

THE EFFECT OF LOW PARTICIPATION OF FEMALE IN SCIENCE AND TECHNOLOGY IN NIGERIA

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Abstract

The paper attempts to examine the low participation of Female in science and technology education in Nigeria. It critically analyses the situation and identifies factors that contribute to this undesirable trend. The paper further discusses the implication of the status quo on women and national development. Suggestions to remedy the problem such as the provision of gender sensitive school environment, provision of scholarship scheme and positive discriminatory policies and practices for female science students and graduates have been proffered.

Keywords: Female, Science, Technology, Education, Participation.

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1 Introduction

The technological backwardness of Nigeria appears to remain one of the strongest signposts of the defects of the nation's education system. Although education as an institution stands a chance of accusing the political and economic institutions for this failure, what remains indefensible however, is the fact that the nation is technologically far behind when compared to other nations, and, the education system though not solely responsible, can however, hardly be exonerated from the problem.

Admittedly, a lot of policies and programmes have been put in place to ensure technological revolution of Nigeria. Science and technology have been critically encouraged by Government. This has led the Government to "insist on a policy of 60:40 science based and humanities enrolment ratio in the tertiary institutions," [1]. To further demonstrate Government's commitment to science and technology, a number of technical colleges, polytechnics and universities of technology have been established in the country. [2] informed us that of the three institutions, there were eight universities of technology, forty four polytechnics, three universities of agriculture, one hundred and eight technical colleges, eleven colleges of education (technical) and fifteen monotronics, among others. Evidently too, these institutions attract better funding than similar conventional Government institutions. In spite of this Government support for the development of science and technology education, it is striking that female participation in these areas is abysmally low compared to the counterpart. This is a serious threat not only to women empowerment and gender equity, but also to the technological progress of Nigeria as a nation.

In this paper, attempt is made to discuss the situation of females in science and technology, draw its implication for development as well as provide some suggestions for an improved female participation in these areas.

2 Issues relating Females in Science and Technology Education

The call for the female gender to have the same type of education or field of study has faced stiff resistance over time [3], despite international convention and policy statements from many countries in support of equity on educational provision [4]. In countries such as Britain, Greece and Spain, the tradition of sex-based technical education still persists [1]. [8] noted further that, even in agriculture where African women are well known as experienced farmers, few women are trained as agronomists or extension workers. A similar conclusion can be drawn from [9] analysis

of the situation in the United Kingdom. He revealed that, as at 1996, women professors in engineering and technology were less than one percent, and that there was no women professors in either agriculture or science.

Bringing the focus to Nigeria, a similar imprint can be seen. As far back as 1985, Women in Nigeria (WIN, 1985), cited by [3] showed that, only one percent of engineering university students were females. Similarly, Table 1 represents enrolment by gender into technical colleges for the year 2011.

Table 1: Enrolment by gender into technical colleges for the year 2011

Enrolment By Gender as @ 2011 Zone	No. of Colleges	Male	Female	Total
North-Central	27	9,914	874	10,788
North-East	09	3,514	388	3,905
North-West	17	7,518	251	7,769
South-East	16	3,371	621	3,992
South-South	26	10,036	1,883	11,919
South-West	26	13,896	2,302	16,198
Total	88	46,658	7,913	54,571

Source: NCCE, 2012

From the statistics in Table I, it could be seen that there is a consistently wide margin between female and male students in the technical colleges in all the zones of the Federation. Whether analyzed from the zonal perspective or when all the zones are combined, the disappointing participation of the female gender is crystal clear.

In a similar vein, [5] stated that, there were only 18.5 and 39.9 percent of females enrolled in science, mathematics and technology in tertiary institutions in the 1991/94 and 1995/1997 academic sessions respectively. Furthermore, between 1998 to 2000, the percentage of females in the sciences in college of education never exceeded 44.4 at any one time [9]. It is not only the student enrollment that reveals this shocking disparity. Even academic staff distribution seems to follow the same trend. Table II, helps to give an insight into the disparity between male and female teachers in science and technology-based subjects.

