Women in STEM Survey Report

By: WillFran Consulting in partnership with the Women's Technology Empowerment Centre (W.TEC)

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Introduction

Studies have shown that the proportion of women in STEM (Science Technology Engineering and Mathematics) relative to men is very low- and in addition to this low percentage, a good number of women continue to leave STEM jobs within the first 5-10 years and rarely advance to the upper level C-Suite positions (AAS, 2020).

It is against this backdrop that WillFran Consulting in partnership with Women's Technology Empowerment Centre (W.TEC) conducted a study to understand what factors are responsible for this phenomenon in Nigeria. It is important to study the perceptions and experiences of women in STEM fields to know the stumbling blocks they face; in order for advocates of more female representation in STEM to implement solutions that attract more girls studying, working, and having long careers in STEM.

This report analyses the results from the Women in STEM survey of women who have either worked or are currently working in STEM fields in Nigeria. Firstly, it provides a short description on the report, explaining why the research was conducted. Secondly, it shows how the research was conducted, with the sections of the survey identified. Finally, it looks at the key findings of the research, analysing the main observations of the participants and their responses.

Report Description

WillFran Consulting in conjunction with W.TEC carried out a study to discover why women leave the STEM field within the first few years. The research was carried out via online survey to gather information and data from the six geographical zones in Nigeria: North-West, North-East, North-Central, South-South, South-East and South-West. The survey was distributed across the social media platforms Facebook, Twitter, Instagram and LinkedIn. The format for the questionnaire survey contains closed-ended questions and Likert-type questions to assess the challenges faced by women in STEM in Nigeria. 102 female respondents took the survey.

Why was the study conducted?

In Nigeria the gender disparity in the science and technology fields is growing, which is worrying considering 90% of the jobs in the next 10 years will require technology knowledge and skills (W.TEC website). This coupled with the fact that some women are leaving STEM jobs in the first few years paints an alarming picture for the country. So we conducted this study to assess why interest in working in STEM fields is declining among women. In essence we wanted to answer the Research Question: Why are women leaving STEM field after working a few years?

To help us answer this question, the study was designed in a way to find out what they studied at university level, how long they have worked in a STEM field, and their perceptions and experiences working in STEM fields. Results from the study helps policymakers implement solutions that increase the representation of women and girls in science and technology. This survey adds to insights on solutions to prevent the continuity of under-representation of women in science and technology. A steady exit of women not only limits female tech experts but continues to widen the gender skills gaps for the future of work. Thus, women will be left behind in tomorrow's world.

Methodology

The study relied on information and data collected via an online survey. To get a fair reflection of the country, the survey was evenly distributed among the six geopolitical zones. It specifically targeted women who have or are currently working in STEM fields. The survey was launched on the 1st of September 2020 and ended 9th of October 2020.

Survey Design

Before taking the survey, an ethical section was provided for the participants to give them all the information about the nature of the project, to receive their informed consent, and give them an opportunity to refuse to partake in the survey. It consisted of five sections:

- Background information: this included demographic details of the respondents, motivations for choosing STEM and the course they studied at university
- Status in STEM: inquiries about how long they worked in STEM, what industry, and the highest position they have held in STEM
- Perception & Experiences working in STEM: this section aimed to assess how they felt about representation of women in their fields, whether they have experienced barriers to career progression, unfair treatment, and if organization address gender related grievances
- Female Representation: this section asked the participants to assess the degree to which they feel women are represented in STEM
- Promoting Women in STEM: focused on finding out what the respondents believed should be prioritized when increasing the representation and participation of women and girls in STEM

What are the key findings?

