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**GENDER, EQUITY AND ACCESS
2008 CAPA CONFERENCE IN BANJUI GAMBIA**

**EXPERIENCE IN PROMOTING FEMALE PARTICIPATION IN SCIENCE
AND ENGINEERING TRAINING BY MBEYA INSTITUTE OF SCIENCE
AND TECHNOLOGY**

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Abstract:

Mbeya Institute of Science and Technology is one of four Government Technical Institutions in Tanzania. Education and Training in these Technical Institutions are based on Science and Engineering fields. The basic catchments areas are the students who have completed Ordinary Secondary Schools Education with good passes in science subjects. More male students are opting to study science subjects in Ordinary Secondary Schools than female students. This attributes to more male students to enroll in Technical Institutions than female students due to the limited number of female students from the catchments areas. There are very few female students with good passes in science subjects who can be enrolled in these Institutions. In order to promote female participation in science and engineering fields, technical institutions have adopted an affirmative action whereby female students with low passes in science subjects are provided with special access course programmes. Those who pass Access Course examinations are allowed to continue with the course of three years at technician level. This initiative has attributed to a promising progress in enrollments of female students in technical institutions. There are few challenges which Technical Institutions are facing; funding is one of the main challenges which negatively impact on this programme. Some of the female students with low passes in science subjects and who are interested with this field are coming from poor families, that they can not afford to pay a little tuition fee contributions, little payment for accommodation and they can not even afford to pay for their own meals. This paper explains the experience of Mbeya Institute of Science and Technology in using the Access Course Programmes to increase the female students' enrollments in Science and Engineering training.

Keywords: Female students; Access course; Technical education.

Introduction

In Tanzania there is a genuine political will to ensure that girls are given equal access to science and engineering training. Women were regarded as inferior to men and were not expected to aspire as high as men, especially in what were considered as male fields science and engineering. Lack of access to science and engineering training opportunities affects more women than men. It is known that women are guardians of their children's welfare and have explicit responsibility to provide for them materially. It is assumed that educating women would make them too independent; they would not do what they are expected to do, that they are supposed to look after the house and bring up a child which is the opposite.

