Gender Disparity in Course Offering and Graduate Output in Nigeria: A Case Study of the University of Lagos: 2003 – 2008

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The paper examined gender disparity in course offerings, particularly in science related areas of study, using the University of Lagos as a case study. The main sources of data included Joint Matriculation Examination Admission lists for five years, the order of proceedings for convocation from 2003-2008, covering all faculties and national statistics of education (Federal Ministry of Education, 1999-2005). The student enrolment disaggregated by course of study and gender was used to compute respective percentages and/or proportions. The findings showed the fact that girls were very much concentrated in the so-called female traditional subject areas of liberal arts and a disproportionate few were found in Engineering, Medicine, and Law. Female enrolment in Mathematics, Science and Technology appears insignificant in view of the national focus on science and technology as the key to development. A discussion of factors militating against women’s education, particularly in science, was undertaken and some solutions proffered.

Keywords: gender disparity, university of Lagos, science, liberal art, women’s education

INTRODUCTION

The emphasis, since the second half of the 20th century has been on education for all. Particularly, there has been a growing concern about the gender imbalance in science classes (Kelly, 1987; Udeani, 2003, Lockheed, Brooks – Ginn, Casserlym and McAloon, 1985). Much has been achieved since gender issues were brought into focus (Copenhagen, 1980; Nairobi, 1985, Beinjing, 1995). Even before most of the action plans, Nigeria’s goals of education have been spelt out in the National Policy on Education (NPE), 1977, revised in 1981, 1984, 2004 and 2008). Specifically, the national goals of tertiary education include contributing to national development through high level manpower training. To achieve this in an age of science and technology, the NPE states that a greater proportion of expenditure on university education shall be devoted to science and science oriented courses in the conventional universities in the ratio of 60:40; and 80: 20 in the universities of technology. At the polytechnic, the weighting is 70:30. The 2008 version of NPE embodied some policy innovations and changes including repositioning science, technical and vocational education for optimum performance and the introduction of Information and Communication Technology (ICT) into the school system.

Another relevant part of the NPE is the emphasis on education as an instrument per excellence for national development, and that every child shall have the right to equal educational opportunities irrespective of any real or imagined disabilities. From the provisions of the NPE, it appears that Nigeria is concerned, not only with accessibility but also the quality of that accessibility in terms of national development. Qualitative accessibility means that Nigerian citizens, all girls and boys, women and men in school should be able to study those courses that are of national relevance without any hindrance. It is also important that all Nigerians are scientifically and technologically literate in order to be able to exploit personal, national and natural resources to contribute to national development. However, the disparity in the education of girls and boys right from the primary school, with attendant greater constriction in girls’ enrolment at succeeding levels (Abe, 1987), appears to be a major challenge to the achievement of the goals and objectives of the NPE as stated above (Abe, 1987, American Association of University Women, 1992, Kelly, 1987). The table below illustrates the enormity of the problem even at the primary school level.

Table 1: National Summary of Primary School Enrolment 1999 – 2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Males (%)</th>
<th>Total Females (%)</th>
</tr>
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<tbody>
<tr>
<td>1999</td>
<td>10,058,434 (56.26)</td>
<td>7,818,894 (43.74)</td>
</tr>
<tr>
<td>2000</td>
<td>10,738,029 (55.00)</td>
<td>8,413,413 (45.00)</td>
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<tr>
<td>2001</td>
<td>10,583,411 (55.00)</td>
<td>8,457,812 (45.00)</td>
</tr>
<tr>
<td>2002</td>
<td>11,015,011 (55.00)</td>
<td>8,791,071 (45.00)</td>
</tr>
<tr>
<td>2003</td>
<td>14,366,513 (56.00)</td>
<td>11,338,280 (44.00)</td>
</tr>
<tr>
<td>2004</td>
<td>11,828,494 (55.00)</td>
<td>9,926,359 (45.00)</td>
</tr>
<tr>
<td>2005</td>
<td>12,189,073 (56.00)</td>
<td>9,926,359 (44.00)</td>
</tr>
<tr>
<td>Total</td>
<td>80,778,965 (56%)</td>
<td>64,346,848 (44%)</td>
</tr>
</tbody>
</table>


Between 1999 and 2003, total female primary schools’ population was 44 percent as against 56
percent for males. Granted, we may not record equal representation, the above data indicate a clear gender gap even at this initial level of the education ladder. Of course, the same source of data also indicated that there is usually increasing constriction for girls’ participation as one moves up the system. The total enrolment of males and females in Nigerian universities during the same period was 494,822 (64 percent) and 285,179 (36 percent) respectively. Naturally, university output follows the same pattern of female under-representation.

