Gender Factors Responsible for Low Enrolment in Engineering and Nursing in Nigerian Universities: A Case Study of University of Ibadan, Ladoke Akintola University and Bowen University

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Abstract

This study explores gender-related factors influencing undergraduate students' experiences and course choices in the disciplines of Engineering and Nursing across three purposively selected Nigerian universities: the University of Ibadan (UI), Ladoke Akintola University of Technology (LAUTECH), and Bowen University (BU), located in Oyo and Osun States. These institutions were chosen based on their historical significance and the early establishment of both Engineering and Nursing programs. In addition, the universities were selected based on their proximity to minimise security risks during data collection. The study examines gender factors responsible for the low enrolment rates in Engineering and Nursing programs in Nigerian universities, investigates their causes and effects, and proposes possible solutions and recommendations. The findings aim to promote gender balance in the two professions and assist both government and university authorities in formulating equitable educational policies. A qualitative research design was employed, involving 72 participants divided into two respondent groups. The first group comprised 48 final-year undergraduate students (500 Level), equally representing both genders and disciplines, who participated in In-Depth Interviews (IDIs). From each university, 16 students (eight per discipline, with gender balance) were interviewed. The second group consisted of 24 Key Informant Interview (KII) participants drawn from academic staff in strategic positions—one Reader (Sub-Dean) per discipline and three Senior Lecturers from each discipline per university—totalling eight key informants per institution. The Social Cognitive Career Theory (SCCT) provided the theoretical framework, guiding the exploration of factors shaping students' academic and career choices. Data were analysed using content analysis techniques to uncover patterns and insights into gender dynamics within these traditionally gendered disciplines. The study offers a nuanced understanding of gendered academic trajectories in Nigerian higher education.

Keywords: *Gender, Engineering, Nursing, University, Undergraduate Students*

Introduction

The term that describes the revolving idea in this discourse is gender factors, which represent the common oversimplified, abstracted, and collective views of the characteristics and roles of men and women (Fiske & Stevens, 1998; Deaux & LaFrance, 1998). According to Adekunle (2025), gender is the indigenous and modern societal realities of males and females. Gender is a platform for conflict resolution (Adekunle, 2023; Adekunle, 2024). Gender is an approach against inequality between males and females (Adekunle, 2019; Adekunle, 2020; Adekunle, 2021; Adekunle, 2022). Gender determines societal values (Adekunle, 2004; Adekunle, 2009; Adekunle, 2014; Adekunle, 2027). These factors are often accepted from an early age and can decisively influence educational and professional pathways. In relation to Nigeria, these assumptions are cultural and tend to bias older societies in their perceived level of efficiency or usefulness.

Most of these factors result in self-selection, a phenomenon where people, especially students, make unconsciously rational decisions on the career paths to take depending on how masculine or feminine the options appear to be (Eccles, 2007; Musso et al., 2022). Additionally, more rigid institutional frameworks of gender factors also tend to bias curricula, mentorship, and access to education, professional networks, and available role models (McGuire et al., 2020). This suggests that, inasmuch as overt inequalities are levelled, informal cultural norms sustain biased divisions of labour by gender, even with the increased availability of education and work.

In order to rectify such imbalances, it is important to note the difference between gender equality and gender equity. As per the definition provided by the United Nations in 2006, gender equality implies equal enjoyment of rights within the context of access, roles, and opportunities, irrespective of gender. This includes access to services such as education, career opportunities, and leadership positions. However, as we pointed out previously, mere access does not guarantee success, especially in the presence of deep-rooted social inequalities within a society. This is the point where gender equity provides a more pragmatic and balanced approach. Gender equity gives recognition to the fact that there are different starting points and proposes measures to assist these people, such as affirmative action, the granting of some scholarships, mentorship programs, and more (UN Women, 2019).

For instance, in engineering, a STEM field with a pronounced gender gap, targeted gender-equity measures may encompass fostering a supportive atmosphere, active recruitment of women into leadership positions with teaching roles, and targeting female students academically (De Welde &

Stepnick, 2023). In nursing, where men make up the minority, equity-based interventions can also target the stigma placed on male caregivers. These would include campaigns aimed at redefining caregiving as a gender-neutral job role and proactively advertising to male students (Rosa & Clavero, 2022).

To conclude, for this study, gender is framed not only as a biological binary, but also as the social and cultural ascribed meanings that influence behaviour, identity, and opportunity. This understanding is pivotal to assessing all the ways in which gender-related phenomena, particularly stereotypes, social norms, and biases, affect students' interactions and subsequent career pathways in the context of the Nigerian higher education system. Understanding gender as performative and relational as well as institutional allows for a deeper scrutiny of the striking imbalance in the enrolment figures of engineering and nursing programs; male and female undergraduates in Nigeria are often reported to face (Gradín, 2021; Odeleye & Odeleye, 2022).

