The Role of Mathematics Education in Women Empowerment

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The importance of Mathematics as a tool for science and technology is continually increasing. While science and technology have become so pervasive, mathematics education has continued to dominate the school curriculum and remains a key subject area requirement in higher education and employment sector.

The hue and cry which follow the publication of mathematics results has become an annual ritual. The post-mortems about the results eclipses a number of areas where female students have lagged behind. This has also impacted on courses and careers sought by women in the working world. They have attributed their failure to perform to expected standards to lack of sound background knowledge of mathematics. It is this realization that the skills learnt at school have had very little if any, bearing on what society needs in terms of productive citizens that prompted the research to look into problem areas in the teaching and learning of mathematics so as to equip students with the necessary skills needed on the market. In this regard, the gender imbalances in enrolment, achievement at school level, colleges and universities and the employment sector were also issues of concern. Our societies are becoming more and more technological with a mathematical bias, more attention being focused on attainment of mathematical competencies. Since Zimbabwe attained its independence in 1980, most women have taken indigenisation policy and affirmative action policy seriously. This has seen both the formal and informal sectors involved in the running of cooperatives and small business enterprises for which clear understanding and application of mathematical concepts and skills is required. This triggered the need for research into aspects pertaining to the role of mathematics education in assisting career choices undertaken by women. The argument is, to what extent does Mathematics education offer new challenges and opportunities for women advancement?

The 'O' and 'A' Level Mathematics syllabuses essentially spell out the national goal of laying a base for manpower training. That at tertiary level aimed at producing trained and skilled manpower for the country's economic growth were then looked at in light of the relationship between the level of mathematics education acquired and job opportunities through making a comparative study on the number of males and females undertaking mathematics in schools and colleges and in some of the mathematics-related occupations from both the formal and informal sectors.

Empowerment provides opportunities to increase knowledge and vocational skills for survival and also improves accessibility to more enterprising career paths for women.

Imbalances in enrolment, performance, subjects and subsequent employment in jobs that have a mathematical inclination underscored the need for intervention programs to bridge the gap while it revealed the need for a curriculum reform as a mechanism for improving the quality of education. Corresponding changes in assessment procedures are seen fit to accompany these reforms so as to ensure a holistic approach to learning. The research sought to provide a diagnostic tool from which to view other changes that were seen fit in the teaching, learning and assessment of Mathematics in the context of women empowerment.

This research was a descriptive survey whose target population was that of women in employment, undergoing skills-training and those still in high school. The research showed how these women are under-represented in mathematically related studies and careers. A stratified random sampling of high schools, colleges and the formal and informal employment sectors of the economy were used in the selection. Interview schedules and questionnaires were used in the collection of data. Both qualitative and quantitative cross validation exercises were conducted through observation schedules and archival records. It provided a base for further exploration of issues related to the design and delivery of mathematics education.

A trend analysis showing how enrolment and pass rates in mathematics have dwindled from 'O' Level through to mathematics-related occupations was established by way of a three-point moving averages. A correlational analysis of the career opportunities by gender was done starting from subject choices in the schools, tertiary institutions and subsequently in the employment sectors.
Mathematics and Gender in Ugandan Primary Schools: Influence on Teachers, Parents and Learners

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Problem, Objectives and Significance
In Uganda, gender disaggregated primary school performance data indicates that though mathematics is poorly performed relative to other subjects (Social Studies, English and Integrated Science), there is a significant gap between the performances of girls as compared to that of boys. This gap is not only evident during; teacher made and standardised examinations but also with the classroom participation. Basing on this observation, one would then wonder what the cause of this performance disparity is, since both girls and boys come from similar homes, sit in the same classrooms, are taught by the same teachers and are subjected to the same assessment. This rises an automatic question that of the stakeholders; parents, teachers and pupils, who is responsible for the observed gender disparities. The paper presents results of a study that was conceptualised with the overall aim of finding out the possible causes to the performance disparities among boys and girls in primary schools in Uganda. It was hoped that if careful note of the findings of this research was taken, the study would contribute to the bridging the performance gap between girls and boys in Ugandan primary schools.

Context And Underlying Assumptions About Gender And Mathematics In The Classroom
Research over the last two decades has shown that males and females have different classroom experiences because they approach learning differently and because teachers tend to treat them differently. Girls' achievement in mathematics during elementary grades is equal to boys' but decreases in the middle school (Callahan & Clements, 1984; Dossey et al., 1988). An analysis of math achievement of twelfth grade girls in 15 countries revealed that in all but three countries girls were less successful than boys (Hanna, Kudiger, & Larouche, 1990). That gender differences seem not to surface until age ten (Callahan & Clements, 1984; Dossey, Mulis, Lindquist, & Chambers, 1988) suggests that the decline of female achievement is the result of a strong pattern of socialization to mathematics success or failure rather than to gender differences in innate ability. As girls progress through school, they are less likely to continue their math education, either taking more rudimentary courses or dropping the subject altogether (Pallas & Alexander, 1983).