

Influence of Inspiring Girls Now In Technology Evolution (IGNITE) in Gender equality in Science, Technology, and Mathematics (STEM) Education in Nigeria

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Abstract

This study explored the roles of Inspiring Girls Now in Technology Evolution (IGNITE) in gender equality, through promoting the participation of girls and developing their interest in science, technology, engineering, and mathematics (STEM) education in Nigeria. IGNITE, a nonprofit, is a network of girls and women who inspire and teach each other. The study adopted both descriptive and survey designed method of quantitative paradigm. 200 school girls and 40 female teachers from 20 senior secondary schools in Katsina and Ilorin, of Katsina and Kwara State respectively were sampled, adopting proportional random sampling procedure. A twelve (12) test items with four-Likert summative scale of ‘Excellent Impart (EI); Good Impart (GI); Fair Impart (FI); and No Impart (NI). Descriptive statistical tools were employed and data were analysed using mean and standard deviation. The paper aims to encourage the girls to pursue careers in STEM, to bridging the gender gap, promoting diversity and inclusion, and in providing networking for girls and women in STEM fields. The findings revealed that IGNITE, through its organized programs, it creates powerful networks of support for women at their place of workplace, its community volunteerism supports share values of diversity and inclusion, it inspires girls to pursue STEM subjects with their friends. It removes barriers facing girls of color so they can see themselves represented in STEM, and it advocates initiatives to close gender gap in STEM Education. The study recommends that mentorship programs where female students can connect with female STEM experts be promoted, to draw a robust curriculum in the teaching of coding and other technology skills, focusing on how STEM experts make an impact on the world, and gender biases attached to mathematics be de-emphasized at home and more in schools for improvement of quality of life, inclusiveness and opportunities in Nigeria.

Introduction

Complete gender disparities remain an issue in economic and political arena worldwide. And, while there has been some progress over the decades, on average; women in the labour market still earn 20 per cent less than men globally. The source add that; as of present year, 2024, only 26.8 per cent of all national parliamentarians were female, a slow rise from 11.3 per cent in 1995 (unwomen.org). The discrimination centers on many areas of life, including marriage and family, culture, religion, sport, employment and education (teara.govt.nz). Educating to learning and development which integrates the areas of science, technology, engineering and mathematics (STEM), an issue in the gender class worldwide. According to Shuaib S.A. printed on Daily Trust (April, 2024); that lack of educational and training programs that address the specific needs and challenges faced by women in pursuing careers in technology and related fields contributes to the underrepresentation of women in Technology industry in Nigeria. Igniteworldwide.org posted that Science, Technology, Engineering and Mathematics (STEM) fields are among the fastest growing careers in the world, but women are being forsaken.

However, seeing things from others' point of view can contribute meaningfully to solving problems and the like of forsaken in gender equality. Problem-solving in gender equality is a crucial task that requires collaborative process. Collaboration as cross-sectorial is essential to ensuring all girls and women have access to what is due for them, and of course what benefits human hood (Foluyinka et al. 2023). A growing body of research has shown that promoting gender equality in Science, Technology, Engineering and Mathematics (STEM), benefits not only girls and women but essential to achieve peaceful societies, with full human potential and sustainable development. Gabrielle (2022) that STEM proficiency has been declining in America since the 1980s threatening the nation's continued technological leadership. Globally, the distribution of STEM varies with only a few countries showing equality.

The inequality as it reads on some reports: UNESCO reported that less than 30% of the world's researchers are women (Habibat 2022). Aina (2022) compare with some developed countries, the trajectory of STEM in Nigeria revealed a significant achievement in the past, with present critical challenges that require attention. Challenges as lack of encouragement of young women and girls

to develop interests in STEM Education is indeed worrisome. Differences in technological skills are gradually decreasing, particularly among young people, as lack of gender diversity in the workforce particularly in the field of inventing, designing, evaluating, developing and disseminating digital services and goods remains striking as the gender imbalance is still very noticeable. Elena (2019) had it that studies repeatedly reported that math and science are perceived as male domains, and scientists as predominantly male. The participation of women in the Nigerian tech sector is low. In a survey of 93 technology firms, only about 30% were owned by women (Razaq 2020).