- Most women (83%) cited personal interest or in STEM as the main factor that motivated them to begin a career in STEM field
- More than 40% majored in engineering or science courses at university
- For women who left STEM many factors contributed to their decision including: difficulty in moving up the career ladder, unfair treatment, and discrimination in their fields
- 54% of the women claimed to have experienced barriers to women gaining career progression in STEM fields & believe it is difficult for women to secure funding for startups
- 70% believe organizations that promote girls studying and working in STEM are the most important solution to increasing the participation of women in STEM fields

Background

Demographics

From the analysis, 66% of the respondents fall within the age bracket of 18-30, 22% fall within the 31-40 age bracket, 9% fall within the age bracket of 41-50 and 3% fall under the 50+ age bracket. Thus in Nigeria, young women account for a large proportion of women in STEM today. This finding is similar to that of African Academy of Sciences, AAS (2020) which discovered that a large portion of their respondents were within the age bracket of 19-35 years old. This was expected as more young people are entering the STEM sector in recent times, and more girls are choosing to study science and technology related course than any other time in history. Research shows that nine of the 10 fastest growing occupations that require at least a bachelor's degree will require significant scientific and mathematical training. Attracting and retaining more women in STEM will maximize innovation, creativity and competitiveness (AAUW 2010).

A majority of those who responded to the survey reside in the South-West region of Nigeria, comprising 52% of respondents. While 21% of respondents reside in the North-Central region. This does not imply that a larger portion of women in STEM in Nigeria reside in the South-West region but indicates that women in the South-West were more forthcoming in participating in the survey. It could also suggest that women in this geographical location are more data-driven. In contrast, a very small proportion (2%) reside in the North-East. The response in the South-West region can also be as a result of the fact that Lagos is the commercial hub of Nigeria. This equates to more employment opportunities which would mean more tech companies and experts would congregate in this regional part of the country.

Motivations for Choosing STEM

A combination of factors influenced many women to join a STEM field. From the analysis, an overwhelming majority (83%) cited personal interest or passion as the main factor that motivated them to begin a career in STEM. Other motivators such as family (11%) and better work environment (10%) and role model (6%) were cited but to a lesser extent- suggesting these are usually secondary motivators.

This result implies that majority of women in STEM were primarily influenced to enter STEM by developing a passion for the science and technology. This finding is in line with that of AAS (2020) which found in their study from analysis of their qualitative data that a large number of respondents cited passion as a factor that influenced their decision to enter STEM. However, they found from quantitative data analysis that majority of the women surveyed (76%) placed their personal capabilities above personal interest in the choice of whether they pursued STEM related careers or not.

Educational Background

With regards to the subject the respondents studied at university, two courses were predominant, Engineering (21%) and Science (Physics, Chemistry, Biology) (21%). Information Technology comes up behind as the third most studied subject in the University by women in STEM (11%). Many other subjects were selected, but to a far lesser extent- including courses like Medicine, Arts & Sciences, Law, Mathematics and Accounting.

Status in STEM Field

From the analysis, only 14% of the surveyed respondents were not currently working in STEM, while 85.85% were working in a STEM field.

Among those who stopped working in STEM, many reasons were provided for leaving STEM, including early retirement, stiff opportunities, difficulty in moving up, unfair treatment, and discrimination. This finding is in line with that of Dasgupta and Stout (2014) who both carried out a study to examine some of the obstacles girls and women face in STEM. They found that in early to mid-adulthood, discrimination such as subtle gender bias in hiring and promotion, biased evaluation of scientific work and non-inclusive department climate all undermine the retention of women in STEM.

About 39% of the respondents have worked for 1-3 years in a STEM field, while a quarter of respondents have worked in a STEM field for 5-10 years and above. Relatively, only a few women have worked for more than 5 years in STEM. The results indicate that a higher proportion of women are new to STEM fields considering two thirds of the respondents are between 18-30 years. More analysis would be needed for those that have spent 5-10 years in STEM fields.

Industries Respondents Worked In

Majority of the women in STEM in Nigeria are in the Information Technology, Education, Medical & Healthcare industries. Around a quarter of the respondents indicated they had experience working in Information Technology industry, while another 24% have experience in Education, and 22% chose

Medical & Healthcare sector. With regards to a growing industry Fintech, only 12% have experience working there, while Engineering 16.5%, Oil & Gas 11.65%.

