

## Gender Equity in Science Teacher Education for Sustainable Development: An Emerging Perspective

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**Abstract** *The problem with gender equity has been a male-dominated science and technology education in the nation's educational development. The reverse is the case in emerging trend of enrolment statistics in science teacher education in the college used as the case study: Alvan Ikoku Federal College of Education, Owerri. Data revealed that the emerging enrolment statistics in science teacher education is female dominance, leaving the males trailing behind. This may be attributed to the inertia of males towards the teaching profession particularly at the primary and secondary school level. This emerging development presents a future whereby science laboratories are manned mainly by female sciences teachers. The teaching profession produces middle level manpower that may not adequately provide a male flair to science teaching. This tendency may reproduce itself in the future, hence denying the teacher educational environment the world acclaimed emphasis on sustainable development.*

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### Introduction

Cultural in Nigeria, virtually every father prefers a male child to female. This is usually the hallmark of achievement this assets as inheritance to his biological sons. Hence being a father of many responsible sons is a thing of joy. On the contrary, being a father of many a female child is a thing of agony and anxiety. Females should have no right to inheritance of their father's assets and riches because they are another man's property" this is not peculiar to Nigeria; many African cultures encourage the male child syndrome (Sokoya 2002).

Male children are a source of pride to every family because the society belongs to them. This syndrome originated from the Nigerian culture and has not only penetrated into but perpetuated itself into the educational system of the country. The post independence Nigeria society had the male-female ratio in her educational system predominantly focused on males in public schools. Enrolment statistics in the tertiary level for three consecutive years typifies this.

**Table 1. Nigeria Polytechnic Enrolment 1990-1993**

| Year    | Male   | Female | Total  | Female%  |
|---------|--------|--------|--------|----------|
| 1990/91 | 62,584 | 20,801 | 83,445 | 24.9991  |
| 1991/92 | 63,846 | 23,433 | 86,279 | 26.00083 |
| 1992/93 | 71,141 | 21,250 | 92,391 | 23.00008 |

Table 2. Nigeria University enrolment 1990-1993

| Year    | Male    | Female | Total   | Female%   |
|---------|---------|--------|---------|-----------|
| 1990/91 | 163,890 | 07,219 | 234,129 | 30.0003   |
| 1991/92 | 173,492 | 93,419 | 266,911 | 36, 00006 |
| 1992/93 | 201,852 | 99,420 | 301,273 | 32, 99997 |

Source; *Federal Ministry of Education, 1994*

Table 1 demonstrates male dominance in Polytechnic enrolment. The enrolment statistics portrays 25%, 20% and 23% for female in 1990/91, 1991/92 academic sessions respectively. These data might not only be as a result of youth population who desired to be enrolled into polytechnic admission and matriculation for the three consecutive years. It might also be attributed to the aversive culture which was deterrent to female education in the acquisition of masculine skills; obviously entrenched in polytechnic education in Nigeria. Enrolment statistics into tertiary education in Nigeria portray gender biases. Courses at the tertiary level are erroneously and inadvertently categorized by gender. By natural inclinations, female find themselves enrolling for course that are gender compliant.

Table 2 portrays the university enrolment statistics for the three years. Female enrolments were 30%, 36% and 33%. This obviously reveals the universality of courses at this level, where females have opportunities to be where they can be without bias; though bias is nor completely eliminated for strongly male-dominated courses such as: mechanical, electrical, chemical, and petroleum engineering. Obviously, gender influence on course enrolment is very highly manifested in universities of technology, where the number of females in each course can easily be counted. Male dominance in the education system is gradually changing in the Nigeria society. Sokoya (2002) confirmed this. The enrolment statistics in education which obviously is moving towards gender equity may be attributed as a product of the revised Federal Ministry of Education (1981) which state that:

"it is governments wish that any existing contradictions ambiguities and lack of uniformity in education practices in the different parts of the federation should be removed to ensure even and orderly development of the country.

Section 3, paragraph 11, emphases that:

With regard to woman's education, special effort will be made by Ministry of Education and Local Government Authorities in conjunction with ministries of community Development and Social Welfare and of Information to encourage parents to send their daughters to school. *Federal Ministry of Education*

In pursuance of this declaration, years later in September 1986, the woman education Branch of the Ministry of Education was created with these objectives.

- i. Provision of more educational opportunities for girls from primary to tertiary.
- ii. Creating awareness to all citizens to the fact that equal opportunities exists irrespective of gender, age, locality, creed or special states and should be more available to all.
- iii. Reorienting the attitudes of all females irrespective of age toward education
- iv. Provision of functional education for girls and women through skills such as sewing, cooking, banking, etc.
- v. Promoting the education of girls and women in the fields of sciences and technology education (Mbah, 2002).