The year 2020 statistics reported by the Nigerian Communications Commission (NCC) reads that women account for only 31% of the total workforce in the Nigerian ICT sector. The problem of underrepresentation of girls and women in Science, Technology, Engineering, and Mathematics (STEM) fields contributes to a lack of diverse perspectives and solutions in technological innovation. Leadership Sunday Times (2023:23) posted that Economic Community of West African States, Female Parliamentary Association (ECOFEPA)'s deliberations in her meetings of recent aligned with 2050, which placed more emphasis on women and youths development in the sub-region, with aim of gender inclusiveness. Victor (2024:21), engineers called for an increase in scholarships and grants schemes to bring women into STEM/STEAM departments, prevent discrimination and sexism against female students, and improve retention rates at work places in Nigeria. Also, according to the National Bureau of Statistics, women make up on average just 22% of the total number of Engineering and Technology university graduates each year (wtcc.org.ng/the-gender-gap/). This gap also limits the potential of girls and women to contribute to meeting the Sustainable Development Goals (SDGs).

Blog.blg1.com defines SDGs as a collection of independent but interconnected goals carefully designed to give all on our planet a better future, with hundreds of targets and measurement indicators geared toward a date of 2030. The goals were created with business in mind, providing strategies, policies, and frameworks that enable the deployment and adoption of innovative technologies and practices to achieve sustainable development. This requires a multi-stakeholder approach involving governments, businesses, civil society, academia, and non-governmental organization to develop and implement strategies and policies that support the deployment of Science, Technology and Innovation to meet SDGs. FGN (2013:31) adds words that in achieving

a goal following the provision of technologically based skills training that ensures students understand how their expertise fits into improving the society and fulfilling national goals, government shall ensure that institutes operate in collaboration with relevant establishments to ensure the reality.

The reality is that women with their God given talents and experiences bring important knowledge, skill sets and ideas to nation development. Proving the talent of women scientifically, amenclinics.com, submits that in problem-solving, women tend to harness several areas of the brain while men rely on a more localized effort. History equally revealed that Ada Lovelace is widely considered to be the first computer programmer as she is often credited as the world's first computer programmer. Engineering before now recorded Edith Clarke as the first woman to be professionally employed as an electrical engineer in the United States of America. And Hypatia is known as one of the earliest mothers of mathematics. She lived from 370 to 415 B.C. in Alexandria, Greece (123helpme.com). And, seen the World and Nigeria in particular, as a country missing out on the talent of girls and women, especially women in the Northern part of Nigeria, who are not fairly represented and as it reflects in the worsening gender inequity seen in many STEM fields, IGNITE, a non-governmental with its distinctive roles considering the important of signing-up for STEM Education, as it promotes the participation of girls and developing their interest in STEM education and contributing to nation development.

According to Victor (2022) for the growth and development of a nation, it is important to give men and women equitable chances to enroll in STEM programs. Jacob (2022) that STEM Education in Nigeria faces some challenges as lack of creativity and employability skills, poor quality teachers, etc. Ana et.al (2019)'s study that encourages female students in STEM areas reveals that the purpose of the women in Science, Technology, Engineering and Mathematics project is vital for present dispensation, especially in young people and girls. It is however noted that by investing in girls' education and ensuring equal access to educational opportunities, societies can break the cycle of inequality, empower women, and foster sustainable development for all. Africanmarketscale.com, explains that Science, an ongoing thought process, allows development of new technologies. Technology enables teachers to engage students in unique, innovative and equitable ways of doing things. usnews.com, posts that engineering lead to design, conduct experiment, identify and solve problems using principle of science, business and mathematics. And, with

mathematics, we can identify relationships, comprehend patterns, and make future predictions that shape our world educationally (allenoverseas.com).

To this background, the study hold premise as catalyst for promoting gender equality in STEM education in Nigeria by leveraging on social cognitive theory where individuals learn through observation, imitation, and modeling of others' behavior. It mitigates stereotype threat by providing a supportive environment where girls can challenge stereotypes, develop resilience, and build confidence in their STEM abilities. And consequently, with socialization theory that emphasizes the role of social interactions and cultural norms in shaping individuals' beliefs, attitudes that sometimes discourage girls from pursuing STEM education and careers. The study at this end seeks to counteract the influences by promoting a culture of inclusivity and breaking down gender stereotypes surrounding STEM fields through IGNITE's role play. The role play study adopts descriptive and survey designed method of quantitative paradigm, noting areas as Katsina and Kwara State respectively of Nigeria as case studies, and by proportional random sampling procedure for analyses through mean and standard deviation with focus to addressing gender disparities by promoting girls and women participations in STEM fields.