Animal Science, Research, Data Analysis, Agriculture, Telecommunications, Marine Biology all had small percentages of women represented. This finding is in line with those of Beede, Julian, Langdon, McKittrick, Khan and Doms (2011) and Deloitte (2016) who all found in their studies that women with a STEM degree are more likely to work in education or healthcare.

Finally, results show that the highest position held by nearly 60% of the respondents is entry/junior level. While 28% held senior level, and only 5% of the surveyed respondents are or have been founders. Seeing that majority of the respondents were young people this comes as no surprise.

Perceptions and Experiences working in STEM

More than half of the respondents felt only 10% women were represented in their recent company, indicating they believed women are scarcely represented. This could be attributed to women -in science and technology fields- being seen as less capable than men in the eyes of society- a societal norms that needs to change in Nigeria .

About 54% of the women had experienced barriers to women gaining opportunities for career progression in STEM fields, as a result of gender inequality as there are biases for women taking up higher positions compared to men. This explain why they are not represented in STEM fields, and partly accounts for why some women left STEM fields (as mentioned above) despite having a passion for it.

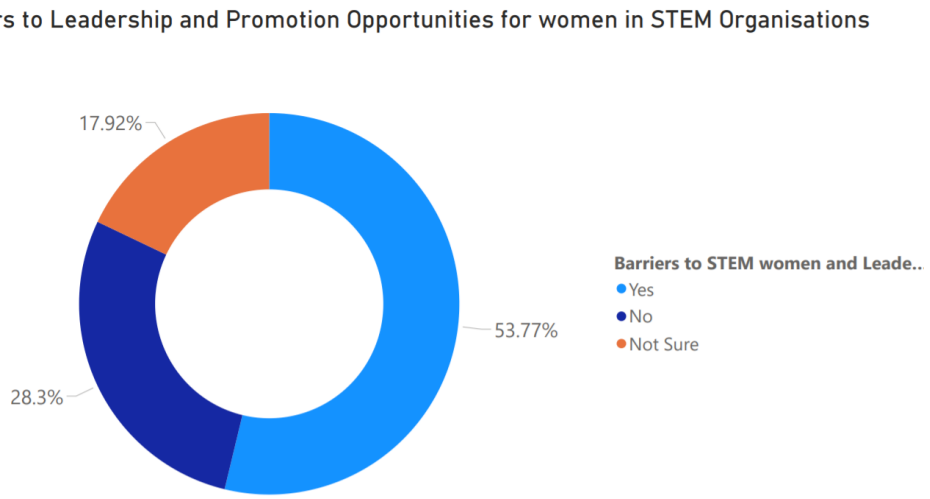

Figure 1) Have you experienced Barriers to Leadership and Promotion Opportunities?

Almost two-thirds of the participants indicated it was likely there were instances where women in STEM were subjected to unfair treatment because of their gender. While only 16% said it was unlikely, and a small number (6%) said very unlikely. This implies that majority of the women noticed unfair treatment for being a woman in STEM and believe they face unnecessary prejudice in the work place.

Female Representation in STEM Sectors

The results indicate women in STEM believe they are scarcely represented and face difficulties in countering this. With regards to female representation, more than half believed it was difficult for female STEM entrepreneurs to secure funding for their startup.