For the achievement of national goals of development, particularly those of the Millennium Development Goals (MDGs), there is the need to be concerned not only about the issues of accessibility but also the quality and relevance of that accessibility in terms of female participation in Science, Mathematics and Technology (SMT) and ICT; and to continually focus on the under-representation of women in SMT which are crucial to personal and national development. Qualitative accessibility means citizens, girls and boys in good number should be in school, pursuing these courses that are of national relevance. Researchers should therefore be interested in both the physical accessibility and the quality of that accessibility in terms of course enrolment and output relevant to areas of national emphasis, particularly in an age when personal, national and global goals are measured in terms of science, information and communication technology. It is clear that gender disparity at the tertiary level is a built-up from the lower levels and that certain cultural constraint, practices, attitudes and expectations have been documented as contributing to the educational gap between men and women (Aloba, 1998, Erinosho, 1994, 1997, Obura, 1991). Certain national, regional and global efforts of which Nigeria is signatory, have been made to bridge this gap (United Nations Declaration of the Women’s Decade, 1975; Copenhagen 1980, Nairobi 1985, Beijing 1995, World Summit 1995). In Africa, Lagos plan of Action (1980), the Kilimanjaro Programme of Action on Population and Self-reliant development (1984), the African charter on popular participation and transformation (1990), the Abuja Treaty (1991), the Ouagodougou Declaration on the Education of Girls (1993), the Kampala Action Plan on Women and Peace (1993) demonstrate the premium placed on the matter.

Despite all these, it appears disparity, particularly in terms of qualitative access is yet to be adequately addressed. The focus of the paper is therefore, to undertake a case study of gender disparity in course offerings and graduate outputs, using University of Lagos as a case study. University of Lagos appears well placed because it usually receives a large number of applicants and admits a large number of students as a result of its location in Lagos metropolis, the nerve centre of commercial and industrial activities.

The Problem

The indices of women’s education include literacy rates, dropout rates, secondary school enrolment, women teachers, years of schooling, measured by years of schooling and enrolment in higher education (King and Hill, 1993). There is however gender disparity in all the indices which are costly to development. Particularly, there is a dichotomy in female and male enrolment in SMT at the tertiary level. Restricted access to SMT appears to be a significant characteristic among girls that demands continual research attention (Erinosho, 1994). As one moves up the educational ladder from the primary to tertiary level, fewer and fewer girls enroll in SMT disciplines, with the number of women enrolled in SMT based faculties being extremely small.

Another dimension of gender disparity lies in the types of courses and subjects that females pursue. Although there is no scientific evidence that females were unable to pursue studies in the sciences, mathematics and technology disciplines, the number of females in these disciplines has always been minimal. Consequently, there is a trickle down effect of female ability to pursue professional careers in SMT (Abdallah, 1988). Statistics show that at the primary school level, enrolment of boys and girls is almost equal. However the population of girls gradually dwindles with progression through the educational ladder. Of equal importance is the apparent difference in the curriculum choices made by boys and girls resulting in consistent under-representation in science and scientific careers among girls and women.

Particularly for Nigeria, as spelt out in the National Policy on Education, and as stated earlier, (NPE, 1977 revised 1981, 2004 and 2008), not less than 60% of university places shall be allocated to science and science-oriented courses in the conventional universities, and also not less than 80% in the universities of technology. At the polytechnic, the weighting is 70:30. It is clear from the above that government places high premium on science and science related courses at the tertiary level. In the true spirit of equity, and all other things being equal, male and female students should be equally represented at the admission and graduation points. Thus, there is the need for research interest in how girls fare given the importance of science and technology to national development as emphasized in the NPE and girls general low participation in tertiary education. The study, therefore, focused on the University of Lagos as a case study. Apart from two other Nigerian universities, University of Lagos is third in terms of the number of students admitted (FME, 2007).
PURPOSE OF STUDY
The main purpose is to investigate gender disparity in admission, course of study and graduate output in the University of Lagos. Specifically, the purpose includes:

1. determining the number of female and male undergraduates admitted into the nine faculties of the University of Lagos during the period under study;
2. comparing the output of male and female graduates in science and science-related courses.

RESEARCH QUESTIONS
An attempt was made to answer the following research questions.