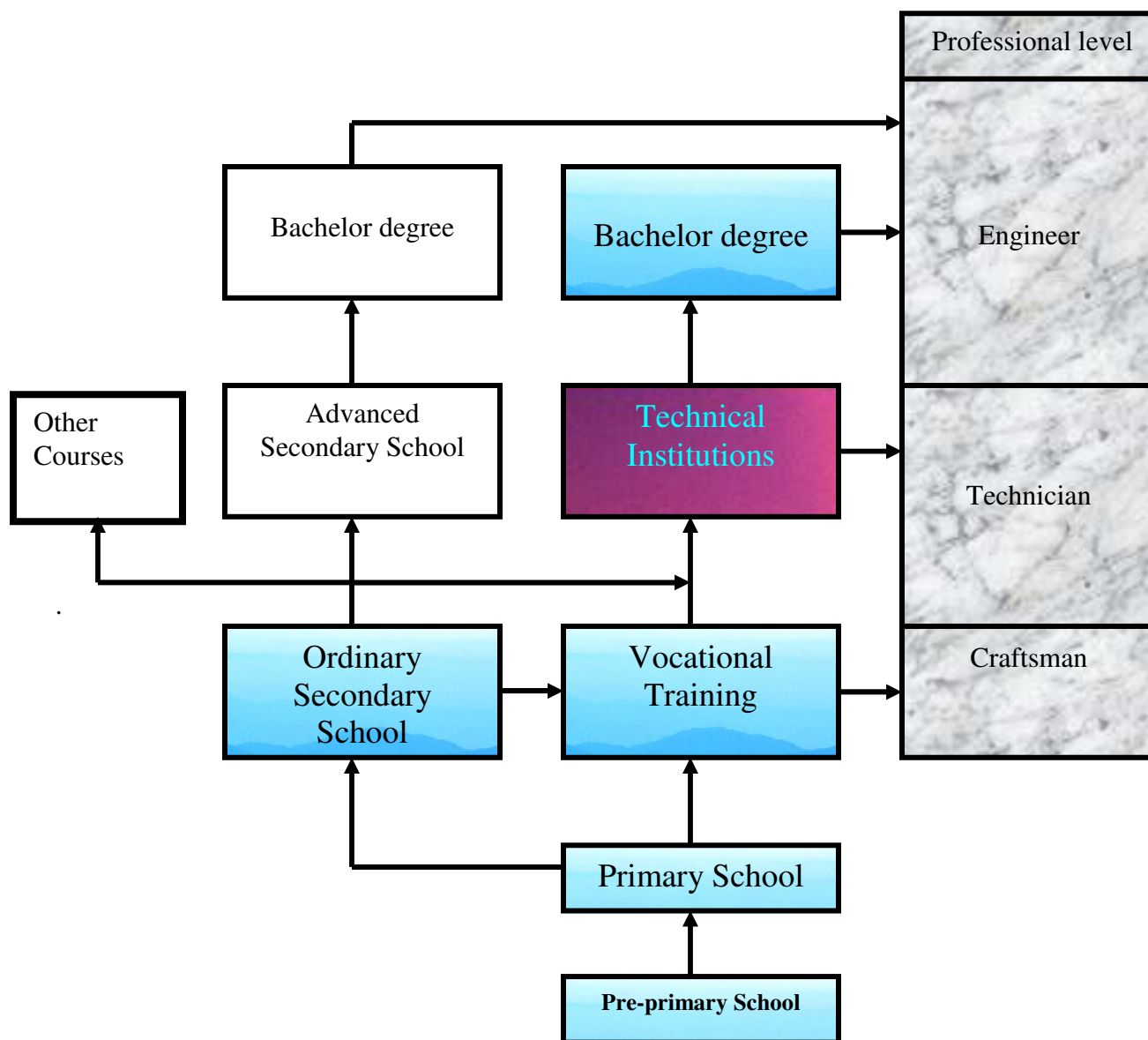
Providing access to female in science and engineering may make their lives easier by using the knowledge they learn in their daily life. For a long time female were discouraged from pursuing science and engineering training, this did limit their access to jobs that related to engineering fields, and which paid considerably more than those which female were traditionally allowed to do. In industries, many female hold low level skills and low paid jobs. Difference access to education and training opportunities have led to small proportions of women in the formal sector and their concentration in low paid production jobs limited their career prospects. There are very few women in technical education and training. Technical education has generally been dominated by men, and women everywhere found difficult to make it. The differences in the numbers of women working in science and engineering can be ascribed to a variety of causes, rooted from the culture and history of each ethnic group. There is often more respect for male professionals than there is for female. Career women often have to work harder at their jobs. Despite all these obstacles, women continue to move into different professions, including those traditionally seen as male jobs, such as engineering and architecture.

Education system in Tanzania

The structure of the formal education and training system in Tanzania constitutes of two years of pre primary education, seven years of primary education, four years of ordinary level of secondary education, two years of advanced level of secondary education and three or more years of tertiary education. The structure has three levels namely primary, secondary and tertiary. The primary education is the basic level, and it includes pre primary, primary and non-formal adult secondary education. The secondary level education includes ordinary and advanced levels of secondary schooling. The tertiary level includes programs and courses offered by non-higher and higher education institutions. The aim of the government is to make sure that everybody passes through this system. Due to various reasons and circumstances others fail to pass through this system, hence they enroll themselves to informal vocational training after the completion of primary school.

