Challenges for women in technical and science education in Nigeria

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The paper discusses the challenges of women in Science and Technology Education in relation to reforms and development in Nigeria. These challenges, such as socio-cultural factors, can reduce and even inhibit women participation in scientific and technological fields. The study presented here adopted a descriptive survey design to sample the opinion of professional women in Science and Technology and female students studying Science and Technology presently. A representative sample of 406 respondents was administered a questionnaire, later analyzed using mean and Z-ratio. The major findings revealed that, from birth, women are discouraged by the society from studying Science and Technology through cultural practices and socialization, on the pretext that Science and Technology are too hard and rigorous for women. Our recommendation is that girls should be allowed to exercise their mental ability according to individual potentials. Teachers should use a gender inclusive (girls friendly) approach in teaching Science and Technology, and the Government should ensure implementation of specific policies for women education.

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Introduction

Technology and Science education is very important for both men and women alike because it accelerates the pace of change in the world. They provide foundation for wealth and development, bringing immense improvement to the quality of life and people's ability to interpret the world. From an individual point of view, the process of Technology and Science education provides knowledge, develops skill and inculcates the attitudes that are necessary for future occupation.

Additionally, Technology and Science education is an important tool in National Reforms for Development and Poverty Reduction in the Present National Economic Empowerment and Development Strategy (NEEDS) for Nigeria. NEEDS focuses on four key strategies: reorienting values, reducing poverty, creating wealth and generating employment. (National Planning Committee, 2005, Okebukola 2005).

Participation of women in Science and Technology is necessary. Nevertheless socialization and traditional roles assigned to the girls at birth will determine the level of participation that girls will take in Technology and Science education, because the life of a person is influenced or affected by socio-cultural forces. When a child is born, he or she is bound to learn the behavioural patterns necessary for living in human society. The culture that is learned, to a large degree, determines how the child thinks and feels, directs his or her actions and defines his or her outlook on life.

The socialization of a child takes place at home, school and environment by parents, teachers and the whole society. During the socialization process, the

practice of assigning values, status and attitudes to people on the basis of gender has caused many forms of discrimination, deprivation and inequalities between the sexes. This situation has resulted in low participation of women in Technology and Science (Modupe, 2002). Even when large proportion of females at secondary school level enrol for Science subjects, a very persistent and wrong belief still holds that females are by nature technologically ignorant and unable to absorb scientific and technological information or to acquire the necessary skills. As a consequence, many women opt for human and social science courses at University level.

They need not only to overcome their traditional roles as mothers, wives and caretakers, but need to challenge also the social structures of institutions and the segmentation of the labour market. The internalization of values and believes about appropriate roles and expectations has affected women in participating in Technology and Science education.

The goal of this paper is to examine the challenges of women in Science and Technology education in Nigeria, related to National reforms for development, so as to recommend ways of improving the proportion of women participating in Science and Technology education. These will enable women to engage with the process, products and effect of Technology and Science on day-to-day basis.

To accomplish that, the following study was conducted:

METHODOLOGY

Design

The study is a descriptive survey research.

Sample and Sampling Techniques

The sample consisted of 376 female students of Physical Sciences and Engineering courses and 30 females professional women randomly selected from 3 tertiary institutions in Rivers State.

Research Questions

To what extent do cultural factors challenge women participation in Technology and Science Education?

To what extent do socialization factors challenge women participation in Technology and science Education?

Hypotheses

There is no significant difference in the response of female students and professional women on cultural factors.

There is no significant difference in the response of female students and professional women on socialization pattern.

Instrument for Data Collection

The main instrument was a questionnaire, an 11-item instrument developed by the researcher, with each item set to determine the extent that socialization and cultural practice challenge women participation in Technology and Science education. The questionnaire was prepared on a likert type.

Data Analysis

The following qualification:

1-1.5 very low Extent
1.5-2.5 low Extent
2.5-3.5 moderate Extent
3.5-4.5 High Extent
4.5 and above very High Extent

was employed to interpret the responses on the research questions and 0.05 level of confidence was to determine the Z-ratio.

Results and Discussion

From table 1, responses show globally that the women already active in Technology and Science occupations maintain that cultural factors handicap women participation in Technology and Science education at high extent, meanwhile the female studying Technology and Science believe that the handicap has a moderate extent.