The creation of the Women Education Branch of the Ministry of education was a necessity to meet the need for gender equity in the educational sector of the economy. It actually came to attain equilibrium between masculine courses and feminine courses by diffusing the sex-role segregation in educational opportunities in the country.

## Concept of Gender

Gender has attracted varieties of definitions from researches and scholars. It emerged as a social issue with scholars adopting it to distinguish the social and biological aspects of the differences between male and female. Conceptually, it is defined as those aspects of male and female shaped by social forces. It can as well be described as the meaning the society gives to biological differences in humanity. According to Ejifugha and Nosike (2005) sex is natural, gender is nurtured. Being nurtured gender is subject to cultural influences and interpretation as well as limitations. Each community shapes and determines the cultural tenets that define the male gender versus the female gender.

With a meticulous encroachment the gender issues, social scientists have developed a broader approach to the social phenomenon. It is to be considered as the way societies are organized functionally, rather than mere attribute of the individual male or female, or their collective attribute as males or females. This concept is rather comprehensively focused on the way societies are organized around male or female responsibilities.

Like race and social class, gender orders and directs social relationship and prejudices. Gender determines and affects 'power to' and 'power over' (Riley, 1997). 'power to' implies the ability to act and obtain access to social resources such as education and political opportunities/positions 'power over' implies ability to assert ones wishes and goals even in the face of challenging situation. The female gender was handicapped by society to demonstrate 'power over' circumstances around them. Consequently, gender is a social phenomenon which is subject to reconstruction, for the attainment of social equilibrium.

Substantiating Riley's declaration of female' incapacitation of 'power over' resources, Rogers in Ejifugha (1999) asserted that males have power over knowledge and resources and that increases their oppressive tendency and practical power over women. Culture is a major determinate factor that constructs and reconstructs gender; hence, gender biases differ from community to community. The clamour for gender equity in our educational system particularly in science teacher education may be a contextual case in Nigeria.

Gender equity is not synonymous with sex equity. Sex equity deals with biological male or female, while gender equity deals with socially constructed and reconstructed roles of male female. Gender has social, cultural and psychological connotation. Its definition is focused on masculinity and femininity. The proper term for defining sex is male and female while gender is masculine or feminine. Although femininity may be independent of biological sex, masculinity is concerned with attitude that describes males in the social and cultural context. Hence the normal male has a preponderance of masculinity while a normal female has preponderance of femininity while normal female has a preponderance of femininity. According to Stroller in UNESCO (1997) gender is the amount of masculinity and femininity found in a person. Furthermore, gender refers to ones subjective feeling of maleness and femaleness irrespective of ones sex. This is described as gender identity. It is possible to be genetically of ones sex without socially and emotionally desiring to belong to that sex. It is possible to be genetically male or female but with gender identity of the opposite sex. This is described as trans-sexual identity.

Gender is mostly determined by behavioral attributes given by the society eg submission; humility and quaintness are considered to be feminine. Attributes like dominance, aggressiveness, talkativeness are masculine (UNWSCO 1997).

## Gender Influence in Science Teacher Education

Alvan Ikoku Federal College of Education, Owerri is a case study for this paper. As one of the foremost colleges of education in the country, it was established to produce middle level manpower for teaching and learning in primary and secondary schools. Enrolment statistics in the college for the three recent academic years present a picture of a changing trend in gender equity in tertiary education especially from the perspective of science teacher education.

Table 3. Enrolment Statistics in Science Education-Degree Programmes

| Year    | Male        | Female      | Total | %     |
|---------|-------------|-------------|-------|-------|
| 2006/07 | 231 (24.1%) | 727 (75.%)  | 958   | 52.13 |
| 2007/08 | 146 (30.5%) | 330 (69.0%) | 478   | 26.03 |
| 2008/09 | 108 (27%)   | 292 (73%)   | 400   | 21.37 |

Table 4 Annual Enrolments in Science Education

| Year    | Female | %     |
|---------|--------|-------|
| 2006/07 | 978    | 52.12 |
| 2007/08 | 478    | 26.03 |
| 2008/09 | 400    | 21.77 |

Table 3 shows that male enrolment in science was 24% in 2006/2007, which increased to 30.5% in 2007/08, and dropped to 27% the following academic session. Female enrolment in 2006/07 was 75.86%; it dropped to 69.03% in 2007/08 and escalated to 73% the next academic session.