Statement of the Problem

The problem statement for this research revolves around the pressing issues that hinder gender equality in STEM education in Nigeria. Underrepresentation of female participation in STEM education in Nigeria is glaring. Girls are often discouraged or face societal stereotypes that discourage them from pursuing STEM careers. Girls in Nigeria, especially in remote areas, face challenges in accessing quality STEM education resources thereby causing the disparity in educational opportunities between genders, and deep-seated cultural and societal norms with the belief that STEM subjects are more suitable for males. Also, lack or limited number of Female Role Models in STEM fields in Nigeria makes it difficult for girls to envision successful careers in these areas. This study however aims to investigate the roles of Inspiring Girls Now In Technology Evolution (IGNITE) in addressing these challenges and promoting gender equality in STEM education. By understanding the specific issues faced by girls in Nigeria and evaluating the effectiveness of IGNITE in mitigating these challenges, it contributes valuable insights and recommendations for fostering a more inclusive and equitable STEM education landscape in the country.

Research Questions

The researcher seeks to produce answers to the questions as:

1. What are the primary challenges faced by girls in remote areas of Nigeria in accessing quality STEM education resources?
2. To what extent does the lack of female role models in STEM fields influence the career aspirations and choices of girls in Nigeria?
3. What are the key components of the IGNITE program that contribute to its success in promoting gender equality in STEM education?
4. What are the perceptions of teachers, parents, and community members regarding the role of girls in STEM education impact girls' educational experiences?

Objective of the Study

The main objective of this study is to explore the role of Inspiring Girls Now in Technology, such that ascertain:

- the primary challenges faced by girls in remote areas of Nigeria in accessing quality STEM education resources
- To find out how lack of female role models in STEM fields has influence on career aspirations and choice of girls in Nigeria
- To verify the key components of the IGNITE program that contribute to its success in promoting gender equality in STEM education
- To read how the perceptions of teachers, parents, and community members regarding the role of girls in STEM education have impacted girls' educational experiences

The Significance of the Study/ IGNITE Initiative

The study research with aauw.org, that giving women equal opportunities to pursue and thrive in STEM careers helps narrow the gender pay gap, enhances women's economic security, prevents biases in STEM fields and the products and services they produce and ensures a diverse and talented STEM workforce. As such, educating, training, and hiring more women in STEM in Nigeria can lead to better scientific and financial outcomes, hence, increasing diversity in the workforce means gaining a variety of perspectives and ideas, which can give organizations with

their initiatives a competitive edge. While specific studies on impact of Initiatives in gender equality in STEM Education in Nigeria might be limited, Initiatives like IGNITE seeks to address the disparities by providing inspiration, education, and direct opportunities for girls and young women to engage with STEM subjects. IGNITE, an acronym for Inspiring Girls Now In Technology Evolution, a non-governmental organization, a technological-based initiative that works directly with teachers in schools all over the world, advocating for education and career advancement for girls, and from historically marginalized communities, play a better role within the context of the national policy.

FGN (NPE 2013:09) listed that special efforts shall be made by all tiers of government and appropriate agencies and parents to encourage the education of the girl-child. FGN (FMOE 2018:43) supports that products of Science and Technology Education (S&TE) often transcend national boundaries, as such, the development of S&TE calls for collaboration among scientists, technicians, technologists, engineers, entrepreneurs, governments and non-governmental within as well as at inter-country, regional or global levels. These include but not limited to supporting human capital development in institutions that are engaged in S&TE programs; promote international exchange programs and linkages for S&TE staff and students. FGN (NSTIP 2022:17) buttress the policy noting with the advocate to support the promotion of indigenous technology and empowering women in the utilization of science, technology and innovation for economic development.

Following the policy concepts above, IGNITE collaborates on the development. It connects STEM to pressing social inequities which allow youth students, to learn through a personal lens; advocates for STEM Education, promoting women in STEM careers, organizes hands-on STEM base activities, present inquiry-based learning, job shadow, and storytelling. It leverages peer-to-peer, and women to girls mentoring to address the scarcity of STEM educators, and effectiveness of networking in education for gender equality, just but a few. And, for the past 21 years of research, incorporating proven methods, IGNITE Worldwide engages in activities of closing the gender gap in STEM, addressing the root cause by serving historically marginalized girls. This is by extending the program and training free of cost to community worldwide (Cathi 2023 igniteworldwide.org). Communities as Katsina and Ilorin metropolises, Katsina and Kwara States respectively, are fast growing ones with increasing number of girls. Royal Ibeh (2024) reported from the Leadership

daily: 'Katsina leverages Tech to unlock full potential, a journey towards technological advancement'. IGNITE lend support as it brings series of initiatives to encourage and support women in technology. There is also a growing movement to improve digital literacy, teaching of coding, artificial intelligence (AI) among girls and women in Nigeria, which can help to bridge the gap and ensure that more women have the skills and opportunities to succeed in technology. The experience of the researcher as an educator, the IGNITE Worldwide Nigeria ambassador, provides an insight to research on the roles of Inspiring Girls Now In Technology Evolution (IGNITE) in Gender equality in Science, Technology, and Mathematics (STEM) Education in Nigeria, adopting empirical method of research.