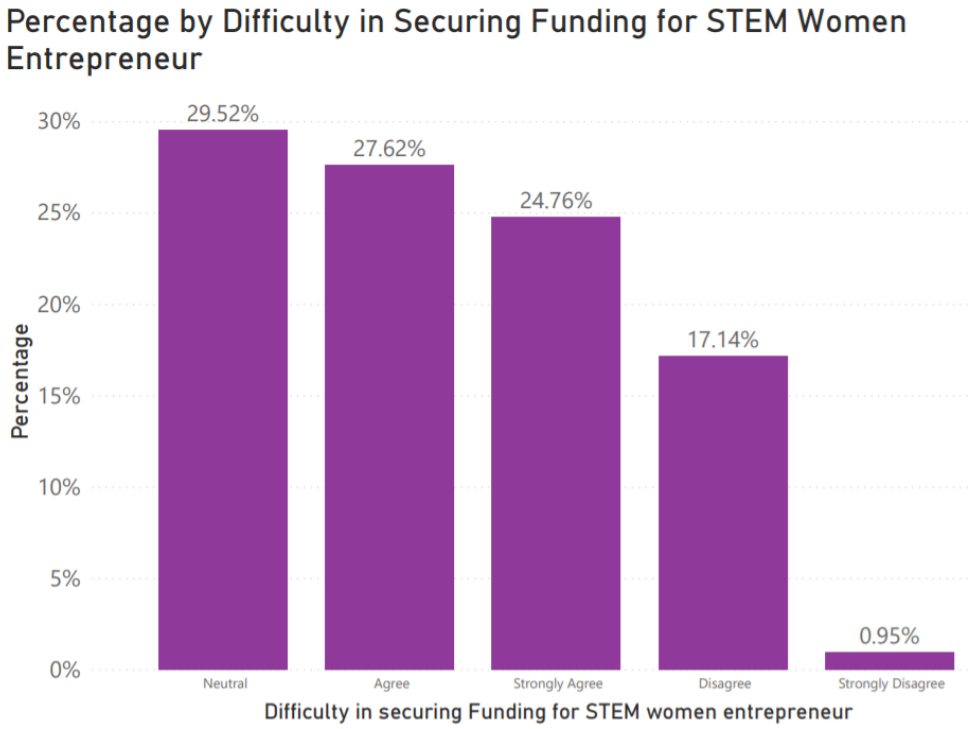

Figure 2) Rating on whether you believe it is difficult to secure funding for STEM Women Entrepreneurs

About 49% strongly agree that is lack of gender inequality in the STEM industry while 25% indicated they agree; that is 74% of respondents stating they believe there in gender inequality in the STEM industry.

As shown from this survey, it was noted that women tend not to get to the peak in stem industry or do not have the privilege to get selected in a stem organization, or tend to leave over a period of time, this could be due to few female policy makers, limited mentorship opportunities, and few scholarship opportunities widely disseminated to women. Therefore important to increase the representation of women and girls in stem field to address this. Indeed 85% of the responded that they strongly agreed with this assessment, which shows many women in STEM believe increasing female representation plays a key role in addressing gender disparity in STEM fields.

Promoting women and girls studying and working in STEM

When it comes to promotion, almost a quarter of the respondents chose “sometimes”. Indicating a neutral position in their belief of whether STEM organizations in Nigeria promote the values of diversity, inclusion, and women in leadership positions. This shows that to some extent organizations in STEM try to ensure that women feel included and feel there are paths to career progression.

About 70% of respondents indicated they know at least one STEM organizations that promotes the women and girls studying and working in STEM fields. However only a quarter could list organizations they know of. Some include: Girls Coding, She Code Africa, and W.TEC. On the other hand, the remaining respondents said they had never heard of an organization that does this. More can be done to increase the visibility and works of organizations that promote Girls in STEM.

When asked to indicate what they believed played the biggest role in increasing the number of women working in STEM fields in Nigeria, nearly 70% chose organizations that promote girls studying and working in STEM. Furthermore, nearly half of the respondents chose more information on opportunities for girls in STEM, when asked to prioritize one policy option to increase the involvement of women and girls in STEM. Thus, STEM organizations in Nigeria are seen as the most important in promoting participation of women in STEM, while many women in STEM believe opportunities should be made more visible if we are to address the gender disparity in the future

When asked to provide further comments the respondents gave very candid assessments of the issues facing women, why many leave, and what needs to be done to address the problem. Some indicated:

“Awareness should be increased and opportunities created for women and girls in higher institutions.” “Women in Nigeria most likely leave STEM careers due to pressure and its effect (mental

health) perhaps." And "There is no real mentorship and funding to encourage women in STEM in Nigeria."

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