Based on the above observations, this study, therefore, critically examined gender factors responsible for low enrolment in engineering and nursing professions in Nigerian universities. The universities purposively selected are the University of Ibadan, Ladoke Akintola University and Bowen University. They were selected based on their historical significance and the early establishment of both the Engineering and Nursing programs. Besides, the universities were also selected based on proximity to avoid security challenges during data collection. The study examines the causes, effects and solutions and provides recommendations. This study will help to create gender balance in two professions and also assist both government and university authorities in shaping educational policies.

Overview of the Nigerian Educational System

Understanding the Nigerian Educational System and Its Gendered Implications

As stated earlier, an understanding of the Nigerian educational system is pertinent when examining factors such as why students navigate undergraduate program options using gendered lenses, especially why boys opt for engineering and girls choose nursing. It is important to note that in Nigeria, students' educational trajectories are not constructed only on the basis of academic performance or their individual interests, but are also situated within a socio-cultural policy framework which defines access, including expectations and outcomes. The gaps or mitigations in the disparity in educational opportunities across various genders and disciplines, such as

Engineering and Nursing, are significantly influenced by the educational system structure, policy system, and regional boundaries within Nigeria (Ekpeyong, 2023; Odeleye & Odeleye, 2022).

Theoretical Framework

The Social Cognitive Career Theory

The Social Cognitive Career Theory (SCCT) was developed by Lent, Brown and Hackett in 1987. The theory grew out of Albert Bandura's social cognitive theory. The theory proposes that career choice is influenced by the beliefs the individual develops and refines through vicarious learning. This is where a person learns something through observation and imitation of others. It is, therefore, connected with the present study, which sought to establish the relationship between gender stereotyping and career aspirations. Through vicarious learning processes, students may pick up the prejudices of their parents and other members of society. For example, pupils whose parents say certain careers are for men while others are for women may adopt such attitudes themselves.

The perceptions of a career may also be influenced by the beliefs the individual develops through social persuasion. Among the socio-cultural factors that influence career development is gender stereotyping. For example, many students may restrict their career choices to careers that are gender stereotyped (Eccles, 1994). Females and males make different choices because of their socialisation experiences and the ways social forces structure the opportunities available to them (Angwaomaodoko, 2023).

The above argument is also reinforced by John Holland's personality type theory developed in 1959 (Holland, 1997). Holland's theory rests on the assumptions that People can be categorised into one of the following career types: realistic, investigative, social, conventional, enterprising and artistic. Realistic people are physically strong and deal with problems in practical ways. They are best oriented towards practical careers such as farming, truck driving and construction. Investigative individuals are best suited for careers such as mathematics and sciences, or investigative occupations in which one can engage in one's preferred activities and competencies. Social individuals are likely to be best equipped to enter "people" oriented professions, such as teaching, social work, and counselling. Conventional people are individuals who show distaste for unstructured activities. They are best suited for jobs like subordinates, such as bank tellers, secretaries and file clerks. Enterprising individuals energise their verbal abilities towards leading others, dominating other people and persuading people on issues of products. They are best suited

to enter careers, such as sales, politics and management. Artistic individuals prefer to interact with their world through artistic expression, avoiding conventional and interpersonal situations. They are oriented towards such careers as art and writing.

According to Savickas and Lent (1994), it has been shown that females tend to score high in artistic, social and conventional occupations, while men are more likely to prefer realistic, investigative and enterprising occupations. According to Savickas and Lent (1994), Holland attributes this to our society that channels females into occupations that are perceived to be female-dominated.

Based on the observations above, the relevance of this theory was evident in the research findings that there is gender disparity in career aspirations of students, with the majority of male students channelling their aspirations towards careers that are perceived to be male- dominated and female students channelling theirs towards careers perceived to be female dominated, as shown in the analyses below:

Methodology

Method of Data Collection and Analysis

The study employed a qualitative research design using two primary methods of data collection:

1. In-Depth Interviews (IDIs): A total of 48 final-year undergraduate students (500 Level) participated in IDIs. From each of the three selected universities—University of Ibadan (UI), Ladoke Akintola University of Technology (LAUTECH), and Bowen University (BU)—16 students were interviewed (eight from Engineering and eight from Nursing, with a gender balance).
2. Key Informant Interviews (KIIs): The study also engaged 24 academic staff members through KIIs. From each university, four key informants were selected: one Reader (Sub-Dean) from each discipline (Engineering and Nursing), and three Senior Lecturers from each discipline, making a total of eight key informants per university. The informants were purposively selected based on their years of professional and administrative experience.
3. Also, letters of introduction and permission for data collection were obtained from the authorities of the three purposively selected universities: University of Ibadan, Ladoke Akintola University of Technology and Bowen University. Besides, the universities were also selected based on proximity to avoid security challenges during data collection.

Method of Data Analysis

Data collected from both IDIs and KIIs were analysed using content analysis, a qualitative method that involves identifying patterns, themes, and meanings within the transcribed interviews. This approach enabled the researchers to interpret the underlying gender-related factors affecting students' course choices and experiences in Engineering and Nursing. The study was guided by the Social Cognitive Career Theory (SCCT), which helped frame and interpret the findings in relation to students' academic and career decision-making processes.