1. Is there a difference in the number of male and female candidates admitted into the faculties of the University of Lagos within the period under study?
2. Is there a difference in the number of female and male students admitted into science and science-oriented courses?
3. Is there a difference in the number of female and male graduands in science and science-related courses?

METHODOLOGY
The main sources of data for the study were the National Statistics of Education (1999 – 2005), Joint Admission and Matriculation provisional admissions list for 2003 – 2008 and the Convocation Orders of Proceedings for 2003 – 2008 of the University of Lagos. The objective was to count and compare the number of male and female entrants and graduates in all disciplines, particularly in the science-based disciplines such as engineering, medicine, science and so on. Unfortunately the list of admission and graduates did not differentiate between male and female ones. In addition, many names across the geopolitical zones are unisex. These difficulties were however resolved. First, it is the practice of the University of Lagos to insist that students provide three names, one of which is invariably a Christian or a Muslim name that were usually gender differentiated. Thus, it was easy to classify subjects into male and female categories. However, there was a small number that used only two names. For such, the assistance of colleagues from such areas was sought to resolve the problem. In all, a small number of about 2% of the total students on the admission and graduating list could not be resolved; they were automatically excluded from the study.

All admission lists and convocation proceedings were read twice by the researcher. The data collected during the first reading were verified during the second reading. Less than five per cent of entries made at the first reading needed to be changed during the second reading. Most alterations involved erroneous repetition or entries under wrong categories. National statistics of education for the period 1999-2005 (Federal Ministry of Education 2007) provided statistics for only two of the five years under focus. The national statistics gave a breakdown of data on new entrants and graduates by Universities. Comparing the data generated from the admission and graduating lists of the University of Lagos with the national source for 2003 – 2005 sessions, there was almost perfect agreement between the study data and those of the Federal Ministry of Education in relation to University of Lagos. Thus, we were able to authenticate the data collected.

DATA ANALYSIS
Simple proportion and percentage were employed in comparing female participation in terms of admission into and graduation in the various courses. The emphasis here is gender disparity in the courses offered and their relevance to national development as emphasized by the NPE in relation to the policy of 60/40 science/arts courses. More importantly, the emphasis is on science, technology and information science, which are of national importance and relevance if Nigeria would be able to compete globally. Of course it is clear that the courses at entry will also determine the graduation of students in the various fields. However, it is pertinent to state that the paper does not intend to study the flow of students from entry point to graduation, thereby documenting attrition rate. The main focus is the study of quantitative and qualitative participation of males and females in tertiary education using total number admitted for each category and the courses offered in relation to their relevance in achieving national development, particularly as they relate to SMT.

RESULTS OF THE STUDY
Table 2 illustrates the findings in relation to research questions 1 and 2.

Table 2 illustrates disparity in the accessibility and the quality of participation between male and female undergraduates in the University of Lagos. There was preponderance of males in engineering, 82 per cent as against paltry 18 per cent for females; environmental science 78 per cent to 22 per cent while more females than males were admitted into arts and education – 78 to 22 per cent in Arts, and 61 to 39 per cent in education. There appears to be a tolerable distribution in medicine, pharmacy and social sciences.
Table 2: New Entrants by Course Offered Between 2003 – 2008

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<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
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</tr>
<tr>
<td>Arts N</td>
<td>275 (34)</td>
<td>515</td>
<td>160 (66)</td>
<td>239 (60)</td>
<td>151 (47)</td>
<td>168</td>
</tr>
<tr>
<td>Bus. Admin N</td>
<td>445 (54)</td>
<td>367</td>
<td>195 (62)</td>
<td>115 (38)</td>
<td>525 (57)</td>
<td>(43)</td>
</tr>
<tr>
<td>Education N</td>
<td>676 (47)</td>
<td>743</td>
<td>488 (53)</td>
<td>512 (52)</td>
<td>235 (51)</td>
<td>227</td>
</tr>
<tr>
<td>Engineering N</td>
<td>676 (83)</td>
<td>130</td>
<td>280 (91)</td>
<td>26 (9)</td>
<td>325 (91)</td>
<td>36</td>
</tr>
<tr>
<td>Env. Sci. N</td>
<td>344 (75)</td>
<td>114</td>
<td>182</td>
<td>54 (23)</td>
<td>158 (81)</td>
<td>38</td>
</tr>
<tr>
<td>Law N</td>
<td>69 (80)</td>
<td>100</td>
<td>153</td>
<td>42 (22)</td>
<td>74 (51)</td>
<td>69</td>
</tr>
<tr>
<td>Science N</td>
<td>572 (56)</td>
<td>448</td>
<td>392</td>
<td>251 (40)</td>
<td>299 (63)</td>
<td>180</td>
</tr>
<tr>
<td>Soc. Sci. N</td>
<td>301 (49)</td>
<td>306</td>
<td>150</td>
<td>115 (44)</td>
<td>274 (63)</td>
<td>158</td>
</tr>
<tr>
<td>Pharmacy N</td>
<td>29 (33)</td>
<td>58</td>
<td>28</td>
<td>27 (49)</td>
<td>54 (63)</td>
<td>31</td>
</tr>
<tr>
<td>Medicine N</td>
<td>118 (58)</td>
<td>83</td>
<td>123</td>
<td>74 (42)</td>
<td>165 (60)</td>
<td>110</td>
</tr>
<tr>
<td>Total</td>
<td>3,505</td>
<td>2,864</td>
<td>2,151</td>
<td>1,445</td>
<td>2,060</td>
<td>1,282</td>
</tr>
</tbody>
</table>