Methodology

The study adopted both descriptive and survey designed method of quantitative paradigm, as it is a research method used to try and determine the characteristics of a population, and produces statistical outcomes ([qualtrics.com/experience-management/research/descriptive-research-](https://qualtrics.com/experience-management/research/descriptive-research/)). The Population of the study comprises of all 25,063 and 16,082 girls in Katsina and Kwara States respectively totaled 41,145 that enrolled in Senior Secondary School One (National Bureau of Statistics, 2019). Senior School girls in SS1 and female teachers only were used for the study as the target audience. However, the sample for the study comprised 240 respondents. The proportional sample, though very low with ratio 1:200, a 0.5% of the population adopted of the SS1 students among the 20 senior secondary schools reached.

Proportional random sampling procedure was adopted to ensure representation across the regions and socio-economic backgrounds. It is however hope the sample reflected all the characteristics of all the girls and their teachers in all public senior secondary schools in Katsina and Ilorin areas of the study. Questionnaire was utilized as the research instrument to collect numerical data on demographics participation rate. This is used to gather-in-depth insights into experiences, perceptions and attitudes towards gender inequality, STEM education, and IGNITE initiatives. Preliminary version of the questionnaire was reviewed and validated by a panel of experts comprising of four STEM professionals drawn from science, technology, engineering and mathematics fields along with an educationist, researcher and IGNITE alumni from a University faculty. The observation and suggestions made by the experts were used to for the final preparation of the instrument. A twelve (12) test items with four-linker summative scale of Excellent, Good,

Fair, and No Imparts were re-test with survey and descriptive statistical tools employed, and data were analysed using mean and standard deviation yielding the results hereunder.

Data Presentation

s/n	Questions for the respondents	Excellent Impart (EI)	Good Impart (GI)	Fair Impart (FI)	No Impart (NI)
	To what extent do the challenges faced by girls in remote areas of Nigeria limit their access to quality STEM education resources?				
	To what extent does the lack of female role models in STEM fields influence the career aspirations and choices of girls in Nigeria?				
	How effectively do the key components of the IGNITE program contribute to its success in promoting gender equality in STEM education?				
	To what extent do the perceptions of teachers, parents, and community members regarding the role of girls in STEM education impact girls' educational experiences?				

Researcher’s Survey

The four (4) constructed and validated questions, with 1 each testing 3 items to make (4*3) twelve (12) on four-Likert summative scale of ‘Excellent Impart (EI); Good Impart (GI); Fair Impart (FI), and No Impart (NI). 200 school girls and 40 female teachers from 20 senior secondary schools in Katsina and Ilorin, of Katsina and Kwara State respectively were sampled. The likert summative scale is rated as 4, 3, 2, and 1 on EI, GI, FI, and NI respectively.

The standard deviation is a measurement in reference to the mean. Here, a large standard deviation indicates that the data points are far from the mean, and a small standard deviation indicates that they are clustered closely around the mean. The scores from all categories of respondents would be established on a cut-off mean (\bar{x}) of 2.50 (that is, $4+3+2+1 = 10/4$).

Results

Research Question 1: To what extent do the challenges faced by girls in remote areas of Nigeria limit their access to quality STEM education resources?

Table 1: Mean and standard deviation of the challenges faced by girls in remote areas of Nigeria limit their access to quality STEM education resources

S/N	ITEM STATEMENT	N=24 0	MEA N	SD	REMAR K
1.	Limited access to reliable electricity, internet connectivity, and proper educational facilities in remote areas hinder girls' access to quality STEM education resources		2.76	0.74	Agree
2.	Deep-rooted cultural beliefs often discourage girls from pursuing STEM subjects, leading to limited opportunities and resources for their education in these fields		2.73	0.58	Agree
3.	Remote areas often suffer from a shortage of qualified STEM teachers, resulting in inadequate instruction and support for girls interested in pursuing STEM subjects		2.88	0.71	Agree
	Grand Mean		2.79	0.74	Above Average

Decision $\bar{X} \geq 2.5$ Above Average

Table 1 shows the mean and standard deviation of respondents' ratings on extent the challenges faced by girls in remote areas of Nigeria limit their access to quality STEM education resources. Scores from all categories of school girls and female teachers fall above the established cut-off mean of 2.50 ($\bar{X} > 2.50$). This indicates that the overall average score, or grand mean (\bar{X}), of 2.79 suggests that the challenges faced by girls in remote areas of Nigeria significantly limit their access to quality STEM education resources.