Results and Discussion

Exploring the Socio-demographic Experiences of participants

The study focused on the gender related factors in engineering and nursing disciplines among undergraduates in three selected universities: University of Ibadan (UI), Ladoke Akintola University of Technology Ogbomoso (LAUTECH) and Bowen University, Iwo (BU), all in Oyo and Osun States in Nigeria. The appropriateness of the selected universities was established. This was done by ranking the levels of their founding dates and also having established engineering and nursing disciplines from inception. Out of all the federal universities in Nigeria, University of Ibadan is the first, while LAUTECH is also one of the first state universities and Bowen University, one of the first private universities in Nigeria, all with engineering and nursing disciplines, after which the first three were purposively selected for the study. Besides, the universities were also selected based on proximity to avoid security challenges during data collection.

The study utilised a total of 72 participants, which yielded two distinct groups of respondents. The first group consisted of 48 individuals who participated in In-Depth Interviews (IDIs). These group members were final year undergraduate students (500 Level), and both male and female participants were equitably drawn from the two disciplines being studied—engineering and nursing. Participants were recruited from all three universities included in the study, which are: The University of Ibadan, Ladoke Akintola University of Technology (LAUTECH), and Bowen University. Specifically, sixteen students (eight from each discipline with gender balance) were interviewed per university, leading to a total of 48 IDI respondents.

The second group was made up of 24 participants who were recruited through Key Informant Interviews (KIIs). This group comprised of higher ranked university employees as they were holding strategic positions and ranks within the university's position system. From each of the universities, one (1) male or female sub-dean (who is designated as a Reader) per discipline

(Engineering and Nursing) was selected. In addition, three (3) senior lecturers from each of the two disciplines were also interviewed from each university. Thus, from each institution, there were four key informants, one Reader and three Senior Lecturers, which made 8 KII respondents per university and 24 in total.

In the IDI and KII groups, all participants belonged to the Yoruba and Igbo ethnic groups, which ensured cultural representation pertinent to the study's scope in Oyo and Osun States, Nigeria.

The survey carried out on lecturers and students of engineering and nursing programs at Bowen University, LAUTECH, and the University of Ibadan has uncovered various gender-related factors that impact students' academic choices and progression. The first objective concentrated on understanding the causes of the observed gender enrolment disparity in undergraduate engineering and nursing programs during the 2015/2016 to 2021/2022 academic years in selected institutions within Oyo and Osun States, Nigeria. The findings in Table 4.1 illustrate the pattern of gender enrolment in undergraduate engineering and nursing courses. It illustrates the gender ratio, whether male to female, or female to male admissions, whereby in engineering there is predominance of male undergraduate students compared to females, while in nursing there is predominance of females over males. The results of this study confirmed that there are many reasons that influenced this gender enrolment disparity.

A respondent who happened to be the sub-dean in one of the universities explained that there is a plethora of factors responsible for the low number of female students showing interest in engineering courses. He stated that:

> However, an academically oriented factor is the widespread conceptualisation of engineering courses being extremely difficult. This false observation about engineering has greatly affected the interests of female students as they drop in their numbers. Perhaps, if students in general are made to see engineering as being fun rather than overly complex, the number of female engineering students may increase.
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> **(KII/Male/Sub-Dean/Engineering, University of Ibadan/August, 2023)**

While another respondent revealed thus:

> Over the years, the reason for having low enrollment in female students is that they see engineering as a male-dominated field, and they believe it

> requires more power and effort to become an engineer. **(KII/Male/Lecturer/Engineering, Bowen University August, 2023)**

Engineering as a Calling and Applied Science

Using the framework of Social Cognitive Career Theory (SCCT), it was established that career choices are profoundly shaped by sociocultural factors. The theory was seen to be particularly useful in understanding the underrepresentation trends in engineering and nursing. In the same vein, another respondent said that engineering is a calling, a discipline which is an applied science where subjects like chemistry, physics, and mathematics are applied to solve real-time problems to make life easy for human beings. He further said:

> So as mentioned, the engineering requires students or candidates who want to read engineering must have requirements which are physics, chemistry, mathematics and biology, and that means that the candidate must have these subjects and must be well-grounded in them. If you see, right from the secondary school we know that most of the students who chose to read science subjects, because of poor orientation they have impression that when they read science subjects what they will have to do is to read medical related courses irrespective of whether they are good in that area or not and that is exactly what happen to enrolment in engineering.

The respondent added that:

> Not only to female engineering people but to students generally, they have belief that they must go for medical related course, when they now choose at the entering point course, they apply through jamb, in those days if you read any science you can go to any field but not now, if you want to come to engineering, one must sit for jamb subjects which include physics, chemistry and mathematics, without mathematics you cannot come to engineering and that's why we have low enrolment of female into engineering.
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> **(KII/Sub-Dean/Male/Engineering, Ladoke Akintola University of Technology September, 2023).**

Technical Complexity as a Barrier

The study concluded that self-efficacy beliefs were most profoundly influenced by perceptions of technical difficulty. Female students seemed to have a hard time accepting their capabilities as engineers owing to the mathematical components of the discipline, while male nursing students appeared to have doubts about their caregiving abilities. These confidence gaps were attributed to having no early exposure and insufficient social reinforcement.