Source: University of Lagos

Table 3: Graduands by Faculty and Gender 2003 - 2008

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<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Arts (%)</td>
<td>142 (53)</td>
<td>126 (47)</td>
<td>511 (63)</td>
<td>162 (27)</td>
<td>161 (44)</td>
<td>215</td>
</tr>
<tr>
<td>Bus. Admin (%)</td>
<td>298 (71)</td>
<td>123 (29)</td>
<td>279 (30)</td>
<td>661 (70)</td>
<td>521 (59)</td>
<td>366</td>
</tr>
<tr>
<td>Education (%)</td>
<td>255 (55)</td>
<td>212 (45)</td>
<td>303 (60)</td>
<td>155 (40)</td>
<td>91 (30)</td>
<td>208</td>
</tr>
<tr>
<td>Engineering (%)</td>
<td>236 (89)</td>
<td>29 (11)</td>
<td>289 (91)</td>
<td>90 (45)</td>
<td>45 (9)</td>
<td>653</td>
</tr>
<tr>
<td>Env. Sci (%)</td>
<td>109 (73)</td>
<td>40 (27)</td>
<td>123 (58)</td>
<td>88 (42)</td>
<td>197 (78)</td>
<td>56</td>
</tr>
<tr>
<td>Law (%)</td>
<td>222 (60)</td>
<td>114 (34)</td>
<td>163 (51)</td>
<td>113 (41)</td>
<td>160 (45)</td>
<td>147</td>
</tr>
<tr>
<td>Science (%)</td>
<td>315 (65)</td>
<td>170 (35)</td>
<td>385 (55)</td>
<td>313 (45)</td>
<td>387 (69)</td>
<td>172</td>
</tr>
<tr>
<td>Soc. Sci (%)</td>
<td>337 (69)</td>
<td>140 (31)</td>
<td>857 (72)</td>
<td>326 (28)</td>
<td>278 (64)</td>
<td>158</td>
</tr>
<tr>
<td>Pharmacy (%)</td>
<td>27 (60)</td>
<td>18 (40)</td>
<td>34 (50)</td>
<td>31 (49)</td>
<td>34 (54)</td>
<td>31</td>
</tr>
<tr>
<td>Medicine (%)</td>
<td>137 (77)</td>
<td>42 (33)</td>
<td>153 (54)</td>
<td>131 (46)</td>
<td>153 (54)</td>
<td>31</td>
</tr>
</tbody>
</table>

Source: University of Lagos Convocation Order of Proceedings 2003 - 2008

A close look at table 3 indicates that the majority of graduates were males. So, in terms of accessibility, males have an advantage over females across all faculties. Males were preponderant in some instances, in the ratio of 7.3 in medicine. Even in the so-called female friendly areas such as the humanities, males were predominant 51 to 49 per cent, perhaps indicating that the females appear endangered even in these areas of study. In Business Administration, it was 53 to 47 per cent male/female ratio. The only faculty where females were in the majority was in Education 54 per cent.