Technical Education system in Tanzania

Technical Education system in Tanzania follows the 1-7-3-3 system. Candidates start with the pre primary education for one year and then seven years primary education where candidates sit for Nation Examination at the end of seventh years. Those with good passes continue with ordinary secondary school education for four years and sit for another national examination at the end of four years. Candidates with ordinary secondary school education who have good passes continue with further education. Further education may either be advanced secondary school education for two years or three years of technical education or any other professional course. Candidates with lower passes in the National examinations of primary and ordinary level secondary education may join Vocational Training education for one to three years where they may be awarded National Technical Awards levels one to three. Professional they are called craftsmen.



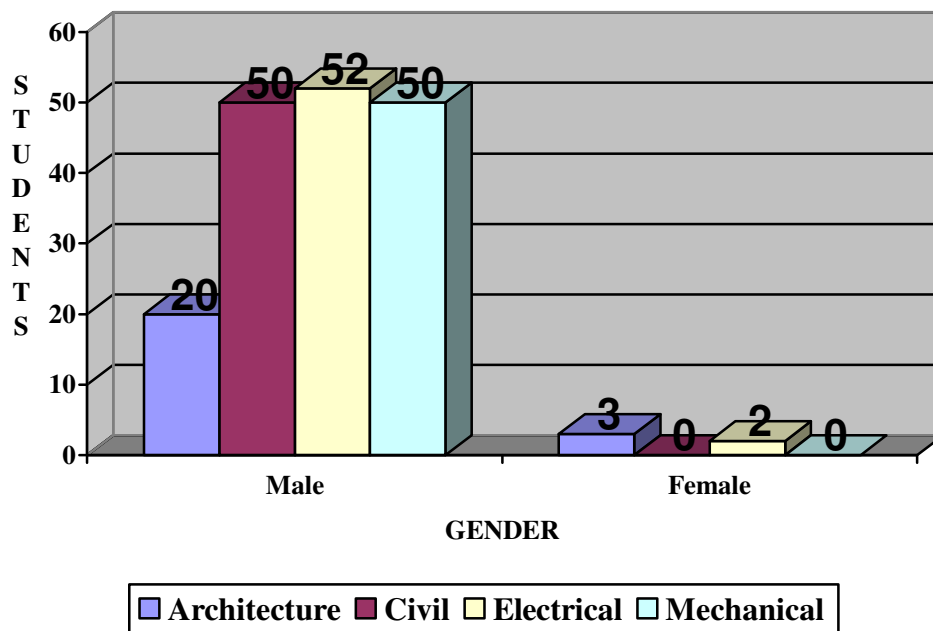
Ordinary level secondary school education

Education provided at ordinary level secondary school is grouped in two main categories that are science and non science disciplines. Many ordinary secondary school students prefer opting to study non science disciplines as they believe that the non science disciplines are easy to understand and that they may easily get good passes on national examinations than in science disciplines. Many female students at ordinary level secondary school prefer to study the non science subjects on the same mentality of understanding.

Student enrollment at Mbeya Institute of Science and Technology

Mbeya institution of Science and technology is one of the Technical Institutions which produces technicians in Tanzania. The catchments areas for Mbeya Institute of Science and Technology are candidates with ordinary secondary schools education, who passed science subjects on national examination. Other catchments areas include craftsmen with National Technical Awards level three who initially had ordinary level secondary school education. The minimum entry qualifications to join Mbeya Institute of science and Technology for technician level is based on passes in science discipline from ordinary secondary school with at least an average passes of grade “C”. As shown on the following chart the number of qualified male candidates to join Mbeya Institute of Science and Technology is very much bigger than the number of qualified female candidates.