Table II: Male and Female Teacher Employment in Science and Technology-Based Subjects.

Subjects	Mf	M	F
Agricultural science	365	21	31
Auto education	21	334	0
Biology	233	194	39
Building	38	36	02

Chemistry	215	176	39
Computer science	30	25	05
Electrical/electronic	46	46	0
Integrated science	215	172	43
Mathematics	243	219	24
Metal work	29	27	02
Physics	162	155	07
Technical education	194	188	06

Source: NCCE, 2011.

From the data in Table II, it can be inferred that the male sex dominates virtually all the science and technology-based teaching staff in Colleges of Education for 2011 in Table 1. Although the statistics represents the situation for only a particular year, the National Commission for Colleges of Education (NCCE) statistical data, have consistently showed a similar trend in the Colleges of Education (COEs). Thus, it can be argued based on the available evidence that female participation in science and technology is not encouraging, especially when compared to the male sex.

3 Factors Responsible for the Low Participation of Females in Science and Technology Education

The factors that contribute to the low participation of the female gender in science and technology could be as complex as the factors that generally impede females from having access to schooling. What appears indisputable however, is the fact that an unsupportive environment for females (both at the school and the wider society) remains one of the central factors for this low participation.

At the school, the female gender is faced with serious challenges from teachers and students alike to go in for appropriate courses that are traditionally approved (covertly or overtly) for women. [6] observed that even where the formal curriculum is gender “neutral”, the hidden curriculum significantly influences these choices. [4], also strongly posited that teachers’ attitudes, behaviours and expectations, the gender nature of the school environment, the home and society at large interrelate to students which course fits which sex. Thus, many perceive that the male sex has the features necessary for studying science such as ability to think independently, emotional toughness, rational thinking and objectivity, when compared with the female sex.

Other factors that could be attributed to this problem are lack of guidance [1], lack of female role models, especially, female science teachers and female scientists and technologists. As we have

noted earlier, fewer female science and technology teachers could be found at any level of the education system. Thus, the absence female role models will significantly impact on the females' attitudes and behaviours towards science and technology.

Equally, unfounded beliefs and socially prescribed perception as embodied in many cultures and processed and disseminated through socialization process that females are intellectually inferior and thus cannot cope with the sciences could be another factor for this disparity. Similarly, the physical structures of females may be misinterpreted to suggest that "soft" courses rather than sciences, best fits them. Closely linked with this is the stereotyped curriculum and other learning materials which actively and latently depict women as inferior, and which significantly encourages the participation of the male sex in science and technology?

Other explanation to this problem may be the domestic and childcare responsibilities of women, who traditionally are expected to spend their considerable time in the home. Hence, courses that may lead to less demanding job such as teaching are often recommended. In addition, females are often led into courses that have direct relevance to their domestic responsibilities such as home economics, nursing and midwifery, teaching, etc. Whatever factors that contributes to this ugly trend, what is certain perhaps is that the present trend if not checked, can affect not only the female gender but the nation at large.

4 Implication of the Low Participation of the Female in Science and Technology in Nigeria

The status quo is certainly an unhealthy development. The trend has the propensity to impede greatly the realization of gender equality, especially in education and in the labour market. Since the male gender continues to dominate the field of science and technology there will few female who will avail themselves for job opportunities in the field, even if a specified percentage of vacancies is specifically reserved for them. This low participation "becomes a threat that goes beyond the school by affecting women's future lives" [3]. Similarly, since women constitute almost half of the nation's population, a large percentage of her human resources will not actively contribute towards technological progress of the nation [4]. Put better, it can be argued that since the overwhelming majority of the female sex study courses other than science and technology, a lot of female talents who probably could have substantially contributed to technological breakthrough of the nation, will be lost.

