



COUNSELLING AS A PANACEA FOR RESOLVING THE CAUSES OF GENDER IMBALANCE IN STUDENT ENROLMENT IN ENGINEERING TECHNOLOGY PROGRAMME

Eunice Nnenna Eze,¹ Mercy Ifeoma Uba,¹ Chinyere O. Elom¹, and Gloria O Okorie².

¹Department of Guidance and Counselling, Faculty of Education

²Academic Staff Matters Unit

Alex Ekwueme Federal University, Ndufu-Alike, Ebonyi State, Nigeria

Abstract

The study investigated the place of counselling in resolving the causes of gender imbalance in students' enrollment in engineering technology in the era of emerging technology at Alex Ekwueme Federal University Ndufu-Alike Ikwo (AE-FUNAI). The study adopted a qualitative design. Purposive sampling procedures were used to select 25 students from the Faculty of Engineering Technology, faculty officers, and the admission office in (AE-FUNAI), Ebonyi State, Nigeria. Data were collected through personal interviews, enrollment records, and a semi-structured questionnaire. The findings of the study showed that there is a gender imbalance in students' enrollment in Engineering Technology in favour of males due to lack/insufficiency of competent science teachers in secondary schools, lack of school counsellors, lack of technological awareness, etc. The study recommended employing sound, qualified, competent, and effective science teachers and school counsellors in all secondary schools, creating technological awareness through orientations, seminars and training, and introducing artificial intelligence that will technologically assist the students, especially female students, to appreciate emerging technologies, and awarding scholarships to all female students who wish to study engineering technology in the universities.

Keywords: Gender, Gender Imbalance, Students Enrolment, Counselling.

Introduction

The world is driven by various forms of emerging technology for optimal development. Presently, educators and researchers are focusing on various methods of improving teaching and learning in different learning environments. Lots of novel ideas are welcomed in the fields of engineering, architecture, education, etc., as there is an emergence of new ideas, skills, and methods for improved pedagogy.

There is a growing interest around the globe in the emergence of new technologies in various fields of human endeavour, not only in teaching and learning. Evidence from previous research by Rotolo et al. (2015) revealed that emerging technologies have been the subject of much debate in academic research and a central topic in policy discussions and initiatives. The technologies that were not there in the last three decades which emerged include innovations in areas like artificial intelligence, biotechnology, and the Internet of Things.

As suggested by Rotolo et al. (2015), approaches to the detection and analysis of emergence tend to differ greatly even with the use of the same or similar methods. In teaching and learning, introducing new technologies aimed toward improving processes in an all-encompassing manner is strongly advocated to meet internationally accepted learning standards. In modern contemporary society, parents aspire to provide the best gift of sound education to their children in this era of emerging technologies, aiming to endow them with the knowledge and skills required for better living. The right to education is a fundamental human right. This comprehensive educational privilege is supposed to be afforded to the child from primary school, through secondary school, and into higher institutions of learning, including the university, as stated by Agwu (2014). Enrollment in university education, which empowers beneficiaries and entrusts them with the privileged opportunity to acquire knowledge, wisdom, and abilities to cope with life demands, should be available to both genders. Knowledge to meet the demands of advancing technology should ensure gender equality.

Gender has been defined in various ways by many experts. According to Omoregie and Ihensekien (2009), gender refers to society's division of humanity, based on sex, into two distinctive categories – males and females, encompassing norms, behaviours, and roles associated with being a woman, man, girl, or boy, as well as relationships with each other. Gender is defined as the social characteristics attributed to men and women, such as roles, norms, values, attitudes, and relationships of interaction between men and women in society. In a previous research study (Mumuni, 2000), it was suggested that sexual stereotypes are based along the lines of gender roles, viewing men as tough, aggressive, competitive, hardworking, and independent. Women, on the other hand, are characterized as emotional, sensitive, soft, nurturing, family-oriented, and more interested in people and ideas. Females are 'better at rapport talk,' aiding them in creating connections and negotiating relationships,

while males are more 'proficient in report talk.' This assertion reflects gender roles in the choice of students in various disciplines at the university level, with males predominantly enrolling in "tough and demanding" courses, while females enrol more in courses that promote human interaction and relationships (Eze, 2019).