STUDENTS ADMITED AT MIST ON YEAR 2000 BEFORE STARTING ACCESS COURSE

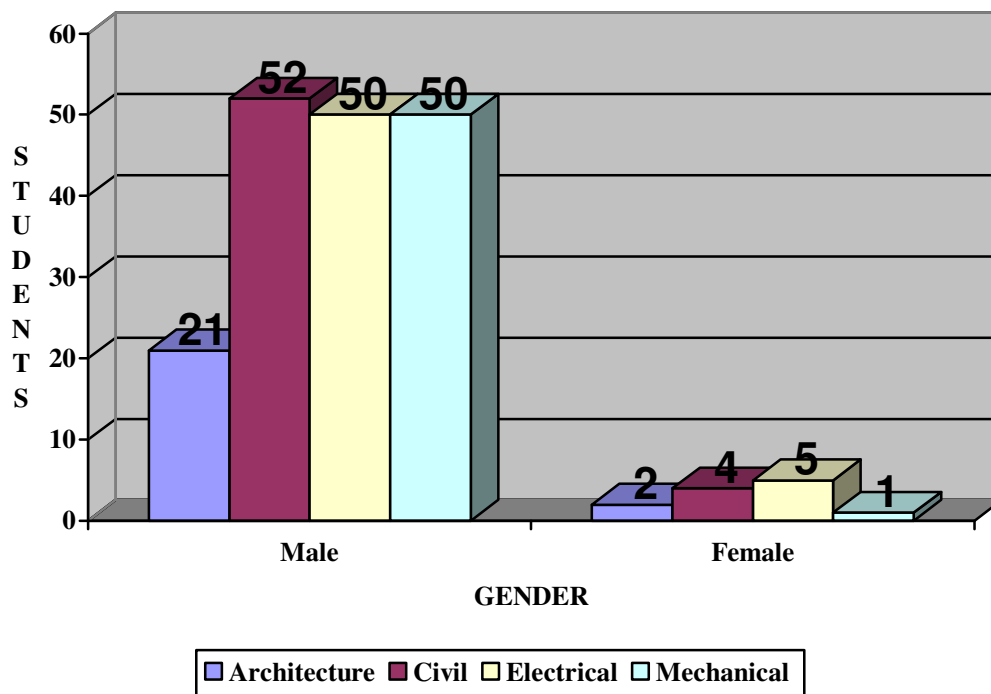


As shown on the chart above, the number of female candidates joining technical programmes is low as compared with male candidates. There is very poor enrollment of women in technical programmes. Candidates joining Mbeya Institute of Science and Technology have opportunities to study technical fields in Architecture, Civil Engineering, Electrical Engineering, Mechanical Engineering and Computer Engineering. Another field which is not shown in the chart is the field of Science and Business Administration it is started this academic year 2008/2009. The basic salaries in science fields are much bigger than in non science fields of employment with the same level of education. Thus by employing more female in science and engineering fields, will very much help reduce poverty in Tanzania.

In order to encourage female candidates to join science and engineering fields, Mbeya Institute of Science and Technology decided to start running a training programme called “Access Course”. This course was aimed to encourage female students with lower passes in ordinary secondary school education level to join Mbeya Institute of Science and Technology. Access Course at MIST started since 2002. The course is advertised in all

famous news papers in the country, female candidates apply for the course. Successful candidates from those who apply are selected and trained for ten weeks. During the training they revise all science subjects learned at ordinary level secondary school. At the end of this course they are given special examination, whereby those who pass examination are selected to join the courses at MIST and granted Government sponsorship for their studies. Access course Programme has helped increase the number of female candidates at MIST as shown in the following chart for fields of studies Architecture, Civil engineering, Electrical engineering and Mechanical engineering.

