This paper analyses the efficacy of efforts being undertaken to achieve gender equality in science, mathematics and technology (SMT) education in Tanzania. The paper explores mainstreaming strategies in relation to the available good practices and lessons learned from the long periods of research and interventions. Discussed is the absence of a comprehensive national strategy for mainstreaming gender in education and in particular in SMT education. Lack of stakeholders’ shared vision on gender equity poses the main challenge for developing support systems for gender equitable participation in SMT education.

INTRODUCTION

Tanzania is one of the countries that have introduced educational targets and is currently implementing a 5-year Primary Education Development Programme (PEDP) since 2001 and start to implement the Secondary Education Development Programme (SEDP) mid 2004. PEDP seeks to establish high quality education for all while SEDP aims to prepare future national workforce and leaders.

In Tanzania the gender gap in science and mathematics is still very wide with females lagging far behind males. The most influential factors for the under representation of females are the low participation rates in advanced courses and lower performance levels in examinations.

Efforts to bridge the gender gap in education in Tanzania go way back to 1961 when the country attained independence. While the government has played a major role in the quantitative aspect of achieving nearly equal enrolment numbers of boys and girls in primary and secondary schools, the Civil Society has tried out numerous interventions to bridge the gender gap in both the quantitative and the qualitative aspects of education (Masanja: 2004, Helgesson: 2001 and Swanson et al: 1998). Despite recent progress in female enrolment owing to positive actions and sensitisation campaigns, disparities still exist and are quite striking in some communities. Obstacles and resistance to gender equality in education persist especially in marginalised areas where traditional attitudes are predominant (Masanja: 2004, 3).
GENDER MAINSTREAMING IN TANZANIA

Drivers
The government of Tanzania is bound to promote equity and non-discrimination policies in the education sector by virtue of being a signatory and a party to many regional and international human rights conventions that emphasise equitable and quality education to be a right for every citizen, (Rusimbi: 2002, 4). These include the recent education sector reforms such as the 1990 Jomtien Conference on Education for All (EFA) which pledged to achieve universal primary education by 2000, the 2000 Dakar Framework for Action that made a commitment to attain EFA and set goals for achieving gender equity in primary education by 2005 and universal completion of primary education and halving of adult illiteracy by 2015, and the 2000 Tanzania Poverty Reduction Strategy (PRS) that has prioritised and put emphasis on education as vital to sustained development.

Opportunities
PEDP and SEDP aiming at attainment of the EFA goals are limited but they are significant attempts to attain gender equality in education. In addition, there has been a rapid growth of strong civil society organizations (CSOs) and coalitions within the area of education in Tanzania. This has strengthened advocacy on issues of gender and education and expanded the pool of gender expertise within the country and these are playing a key role in raising awareness and influencing changes in policies and laws. Finally, the donor community is taking an active role in ensuring that PEDP and SEDP take gender into consideration as a key variable. These provide significant opportunities for addressing the real needs of females and males equally in the education sector.

However, Tanzania has not yet taken full advantage of these opportunities to mainstream gender into the education sector, due to constraints including on-going economic and social policies, institutional structures, laws and traditional gender practices (Rusimbi:2002,5). These factors complicate the chance to take full advantage of the existing opportunities, especially those related to putting theory and goals into practice. Due to these constraints majority of females in Tanzania have remained with fewer opportunities in education and training than males (ibid)

Challenges
Analysis of gender mainstreaming efforts in the on-going education reforms (Rusimbi: 2002, 7-11) mentions some of the key challenges to gender equality in education in Tanzania to be the lag in domesticating international commitments into national laws, policies adapted from international financial institutions the World Bank (WB) and the International Monetary Fund (IMF)), insufficient gender mainstreaming of national educational reform processes, institutional barriers to engendering the education sector and a constraining socio-cultural environment.
CLOSING THE GENDER GAPS IN SMT EDUCATION