Quantitatively, the scale tilts heavily to the side of males. In such areas of national emphasis as science, technology, engineering, medicine and pharmacy, the disparity is quite glaring. In engineering for instance, it was 87 to 13 per cent. The picture appears fair in science where males were 61 and 39 per cent. In Environmental Science, it was a ratio of 7:3 while in sciences; the ratio was 3:2 in the 5-year period. The proportion of female graduands ranged between 22 to 27 per cent with the exception of 2004/2005 academic year when it was 42 per cent for females.
Similarly, there were more male than female graduands in the social sciences with a ratio of 7:3 except for the year 2006/2007 when males constituted 57 per cent while female were 43 per cent. However in pharmacy, it appears females fared better with the ratio of approximately 3.2 with the exception of 2007/2008 where they almost tied at 51 per cent and 49 per cent respectively. In medicine, there was a variation in the number of male and female graduates ranging from 7.3 for three years and 3.2 for two years. On the contrary, there appears a more equitable access in Law ranging from a ratio of 3.2 to almost an equal representation in three of the 5 years under consideration. In all, our data showed that on both scores, girls are disadvantaged in quantitative and qualitative access to higher education.

DISCUSSION
It is evident that the choice to study or not to study science is made at the secondary school and the data in this study has emphasized an important consequence of the imbalance in such decision-making particularly for realizing national policy of 40/60 in humanities and science. Majority of women who constitute over 50% of the Nigerian population are not only under-represented at tertiary education but also in science and technology with costly consequences for economic, social, technological and industrial development of the individual and the nation. An accelerated approach to development should involve the active participation of both men and women, particularly in science and technology which are crucial for extending human capital (Harding 1987), to master the environment, expand employment opportunities and create wealth through increased productivity (Erinosho, 2003). Unfortunately, most countries in Africa, Nigeria inclusive, still consciously and unconsciously, exclude most of their women for many impulsive reasons, which include the general view that they lack interest and ability due to the prejudices and biases built up at home through primary socialization which is unfavourable for girls aspirations in science and technology, from the kinds of toys, to verbal labeling. Their school experiences unfortunately do not eliminate these prejudices but rather serve to promote them (Sigot, 1987). These unintentional biases and outmoded institutional structures have been identified as hindering access and enrollment of women in science (Abe, 1998, Shalala et al, 2006, Eccles J.S., Barber B., and Josepowicz D. 1999). Other factors include experiential differences that are culturally based, differential treatment of male and female children by parents and teachers (Abe 1989, 1992; Becker, 1987; Beaman R., Wheldal, K., Kemp, C., 2006). Other explanations for girls’ low participation in science related courses include the fact that textbooks are often particularly sexist (Eccles et al, 2007, Sadker and Zittleman 2005; Abe, 1992). These distortions in science texts of the image of science are likely to have consequence on who takes part or not. Textbooks play an important role in influencing class activities and are crucial in shaping behaviours. They do not only distort the image and use of science and technology as masculine, they do not relate science to everyday experience (Joshi and Anderson, 1994). In addition, textbooks do not acknowledge the contribution of women scientists, nor promote women role models for girls, even when professional advancement in science and technology is key to women empowerment and development. Other contributing forces include lack of adequate government support for the teaching and learning of science and technology in terms of funding including adequate and appropriate facilities.

The foregoing are some of the causes of gender disparity in science and related areas with dire consequences for the achievement of national goals of development. About half of the population is held back from active participation due to sex-stereotyped instructional materials and teacher classroom behaviour, out-moded socio-cultural beliefs and practices and lack of adequate government support for the teaching and learning of science.

RECOMMENDATIONS
In order to increase the participation of girls and women, it is imperative to recognize the gender dimension of science and technology, as a way of encouraging women’s increased participation at all levels of education and training. There is the need to increase women’s access to university education and particularly, more of them should be encouraged to offer courses in science-related areas at the secondary school level in order to provide the much needed reservoir for admission into tertiary institutions.

At a personal level, it is often stated that girls and women appear simply less interested in these areas than men. The argument supposes that even when they have comparable ability and aptitude to men, women often prefer people-oriented careers (Baron-Cohen, 2007, Hakim, 2006), preferring jobs that can be adapted to personal and family needs. The employment environment also discourages women from taking science professions. Employers often prefer male to female engineers in the belief that marriage and family duties may affect the work output of female employees.

In order to increase the participation of girls and women, the issue of women’s under-representation should be brought to the front-burner of government attention. At the level of the home/parents, there is the need for massive national awareness on how child-rearing practices, particularly, gender-differentiated ones, can affect what children can become in future. In addition, campaigns against the
out-moded, socio-cultural beliefs and practices that have hitherto impeded women education generally, and in particular their participation in science, should be undertaken.