STUDENTS ADMITTED AT MIST ON YEAR 2004 AFTER STARTING ACCESS COURSE



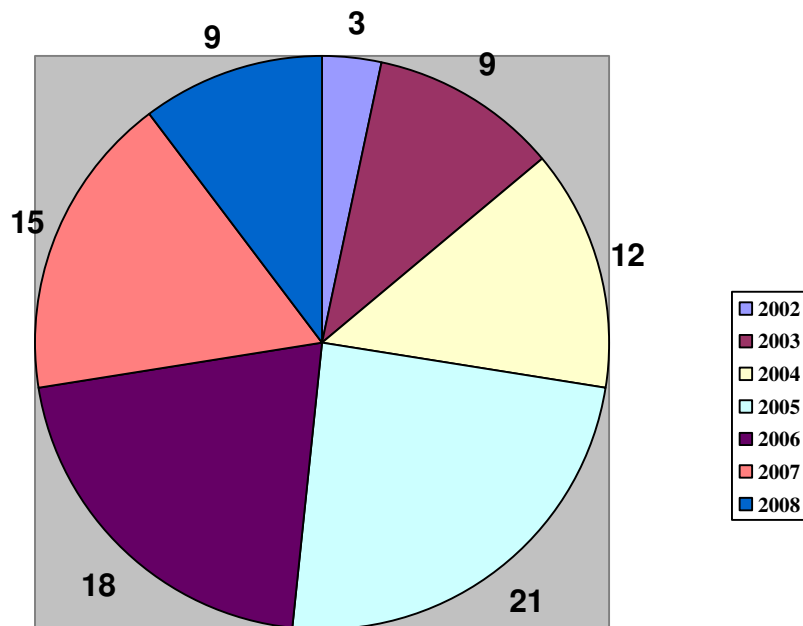
Female Students at Mbeya Institute of Science and Technology

The chart above shows the number of female candidates enrolled through access course. With access course still the number of female candidates is not big. Gender equity at Mbeya Institute of Science and technology and in other higher technical education in general is a serious constraint in Tanzania, especially in science and technology related academic programmes. This is due to the fact that, female students qualifying for science and engineering programmes is too small to make the difference, and is coupled with the misconception that science and engineering courses are masculine. However, with the introduction of special access Programme, the total enrolment of female students is growing.

Progress of Access course at MIST

The following chart summarizes access course registration and selected female students who joined Mbeya Institute of Science and Technology at technician level from 2002 to 2008.

FEMALE STUDENTS REGISTERED AT MIST FOR ACCESS COURSES
FROM 2002 TO 2008



Challenges facing MIST with access course programme

MIST is facing a big challenge in running access courses. As shown in the chart above since the Institute started access course in 2002, the enrollment of female students at MIST through this course has increased year after a year. Since 2005 the number started decreasing until this year 2008. The factor is the decline in interest by the applicants for Science, Engineering and Technology courses. In Tanzania the enrollment in many higher learning institutions is higher in non science field than in science and technology fields, even candidates with higher passes in science combinations opt to join non science fields. There could be some basic reasons for this trend including some short term benefits evident from the current dominance of trade over direct science based production system in the country. Another factor associated with the low recruitment level of students into science and engineering courses include erosion of mathematical skills. Some interested female candidates in engineering, are coming

from poor families which can not afford to pay little money for access course though is known that after completion of the access course those with good passes will be granted Government sponsorship for their studies at MIST.

Conclusion

It has often been said that, if there were more female teachers and lecturers who could act as a role model to girls, there would possibly be an increase in the number of girls attending such establishments. Some of the factors which influence women's participation are: prejudices about women's abilities and attitudes; their roles; their behaviour and aspirations; culture, politics and society; absence of role models; image of science; parental expectations, beliefs, attitude and home environment; teacher attitudes and behaviour; curriculum; career guidance; employer's attitudes; lack of education and training facilities; lack of quotas; lack of exposure to technically oriented subjects; group pressures at home and at school; classroom interactions between girls and boys; lack of school books and resource materials; and lack of confidence to try new things. This list is long, and further research would be required to find out exactly which factors influence negatively women's participation in technical fields. However, as elsewhere in the developing world, things are slowly changing for women. More women are joining the formal sector of the economy, more girls are joining technical courses, more women are moving into professions so far dominated by men, and more women are becoming self employed. In the years to come, we will see many changes, although the poor economic situation may not provide many job opportunities. With more competition for jobs women may lose out, especially where there are domestic and family demands placed on them.

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