Enrolment and Performance

As a result of deliberate efforts by Tanzania Government to attain Universal Primary Education (UPE) in 1974 and recently under PEDP, Tanzania has come close to achieving gender parity in primary school enrolments, with exception of specific districts with high pastoralist population and in some of the coastal regions. The gender gap widens significantly at higher levels of education with females being under-represented in key subjects such as Science and Mathematics. The ongoing national level plans and programmes have not resulted in the closure of the gender disparities in enrolment and performance at primary level as can be seen in the Table 1 and Figures 1 to 4 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>STD VII to Form I Transition Rates</th>
<th>Gross Enrolment Ratio</th>
<th>% Enrolment Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Total</td>
<td>Female</td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td>76.7</td>
</tr>
<tr>
<td>2000</td>
<td>14.81</td>
<td>15.73</td>
<td>76.7</td>
</tr>
<tr>
<td>2001</td>
<td>19.27</td>
<td>19.90</td>
<td>82.7</td>
</tr>
<tr>
<td>2002</td>
<td>18.87</td>
<td>20.52</td>
<td>96.1</td>
</tr>
<tr>
<td>2003</td>
<td>18.15</td>
<td>19.07</td>
<td>102.1</td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Enrolment and transition 1999 - 2004

Source: MoEC, Basic Statistics in Education 1999-2003

Figure 1: Gender disparities 1999-2004 mean values
Gender disparities are even more pronounced amongst the vulnerable groups. For example, Figure 5 shows gender disparities in 2001 enrolment of the disabled children in primary schools in Tanzania.
Clearly disabled children are largely excluded from schooling. The number of disabled children in the primary school going age group is estimated at about one million. Due to lack of special equipment and specially trained staff, the visually and hearing impaired students are excluded from taking SMT subjects at post primary level.

GENDER MAINSTREAMING IN SMT

Lessons Learnt

Women representation in the disciplines of sciences, mathematics and technology is generally low in access, participation and performance. Various studies have established that girls have obstacles in many ways to utilise their educational and intellectual capabilities, (Masanja: 2004, 3). Fewer girls choose SMT subjects and the overall performance of girls is much worse than that of the boys especially in SMT subjects. This results into very low enrolment rates in Science, Engineering and Technology based subjects and disciplines at tertiary level, especially those requiring Mathematics and Physics knowledge and skills.

Successful interventions have been undertaken both nationally and institutionally to redress gender imbalance in education in general and in SMT subjects, for example the Female Education in Mathematics and Science In Africa (FEMSA) Tanzania Project (1996-2001) and the University of Dar es Salaam Pre- Entry remedial programme for girls (on going since 1997). Many other interventions are undertaken by government and others.

The trends in enrolment and performance in advanced secondary school level science is as given in Figures 6, 7 and 8 below:
The situation worsens at the tertiary level, where women are seriously underrepresented in science, engineering and technology as can be seen in Figure 6:
At the tertiary level, enrolment is still stereotypic with technology being least favoured while social work is most favoured by female students as can be seen in Table 3.

<table>
<thead>
<tr>
<th>Year</th>
<th>DIT</th>
<th>NSWI</th>
<th>CBE</th>
<th>TSJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998/99</td>
<td>5.98</td>
<td>60.58</td>
<td>40.54</td>
<td>51.28</td>
</tr>
<tr>
<td>1999/00</td>
<td>7.84</td>
<td>60.11</td>
<td>43.31</td>
<td>40.98</td>
</tr>
<tr>
<td>2000/01</td>
<td>7.91</td>
<td>69.57</td>
<td>40.84</td>
<td>45.45</td>
</tr>
<tr>
<td>2001/02</td>
<td>8.61</td>
<td>73.37</td>
<td>33.18</td>
<td>42.67</td>
</tr>
<tr>
<td>2002/03</td>
<td>10.85</td>
<td>68.44</td>
<td>35.48</td>
<td>47.95</td>
</tr>
</tbody>
</table>

