6

Towards Gender Sensitive Counseling in Science and Technology

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Introduction

This chapter discusses the role of gender-sensitive counseling in relation to female retention in science and technology courses. It is based on a study carried out in Osun State, Nigeria, on the availability of viable counseling services in secondary schools to promote female participation in science and technology. While a wealth of research over the past two decades in Africa shows a consistent pattern of under-representation of girls in science and technology subjects and careers (Eshiwani 1983; Obeng 1985; Manthorpe 1982; Ruivo 1987; Jegede 1998: Erinosho 2001), not much has been done to examine counseling services in schools.

Gender inequality in science and technology is a worldwide phenomenon that has defied attempts to unravel it so far (Erinosho 2001). To worsen matters, the gap between male and female interest and performance in science appears to be on the increase in spite of all efforts. In fact, if the issue constitutes a serious problem in developed Western societies, it is far worse in Africa. In this chapter, reference is made to Nigeria not just because it has the largest population in Africa, but also because, in Nigeria, as in other African countries, the issue of girls' under-representation is so persistent. It was reported in 1992, by the Science Teachers Association of Nigeria (STAN), that less than 10 percent of the total enrolment in Nigerian universities for science and technology disciplines were females, only 6 percent of those enrolled in the West African and the Senior Secondary School Certificate Examinations were girls and less than 5 percent of university academic staff in science-related disciplines were females. This is worrisome in relation to the fact that females make up about 60 percent of the country's 100 million inhabitants. Specifi-

cally, less than 30 percent of the one million girls in secondary schools take sciences. This is similar to what obtains in almost every country in Africa and may well be worse in countries with fewer resources allocated to education.

According to Adesemowo (1998) guidance and counseling is an indispensable arm of education. In line with this, the Nigerian National Policy on Education (1977, revised 1981, states:

> In view of [the] apparent ignorance of many young people about career prospects and in view of personality maladjustment among school children, career officers and counselors will be appointed into post-primary institutions [paragraph 85 ii].

Counselors play a key role in the process of streaming students either into sciences or arts. Thus, the importance of counselors for career choice is obvious. They can either influence consciously or unconsciously the perception of females about science and technology domains. Hence, the intention of this chapter to focus on the role of counselors in helping girls into sciences.

Previous studies have shown that usually girls start school with positive attitudes towards the sciences but that their interest diminishes as they proceed further (Erinosho 1997). One of the reasons that have been advanced for girls' diminishing interest in science is that they do not experience science activities and skills in the classroom to the extent that boys do (Khale and Lakes 1983). Available evidence shows that, in terms of their instructional strategy and expectations, teachers treat girls differently from boys (Khale and Lakes 1983; Oakes 1990). The research shows that males generally receive more attention from teachers and dominate classroom activities (Goods et. al.1973; Tyack and Hansot 1990) and also get more exposure to appropriate role models (Hills et. al. 1990). Furthermore, available evidence in the Nigerian context shows that girls often learn science in a gender-biased classroom environment, that is, one in which both the overt and the hidden curricula treat boys and girls differently. According to Okeke (1999), the need to address the issue of gender stereotyping in Nigerian schools is widely accepted, but specific, coordinated programmes or projects are yet to be instituted, unlike in Ghana and Botswana (Ghana Science Clinic for Girls and Botswana Road Shows).

This Study

Even though science educators agree that girls need special motivation (especially counseling) to stimulate their interest in science, no study, as far as I can tell, has investigated the availability and effectiveness of such support in enhancing females' participation in science. Therefore, an investigation of counseling in schools is timely. The key questions guiding the study were as follows: If girls are under-represented in science and technology, have counselors contributed to it and, if so, how? What structures and facilities are in place to encourage girls' interest in science and technology? And, finally, to what extent does the training received by counselors prepare them to be gender-sensitive in science and technology counseling activities?

The main aim of this study was to investigate the effectiveness of counseling for promoting a gender-sensitive curriculum in science and technology. Specifically, the objectives of this study were to:

- find out the availability, or otherwise, of viable school counseling services in science and technology
- determine to what extent sexism prevails among school counselors
- assess the programmes put in place for effective science and technology counseling, such as excursions, career days, seminars and so on
- assess the training of counselors as to whether it adequately prepares them for counseling aimed at retention of females in science and technology.

Studies of this nature are long overdue in Africa. If developed countries are still trying to unravel the mystery, Africa has to double its efforts to demystify the non-participation of girls in science and technology. According to Beoku-Betts (2003), since science is part of the larger society in which we live, we need to understand how its historical and geographical evolution and location has interacted with structured systems of inequality, whether based on race, gender, colonialisation or globalisation, to shape particular consequences for people in those societies. Harding (1991) also notes that, in order to answer the question why so few women in some societies are in sciences, a more comprehensive understanding of the constraints and barriers is required than when scientist of European descent are the primary population under consideration. In the first instance, African's problems as related to development issues are compounded by problems of socio-cultural stereotypes. If the socio-cultural issues are to be tackled, it has to start with counseling girls in school, who will then effect change in the society. If change is to be effected in the schools, it has to be done through effective counseling. Thus, a study of this nature may well be the key to the malaise of non-participation of females in science and technology in Africa.

