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The Changing Face of Women in Physics in Ghana

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Abstract. Ghana is said to be the first independent sub-Saharan African country outside South Africa to promote science education and the application of science in industrial and social development. It has long been recognized that many schools' science curricula extend the extracurricular activities of boys more than those of girls. In order to bridge this gap, efforts have been made to give girls extra assistance in the learning of science by exposing them to science activities through specific camps, road shows, exhibitions, and so on. The best known of such efforts is the Science, Technology, and Mathematics Education (STME) camps and clinics for girls, which started in Ghana 23 years ago. Since our attendance at the Third International Conference on Women in Physics in Seoul, Korea, a lot has been achieved to further improve female science education, and this credit goes to STME. The first female nuclear engineer from Ghana graduated from the University of Ghana in March 2010.

Keywords: Ghana, science education, technology, mathematics, women
PACS: 01.10.Hx, 01.40.-d, 01.75.+m, 01.78.+p

Ghana is said to be the first independent sub-Saharan African country outside South Africa to promote science education and the application of science in industrial and social development [1]. It has long been recognized that many school science curricula extend the extracurricular activities of boys more than those of girls. A number of innovative actions are under way to remedy the situation, such as national policies, compulsory science and technology education, positive discrimination (affirmative action) for girls, changes in curricula and textbooks, and awareness-raising activities. Currently, female science education has increased tremendously due to the introduction of the Science, Technology, and Mathematics Education (STME) clinics introduced by the Ghana Education Service (GES) in 1987.

NATIONAL POLICIES AND INITIATIVES

The SMTE clinics for girls, which have been available in Ghana courtesy of the GES since 1987 [2], has corrected the misconception girls have about science, including physics. Consequently, more girls are now pursuing science, and physics, even at the higher academic levels. These camps provide the following:

- Parents, teachers, role models, and resource people are brought together to talk and interact with the girls.
- The girls are asked to do projects, which they display on posters for parents to see and appreciate.
- Role models and resource people walk the girls through some projects in their areas of expertise. The girls also visit industries where they are exposed to many new things. This helps them to appreciate and begin to develop interests in these fields.

Since Ghana decided to add nuclear energy to its energy mix, it has responded by developing strategies and programs to maintain competence and to preserve and transfer nuclear knowledge and skills as prerequisites for maintaining high standards in the application of nuclear technology [3]. As such, the Postgraduate School of Nuclear and Allied Sciences, University of Ghana (SNAS-UG) has been established jointly by the Ghana Atomic Energy Commission (GAEC), with the support of the International Atomic Energy Agency, to address the problem of human resources in Ghana, and in Africa. Since the school was established, more women have been encouraged to apply.

TABLE 1. Comparison of the number of female and male students at SNAS-UG, 2006–2009

YEAR	MALE	FEMALE
2006	29	7
2007	33	8
2008	36	7
2009	41	14

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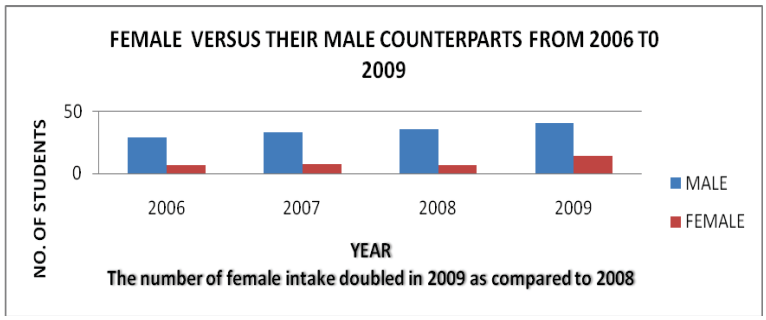

FIGURE 1. Comparison of female and male students at SNAS-UG, 2006–2009.

IMPACTS AND OUTCOMES (SUCCESS STORIES)

Women have been better able to deal with gender stereotypes associated with female participation in so-called nontraditional careers as misconceptions and psychological barriers to female participation in science, technology, and mathematics are gradually being broken. Female enrollment in science and mathematics is now higher than before the program started.

Recent senior high school examination results indicate that girls are achieving better grades in science compared to their performance in previous years [4]. After STME intervention there has been a total of 40,908 girls at the clinics and camps from 1986 to 2010 [4].

In addition, by the year 2011 SNAS-UG had produced two female nuclear physicists and about10 female scientists in various fields of science. The first female nuclear engineer in Ghana graduated from the school in March 2010. Over the past five years, three women have graduated with a master's degree in physics from the University of Cape Coast.

It has been 20 years since the clinics were organized, and women are currently being employed in areas that were previously perceived to be male dominated. For example, the GAEC, whose employees were predominately men, has over the past five years seen an increasing number of female research scientists as part of the workforce. In the education field, more women are now teaching science in the junior and senior high schools and at the tertiary levels. Currently at SNAS-UG there are four female lecturers.

CONCLUSION AND RECOMMENDATIONS

Between 2005 and 2010, there has been an increase in the number of Ghanaian girls participating in science, including physics. The performance of girls participating in science has improved remarkably compared with previous years. The strategies and actions being taken to address the underrepresentation of girls in science, and specifically physics, are effective. There has been an improvement, but more needs to be done to get girls in rural areas to be a part our success story.

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