Research Question 2: To what extent does the lack of female role models in STEM fields influence the career aspirations and choices of girls in Nigeria?

Table 2: Mean and standard deviation of the lack of female role models in STEM fields

influence the career aspirations and choices of girls in Nigeria

S/N	ITEM STATEMENT	N=24	MEA	SD	REMAR
		0	N		K
1.	The absence of female STEM role models in remote communities makes it challenging for girls to envision themselves succeeding in STEM fields, further widening the gender gap		2.79	0.44	Agree
2.	Without female role models in STEM, girls may perceive these fields as predominantly male-dominated, leading to the internalization of gender stereotypes and a lack of confidence in their own abilities to succeed.		2.67	0.51	Agree
3.	Visible female role models in STEM can contribute to cultural shifts in societal attitudes towards gender equality and women's participation in traditionally male-dominated domains, fostering a more inclusive and equitable society		2.88	0.53	Agree
	Grand Mean		2.78	0.47	Above Average

Decision $\bar{X} \geq 2.5$ Above Average

Table 2 shows the mean and standard deviation of respondents' ratings on the extent to which the lack of female role models in STEM fields influences the career aspirations and choices of girls in Nigeria. Scores from all categories of school girls and female teachers fall above the established cut-off mean of 2.50 ($\bar{X} > 2.50$). This indicates that the overall average score, or grand mean (\bar{X}), of 2.78 suggests a high level of influence from the lack of female role models on girls' STEM aspirations in Nigeria.

Research Question 3: How effectively do the key components of the IGNITE program contribute to its success in promoting gender equality in STEM education?

Table 3: Mean and standard deviation of the key components of the IGNITE program contribution to its success in promoting gender equality in STEM education

S/N	ITEM STATEMENT	N=24	MEA	SD	REMAR
		0	N		K
1.	The IGNITE program employs targeted outreach strategies to reach girls from diverse backgrounds, including those in underserved communities or with limited access to STEM education resources		3.02	0.54	Agree
2.	The IGNITE program emphasizes hands-on, experiential learning experiences such as workshops, labs, and projects, allowing girls to explore STEM concepts in a practical and interactive manner.		3.21	0.62	Agree
3.	IGNITE utilizes monitoring and evaluation mechanisms to assess program effectiveness, identify areas for improvement, and ensure ongoing refinement and adaptation to meet the evolving needs of girls in STEM education		2.98	0.77	Agree
	Grand Mean		3.07	0.64	Above Average

Decision $\bar{X} \geq 2.5$ Above Average

Table 3 presents the mean and standard deviation of respondents' ratings on the effectiveness of the key components of the IGNITE program in contributing to its success in promoting gender equality in STEM education. Scores from all categories of school girls and female teachers exceed the established cut-off mean of 2.50 ($\bar{X} > 2.50$). This indicates that the overall average score, or grand mean (\bar{X}), of 3.07 suggests that the key components of the IGNITE program are highly effective in promoting gender equality in STEM education.

Research Question 4: To what extent do the perceptions of teachers, parents, and community members regarding the role of girls in STEM education impact girls' educational experiences?

Table 4: Mean and standard deviation of the perceptions of teachers, parents, and community members regarding the role of girls in STEM education impact girls' educational experiences

S/N	ITEM STATEMENT	N=24	MEA	SD	REMAR
		0	N		K
1.	Some teachers may hold unconscious biases regarding gender roles and abilities in STEM subjects, which can inadvertently influence their expectations and interactions with female students, potentially leading to differential treatment and opportunities in the classroom.		2.69	0.44	Agree
2.	Parental beliefs and expectations about gender roles and career choices may influence the level of encouragement and support girls receive in pursuing STEM education, impacting their confidence and motivation in these subjects.		2.78	0.51	Agree
3.	Negative stereotypes about girls' abilities in STEM subjects can create a phenomenon known as stereotype threat, where girls may underperform or disengage in STEM-related activities due to the fear of confirming these stereotypes, further perpetuating the belief in their perceived inferiority in these fields.		2.93	0.53	Agree
	Grand Mean		2.80	0.47	Above Average

Decision $\bar{X} \geq 2.5$ Above Average

Table 4 displays the mean and standard deviation of respondents' ratings on the extent to which the perceptions of teachers, parents, and community members regarding the role of girls in STEM education impact girls' educational experiences. Scores from all categories of school girls and female teachers surpass the established cut-off mean of 2.50 ($\bar{X} > 2.50$), indicating a notable impact. The overall average score, or grand mean (\bar{X}), of 2.80 suggests that the perceptions of teachers, parents, and community members regarding the role of girls in STEM education significantly impact girls' educational experiences.