The study focused on counselors who deal with females between 12 and 20 years. This age group is important because it coincides with the development of the sense of gender identity, the internalisation of gender roles and some of life's major decisions such as education and career choices. The decisions taken during this period largely determine future personal development. Furthermore, UN data shows that 29 percent of the world's population was in the age range of 10-24 years in 1990, and that 83 percent of these lived in the developing countries. It has also been observed that, while this age group is a declining proportion of the population in industrialised countries, it is a rapidly growing proportion in developing countries (WHO 1986). In Nigeria, it has been estimated that there are about 26.5 million adolescents, out of whom 13.8 million (about 52 percent) are girls (NDHS 1990). For African countries to develop, therefore, the preparation and nurturing of youths, and especially girls, is essential.

The research undertaken for this study was qualitative, employing descriptive survey as its research design. The population for the study consisted of all schools

in Ile-Ife in Nigeria. Sixty counselors participated in the study, as most schools are without practising counselors. These counselors represented 90 percent of all the counselors in schools in Osun State at the time of study. The 'snowball' sampling technique was used; each participating counselor referred the researcher to another school counselor. In the end, 38 female and 22 male counselors were interviewed. The content and validity of the interview instrument was ensured with the assistance of experts in the field and the directors of the 2003 Gender Institute at CODESRIA. The researcher interviewed counselors with assistance from the contacts who helped with their identification. They were interviewed on the counseling programmes available in their schools for science and technology in terms of excursions, career day, seminars and so on. The interviews also elicited responses on the counselors' perceptions of female involvement in science and technology subjects and careers. Furthermore, responses were also elicited on the course content of the training counselors were exposed to in the university, especially with regard to its gender-sensitivity. Thirty schools were visited to determine the viability of counseling services in the schools. The data obtained was analysed using descriptive statistics and other qualitative analytical tools.

The research revealed that only 20 schools out of all those visited had a counselor's office. Indeed, counseling services were poor in general. All counselors also had clerical and administrative duties. Ten of the counselors had postgraduate degrees and fifteen were graduates. Five had no counseling qualifications at all, which is contrary to the requirements stated in the Nigerian National Policy on Education (1981). No school made provision for Guidance and Counseling on the school's timetable. This meant that students who wished to see the counselor could only do so during break time or a free period. Most counselors only addressed the students every last Friday of each month, for thirty minutes, during extra-curricular activities time.

The sixty counselors interviewed were asked their views on girls' participation in science and technology. Some of the responses are presented below:

Response A: 'It is good for a girl to participate in science and technology, but there are certain occupations a woman should not dabble into. Though what a man can do a woman can do, it is better for instance… I cannot imagine a lady going under a vehicle or a car checking out its problems'.

Response B: 'From my own background, there are no differences in gender. My parents did not raise me up or treat me like a girl, or make me conscious of my sex. So, a woman should take part in science and technology'.

Response D: 'In my opinion, it is better for a woman to be careful in choosing science and technology careers, since we have so many professions that she can choose from'.

Response F: 'Girls can be encouraged … but they have not been. Some engineering courses, like Electrical and Mechanical, that do not involve climbing, girls can do'.

Response H: 'A woman might only be able to cope if the children are not too many or after child-bearing'.

From the above, it is clear that the barriers to female participation in science and technology are subtle. Nevertheless, 90 percent of counselors showed some gender bias. Some tried to hide their bias, but further probing showed they were not free of sexism.

Respondents were also asked about some of the programmes put in place for science and technology. Only nine schools (30 percent) organised career days focusing on science and technology. Three schools (10 percent) invited female speakers and had excursions to science-based and technology-based firms. Only one school distributed any information leaflets.

When counselors were interviewed on their exposure to gender issues during their academic training, some of the responses were very interesting. For example, one reported: 'We were not given gender studies training; it is a new doctrine'. Another said: 'We were exposed, because they made us believe that the problems we are having as women are gender problems'. Another counselor said:

> In the educational sector, people are clamouring that male clients should be counseled by male counselors and vice versa. But in our training, we are advised to counsel anyone we want. We should not see ourselves as running after girls. Even in counseling ethics, your activity with a female client should be professional.

Someone also likened gender studies to psychology and said, 'Yes a little bit, like psychology, childhood and adolescent psychology'. Another response was: 'Yes. Strictly in guidance and counseling; it is part of the training because when you go to the field you are going to work with both males and females. But another counselor said:

> The question of gender does not arise at all in counseling. In guidance and counseling, we refer to every human being in neutral gender. We are not gender-unfriendly or gender-unconscious.