Within the context of this research work, gender was discussed based on the marginalization of female students' enrollment in engineering technology at the university. The researchers referred to this as gender imbalance, a social phenomenon where people are not treated equally based on their gender. It manifests as unjust behaviour or insights of people based on gender, resulting in an unequal representation of males and females in various fields of human endeavour. In educational settings, gender imbalance can best describe the discrimination of individuals based on their gender in terms of admission preferences and choice of discipline. The United Nations Girls' Education Initiative (UNICEF, 2001) reported that two-thirds of the world's population without access to schooling were women and girls, totalling an estimated 142 million females worldwide. Since education has the unique ability to promote social change and personal well-being for both men and women in this era of emerging technology, initiatives should be put in place to improve access for more female enrollment in universities, especially in the fields of engineering technology.

A nation can move forward to greater development when its citizens, especially females (women), are educated. This is consistent with research by Nussbaum (2003), who stated that the rapid socio-economic development of a nation depends on the type of women educated within it. Additionally, research by Esia-Donkoh (2014) noted that women's participation in education is one of the determining factors for achieving the developmental goals of any society. This means that no nation can be fully developed when the education of its females is relegated to the background. Veletsianos (2016) noted that in some countries, limited progress has been made in sending children, many of whom are girls, to

school, with girls from poor households being one of the groups most at risk of never attending school. In 2006, in Pakistan, 60% of children not in school were girls, while only 12% of poor Hausa girls in Nigeria went to school. The odds of attending school are not in favour of girls from poor households (Engendering Empowerment: Education and Equality, 2010). This scenario contradicts the Education 2030 agenda, which states that gender equality requires an approach ensuring that girls and boys, women and men, not only gain access to and complete educational cycles but are empowered equally in and through education. To close the gender gap in education and promote access to gender-balanced education, the United Nations Millennium Goals Summit in 2000 responded to the shortcomings of the access approach by setting two-millennium Goals addressing the lack of equality and empowerment in girls' education (UNESCO, 2021). Empowering girls through balanced quality education is a driving force toward the growth and development of the country.

It is worth noting that more girls have enrolled in education presently, but in some countries, despite the efforts of the United Nations to achieve equality in education for all, gender balance in educational enrollment has been overlooked. For instance, in countries like Mali, Burkina Faso, Niger, Pakistan, Chad, Yemen, Ethiopia, and others, the gender gap in favour of boys is wide (Aikman & Unterhalter, 2007). As Ijaiya and Balogun (2009) noted, the issue of gender imbalance or inequality in education is far more prominent in less developed countries, including Nigeria, where several studies have shown that under the guise of religion and tradition, men discriminate against women, thus denying them access to skills and education for useful activities. Girls have been discriminated against in various aspects, including education, compared to their male counterparts (Aikman & Unterhalter, 2007). Records of student enrollment in Nigerian universities in the past were generally in favour of male students, who had more access to educational opportunities and dominated educational institutions. This assertion aligns with the views of Omoregie and

Ihenksekhen (2009), who stated that Nigerian women and their counterparts in other African countries have been debased and dishonoured by the belief that every woman is supposed to consider motherhood as the principal purpose of her existence. As they noted, women are expected to produce children, cook, perform all domestic chores, and be subordinate to male authority. Meanwhile, in some communities, female children are not sent to school like their male counterparts due to erroneous cultural beliefs that sending girls to school will interfere with their marriage, which they consider the primary mission of a female child (Omoregie & Ihenksekhen, 2009). To resolve this perennial injustice against the female gender, counselling is needed.