Table 4 portrays that enrolment in science education was on the decrease in the college in the last three years, from 52.12% to 26.03% to 21.77% in 2006/07, 2007/08 and 2008/09 respectively. These data reflect the picture of a science education programme in a typical college of education in the country. On analysis, data presented in the polytechnic and Universities. This may be attributed to the time frame of the enrolment on both instances in universities, polytechnics and college of education. Time frame and the incongruity of the samples notwithstanding, the thrust of the paper is the influence of gender in the choice of course of study.

The female gender dominant in the College of Education is probably because teaching at the primary and secondary level is considered mainly to be feminine. Family income accruing from this middle level manpower production could be considered to be primarily subsistent. This is the reason for male a version to teaching at this level is obvious.

On the other hand, increase in female enrolment statistics in science education is considered by the authors to be very highly impressive. This may be attributed to be a consequence of the revised national policy on education which promoted female education in Nigeria. Additionally and very importantly is the laudable achievement of the women education branch of the Ministry of Education. One of the objectives is to promote the education of girls and women in science and technology. Enrolment statistics of females being higher than males in a Federal College of Education is obviously a result of emphasis on promoting science and technology education of the feminine gender.

The adverse effect of this development is the fewness of male teacher in science education at the basic level of education in this country. If unattended to, it will certainly create gender inequity on promoting science and technology at the foundational stage of education. This imbalance is very apparent in our public primary and secondary schools. This will not only reinforce the erroneous impression that teaching at that level is a female occupation but also creates an educational environment where mainly female teachers conduct experiments in science laboratories. This development is inimical to sustainable development.

## Gender Equity and Sustainable Development

Gender inequity is an obvious indicator of disequilibrium in the specific field where it occurs. The field of education requires gender equilibrium in the teaching of science. This is to enable it to be able to foster procreation of manpower in it. Gender equity in the field of education erases the erroneous impression that the study of science in teacher education is feminine. If this trend is ignored, it may develop to be the way it is done.

Sociologically, mores develop to become norms and norms develop to become custom and custom, with years, turn out to become culture. This explains how behaviours like submissiveness, quietness and humility are considered to be feminine source. This development in education may not promote science education for sustainable development. Science teacher education is not feminize. The Ministry of Education should correct this development before it becomes the pattern and eventually described as such.

The World Commission on Environment and Development (The Brundtland Commission) brought the term 'Sustainable Development' into popular use in 1987 (Nosike, 1996). Sustainable development focuses on improving the quality of life without compromising the need of the future generation. The term encourages humanity to focus on sustaining the natural endowment of the physical environment in the pursuit of his daily needs. The concept demands the exercise of precautionary measures that will continue to sustain the natural environment while humanity is in pursuit of economic development. Man must continue to live within the limitations of the physical environment as both a provider of input and a "sink for wastes" Humanity must realize that even if environmental degradation does not reach a life-threatening level, it can result to a perceivable decline in the quality of life of mankind.

Furthermore, sustainability means survival, keeping the community alive. This implies food production and the means to this end is Agriculture-which is science-based. Sustainability also means economically acceptable production whereby everything removed is being replaced so as not to harm the ecology. This is also primarily science-based.

In a social sense, sustainability is viewed as a growing economic and social order with production structures and relationship. This obviously ensures fair distribution of income, power and opportunities, thus providing the basis for social peace (Serageldin 1993).

Against this background, gender inequity in science teacher education may not promote fair distribution of income, power and educational opportunities, and as well may not yield an acceptable production structure in manpower development. Additionally since sustainability advocates the replacement of whatever is removed from the environment, gender inequity if not balanced will not promote social peace and order.

## Conclusion

Gender equity in science teacher education is a contemporary necessity in a world where the World Bank has engaged in promoting quality science and technology education (STEP-B, 2009) in developing countries with Nigeria as a beneficiary. This is channeled through the science and Technology Education for post-basic (STEP-B) institution in the country. With this World Bank assisted project, the promotion of science and technology education in the country is the focus. Federal universities, polytechnics; college of education and unity schools are the beneficiaries of this project currently nationwide. Science teacher education should not be allowed to be gender dominated in order to give the colleges of education equal share in taking advantage of the opportunities for promoting science and technology teacher education. This inference is drawn from the conclusion that economic development is positively correlated with areas of male dominance.

The author recommended that the national education policy of science/art student ratio should be implemented in, college of education. Though social sciences are inclusive, natural science teachers should be given priority attention in enrolment with bias toward gender equity.

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