Discussion of Findings

With respect to the findings on table one, and as regards girls and female teachers in remote areas' limited access to quality STEM education resources such as electricity, internet connectivity following cultural beliefs, and STEM education teachers, etc. are believed to be a challenge. This is as attested by the girls with grand mean (\bar{X}) above the cut-off mean of 2.50 by 0.29. The premise here tally with Jacob (Feb. 2022)'s view on STEM education in Nigeria as facing some challenges, such as lack of creativity and poor quality teachers. Susane (2020) add that women are underrepresented in STEM, and this poses new challenges at the dawn of the era of digital transformation. MarketScale (April, 2023) opine that early education programs often fail to expose minorities to technology career paths. Consequently, educational background of teachers in remote area should be creatively developed, not only conferring marginal scholarship but also offering just inducement and salary (Anton 2010).

As read for the second finding, the overall average score or grand mean (\bar{X}) of 2.78, a 110% high explains high level of influence from lack of female role models on girls' STEM career. The girls agreed with 0.44, 0.51, and 0.53 on individual SDs and average of 0.47 SD of missing out in the absence of role model or mentor. The challenges worth lowering girls morale, as it results to lack of confidence in the girls abilities to succeed, even where there is no role model who would encourage them to pursue STEM careers (Galina 2023). Presence of role models in STEM is believed to make the girls feel among, be more inclusive and equitable society. Cathi (2015) posted that when the women meet and share their personal stories with girls, sparks of curiosity knowledge, hope and possibility are ignited. Claudia et al, (2024) adds that connections with STEM professionals, hands-on projects, and collaborative group work were found to play a pivotal role in guiding students' educational decisions and fostering awareness of STEM career.

The third findings is discussed as the girls shows enthusiasm towards IGNITE's all-time activities. The girls having been participating in IGNITE program through IGNITE Club established in their schools; see the study as a workshop or event that IGNITE Worldwide Nigeria have always organize. And as shown by the scores from all categories of the school girls and female teachers, it exceed the established cut-off mean ($\bar{X} > 2.5$). That is, grand mean of 3.07 indicates the components of the IGNITE program are highly effective in promoting gender equality. In support of the findings Cathi (2024), post that we serve and encourage young women to do volunteerism through our organized programs. We make this happen by extending the program and training free

of costs to communities Worldwide. We do job shadowing, a type of on-the-job training that allows an interested student on break (during holiday) to follow and closely observe another young woman STEM expert performing the role.

“It is hard to be what we cannot see” ---- Dr. Nina Ansary

Some of the girls had this to say at IGNITE programs:

“I know that with big interest in Mathematics I can grow to be rewarded with STEM career”

----- IGNITE Alumna, Katsina Chapter

“It inspired me by changing my mind to become an engineer. Today’s program inspired me to know more about STEM” ---- IGNITE Alumna, Ilorin Chapter

“IGNITE was the first step I took towards pursuing a tech – related career. It gave me the ‘push’ I wanted and the resources I needed in order to succeed”

----- Ruby Vohra IGNITE Alumna

And after the program, www.igniteworldwide.org rates as:

100% of students are interested in STEM

82% of students know more about STEM career choices and the benefits of working in a STEM field

82% of students feel more confident in pursuing STEM career

81% of students gained perspective and feel more hopeful about the future

The study’s fourth discovery unveiled that it is significant notable impact in the level of perceptions of teachers, parents, and community members regarding the role of girls in STEM education, as it impart the girls’ educational experiences. The findings may be influenced by varying academic and moral interactions experience of both the students and their teachers, parents and the community had before and during the course of the study. And with the score of grand mean, 2.80 that surpassed the established cut-off mean 2.50, though slight difference but attested a strong agreement for unconscious biases, beliefs and expectation about gender roles and career choices, and negative stereotypes about girls’ abilities in STEM subjects. The findings concur with assertion of Yasemin et al. (2023) that bias against the abilities of girls and students results to limitation in academic growths. Also buttressing the findings is Shuaib (2024:09) adding that

discrepancy threatens Nigeria's potential for general technology growth as well as gender inequality.

In summary, the findings read that it is imperative to address the all-time issues as gender inequality, quality education irrespective of the environment or areas of the country, female role models, impart able programs, perceptions, among others limiting female (girls and young women)'s possibilities in the digital world, as Nigeria works to harness the transformative power of science, technology, engineering and mathematics education for socioeconomic development.