Thirdly, this will not allow for effective role modeling to young girls to aspire to read science and technology-based course. Since most female teachers are art-based, girls may be overtly or covertly motivated to read art-based courses thereby, allowing the situation unabated. In the same vein, female teachers being generally noted for kindness and care, may influence a large percentage of students (of both sexes) to like them (i.e. the teachers) and their subjects (which are mostly art-based).

In this situation, especially where guidance career is inadequate (as it is the case with most of our schools), more students may choose to major in the art-based subjects. With this situation, even the effective implementation of the prescribed 60:40 science/art enrolment ratio into tertiary institutions will be difficult to arrive at. Thus, the long-term implication of this is the vicious reproduction of more art-based graduates at the detriment of the nation's yearning for more science-based graduates. Notwithstanding this, it is our belief that this problem can be combated if appropriate steps are taken.

5 Conclusion

Even though female access to education is generally low compared to the male counterpart, their participation in science and technology education is even lower. This poses a great threat to the empowerment of women, especially, in this millennium where science and technology significantly determines individual and national growth.

6 Recommendation

The study recommended that there is the need for gender-sensitive educational environment so that both males and females can counter stereotypes and challenge gender structuring in educational provision. This can be achieved through sensitization derived through workshops, teacher training and effective policies that are aimed at challenging gender regimes. It is suggested that, teacher training should have programmes that will help transform trainees to appreciating the existing gender related problems and to see the need for a change. Similarly, the development of gender-sensitive science curriculum materials will help reduce the problems.

The provision of scholarship to female science students can significantly impact on their enrolment into science and technology education. Poverty has generally, been identified as one of the major problems confronting female education in developing economies. Thus, if the proposed

scholarship scheme is introduced, the gesture is capable of enhancing their enrolment into science and technology education. The scholarship can be initiated by the Federal Ministry of Education through its scholarship board.

The National Board for Technical Education (NBTE) can also participate in the scheme. Similarly, non-governmental organizations (NGOs) that are especially gender-based can actively contribute towards this end. Also, there is the need for positive discriminatory policies and practices to support the enrolment and employment of female science candidates. This will likely motivate females into the fields of science and technology.

References

- [1] Adeloye, J.A. Towards a realistic participation of women in technological education in the 21st century and beyond: The guidance factor. *Journal of Women in Colleges of Education*, 3, 109-144, 1999.
- [2] Anikweze, C.M. Indigenous technology: Technology transfer and technological education in Nigeria. Lead paper at the 3rd National Conference, FCE (T), Gusau, 1998.
- [3] Bakari, S.G. Towards a gender-sensitive education: The case of Federal College of Education, Yola, Nigeria. A master's degree thesis, university of Sussex Institute of Education, 1998.
- [4] Bakari, S.G. Striving for gender equity in education: The role of teacher training in the 21st century Nigeria. Paper presented at the International Conference organized by NAEND at the Kaduna Polytechnic, 3-8 August 1999.
- [5] Ekuri, E.E. and J.O. Windapo. Gender differential in the production of science, mathematics and technology teachers: Implications for research and training. In K. Isyaku; C.M. Anikweze., A.A. Maiyanga and G.M. Oloku (Eds.), *Teacher Production, Utilization and Turnover Patterns in Nigeria*. Kaduna: National Commission of Colleges of Education, 2000.

- [6] Gordon, R. Causes of girls' academic underachievement: Influence of teachers' attitudes and expectations on the academic performance of secondary school girls. SIDA: Harare, 1993.
- [7] National Commission for Colleges of Education. Statistical Digest on Colleges of Education in Nigeria, ATMAN, 2011.
- [8] Stromquist, N.P. Transforming education and training in ILO (Ed) *Gender Education and Development*. Turin: International Training Centre of the ILO, 1996.
- [9] Wisker, G. *Empowering Women in Higher Education*. London: Kegan Paul Ltd, 1996.