The study also concluded that self-efficacy gaps in nursing and engineering stemmed from academic and sporting expectations as forms of gendered gatekeeping. Participants reported that engineering called for both rigorous calculation and technical stamina, while nursing showed a requirement for emotional and physical hardiness. There appears to be no balance between high standards and easing pathways of some sort for females, which the researchers deemed essential to be put in place. These socio-cultural notions intersect with the level of bodily effort and mental exertion deemed appropriate in each field. Engineering was viewed both qualitatively and quantitatively as an excessively rigorous intellectual undertaking; faculty and students described the engineering programs as for students who were physically strong and mathematically capable. From a gender perspective, this position is quite unfortunate for women because they are, more often than not, socialised to feel that STEM fields are beyond their reach.

> I think because engineering is mathematically based, it is assumed that men are smarter in technical areas like that than women. I think that is why we have more males than females in engineering" **(KII/Lecturer/Male/Engineering, Bowen University, August 2023)**

Numerous lecturers observed that a lot of students tend not make it to the final year because they do not satisfy the course requirements due to insufficient prerequisite due to poor background.

> I think because engineering is mathematically based, it is assumed that men are smarter in technical areas like that than women. I think that is why we have more males than females in engineering." "Mathematics, Physics and Chemistry in the secondary group at the time in the Essex class, most students are actually weak in these three courses, which is the foundation of engineering. And it's like if we are building something on the foundation that is very weak, there is no way there will not be a problem. So that's the major reason when they start in the 100 level, it will be very good, but

> because of that weak foundation. As that getting to the 200 level, 300 level, 400 level and then the level of, I mean, the level of complexity that courses is becoming high. They tend to have more problems, and that's where they tend to fall out **(KII, Lecturer/Male/Engineering, Ladoke Akintola University of Technology, September 2023).**

On the other hand, nursing was described as emotionally and physically demanding. The degree of exhaustion and fatigue is attributed to the intensity of clinical rotations, ongoing patient care responsibilities, and prolonged periods of study. Some participants noted that students tend to take up nursing as a result of parental pressure, only to later realise that the emotional toll exacted by the profession greatly surpasses what they had anticipated, resulting in attrition.

> "It is very interesting but stressful. There are a lot of presentations, assignments and so on, we do every semester. "**(IDI/Student/Female/Nursing, University of Ibadan August, 2023)**
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> "My experience in the courses of studying Nursing is that nursing is a rigorous activity." **(IDI/Student/Female/Nursing, Bowen University August, 2023).**
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> It's a caring profession, yes, and nurturing because you get to be with your patients, whether at home, whether in the community or other setting, so you get to be with your patients or with your clients, as the case may be most of the time in fact 24 seven because when one nurse comes another one takes over and like that. So, you spend more time with them, and because the female gender is known to be very caring by nature, we are seeing that. Well, looking at the history of nursing, actually, we see that some males were involved. But as time goes on, they were. I don't know if to say it's intentional that they just wipe out the male gender from that profession, so just to include the female, maybe because of the attributes, the attributes of females also and again, there are some procedures in nursing actually that will be that will seem dirty to males. Like a nurse is. A nurse is expected to give a bed bath to a patient, expected to dress wounds, feed, you know and do some other things, other procedures that may seem

> dirty to a male or that a male may not feel comfortable with, like being in a paediatric ward. Now a baby is crying, and at the same time. You want to feed the baby, or you want to give drugs to the baby? Definitely, you need to calm that baby. Or let me give another example, like you want to give an injection to a baby. Of course, you have to look for a way that the baby will accept taking that injection. So, it's known that a female is more suited for that kind of procedure or that kind of role. And that has been one of the major factors responsible for having more females than males in the profession"
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> **(KII/Lecturer/Female/Nursing, Bowen University August, 2023)**

This factor was revealed to be a contributing reason as to why most females tend to veer away from the challenging mathematics and science subjects that constitute engineering. A larger proportion of males compared to females seems to excel in mathematics, and mathematics serves as the foundational language of engineering. That explains the prevalence of males in engineering positions as compared to females.

Another respondent thinks that engineering, especially civil and electrical are physically taxing and females are not built for stress, which is why we have more males in engineering, which many times is not true:

> From time immemorial, engineering has been term to be a male dominated course probably because it is a physical course that you need to carry load, then do a lot of practical maybe electrical may not be physically tasking but civil engineering, building, and mechanical, all of those are physically tasking, so I think it is just socio economically assumed that women are not built for stress I think that is majorly why more males are expected to be here than females and which many times is not so.
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> **(KII/Sub-Dean/Female/Engineering, Bowen University August, 2023)**
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> The female sub dean of Engineering further explained that the number of females usually apply for engineering is very low compared to their male counterpart. She stated:
>
> …… low number of female students are admitted because the number of female students who actually apply is lower than the number of male