Conversely, this was the response of yet another counselor:

> Not at all, but our association, the Counseling Association of Nigeria (CASSON), is taking that up now. We are moving on from psychological topics to contemporary issues in Nigeria, and gender issue is one of them.

To the researcher, all the responses recorded are similar to the patterns quoted above, and one can infer that the training received by counselors was not gender-sensitive. Most counselors, both male and female, could not effectively describe what gender issues are all about or even state the fundamentals, the ABC, so to speak, of gender studies. Correct differentiation could not be made between gender and sex. None of them understood gender as socially constructed identities located within cultural practices.

In addition, many gendered connotations could be extracted from the counselors' responses, such as the idea that a woman's place is in the home and that a woman is unable to think. Thus, the counselors were sexist without being aware of it. Perhaps it can also be inferred from the study that, coupled with the counseling bias, some

gendered identities might have restrained the participation of girls in science and technology. Society has impressed upon girls not to move close to a male, e.g., in religious ideologies. Therefore, if the counselor is a man, the girl child stays away, and vice-versa. The girl child has also been impressed upon to watch what she says, that is, keep silent and avoid talking too much. The implications of this in counseling are that self-disclosure is limited. Effective counseling is thereby hindered, since communication between the girl child and the counselor cannot proceed effectively.

The findings from this study buttress the claims of feminist standpoint theories that women's lives have been erroneously devalued and neglected, yet these lives should be the starting points for scientific research and the generators of evidence for or against knowledge claims. In the first instance, human lives are part of the empirical world that scientists study, but human lives are not homogeneous in a gender-stratified society. Women and men are assigned different kinds of activities in such a society; consequently they lead lives that have significantly different contours and patterns. Indeed, using women's lives as grounds to criticise the dominant knowledge claims that have been based primarily on the lives of men can decrease the partialities and distortions in the picture of nature and social life provided by the natural and social sciences. According to Harding (1991), women are valuable strangers to the social order. Another basic claim for feminist research by standpoint thinkers is women's exclusion from the design and direction of both the social order and the production of knowledge.

Since the responses revealed that counselors had not been exposed to gender studies, some of their sexist attitudes might have resulted from ignorance. In fact, some counselors equated gender studies to courses on counseling ethics, adolescent psychology, child psychology and so on. This might have accounted for their counseling biases and subtle gender discriminations. If counselors were better informed, they could assist in identifying girls that are skilled and talented and can excel in male-dominated fields. Unless the girl child is given information and an opportunity to benefit from unbiased counseling, the vision of equitable participation in science and technology by both sexes will be unattainable. Thus, the assistance of the school counselor is paramount for the involvement of girls in science and technology fields, in order for them to contribute to the development of their own world, totally redeemed from developmental lethargy and prompted to use their brains for development processes.

However, as noted by Malcolm (1993), minority and black women pay a tremendous price for a career in science. For Malcolm, the challenges minority women face in science may the result of factors not only in the scientific community but also in her culture. This statement brings out succinctly the discoveries of this study. Some of the counselors interviewed reflected on the woman scientist's role vis-à-vis the demands of keeping a home and rearing children, which are important issues to a greater percentage of African women. The socially induced need for women always to consider what men or others will think leads to a greater gap between their observable behaviour and speech and their thoughts and judgments.

Conclusion

This study set out to examine the availability of viable counseling services in secondary schools for the promotion of female participation in science and technology. The results reveal that there were no viable counseling services. Moreover, it was found that the counselors themselves were sexist and that there were no programmes on the ground that could assist in promoting girls' participation in science and technology in the schools. Finally, the training programmes experienced by the counselors at university had been devoid of gender studies.

One cannot expect to raise the levels of girls' and women's participation in science and technology without greater understanding of gender and women's studies by counselors. What kinds of interventions can promote participation in science and engineering careers by females? Malcolm (1993) suggests the following: starting early, making appropriate career information available and providing role models who are minority women. There is a need to encourage young girls especially, in order to make sure they participate in sciences from a young age and do not to leave these fields by default. Okeke (1999) argues that the best way to promote girls' access to science is to develop a well-articulated, sustainable and comprehensive programme of sensitisation and training for science and technology educators. Early and appropriate exposure to physical sciences, mathematics and technology is essential.

One of the interventions that counselors can embark on is direct counseling on gender-specific issues. For example, since marriage, child-rearing and work are all essential ingredients in most African women's lives, counselors should ensure that counseling interventions take these concerns into account. Finally, the main recommendations that flow from the findings of this study are the following. Counselor education programmes must include gender studies, practising counselors must be exposed to gender-sensitive training workshops to assist them in their counseling interventions in order to eliminate sexism, and opportunities for early work experience in science-related fields for girls should be encouraged.

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