(86.8)	(90.1)	(90.6)	(87.1)	(88.6)	(91.8)	(75.0)	(84.0)	(88.8)
Female	38	55	61	79	38	49	6	7	333
	(13.1)	(9.8)	(0.0)	(12.8)	(11.3)	(8.1)	(25.0)	(15.9)	(11.1)
Total	289	561	655	617	335	604	24	44	3129

From the above, Tables 3 and 4 show that the male students dominate that of the female counterpart.

Table 5: The total proportion of male and female students admitted between 2019/2020 to 2020/2021 academic sessions in the Faculty of Engineering based on departments.

Gender	Agric. and Bio-resour. Engr. Freq. (%)	Electrical Engr. Freq. (%)	Civil Engr. Freq. (%)	Electronic Engr. Freq. (%)	Mat.&Meta.Engr. Freq. (%)	Mechanical Engr. Freq. (%)	Bio-Medical Engr. Freq. (%)	Mechatronics Engr. Freq. (%)	Total Freq. (%)
Male	516	908	1135	1058	597	1097	34	68	5485
	(87.0)	(83.5)	(90.8)	(85.8)	(88.1)	(75.5)	(75.5)	(85)	(89.1)
Female	77	107	114	175	80	95	11	12	671
	(12.9)	(9.8)	(9.1)	(14.1)	(11.8)	(7.9)	(24.4)	(15)	(10.8)
Total	593	1087	1249	1233	677	1192	45	80	6156

From the above table 5, it shows that the male students dominate that of the female counterpart.

Hypothesis 2: There is no significant difference in the proportion of male and female students admitted in various Engineering Faculty based on departments in University of Nigeria, Nsukka

Table 6: The Chi-Square (X^2) for the number of male and female students admitted to the Faculty of Engineering in the 2019/2020 academic session.

	Values	Df	Asymp. Sign (2-sided)
Pearson Chi-Square	28.555 ^a	7	.000
Likelihood Ratio	27.194	7	.000
Linear-by-Linear Association	148	1	.701
N of Valid Cases	3025		

a 2 cells (12.5) have expected count less than 5. The minimum expected count is 2.12

Table 7: The Chi-Square (X^2) for the number of male and female students admitted in the Faculty of Engineering in the 2020/2021 academic session

		Values	Df	Asymp. Sign (2-sided)
Pearson Chi-Square	16.330 ^a	7		.022
Likelihood Ratio	15.334	7		.032
Linear-by-Linear Association	196	1		.658
N of Valid Cases	3131			

a 2 cells (12.5%) have expected count less than 5. The minimum expected count is 2.77

Table 8: The total Chi-Square (X^2) for the number of male and female students admitted to the Faculty of Engineering in 2019/2020 to 2020/2021

		Values	Df	Asymp. Sign (2-sided)
Pearson Chi-Square	42.721 ^a	7		.000
Likelihood Ratio	40.652	7		.000
Linear-by-Linear Association	343	1		.558
N of Valid Cases	6156			

a 2 cells (6.2%) have expected count less than 5. The minimum expected count is 4.90

Table 8 shows $X^2(7)$ is equal to 42.721, and the probability value is 0.00, which is less than the 0.05 level of significance. It can be seen that the probability value is less than 0.05 level of significance set for the testing of the hypothesis, therefore the null hypothesis was rejected in favor of the alternative which means that there is a significant different in the admission ratio of students admitted in the faculty of Engineering of the University of Nigeria, Nsukka from the 2019/2020 to 2020/2021 academic sessions.

Qualitative Data Analysis

The qualitative data collected through the interview were analyzed thematically below

Theme 1: Awareness of the existence of gender disparity in admission

The results from the interview conducted with the Dean of the faculty, Heads of Department (H.O.D), and some lecturers in the departments under the faculty of Engineering revealed that the Dean, HOD, and lecturers in the faculty of engineering are aware that the number of males and females that enrol in the various department in the faculty are disproportionate, with the male students outnumbering the female ones. Below are a few instances of the responses of the respondents.

Respondent 1: "I am aware that fewer female students enroll in engineering courses."

Respondent 2: "I see more male students in my classes than female ones, year in and out."

Theme 2: Factors that influence the gender disparity

Many of the respondents share their views that one major cause of gender disparity in engineering is due to the mathematical nature of the courses. This finding was the popular view of all the respondents. It is obvious that engineering courses are handled using mathematical tools to solve most of the problems in the courses, hence, this remains the major factor that scares away the female gender from enrolling in engineering courses.

Another factor mentioned by the respondents is the technical nature of the courses. Engineering courses are understandably technically inclined, resulting in a major drawback on the part of the female gender from enrolling in the courses.

Furthermore, some of the respondents attributed the gender skewness in enrolment to a lack of female role models as lecturers in the field. In engineering courses, fewer of their staffers are females, with more male staff teaching the courses, resulting in the female students seeing the courses as only meant for the males.

Another factor mentioned by the respondents is the lack of early exposure of the female gender from primary schools. If the female students are made to understand that engineering and technical courses are not exclusive reserves of their male counterparts, it will go a long way in making them develop an interest in the subject.