> students, and they are usually admitted, especially when qualified. I believe that the low number is based on the number of applications, it's not on our own side
>
> **(KII/Sub –Dean/Female/Engineering, Bowen University August, 2023).**

Gendered Perceptions

Research findings showed that deeply held gender norms contour career aspirations. Engineering was uniformly regarded as a masculine field, and nursing as predominantly feminine. Such perceptions were considered sociocultural and had adverse effects on students' confidence to pursue nontraditional careers. It was documented that gender discrimination persists in Nigeria's education system. Focus group participants noted that children in 21st century Nigeria were still being led—or in some cases forced—to make career decisions in line with positionality aligned with binary gender norms. Researchers advocated for education to be a means for self-identification, not a means for enforcing rigid societal constructs. The degree to which parents and educators imposed these gendered norms was deemed to need urgent policy intervention.

As noted in the provided data, the adherence to narrower stereotypes based on gender was one salient issue. Students and the teaching staff hold the view that engineering is an area of study reserved for men as it demands considerable physical and mental effort, extensive technical skills, and a sharp intellect. Nursing is viewed, in contrast, as a woman's occupation that mostly concentrates on caring and nurturing. These viewpoints arise from the socio-cultural frameworks that have persisted historically. Many respondents talked about biases they faced from their families, teachers, and the media.

This type of primary socialisation greatly shaped their perceptions of what professions they should realistically consider. For example, both male and female students observed that girls were almost never offered sufficient encouragement to pursue STEM during their early years. This is supported by Eccles' (1994) expectation-value theory, and later UNESCO (2021) reported findings where both women argued that self-defence interests and self-efficacy stemmed from harshly gendered early experiences. The impact of the gender biases children is raised with has an enormous impact in terms of students' enrolment and divided interests, extending well beyond the metaphorical scope. The mention of "negative, masculine culture" in engineering was the most cited reason for lack of attraction to the field.

A lecturer at Bowen University noted that:

> From time immemorial, engineering has been term to be a male dominated course probably because it is a physical course that you need to carry load, then do a lot of practical maybe electrical may not be physically tasking but civil, building, mechanical all of those are physically tasking, so I think it is just socio economically assumed that women are not built for stress I think that is majorly why more males are expected to be here than females and which is many times is not so.
>
> ***(*KII/Sub –Dean/Female/Engineering, Bowen University August*, 2023)***

The same can be said for the nursing profession, which still falls under traditional female occupations. This tends to block possible male entrants who, although skilled and empathetic, are underutilised due to caring roles. In this study, male nursing students cited social bias, judgment by their peers, and the lack of male role models as the primary reasons why they either were dissuaded from pursuing nursing or chose to leave the field after entering. This strengthens the claim that the nursing profession is still engulfed by gender stereotypical associations as being women's job regardless of good competencies offered by men.

> "Yes, for instance, as a man like me in nursing, people believe that nursing is basically for females, which is not true." **(IDI/Student/male/ Nursing, University of Ibadan August, 2023)**
>
> "Yes, most times, it is seen as an only-female profession. "
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> ***(*IDI/Student/female/ Nursing*, Bowen University August, 2023)***

Likewise, another respondent sees nursing as a caring profession which is peculiar to girls and ladies, which may lead to a low number of males in nursing. He further stated:

Well, in my own opinion, why we have a low number of males is because the male is furious that nursing is a caring profession, and they see caring as the responsibility of girls or ladies, you know, naturally, they believe that it is ladies who care for people. And so many times we have, many males don't want to come because they feel that, as they know, you know, they will believe that males are not saying that. And that is if you look at nature, that is very true, females are tender. But males, you know, they are restless, and you know, sort of that.

She further remarked that:

> But few people feel that, you know, nursing is meant for females, because they feel that it's a caring profession. And so, females are more caring, and they are more tender. There is a way they can, you know, touch you, or you feel, or you know, really, that is the way they can talk to you, which is not usually found in men, you know. And so, that's why we have most of the time linked this feminism with nursing. Okay, just because they feel that it's a key and females are more into caring professionals, more than males will do.
>
> **(KII/Sub-Dean/female/Nursing, University of Ibadan August, 2023)**

Most individuals integrate gender stereotypes into the field of nursing, segregating occupations as male or female. This line of thought considers nursing as a woman's profession and employs the unfounded criterion that caring is exclusively a feminine trait. Nursing consists of caring for the sick. Within the context of family structures, in a traditional nuclear family with a husband and wife, it is the wife who undertakes the caregiving activities. From history, we all know that Florence Nightingale was the founder of nursing. People may view nursing through a lens. This explains why many people consider nursing a profession primarily for females.

Masibo, Kibusi, and Masika (2024), along with Tong (2023), regarded nursing as a profession fraught with challenges for men, given its perceived caregiving roles as dominated by women. One part of the socio-cultural explanation provided further sheds light, denying some of the unwholesome experiences male caregivers have, particularly when they attend to female patients, as professionally enforcing insistences inviting harassment of a sexual nature. The view of gender relations within the society of the sciences and technologies is embedded and shaped by families, classmates, friends, peers, and a host of other socio-cultural influences.