Counselling provides room for resourcefulness, creativity, and dynamism. It is a process concerned with assisting people to achieve their goals (Ekennia, 2014). Counseling is offered to individuals who are undergoing problems and need professional help to overcome them. Thus, counselling is important because it aims to help individuals understand themselves and their world better, contributing highly to success in every working environment (Agwu, 2014). The relevance of counselling in every facet of life is evident in the National Policy of Education (2008), which states that counselling is a systematic process that emphasizes helping individuals to understand themselves and achieve self-direction. In this research, counselling refers to the assistance rendered to students and university management to encourage more or equal female students' enrollment in engineering technology to grow in tandem with global emerging technologies. Counselling has been useful in assisting different persons in the areas of career, vocational, and personal-social needs. The career counselling needs of students fortify them to meet the fast-growing career-related information necessary to adapt to technological advancements. According to Eze (2012), career counselling helps students understand to update themselves through seminars, reorientations, workshops, and conferences to fit in with job requirements in a technological economy. Obidoa and Ifelunni (2010) stated that

counselling aims to assist the individual in understanding himself and his environment, to make and carry out decisions and plans that hold the potential for achieving satisfactory life goals. This implies that counselling is needed for the optimal and all-round development of students, especially females, to make them well-adjusted and function effectively in a technologically advancing society.

Previous studies (Fajonyomi et al., 2017; Fapohunda, 2011; Ijaiya & Balogun, 2009) have conducted various empirical studies on gender issues, however, no known research has been done at Alex Ekwueme Federal University, Ndufu-Alike (AE-FUNAI) on the issue of gender imbalance in students' enrollment. The focus of this study is on how counselling can offer a realistic solution to the causes of gender imbalance in students' enrollment in Engineering Technology at AE-FUNAI. Therefore, this study may likely be the first to target the gender of students in enrollment in Engineering Technology as a population of its own in the university (AE-FUNAI). A study on the role of counselling in resolving the causes of gender imbalance in students' enrollment in engineering technology in the era of emerging technologies will go a long way to identify the major causes of female underrepresentation in the fields of engineering technology and offer realistic solutions to resolving those challenges. This is the gap that this study aims to fill. This study is therefore relevant due to the massive underrepresentation of female students in various areas of specialization (Mechanical, Chemical, Civil, Electrical/Electronics, etc.) in Engineering Technology at AE-FUNAI, hence the need to encourage equal gender enrollment in the university for sustainable development in the era of emerging technology. The key objective is to investigate how counselling might bring realistic and functional recommendations that will encourage equal gender representation in enrollment in Engineering Technology. The study examines issues such as employing competent science teachers at secondary school levels, ensuring that all schools have professional counsellors, creating technological awareness, and awarding interested students in

fields of technology. The following research questions were formulated to guide the study:

Research Question 1: How can the effective teaching of science courses help students in making career choices in the fields of Engineering technology to lead to a balanced gender representation in such fields?

Research Question 2: How can counselling help the key players in the admission of students to ensure equal gender representation in the enrollment of students in Engineering Technology?

Theoretical Underpinning

Solution Focused Brief Therapy (SFBT) propounded by Insoo Kim Berg and Steve DeShazer in the 1970s (Eze, 2019) underpinned this study. Solution-Focused Brief Therapy can be used to explain how the emergence of technologies can provide a realistic solution to challenges of gender imbalance in students' enrollment in Engineering Technology at universities. The basic thrust of Solution-Focused Brief Therapy is to find a solution to an existing challenge. Therefore, it is centred on strategizing a solution to a present problem, not on how or why the problem came about. Solution-Focused Brief Therapy is relevant to this study because it employs psychological therapies that can be used to demystify irrational beliefs about a concept. The essence of SFBT is to re-awaken the need for counselling for students at the level of making career choices. Counselling students at this level will motivate and encourage more females to enrol in Engineering Technology, thus growing in tandem with the dynamic technological era. The use of SFBT by counsellors in the university will also re-awaken the need for gender consciousness by admission officers in admitting students.

Methodology

This research work is a qualitative design. As previous research (Uwakwe et al., 2021) suggested, the qualitative research method is largely an investigative process where the researcher makes sense of a phenomenon under study. The motive for adopting a qualitative approach assumes that it