Table 1

Responses on the extent that cultural factors challenge women participation in Technology and Science education

S/No	Item	Professional Women Response			Professional Students Response		
		N	Mean	Decision	N	Mean	Decision
1	Girls do not have enough time to study because of their roles to clean the house, cook, and carry younger ones	30	3.3	Moderate extent	376	3.1	Moderate extent
2	Girls that study science and technology to higher level are seen as tough		4.2	High extent		3.1	Moderate extent
3	Cultural protection over women prevents them from making serious decisions, hence, they can not aspire for challenging courses like science and technology		4.1	High extent		3.2	Moderate extent
4	Culturally, women are seen to be weak and not to do tasking job like lifting of heavy objects as might be experienced in technological jobs		4.1	High extent		2.9	Moderate extent
5	The tradition frowns at women doing jobs that involve climbing as might be experienced in technological jobs		3.7	High extent		3.0	Moderate extent
6	Traditional restriction on widows affects them economically, hence the boy-child education is considered first		3.8	High extent		3.2	Moderate extent

Table 2

Z-ratio results on the Extent that cultural factors challenge women participation
in Technology and Science education.

Responses	N	Mean	SD	Z-cal	Z-crit	Decision
Professional women	30	3.9	1.24	3.478	1.96	Accept
Female students	346	3.1	1.4			

Table 2 reveals that the difference in opinion of professional women already
participating in Science and Technology and that of female students still
undergoing training did not differ significantly. The finding is not surprising,
(Alamina 2001, Anyanwu 1980, Nsofor 2001) all agree that a number of cultural
restrictions and roles make women to be interested in domestic matters rather
than in Physical sciences and Technology.

Table 3

Response on the extent that socialization handicaps the women participation
in Technology and Science.

S/No	Item	Professional Women Response			Professional Students Response		
		N	Mean	Decision	N	Mean	Decision
1	The orientation given to girls as domestic workers do not encourage them to do much at school	30	3.5	High extent	376	3.1	Moderate extent
2	Some Science/Technology teachers do not encourage girls to aspire for technological/ science courses		3.0	Moderate extent		3.1	Moderate extent
3	The girls are socialized to see science and technology as difficult subject that boys only should address		3.8	High extent		3.2	Moderate extent
4	The girls are threatened in class by boys when girls perform better than them		2.1	Low extent		2.9	Moderate extent
5	Female model images are seldom seen in science and technology		3.9	High extent		3.0	Moderate extent

Table 3 reveals that professional women and female students in Technology and Science see item 1,3 and 5 to have high extent, while item 2 moderate extent. On the other hand, the female students perceive item 1-6 to all have moderate extent on handicapping women participation in Science and Technology education.

Table 4

Z-ratio result on socialization patterns that handicap women participation in Technology and Science education.

Responses	N	Mean	SD	Z-cal	Z-crit	Decision
Professional women	30	3.3	1.4	0.766	1.96	Accept
Female students	346	3.1	1.6			

The table reveals that again there is no significant difference on the opinion of both groups. Kurubo (1987) and Archibong (2001) both agree that most activities in schools are generally considered masculine, Okwubunka (1977) also observed that low expectations for a girl and overprotection right from birth will likely have a creeping effect on her curiosity, initiative and creative tendencies, which are necessary in her school work and especially in scientific studies and operations.

Conclusion and Recommendations

Socio-cultural factors handicap women participation in Technology and Science education to a relatively high extent and if this is not checked, it will continue to deprive Nigerian women from living up to their responsibilities, which is counterproductive and will impact very negatively on the future National development.

It is therefore recommended that:

1. Girls should be allowed to exercise their mental ability according to their individual potentials.

2. Teachers should use a gender inclusive (girl friendly) approach in teaching Technology and Science subjects.

3. The Government should ensure implementation of specific policies on women education.

References

ALAMINA J. I. (2001). An Impediment To Women in Science: Cultural Influence And The Way Forward. *Science Teachers Association of Nigeria And 42" Annual Conference* (Ed) Heinemann Educational Books, Ibadan Nigeria.

ANYANWU, S. U. (1980) Issues and Patterns of Women Anticipation in Sports In Nigeria. *International Review of Sport Sociology* 4 (5,) pp 20-24.

ARCHIBONG (2001)

KURUBO, N. F. (1987). *Report on Women Education Activities in Rivers State. Ministry of Education, Port Harcourt.*

MODUPE 0. (2002). Gender Inequality In Higher Education: A Remedial Approach. *The Nigeria Teacher Today. National Commission for Colleges of Education* 10 (16) pp 136-138.

NATIONAL PLANNING COMMISSION (2005). *National Economic Empowerment and Development Strategy* (NEEDS). Abuja: NPC.

NSOFOR, C. C. (2001). Cultural Impediments on Women in Science Technology and Mathematics Education: *Science Teachers Association of Nigeria. Heinemann Educational Books, Ibadan* Nigeria 4211 (Ed)

OKEBUKOLA, P. (2005). The Race Against Obsolescence: *Enhancing The Relevance of STAN to National Development. Science Teachers Association of Nigeria.* Pp 7-11.

OKEBUKA, P. A. (1994). History of Education In Nigeria. *Paper presented at the All Nigeria Conference of Principal, Lagos.*

OKWUBUNKA (1977)