Also corroborated with Childs (2021), who emphasised the impact of gender perception on participation within computing technology disciplines in the United Kingdom, mentioning sense of belonging, personal relevance of the career, and general attitude of the gender towards technology as key determinants. In the context of Nigeria, within the sciences and technology fields, the demographic composition shows characteristics of captivity segregation of educational enrolment, which has not attained any meaningful equilibrium, as opportunities in employment remained predominant for males since the occupations stem from educational qualifications and rank (Onwuere, Grice, & Kuipers, 2014).

Culture and Religion

In another perspective, three respondents were of the view that seeing more females in Nursing than males is more of **a stereotype and more of a cultural background and from a religious point of view**. One of them, who happened to be a sub-dean, stated respectively thus:

You know, traditionally. Nurses have been viewed as a female profession. Nursing, Mother and the rest like that, even from a religious perspective, the first set of nurses are female, and unfortunately, I'm a male anyway. So, it makes it interesting, that does not mean there are no males in nursing, but we are few. When you talk of a percentage, maybe less than 10 or 5% globally or something.

He further stated:

> But incidentally, when you talk of nursing leaders all over the world, they are more male than female. But so, I want to believe is the societal perspective that, is a feminine work is a woman that are more caring than a male. Gender stereotyping and they believe that, but the truth is that we have seen a lot of males who venture into nursing and have done great exploits for the profession, for themselves and for the nation. So, from my own, I think it is more of a stereotype and more of a cultural background and from a religious point of view.
>
> **(KII/Sub-Dean /Male/Nursing, Bowen University August, 2023)**

The third respondent saw it as more of a culture, caring or motherhood, which is seen as an issue related to nursing. Stated thus:

> Like you said, in my own opinion. So, I will say that one of the reasons is more of culture, because nursing is seen as caring. And caring has to do with motherhood, which is seen as an issue that relates to women. So, people believe that and it is seen by society as a female profession. So that if you see a man who is a nurse, they just look down on them. And ask, 'How can you be a nurse? **(KII/Lecturer/Female/Nursing, University of Ibadan August, 2023)**

The explanation provided by the lecturers regarding the lack of female participants in the STEM courses offered at the University aligns with that of Thelwall, Bailey, Tobin, and Bradshaw's

(2019) study on gender equity in education in Nigeria. The authors pointed out sociocultural factors as determinants of school enrolment. These adverse stereotypes alongside deep-rooted cultural norms continued to undermine the disparity between male and female enrolment in STEM in favour of males in this region of the country (Najib et al. 2019).

Ego and Traditional Gender Expectations

The research outcomes have elucidated that expectation plays a critical role as a deterrent. It was noted that female engineering students expected to experience social exclusion and gender-based prejudice, while male nursing students expressed fears of their masculinity being ridiculed. Such apprehensions were recorded to prevent willing students from following their passions in non-traditional fields.

Darling-Hammond et al (2020) shared that educational learning all over the world has accelerated in modern times. The gender gap within academics appears to be narrowing, which has led to an increased population and access to education, but there remains an underrepresentation in certain specialised fields (Bailey, Tobin and Bradshaw, 2019). They noted that men historically have dominated in what are considered masculine subjects and careers, while women have been dominant in what are perceived to be feminine subjects and professions. Take, for instance, mathematics and its scientific counterparts—physics and chemistry—which are regarded as masculine disciplines, whereas the arts and most commercial subjects are labelled as feminine.

The previous respondent also mentioned the ego. He revealed that people feel that males should be doctors while females should be nurses:

> You, a man, should always dominate. So, they feel that men should be doctors while women should be nurse so most of the men don't feel good applying to study nursing. In my university and even in other universities, their number has remained very low. If you, as a man, claim to be a Nurse, your fellow men and others will look down on you. They even would say, 'these have become like women. Even those who have an ego will do as if they're interested by making a mockery of them and say, 'I'm going into a female-dominated profession.'
>
> **(KII/lecturer/Male/ Nursing, University of Ibadan August, 2023)**.

While another respondent spoke on public opinion. He further said:

> When you are talking about the number of males, you know it is due to public opinion. So many people think Nursing is for females. So, many parents will not even advise their children, their wards, to choose Nursing. They would rather advise them to choose Medicine rather than Nursing. Some of them who are in nursing actually opted out for Medicine but because they were not taken, they just found themselves in Nursing. Not many of them actually wanted to become nurses. **(KII/lecturer/Male/Nursing, University of Ibadan August, 2023)**.

Also, a respondent revealed thus:

> Nursing throughout the world is known as a female program or female profession. Most of the time, people consider a man or a male that come into the nursing profession as a lazy person. Maybe the individual may not be capable of doing other work that are men oriented. You can always see that females are always more than males in the field. Also, when you see male in nursing, the community see them as doctors and even address them as doctors and so why if you are a female in the profession, they see you as a nurse and then most of our parents always determine the course their children would do, they dictate for their children and so parents normally choose nursing for their female children, attach nursing to female. Why do they attach other courses like engineering, Agriculture. Anything that deals with mathematics, they always attach it to the male individual
> **(KII/Lecturer/female/Nursing, Ladoke Akintola University of Technology, August, 2023)**

Socio-Economic factors

Research has shown that a variety of social factors impact one's professional choices. Family backgrounds, religious affiliations, and cultural traditions, for example, either promote or hinder the exploration of non-conventional professions. In Southwestern Nigeria, though, the informal and formal instructional communication from non-governmental organisations and educational institutions was found to reinforce narrow gender norms.