Finally, one other factor shared by many of the respondents is historical biases and stereotypes from their parents and peer groups. Some parents and peer groups unconsciously tell their female gender that some courses are for males, such as

engineering, among others. This could contribute to their female wards developing negative attitudes towards the course.

Theme 3: Factors/policies that will promote female students' enrolment in Engineering

The respondents averred that to increase female students' enrolments in engineering courses, the following should be

3. Discussion

Findings revealed that the number of male students who were admitted to the faculty of Engineering of the University of Nigeria, Nsukka, dominated their female counterparts. Thus, this tends to retard the success of the achievement of Sustainable Development Goals (SDGs) in education. This finding can be attributed to the fact that most engineering courses require knowledge of mathematics, technical skills, and computer science. Due to a poor background in science subjects like physics, mathematics, and computer sciences, most female students admitted to engineering find it difficult to cope, thus leading to massive dropouts and rejection of admission offers. From the findings, parents are said to contribute to the gender disparity; they tend to discourage their female children by instilling fear in them. Some of the parents also choose courses for their children/ wards without properly checking the academic capability of their children, hence the clamor for professional courses. Some educational and socio-cultural factors also limit female students' interests and confidence in pursuing Engineering as a course. Findings from other related literature supported the findings of the present study, as it was revealed that the number of males participating in STEM or other STEM-related courses is more compared to that of the females (Verena&Deepa, 2022). Others also argue that STEM courses are in the male domain (Blazev et al., 2017). However, girls are considerably less interested in science subjects than boys, and this can be attributed to the stereotype that it is only for males or 'tomboys' (Akinsowon & Osisanwo, 2014).

The findings of the study showed that the male students dominate of female counterparts in all the departments in the faculty of Engineering of the University of Nigeria, Nsukka. The findings also revealed that gender disparity exists mostly in Engineering, and this is in line with the findings of Cheryan et al. (2017) that gender stereotypes are more prominent in engineering, computer science, and physics than in biology, chemistry, and mathematics, and have been shown to correlate with gender disparities in interests. From the findings, the number of male students admitted to the departments was double or even more compared to that of the female students. This is concerning because the gender gap has not been narrowed based on departments despite

implemented. Implementing outreach and mentorship programs in secondary schools, offering scholarships, actively promoting the achievements of female engineers as role models, creating a supportive, collaborative, and inclusive environment, and taking affirmative action in admission. Also, introducing gender-neutral recruitment practices can help boost female enrolment in Engineering.

the prevalent need for Science and Technology, especially in Engineering, for the development of the nation. Also, the 2030 deadline for achieving the vision of Sustainable Development Goals (SDGs) four (4) and five (5) is fast approaching, hence a call for concern.

Interviews with the Dean of Faculty, Heads of the departments, and other lecturers under Engineering also attested to the fact that there is a gender gap in engineering, i.e., the number of males always outnumbers that of the females. They gave the following as the causes or factors influencing the disparity: Engineering courses are mathematics controlled and computation science is also required, lack of proper awareness and lack of early exposure to STEM courses, cultural beliefs and practices like early marriage, the negative influence of parents; some parents choose courses for their children and wards, clamour for professional courses like Medicine, Pharmacy, and Nursing sciences etc., students' performance during Joint Admission and Matriculation Board, tough curriculum, lack of role models and so on.

The respondents also gave some possible policies that can aid in narrowing the long-standing gender gap. They include, thus, policies such as affirmative action in admissions, equal opportunity initiatives, and support for childcare facilities that can help increase female enrolment in engineering. Implementing policies that mandate diversity in admissions committees and promote gender equity in faculty positions can create a more inclusive environment. Policies that focus on eliminating unconscious bias in the admission process and providing financial incentives for female students can be effective in increasing enrollment. Developing partnerships with the industry to provide internships and scholarships exclusively for female engineering students can be a policy approach to consider. Policies that encourage collaboration between schools, universities, and industries to expose young girls to engineering through hands-on experiences can be highly beneficial in increasing enrolments. The findings are in line with the study of Akinbi and Akinbi (2015), in which they listed cultural beliefs and practices, household and family constraints, religious encumbrances, and school environment as factors militating against disparity in formal education.

4. Conclusion

From the data gathered and analyzed, it was discovered that there is still a gender gap or disparity among students admitted into Engineering courses at the University. This gap is attributable to the masculine nature of the courses and the high mathematical and computational skills needed for success in the courses, among others. Based on the findings of the study, the following recommendations were made:

The government at all levels, federal, state, and local government, should encourage female students to study science, especially technology-based sciences like Engineering, by giving them free education and scholarships. The Ministry of Education in various states of the country should employ more female engineering lecturers to serve as role models to female undergraduate students. Parents should be sensitized to the need to encourage their female children to embrace engineering or STEM courses in primary and secondary schools. Certain barriers from home, society, and schools, like the use of biased words, should be discouraged, and any parent, member of the society, or teacher found victim of such should be punished accordingly.

The findings are limited in the design, being a case study in which data were collected from only one university in the country. This could limit the generalizability of the findings. Another limitation to the findings is the regional context of the findings, given that the study was carried out in the southeast region of the country. Thus, further studies should be conducted in other universities in the country, especially other regions of the country, to ascertain the true picture of the students' enrolment ratio in the engineering courses to underscore the extent SDG goals 4 and 5 have been achieved in the country at university levels.

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