DIT=Dar es Salaam Institute of Technology, NSWI=National Social Welfare Institute, CBE=College of Business Education, TSJ=Tanzania School of Journalism

Table 3: % of Female Enrolment in various Tertiary Level Institutions


Despite the remarkable recent progress in female enrolment and performance owing to positive actions and sensitisation campaigns (nationally and at various institutions of learning), gender disparities still exist and are quite striking in some disciplines. Obstacles and resistance to gender equality still persist in disciplines labelled “masculine” where traditional attitudes are predominant (FEMSA: 1997; FEMSA: 2001, Masanja: 2004, University of Dar es Salaam Facts and Figures 1996/97 – 2003/04).

**Challenges to Mainstreaming Efforts**

It is clear that policy makers and practitioners are concerned about the existing gender imbalances and are willing to take the necessary action. In many cases it is not
clear just what that action should be. Research results and interventions undertaken e.g. FEMSA project (1996-2001) and the University of Dar es Salaam pre entry programme for girls (ongoing since 1997) have demonstrated that it is possible to change the situation and make SMT subjects as amenable for females as for males. They indicate ways in which the participation and performance of girls in SMT subjects can be improved. These activities do not require any new institutions or any radical changes in the normal education system. They demonstrate that it is possible to replicate the activities in all schools/ institutions in the system, but within the context of better knowledge about the constraints and difficulties faced by girls in SMT, with feasible interventions that can be implemented in every school/ college, and with a new approach to teaching the existing curriculum.

The mainstreaming will involve a number of levels. For example, we already spend huge sums of money training teachers and students’ assessment. Why can’t we provide teacher training that equips teachers with an understanding of the strengths and weaknesses that girls bring to the learning of SMT; a realisation that girls do face special constraints and difficulties in learning SMT; and a battery of approaches and teaching methodologies that stimulate girls to learn SMT and enable them to perform better. Why can’t we design tests and assessment systems that genuinely allow girls to demonstrate the extent to which they have acquired the kind of SMT knowledge and skills they have learned? Mainstreaming would entail the following:

Attitude change at all levels – teachers, parents, students, education policy makers, administrators and field operatives.

Curriculum development – the SMT of the curriculum and the classroom must be more closely related to the SMT of the community, especially in the everyday lives of girls and women.

Teacher education – girls must learn SMT subjects in a supportive and gender sensitive environment.

Assessment of girls’ attainment – methods of assessment of students’ attainment should not only test the ability to memorise crammed facts.

Remedial support for girls – to make the playing field level because as they move through the school system, girls for various reasons find that they begin lagging behind the boys in SMT performance.

Current reforms in the Tanzania education sector in progress since 2001 address both institutional framework and issues of quality. For example the PEDP policy states that schools should provide an enabling and supportive environment, where learners participate actively in the process and that teachers have skills that are academically sound, child-friendly, and gender sensitive. The ultimate goal is to achieve an education for Tanzanian children and youth that will arm graduates with skills to meet the challenges of today’s world, such as the increasing poverty and the economic marginalisation in the national and global market place.
Three main challenge need attention: the widely held and deeply rooted belief that female students are inherently incapable of attaining high levels of SMT achievement is the greatest challenge. This may be internalised by policy makers, students, parents, community members, educators and female students themselves. Close examination of reports reveals that progress made towards achieving the goals of gender equality are lacking in both quantitative and qualitative indicators. This is another big challenge. Finally, the existing policies, plans and strategies lack proper monitoring tools, which is also a major challenge. The ongoing national level and institutional level policies, plans, and systems lack the three above.

To mainstream gender equity in SMT teaching and learning, all players need to develop a shared vision before they can determine their new roles and responsibilities in supporting gender equality; it is mandatory to develop indicators for measuring change and necessary to design proper monitoring tools to measure progress whether desired gender equality is being achieved.

References