The research indicated there are notable socio-economic factors impacting career decisions. The high levels of youth unemployment in Nigeria, coupled with the widely observed "Japa" migration phenomenon, were cited as largely eclipsing the pursuit of one's vocation. While the study recognised the economically rational basis behind such decisions, it also questioned whether education was empowering students, hence raising moral dilemmas.

In the past, engineering was regarded as prestigious and well-compensated, making it particularly appealing to male students due to their societal conditioning as future providers. As the interviews revealed, male students also favoured engineering due to the high social status and income that came with it. On the other hand, nursing was increasingly chosen by female students, not only due to the resonance of caring and service values but also practical Considering the employment prospects available to nurses, both in Nigeria and internationally, several interviewees noted that the profession holds compelling advantages, particularly given current trends in the international migration of healthcare workers. This encapsulates the recent shifts in the global labour market, which indicate that jobs providing opportunities for emigration are increasingly available and desirable, regardless of the applicant's gender. Nevertheless, the enduring perception of the nursing profession as economically attractive is tempered by the persistent association of this field with women, which continues to deter male students.

> Nobody wants to be a liability, nobody wants to marry a liability, and it is a general belief, and I think it is also correct, is easier for a nurse to get a job in Nigeria and even almost everywhere in the world than maybe some other field of study. So, this is one of the reasons why you see many people want their children is most like most times female. To go into nursing so that after graduation, they can say, because there is a gross increase rate of unemployment now, but when it comes to nursing, the rate is still very low. So, because of the economic value, apart from getting employment, the Worth of the employment when you compare with other professions is still better. So, these are the things that I think people look at that we want them to make a choice, that I want to be a nurse or something. And another thing is the green, as I said, like I talked about the other time, is the green light outside Nigeria about it. Everybody wants to jump out, so to speak. Many people do not; everybody really wants to jump out, so they see that one of

> the easiest ways to go through the process and make it seamless and make it like guys to be a nurse. So, these are some socio-economic values and even in some families too
>
> **(KII/Sub-Dean/Male/Nursing, Bowen University August, 2023)**

Role Models and Mentorship Structures

The absence of non-conventional role models was underscored as a significant challenge. Su et al. (2021) and Bandura (1997) were referenced to show how the absence of female engineers and male nurses perpetuates the visibility of rigid gender roles. The study pointed out the more inclusive representation is essential to counteract stereotypes. The documentation conducted highlighted the gaps in the support systems within institutions and the associated high dropout rates. It was highlighted that numerous capable students abandoned programs because of insurmountable obstacles. The report recommended more comprehensive counselling services, mental health care, and appropriate financial aid, all while preserving the academic rigour. Participants emphasised that employability, economic opportunities, and migration pathways profoundly influenced their choices. Nursing was often referred to as a "Japa" profession, suggesting comparatively simpler pathways to emigration, while engineering was perceived as securing social prestige and financial gain within Nigeria. As noted earlier, the influence of parents was quite evident; girls were often encouraged to pursue nursing because it had abundant job prospects, while boys were directed toward engineering due to societal expectations related to status and income. These findings complement Raghuram (2008) and Ekpeyong (2023), who have pointed out that the educational decisions of students in developing countries are increasingly influenced by economic rationality and migration. Enfield (2019) further argues that socio-economic conditions may also intersect with and exacerbate gendered occupational norms.

Engineering students who are female noticed the absence of female faculty and teaching staff, while male nursing students observed the absence of role models and professional networks. The absence of gender diversity among faculty and mentors reinforced the perception that such fields are more conducive to one gender. Some students received outreach strategies with defined goals, such as school visits and career presentations tailored to disadvantaged groups, but described these efforts as sporadic and insufficient. It is clear that the absence of appropriate gender-sensitive strategies, such as routine school visits, active mentoring, teaching, and counter-stereotypical addresses about women and girls, perpetuates the examined enrolment gaps. These gaps also stem

from the absence of institutional frameworks intended to actively contest these biases, which explains why so little progress has been made in changing stereotypes despite the existence of some awareness initiatives.

> "I think female engineering role models should be promoted to inspire and mentor aspiring engineers." **(IDI/Student/Male/Engineering, BOWEN University August, 2023)**

A key factor is the lack of mentors and role models for male and female students in nursing and engineering. The participants emphasised that representation goes beyond visibility. Professional stagnation was noted as a barrier to students' professional imagination. Participants called for the active development of mentorship initiatives by universities and professional bodies. Students expressed sentiments related to social alienation and lack of identity-affirming figures. Female engineering students noted the lack of women in senior academic positions; male nursing students reported feeling stereotyped and uncomfortable. In addition, a lack of defined mentorship structures exacerbates the problem, leading to a lack of guidance and insufficient motivation. This aligns with Masters (2021) discussion about the influence of appropriate role models on students' perceptions of their possibilities in STEM, as well as Imasogie et al. (2018), who advocated for targeted mentorship and outreach initiatives aimed at school children to broaden participation from underrepresented groups in higher education.