allows participants the opportunity to freely share their views on the subject matter (Creswell, 2015). According to Okolie (2020), the qualitative approach enables researchers to explore data more thoroughly by allowing careful interactions with participants. Insights from qualitative research enable researchers to capture a rich and comprehensive image of a situation and allow the participants to provide more detail about their experiences. It involves collecting and analyzing data like audio-visual, audio and records to assist in understanding a concept or experience. The research was carried out at Alex Ekwueme Federal University (AE-FUNAI). The target participants for the study consist of all students from the Faculty of Engineering. The purposive and convenient sampling techniques were used to select 25 students who participated in the study (e.g., Okolie et al., 2020). The selection process was carried out in two folds. The first part was the selection of students from the Faculty of Engineering Technology. The choice of these students is based on the fact that they are found within the field of Engineering Technology where the females are in the minority. The researchers explained the essence of the interview to the students individually to enable them to feel free to cooperate in the interview. The students were also assured of good use of their positive responses towards students' enrolment in the University. A total of ten students were interviewed in the course of the study, two students from each of the five departments (Mechanical, Mechatronics, Electrical/Electronics, Civil and Chemical engineering) in the Faculty of Engineering Technology were interviewed.

The second part of the interview was the Faculty officer of Engineering Technology and the University admission officer. The essence of the research was explained to them individually before they were interviewed to know the exact number of students admitted and the exact number of students who are enrolment in engineering courses based on their gender. The need to encourage equal representation of male and female students in engineering technology in the era of emerging technology necessitated the study and thus

makes it relevant for improved technological development of the nation.

Data Collection: A previous research (Anthony & Mpine, 2018), showed that the data collection process aimed to elicit a complete description of a participant's experience. Data for the Qualitative research study were collected through face-to-face interviews with the selected participants. This includes one-on-one (personal) interviews and discussions with five undergraduate students from the Faculty of Engineering Technology. Interviews yield detailed information about the participants' experiences and allow for spontaneous responses to reveal the natural feelings, behaviours and attitudes of the participants. The researchers sought for permission and consent from the participants and used professional interviewing skills while conducting the interviews. They also sought the participants' permission to record all conversations on an audiotape. Participants were interviewed face-to-face at a convenient time and place (Wengraf, 2001). Each interview started with the interviewer's introduction to set out the aims of the study. Examples of questions asked during the interviews were as follows: "Do you think that there is equal representation of male and female students in your class?", "What factors do you feel are the cause of gender under-representation in your class?", "Do you think that counselling students can influence their choice in studying Engineering Technology?", and "What do you recommend should be done to resolve this issue of gender imbalance in enrolment in Engineering Technology in the University?"

The face-to-face interviews lasted between 30 minutes to 50 minutes on average. The second phase of data collection was the use of a questionnaire. A semi-structured questionnaire constructed by the researchers was also used to collect data from the remaining 15 undergraduate students of the Faculty of Engineering Technology selected to participate in this study (Offor, 2013). The questionnaire was designed in two parts; Part A and B. Part A comprised the personal information of the participants like name, age, programme, level, and gender while Part B consisted of a series of

questions that reflected participants' feelings, reasons and possible solution to the issue of gender imbalance in engineering Technology. The last phase of data collection was the collection of numerical students' data from the Faculty officer's office records and admission office records in AE-FUNAI. Ethical principles were complied with to protect the rights, safety and respect for the dignity of all participants (Bryman & Bell, 2007). The researchers also applied the following ethical principles, respect for personal autonomy, the principle of voluntary participation in research, avoiding deception or exaggeration of the aims and objectives of the research, informed consent of participants, the principle of justice, privacy and anonymity as proposed by (Saunders 2012). Based on this premise, the researchers underwent ethical conduct as informed consent was obtained verbally from students before the commencement of the study.

To ensure the production of the highest quality data, the researchers utilized recorded data that were transcribed verbatim. These data were analyzed using a thematic data analysis method. Thematic analysis procedures were followed, which included reviewing the themes, defining and naming the themes, and producing the report, among other steps.

Findings

From the thematic analysis, four main themes were identified:

Theme 1: Effective Approach to Teaching of Sciences. This theme addresses how the effective teaching of science courses in secondary schools can motivate and encourage students to develop an interest in studying science courses such as engineering technology.

Theme 2: Compulsory Counseling Services. This theme addresses how making counselling services compulsory at all levels of learning can assist in redirecting students towards building interest in engineering courses.

Theme 3: Technological Awareness Through Orientation Training. This theme is concerned with various ways of creating awareness of emerging technologies through

orientation, workshops, seminars, and in-service training for science teachers.