At the school level, curricula should be revised and gender biases in schools and colleges addressed. The Nigeria Educational Research and Development Council (NERDC) should take the lead by identifying and eliminating sex-stereotypes and develop gender fair instructional materials. To assist other authors and publishers of school textbooks and other writers, a workshop to develop guidelines on the elimination of sexism should be convened by the Council. Authors and publishers should also produce books and other instructional materials with visual images that reflect equal participation of boys and girls in science and household chores.

Certain measures are also needed to bring about a change in their traditional choice of subjects and course programmes. It is important to create a favourable learning climate. Prejudiced teachers are a real problem. Therefore teachers should extend the same treatment in terms of motivation, feedback, higher order interaction to male and female students. There is also the training and retraining of teachers in anti-sexism, not only to recognize it but also to compensate for this in their teaching and learning process. The reform should also include comprehensive materials that would help teachers to guide students to neutralize the past stubborn gender roles.

At various levels of government, professional associations and the mass media, there should be motivation and counseling activities. Support programmes should be established including the promotion of positive images of girls and gender relations directed at changing parents and community attitude towards the right of girls and children to education. Information should be provided to enable women to make the right choice. Gender-free vocational and career guidance materials and practices should be encouraged among school counselors and teachers.

The role of models and mentors, both real and vicarious, in the quest to promote increased participation of girls and women cannot be over-emphasized (Mokros et al, 1980, Moen, 1988). Instructional and reading materials particularly the pictorial representation of the doers and users of science should be balanced. The pictorial materials are critical because they are most often introduced to children even before they begin to talk and obtain most of their impressions about their environment from what they can deduce from picture books. A single picture tells a whole story. The messages therein are more likely to be easily recalled by children than those of printed words (Abe, 1989). For the above consideration, textbooks should be rewritten in a gender-balanced manner, using the guidelines suggested earlier in the paper. Both real and vicarious models and mentors will help to demystify science and technology and dispel the myths and break down girls’ psychological and cultural constraints and barriers. Professional bodies should form action groups and networks made possible through a database that will promote support programmes for role modeling.

At the federal government level, there should be a deliberate action for funding female science and technology education which is girl-friendly and gender sensitive. Government at all levels should also put in place a women’s educational trust that will offer scholarship to women and girls. Individuals, donors and non-governmental organisations should be encouraged to establish special scholarship schemes that will support girls in science particularly, those from disadvantaged families. In addition, government should put in place nationwide government-funded projects similar to the Junior Engineers Technologists (JETs) at state/ zonal levels. JETs has popularized science, but its effect on increasing female participation is yet to be assessed. Science, mathematics and technology clinics for girls should be mounted in specific institutions and locations aimed at increasing female involvement, where the misconceptions revealed in their pre-clinic responses, will be worked upon to alter these misconceptions that have worked against their full participation. At the school level, science fairs, awards and information, can popularize science among girls and women. Government should also undertake a national drive to develop scientific culture, especially by establishing a national training programme in innovative girl friendly teaching approaches in SMT subjects for teachers, and mobilize communities by sensitizing parents in gender issues especially the importance of encouraging girls in SMT. In addition, gender insensitivity and negative attitude of teachers that discourage girls and women from choosing science and technology courses should be tackled through gender-sensitivity training and retraining. It is also important that syllabuses at all levels of education and training are localized in order to link science to individual needs for surviving in an age of science and information technology.

CONCLUSION

In sum, it is common knowledge that education, science, engineering and technology are the backbone of human and industrial development in Africa, and they are also the propeller that drives that engine of national development. Any nation that selects its future human resources from less than half of its population is definitely short-changing itself and
needs to pay attention to the disadvantaged groups, if it must make progress socially, economically, politically, and particularly in health matter. Advancement of women in science and technology fields is a key in improving health, nutrition, education and national productivity, and therefore there is the need to put in place concerted efforts as discussed above, to remove the barriers hindering the development of interest and participation in science and related fields. The active participation of women in scientific and technological fields depends largely on their enrollment in science subjects at secondary school level; and it is at this level, that much work needs to be done.

Gender disparity in course of study pursued by male and female students as illustrated by the data from the University of Lagos indicates the general situation in Nigeria and a pointer to the possible consequences of low participation of girls for national development. The suggestions for action on tackling some of the barriers as identified in the paper will go a long way in increasing girls’ enrolment in science, mathematics and technology starting from the basic levels.

REFERENCES