> Traditional gender stereotypes may discourage ladies from pursuing STEM fields. Bias in educational and career guidance can also steer them away from engineering. Also, a shortage of female role models in engineering can make it less appealing to young people, when visibility of successful female engineers is crucial.
>
> **(KII/Lecturer/Male/Engineering, Ladoke Akintola University of Technology September, 2023)**
>
> I think female engineering role models should be promoted to inspire and mentor aspiring engineers. **(IDI/Student/Male/Engineering, Bowen University, August 2023)**

Institutional and Systemic Barriers

Finally, both disciplines remarked on barriers such as finances, inflexible sequence curricula, and leaving programs due to extraneous academic pressure. Self-imposed limitations were emphasised as a major factor where students perceived biological constraints. The research team explained how self-imposed restrictions have diminished Nigeria's talent pool and called for policy reforms to enable students to appreciate their potential capabilities.

The research concluded that systemic changes are needed to resolve disparities in enrolment. They identified inclusive pedagogical frameworks and gender-responsive career guidance as critical area shifts. It is striking that the study underscored the need for comprehensive institutional restructuring to mitigate the stereotype threats documented by Steele (1997) and Rosa and Clavero (2022), which negatively influence academic engagement and persistence.

Students in the engineering disciplines, particularly female students, remarked upon the absence of support provided to help students who were struggling, as well as the sheer volume of coursework. Nursing students talked about the stress of clinical training, as well as the significant stress associated with high-stakes testing, especially the 400-level licensure exams. Students from both sets of groups stressed the intersection of inadequate finances, the lack of appropriate scholarly and emotional scaffolding, and how these factors intensified the attrition or non-progression problem. These findings illustrate the ways socio-cultural realities shape, and in turn are shaped by, institutional policies that create profound barriers to educational access for students who gender-diversify their fields of study.

This illustrates that social roles and norms influence students' attitudes towards certain disciplines strongly. Many participants reported engineering to be a man's field because it demands physical endurance and technical know-how, while nursing is branded as a caring woman’s discipline. Such perceptions arise from traditional gender splits and are a product of teachers, parents, and society as a whole. Ekpeyong (2023) adapts this idea in the context of Nigeria, asserting that gender expectations are deeply rooted within the culture, stereotypes, and biases regarding gender roles. These observations align with the research done by De Welde and Stepnick (2023) alongside UNESCO (2021) concerning the influence of cultural constructs on the education system and the professional pathways people pursue. All these expectations inevitably violate students' rights to freely select disciplines.

As a critical barrier, especially for the non-traditional participants, respondents highlighted the educational and physical requirements of the respective programs. Respondents characterised engineering as a field requiring significant mastery of mathematics and considerable intellectual effort, while nursing was viewed as a physically demanding field due to extensive caregiving and requiring considerable emotion, owing to long hours. Such concerns create unofficial barriers for students, particularly when students do not conform to prevailing gender norms associated with the field of study. Commonly accepted norms suggest male students lack the requisite emotional competencies to pursue nursing, while female students are perceived as incapable of mastering advanced engineering and mathematics. These reinforce the arguments put forth by Su et al. (2009) and Kim (2020), which contend that these perceptions certainly lower the gender diversity within higher education and within particular fields of work.

> Lack of adequate financial resources to train the students for the lengthy final year training program required to certify an engineer.
>
> **(KII/Lecturer/Male/Engineering, University of Ibadan, September, 2023)**

A different respondent stated that:

> Early educational and outreach, financial aid, scholarship and awareness campaigns.
>
> **(KII/Lecturer/Male/Engineering, Ladoke Akintola University of Technology September, 2023)**

One participant further remarked that:

> In a school like ours, financial situation might be the reason, maybe when they started some students were able to pay but along the line they were unable to pay, so sometimes we have some students dropping or give suspension of study for one year and are not able to meet up with their mates but eventually they will do it but by the time they get to the final year it is not the same number of students that started in 100 level that will be in final class.
>
> **(KII/Lecturer/Male/Engineering, Bowen University August, 2023)**

In conclusion

In the above excerpts, it was revealed that institutional and systemic barriers, lack of role models and mentorship structures, socio-economic factors, ego and traditional gender expectations, culture and religion, and gendered perceptions were gender factors that led individual students, both males and females, in the choice of their career in engineering and nursing professions in Nigerian universities.

Recommendations

Further studies should be conducted on these two professional bodies across different universities in the six geopolitical zones of the country to obtain more comprehensive findings. Counselling units should be established by the government and university authorities to guide students in their choice of careers. Both the government and university authorities should promote gender balance in the two professions through the implementation of strong educational policies.

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