Theme 4: Awarding Scholarships. This theme addresses how awarding scholarships, tuition-free education, and bursary allowances to all females who desire to study any course in engineering technology can help encourage more females to study Engineering Technology.

Theme 1: Effective Approach to Teaching Sciences.

The findings of this study highlight the necessity for effective teaching approaches to science courses, starting from secondary schools. The use of poor teaching methods and unqualified teachers in many private schools and schools in rural areas discourages students from pursuing sciences, which subsequently diminishes interest in courses like engineering technology. Some incompetent teachers present sciences as too challenging, leading students, especially girls, to avoid science classes altogether. One participant recalled an experience with a teacher who couldn't explain basic concepts, leaving students disheartened: *"I was devastated when I had teachers who only read textbooks in class without being able to explain basic concepts. Some teachers scare students away from sciences because of how they present the courses. Many students, especially girls, avoided science classes... It's not possible for a student who dislikes a basic requirement to excel in such a course."*

Further investigation revealed a total lack of science teachers in many rural secondary schools. Interested students often seek help from anyone available or undergraduates visiting the village, as schools lack basic facilities like laboratories and instruments for practical learning. One participant lamented:

"I attended a school with no permanent science teacher, laboratories, or science equipment. It seems no one cares about providing these things. I used to believe that only students in unity schools were taught sciences and were better off in science-related courses at university. Many female students in my class ended up quitting after O' levels and getting married

instead of dealing with unattractive learning experiences."

These participants' views align with the assertion by Omoregie and Ihensekhien (2009), that sending girls to school interferes with their marriage, considered the primary mission of a female child. Poor teaching of sciences in secondary schools has been a significant reason many girls lose interest in science-related courses, including engineering technology. Many end their education after secondary school and opt for marriage, as culture or tradition dictates.

Participants also highlighted that despite how sciences are taught, many female students perceive them as tough and demanding, preferring courses in arts and education. Some remarked:

"Girls are afraid of challenging courses like those in Engineering Technology. They feel arts and Humanities, especially in Education, are easier and more suited to them, being softer and less demanding." "Some girls, especially those from poor backgrounds or rural areas, are ignorant of what science and technology entail and naturally avoid them."

This aligns with Eze's (2019) observation that males tend to enrol in "tough and demanding" courses while females prefer courses that emphasize human interaction and relationships. The theoretical framework underpinning this study suggests that the solution to the challenge of female underrepresentation in engineering technology courses should begin in secondary schools. Developing interest in science among female students should involve ensuring effective teaching of sciences by employing qualified permanent teachers and providing necessary infrastructural facilities.

Theme 2: Compulsory Counselling Services:

Participants affirmed the great need for counsellors to guide students in making career choices. Adequate career-related advice and counselling can significantly impact an individual's career orientation. Counsellors can help demystify erroneous impressions some students have about pursuing sciences, starting from secondary school where they make their career choices. Participants expressed

confidence that having counsellors in schools would be beneficial for the nation, assisting many students in navigating the right career paths, especially in this era of emerging technology. Some participants lamented the lack of counsellors to direct students when choosing subjects, stating:

"I wish we had counsellors who could guide us and help us discover our hidden talents. We would have been in a better position to make choices, especially some of my classmates who succumbed to fears due to the way science subjects were presented by teachers." "I believe counsellors would assist students by informing the government about the issues of insufficient teachers and lack of functional laboratories in our schools. When these facilities are put in place and science teachers are employed, more students will be motivated to study sciences and engineering courses."

Many participants emphasized the strong need for school guidance counsellors in all schools to start early in harnessing the talents and interests of each student towards making the right choices. They also acknowledged the need to build students' interest in sciences by encouraging them and dispelling erroneous cultural beliefs about certain courses like engineering, which some perceive as difficult for females. However, some participants still believe that engineering courses are best suited for males, with one stating:

"Well, the truth is that females and their makeup are not necessarily fit for engineering work. I prefer a man as an Engineer to a woman. Men are mostly valued as Engineers in Nigerian society."