Conclusion

In conclusion, with the study highlighting the role of Inspiring Girls Now In Technology Evolution (IGNITE) in Gender equality in Science, Technology, and Mathematics (STEM) Education in Nigeria, it revealed that limited access to STEM Education resources is a challenge debarring girls exposure to career paths. Missing out female role model lowers girls morale and interest, loss of self-confidence, wrong perception and dejecting gender equitability. It was equally believed that IGNITE initiative programs such as workshops for girls, panel discussion and presentation, job shadowing, among others promote girls and young women participation, encourages and motivate girls to want to sign-up for STEM careers. Unveiled by the study, also is the perception of girls, teachers, parents and the community members that being gender bias limit academic growth of students, it threatens gender equality and slow down nation's growth and development.

Recommendations

- Mentorship programs where female students can connect with female STEM experts be promoted
- Foster collaboration between the government, civil society organization, non-profit organisations, businesses and individual to navigate the gender imbalance cross-country
- Educational background of teachers in remote area should be creatively developed, not only conferring marginal scholarship but also offering just inducement and salary
- A need to draw a robust curriculum in the teaching of coding and other technology skills
- Need to motivate students and adult, using variety of initiatives and incentives, to study and enter STEM career.
- Focusing on how STEM experts make an impact on the world of digitalization is necessary

- Provide rigorous, relevant Career Technical Education (CTE) that prepares students for both higher education and the workplace in order to reinforce classroom instruction and provide tangible relevant skills for greater subject matter retention and competency.
- Government, non-governmental and other organizations should prioritize diversity in their hiring and promotion practices to increase representation at all levels of leadership
- Teachers should be watchful and not to allow male students to interrupt female students when they are speaking
- Implement a comprehensive package of recruitment strategies for science, technology/technical and mathematics teachers throughout secondary schools to expand and diversify the pool of fully prepared and certified candidates
- Constantly organizing mini workshops or conferences where women experts are to serve as panelist and the girls are to make presentation.
- Schools should organize STEM clubs and train students irrespective of gender to do volunteering in the community.
- Create hands-on internships and fellowships for students teachers and faculty with employers in industry, academia, informal STEM networks and civic organisations
- Gender biases attached to mathematics are to be de-emphasized at home and more in schools for improvement of quality of life, inclusiveness and opportunities in Nigeria.

References

1. Ana, I. A. P., Alegandre, J. L., Maria, T. L. A., & Requel, T. (2019). Projects to encourage female students in STEM areas. Fifth International Conference of Higher Education Advances. <http://www.researchgate.net/publication12:05pm>
2. Anni, R., & Barbara, M. (2018). The gender Gap in STEM Fields: Theories, movements, and ideas to engage girls in STEM. <https://naerjournal.com/article/view/v7n2-10>
3. Carmen, M. F., Susana, T. L., Omar, G. P., & Mercedes, I. (2019). Parental support, self-efficacy belief, outcome expectations and interest in STEM. *University Psychological*, 18(2).
4. Cathi, R. <https://www.igniteworldwide.org>
5. Ellen MacArthur Foundation. (2019). *The circular economy in detail*.

6. Coimbra Costa, L. F., Lima, Y. O., & Moreira De Souza, J. (November 2020). *Initiatives for Gender Equality in STEM Education: The Brazilian Case*. <http://www.researchgate.net>
7. <https://www.ellenmacarthurfoundation.org/circular-economy/concept/the-circular-economy-in-detail>.
8. Fakoya, F. (2023). *Cross-sectoral collaboration: The pathway to gender equality*.
9. Fatai, R. (2022). *Nigeria's tech sector is rising, but it's leaving women behind*.
10. FGN. (2013). *National policy on education*.
11. FGN. (2018). *FMOE: National policy on science and technology education*.
12. FGN. (2022). *National science, technology and innovation policy (NSTIP)*.
13. <https://www.globalpartnership.org/blog/cross-sectoral-collaboration-pathway-gender-equality>.
14. Ibey, R. (2024). Katsina leverages tech to unlock full potential. *Leadership.ng*. 18/03/2024, 5, 05 am
15. <https://www.ilo.org/wcmsp5/groups/public/---dgreports/>.
16. International Labor Organization (ILO). (2012). *Global employment trends for women*.
17. John, T. A., & Chia, I. A. (2022). Taraba State University, Jalingo, Nigeria. *Jurnal Varidika*, 34(2), 116–128-ISSN 0852-0976 | e-ISSN 2460-3953. <http://journals.ums.ac.id/index.php/varidika>
18. Kemisola, B. (2022). *Nigeria Female Engineer invent bra to detect breast cancer*. Printed on *Vanguardngr* March 27, 2024.
19. Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The gender Gap in STEM Fields: Te impact of the gender stereotype of maths and science on secondary students' career aspirations. <http://www.frontiersin.org>. <http://123helpme.com/essay/Female-Mathematicians-296787>. *Frontiers in Education*, 4. <https://doi.org/10.3389/feduc.2019.00060>
20. Mikova, G. (2023). *Addressing the Lack of Diversity in STEM Careers*. [Marketscale.com](https://www.marketscale.com)
21. National Academies of Sciences, Engineering, and Medicine. (2016). *Genetically. Engineering Education*.
22. Crops: Experiences and Prospects. The National Academies Press. <https://doi.org/10.17226/23395>

23. Nigerian Communications Commission. (2020) "2019 Nigerian Communications Commission. *Facts and figures report*. <https://www.ncc.gov.ng/stakeholder/media-public/news-headlines/778-ncc-releases-2019-facts-and-figures-report>
24. Okeoma et al. (2017). *Nigerian culture: A barrier to the career progress of women in Nigeria*.
25. <https://www.one.org/africa/blog/nigerias-tech-sector-is-rising-but-its-leaving-women-behind/>.
26. Rahmadi, A., Istiqamah, I., & Anriyanto, M. (January 2010) *Education in Remote Areas from Teacher's Perspectives: A case study of east Kalimantan, Indonesia* https://www.researchgate.net/publication/235935900_Education_in_Remote_Areas_from_Teacher's_Perspectives_a_case_study_of_East_Kalimantan_INDONESIA5:36am Monday April 2024.
27. Humanities and social science communications. (2024). *Research unveils effective STEM program models for high school students from historically marginalized communities*. Nigeria. <http://www.phys.org/news/2024-03-unveil> Gender Equality in Science, Technology, Engineering and Mathematics in Taraba State
28. Shende, S. S. (2024b). Resilience, Emotional Reactivity, Positive Attachment and Alienation among Adolescents of Indian Origin Residing in Australia. *Shodh Sari-An International Multidisciplinary Journal*, 03(03), 402–413. <https://doi.org/10.59231/sari7742>
29. Space Education and Workforce Institute, Susane, G., Ruth, M., & Milagros, S. (2020). *Girls in STEM: Is It a Female Role Model Thing?* PubMed Central. <http://www.ncbi.nlm.nih.gov>
30. Adebayo, O. A. (2024). The pinnacle impacts of the community policing as a pillar in sustaining global peace. *Edumania-An International Multidisciplinary Journal*, 02(02), 49–59. <https://doi.org/10.59231/edumania/9037>
31. Stakes, H.: STEM Education. The California. (2008). STEM collaboration active plan, 08.
32. United Nations Development Programme. (2019). SDG integration: Bridging science, technology and innovation with sustainable development. <https://www.undp.org/content/dam/undp/library/Sustainable>
33. Ankita, A. (2024). Education and empowerment of women in Ancient India: Exploring a glorious past. *Shodh Sari-An International Multidisciplinary Journal*, 03(03), 347–362. <https://doi.org/10.59231/sari7738>

34. United Nations Population Fund. (2023). *Nigeria Tackles the Gender Digital Divide in Nigeria*. nigeria.unfpa.org
35. *University of Wales Trinity Saint David*. European Centre for Research Training and Development Uk. <http://www.eajournals.org>
36. Victor, G. (2020) *Tracking Girls and Women out of Higher-Paying STEM Areas The STEM Gap: Women and Girls in Science, Technology, Engineering and Mathematics* www.aauw.org/resources/research/the-stem-gap/.
37. World Bank. (2019). *Growing smarter: Learning and equitable development in East Asia and the pacific World Bank Group*.
38. Husain, N. (2024). The essentiality of implementing curriculum and activities for gender education in present education system. *Shodh Sari-An International Multidisciplinary Journal*, 03(01), 234–242. <https://doi.org/10.59231/sari7668>
39. Idika, D. O., Faithpraise, F. O., & Anakwue, L. A. (2023). Perception of Women Participation in Digital Education Research for Sustainable Social Adjustment in Calabar Urban, Nigeria: implication on educational peace and security. *Edumania-An International Multidisciplinary Journal*, 01(02), 108–137. <https://doi.org/10.59231/edumania/8978>
40. Tiwari, A. K., & Tiwari, A. (2024). Women’s economic empowerment is a need-based program. *Edumania-An International Multidisciplinary Journal*, 02(03), 168–175. <https://doi.org/10.59231/edumania/9065>

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