This assertion aligns with Omoregie and Ihensekhien (2009), noting that Nigerian women and their counterparts in other African countries have been debased and dishonoured by the notion that every woman is primarily meant for motherhood and domestic chores. These traditional attitudes about the status and role of women pose obstacles to females fully participating in and benefiting from education. The gender imbalance in enrollment needs to be addressed through counselling, starting with counselling parents at the grassroots to address the home environment's influence on a girl

child's career choice. Families and schools, as major agents of socialization, should collectively provide and instill high technological values in female children. Counsellors should fulfil their professional roles by using cognitive restructuring therapy to reshape the psyche of marginalized genders, aiming to modify their thinking and reasoning towards better educational opportunities and restore the lost dignity of the female gender.

Theme 3: Technological Career Awareness Programs

Participants emphasized the importance of involvement from various stakeholders, including the government, university management, policymakers, and philanthropists, in providing technological career awareness programs. These programs aim to help students develop an interest in pursuing careers in engineering technology and reduce gender imbalance in enrollment. Career training sessions on emerging technological fields, career conventions, orientations, seminars, and workshops for secondary school students were suggested as means to achieve this goal. However, many schools lack the financial capacity to organize such activities, hindering students' exposure to recent technological advancements and the need for technological courses. Participants expressed the need for technological career awareness, stating:

"In my secondary school days, we lacked career awareness, which greatly affected many students' exposure to available technological programs. We did not know artificial intelligence and technologically assisted learning. Schools, including the university, should start training students in these areas to encourage more girls to pursue engineering technology courses."

Regarding solutions for achieving equal gender representation in engineering technology courses, participants suggested:

"Providing free career training in emerging technology areas like artificial intelligence and technologically assisted learning will help students keep pace with global technological advancements." "Conducting seminars in the university to motivate students to encourage their

female siblings and relatives to study engineering technology courses."

The Faculty Officer highlighted the lower number of female students and proposed expanding technological awareness seminars to host communities and all rural communities in the state to encourage more students and parents to consider enrolling females in technological courses.

Participants stressed the need for the government and well-meaning individuals to provide functional internet facilities in schools to facilitate technologically assisted learning. This initiative would expose students to various emerging technologies, thereby fostering interest in these fields.

Theme 4: Awarding Scholarships

Building on the principles of Solution-Focused Brief Therapy (SFBT), the study emphasizes providing realistic solutions to the challenges of gender imbalance in students' enrollment in Engineering Technology at universities. Participants strongly advocated for encouraging more students, especially females, to pursue engineering technological courses through scholarship awards. They expressed the need for government and philanthropists to declare scholarship awards, tuition-free education, and bursary allowances for all females interested in studying engineering technology, seeing it as a significant motivation:

"I believe that the government and philanthropists should offer scholarship awards, tuition-free education, and bursary allowances to all females interested in engineering technology. This will greatly motivate them."

"Considering the harsh economic realities, universities should lead the drive to increase female participation in engineering technology by providing free tuition and accommodation. Admission quotas should also be made equal for both genders."

Participants also suggested that introducing technological gadgets in schools could serve as a call to reawaken technological consciousness among females. This recommendation aligns with the views of Esia-Donkoh (2014), who emphasized that women's participation in

education is crucial for achieving societal developmental goals. Encouraging more females to study engineering technology would contribute to Nigeria's technological advancement and provide greater opportunities for them in the global technological landscape.

In summary, participants believed that awarding scholarships to female students would correct the misconception that engineering courses are only suitable for males and would better position their mindset for self-development in line with global emerging technology dynamics. Drawing on Solution-Focused Brief Therapy principles, awarding scholarships, especially to less privileged candidates, would address the gender

underrepresentation of female students in engineering technology. Interviews with the Faculty Officer of Engineering and Technology regarding student enrollment in the programs revealed a significant underrepresentation of female students in the faculty, as presented in Table 1. The Table presents a comparative analysis of male and female enrollment in Engineering Technology Courses at AE-FUNAI from the academic sessions of 2016/2017 to 2021/2022. A critical examination of student enrollment by gender reveals a notable disparity, with male enrollment consistently outnumbering female enrollment.

Table 1 Enrolment Records of the Faculty of Engineering Technology from the 2016 – 2022 session

SESSIONS	MALE	FEMALE	TOTAL	MALE %	FEMALE %	REMARKS	
1	2016/2017	284	33	317	89.6	10.4	More Males
2	2017/2018	258	30	288	89.6	10.4	More Males
3	2018/2019	319	24	343	93.0	7.0	More Males
4	2019/2020	286	25	311	91.7	8.03	More Males
5	2020/2021	247	35	282	87.6	12.4	More Males
6	2021/2022	320	28	348	89.6	10.4	More Males

Source: Students Matriculation Register, Faculty of Engineering (AE-FUNAI).

The Table indicates a pattern of female underrepresentation in Engineering Technology courses. In the 2016/2017 session, male enrollment accounted for 89.6% while female enrollment stood at 10.4%. Similarly, in the 2017/2018 session, male enrollment was 89.6% compared to 10.4% for females. This trend continued in subsequent sessions, with 93% males and 7% females in the 2018/2019 session, 91.7% males and 8.03% females in the 2019/2020 session, 87.6% males and 12.4% females in the 2020/2021 session, and 89.6% males and 10.4% females in the 2021/2022 session. These statistics align with a report from UNESCO's Gender Equality Action Plan (2014 - 2019, 2021 revised), which highlights a significant underrepresentation of females in Science, Technology, Engineering, and Mathematics (STEM) fields globally. The

report indicates that less than a quarter of STEM students are female, and only around 30% of new enrollments in bachelor's degrees in STEM fields are women.

The persistent poor enrollment of female students in engineering technology, particularly in this era of rapid digital and technological advancement, underscores the urgent need for action to demystify and address the underlying causes of this gender disparity.

Discussion and Conclusion

The exploration of the four themes revealed a consensus among participants regarding the need for effective strategies to encourage female enrollment in engineering technology. Effective teaching of science courses in secondary schools was identified as crucial in fostering interest in engineering

among students. Additionally, the presence of competent guidance counsellors in schools was highlighted as essential for guiding students in making informed career choices, thereby potentially increasing female representation in engineering courses. Furthermore, participants emphasized the importance of creating technological awareness through various initiatives such as seminars, workshops, and career conventions to address the gender imbalance in enrollment (Nussbaum, 2003; Esia-Donkoh, 2014). The findings of the study align with Solution Focused Brief Therapy, which emphasizes finding realistic solutions to existing challenges. The emphasis on quality teaching, technological awareness, and guidance counselling resonates with the principles of this therapeutic approach. The study also identified various factors contributing to the low enrollment of females in engineering, including societal expectations, cultural barriers, and limited exposure to technological advancements. The study concludes that effective teaching methods, guidance counselling services, and technological awareness initiatives are essential in addressing the gender imbalance in engineering technology enrollment (Adikwu 2014). Recommendations include government support for scholarships and bursaries to encourage female enrollment, as well as the provision of counselling services in all schools. Additionally, efforts should be made to abolish cultural practices that hinder female education and ensure equal representation of male and female students in university admissions.

Limitations and Implications for Further Studies

While this study provides valuable insights, its findings are limited to AE-FUNAI and may not be generalized to other universities. Future research could include larger and more representative samples to allow for broader generalizations. Comparative studies across various academic settings and disciplines could provide a more comprehensive understanding of gender issues in education. Additionally, further exploration of gender issues in emerging technologies and

other disciplines within universities could be pursued in future studies.

References

- Abraham, S. F. (2021). Mixed methods Templates. Nova Southeastern University Florida, U.S.A. [http://www.fischlerschool.nova.edu/applied-research/procedures and resources](http://www.fischlerschool.nova.edu/applied-research/procedures-and-resources).
- Adikwu, V. O. (2014). Family factors as predictors of Academic achievement motivation among Secondary Schools students in North Central zone of Nigeria. Unpublished Ph.D. Thesis, Department of Educational Foundations, University of Nigeria, Nsukka.
- Agwu, S. J. A. (2014). Management of University Education in Nigeria. Calabar, UNICAL press.
- Aikman, S., & Unterhalter, E. (2007). Practicing Gender Equality in Education (pp. 1-130). Retrieved online from www.researchgate.net on June 1, 2023.
- Anthony, K. I., & Mpine, M. (2018). Phenomenological Analysis of the Lived Experiences of Academics who Participated in the Professional Development Programme at an Open Distance Learning (ODL) University in South Africa. *Indo-pacific Journal of Phenomenology*, 18(1), 1-15.
- Bryman, A., & Bell, E. (2007). *Business Research Methods* (2nd ed.). Oxford University. Retrieved online on June 4, 2020, from www.research-methodology.net.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). thousand oaks, ca: sage.
- Ekennia, C. C. (2014). A handbook of counselling psychology, organization and administration. Owerri: Barloz Publishers.
- Esia-Donkoh, K. (2014). Child rearing practices among student-mothers. *Society & Biology & Human Affairs*, 78(1&2), 20–38. Retrieved from <https://www.researchgate.net/publication/281117729->

- [Childrearing practices among students' mother at University of Cape Coast Ghana.](#)
- Eze, E. N. (2019). Counselling needs and Leadership styles of Administrators as predictors of Corporate peace in the Universities in South East Nigeria. Unpublished Ph.D. Thesis, Department of Educational Foundations, University of Nigeria Nsukka.
- Fajonyomi, M. G., Ogungbade, O. K., & Bolu-Steve, F. N. (2017). Gender imbalance in Leadership positions in the University of Ilorin: Implications for Counselling. *The Counsellor*, 36(1), 1–14. published by Counselling Association of Nigeria.
- Fapohunda, T. M. (2011). Empowering women through higher education in Nigeria. *European Journal of Humanities and Social Sciences*, 9(1), 389–406.
- Ijaiya, T. G., & Balogun, I. O. (2009). Estimating the Impact of Gender Inequality in Education on the wellbeing of women in Nigeria. Kolhapur: Serials Publications.
- Mumuni, B. Y. (2000). Factors influencing female enrollment in educational institutions in Ghana. A case study West Mamprusi District in Northern Region of Ghana. Unpublished M.Phil. Thesis, Cape Coast: University of Cape Coast.
- Nussbaum, M. (2003). Women's education: A global challenge sign. *Journal of Women in Culture and Society*, 29(2), 325–355.
- Obidoa, M. A., & Ifelunni, I. C. S. (2010). *Counselling Youths in Contemporary Nigeria*. Nsukka: Chuka Educational Publishers.
- Offor, E. I. D. (2013). Research process: A sure way of maintaining standard in education. *International journal of Education and Research*, 1(4).
- Okolie, U. C., Nwajiuba, A. C., Eneje, B., Binuomete, O. M., Ehiobuche, C., & Polay, H. D. (2020). A critical perspective on industry involvement in higher education learning: Enhancing graduates' knowledge and skills for job creation in Nigeria. *Industry and Higher Education*, 35(1), 61–72.
- Omoregie, N., & Ihensekhien, A. (2009). Persistent gender inequality in Nigerian Education. Retrieved online on April 30, 2023, from <https://www.researchgate.publications>.
- Rotolo, D., Hicks, D., & Martin, B. R. (2015). *What is an Emerging Technology?* University of Cambridge, Cambridge, United Kingdom.
- Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research Methods for Business Students* (6th ed.). Pearson Education Limited. Retrieved online from www.research-methodology.net.
- UNESCO. (2021). Education for Girls: Gender parity challenge of Education for All Goal.
- UNICEF. (2001). *Children and women rights in Nigeria, A wake-up call (Situation Assessment and Analysis)*. Abuja, Nigeria: National Planning Commission and UNICEF.
- Veletsianos, G. (2016). *Emergence and Innovation in Digital Learning: Foundations and Application*. Retrieved online from <http://www.education.gov.scot/resources/emerging-technology>.
- Wengraf, T. (2001). *Qualitative Research Interviewing: Biographic Narrative and Semi-Structured Methods*. London: SAGE.
- Uwakwe, C. R., Mercy, N. O., Elom, O. C., Uba, M. B. I., Solomon, O. A. O., Chikwendu, U., Francis, A. O., & Eze, E. N. (2021). Academic challenges of student mothers in tertiary education: Implications for inclusiveness and counselling. *Turkish Online Journal of Qualitative Inquiry*, 12(9), 2509–2521.