

Women in science, Engineering and Technology: Exploring the facts

SUMMARY¹

The 2004 report *“Facing the Facts: Women’s Participation in Science, Engineering and Technology”* highlighted the under-representation of women in the Science, Engineering and Technology (SET) sector in South Africa, and the low percentage of research projects with a gender perspective. Following on this, NACI commissioned Tara Research and Equity Consultants to conduct a qualitative study to gain greater insights into gender imbalances in South African science, as well as to explore the experiences, perceptions and policy suggestions of women in the sector. The study included a literature review and 136 interviews with 100 women and 36 men.

Key findings from the literature review

1. Women around the world are under-represented SET. Possible reasons include:
 - Gender stereotyping in family, education and media suggesting that boys are better at maths and science and that men are better suited to careers in science, causing girls to become negative and anxious about their science potential;
 - A male dominated structure and culture in research organisations, including “hidden” gender biases in the selection tools for awarding research grants;
 - Negative dynamics in the workplace, including exclusion of women from social activities, lack of credit for women’s contributions, women perceiving themselves as outsiders in a male-dominated environment, the differential impact of family responsibilities.
2. The literature shows that the representation of women can be enhanced by:
 - Allowing women flexible work hours;
 - Giving women access to female role models and mentors;
 - Supporting networks of women in science that can influence relevant policies.
3. The review confirms the need to focus more on the gender dimensions of research in order to produce results that are more relevant to the needs and perspectives of women.

Key findings from the qualitative study

Results from the qualitative study largely agreed with findings in the literature. The main responses to key issues discussed during the interviews are summarised below.

Why is science not regularly produced by women?

- Gender role conditioning (especially in early education) and gender stereotypes (often reinforced by the media) discourage young women;
- Education deficits in disadvantaged communities aggravate science and maths anxieties;
- Students face financial difficulties before or during tertiary studies;
- Women students perceive sexism from male students and lecturers.

What encourages women to study or enter a career in SET?

- Exposure to relevant career information, educational activities and mentorship;
- Incentives such as bursaries, employment opportunities and earning potential;
- Supportive lecturers, female classmates, women role models;
- An academic culture (perceived to be) free of gender discrimination.

Reasons why women leave the SET sector

- Work environments, equipment and facilities often don’t cater for women;
- Experiences of dominant male ethos, ongoing discrimination and gender bias at work;
- Difficulty in balancing the combined demands of work, family and studies;
- Lack of attractive career opportunities.

¹ The comprehensive report entitled: *“Women in SET: Exploring the Facts”* (published in 2006) is available from the National Advisory Council on Innovation.

Reasons why (some) women remain in the SET sector

- Career fulfilment and career opportunities;
- Support from family, colleagues and superiors;
- Flexible hours in academia helps to balance responsibilities;
- Financial obligations don't allow a change;
- Other sectors are even more biased against women.

What are the barriers preventing women from progressing in SET?

- Men in senior positions dismiss the potential of women and favour men for promotions; while senior "adapted women" may also resist the advancement of women;
- Employers are reluctant to support further studies, seeing women as "risky investments".

What difficulties do women experience around networking?

- Prominent "old boys" network in the work environment;
- Most networking opportunities are "traditionally masculine", for example golf days;
- Lack of time and opportunities to network with other professional women.

Perceptions and suggestions around retaining women in the SET sector

- Several gender equity and discrimination issues persist and must be addressed;
- Most capacity building and professional development initiatives cater for previously disadvantaged communities, rather than women specifically;
- The growing number of women in senior management positions is due to equity policies, and not an overall increase of the number of women in the sector. These women in top ranks are often isolated and over-burdened;
- Companies have effective strategies to recruit women, but don't do enough to retain them (must look at maternity benefits, flexible hours, on-site childcare);
- More must be done to nurture the professional development of women in SET at every step (career guidance, improved teaching, celebrating role models, effective mentoring, support for further studies, career planning, etc);
- The SET sector should offer higher salaries, better opportunities and be more accommodating regarding women's family roles;
- More funding, grants, employment and promotion opportunities should be channelled towards women, including effective quota systems where relevant;
- The assumption that women are the primary homemakers and caregivers must be challenged.

Perceptions and suggestions around "Science for Women"

Several respondents were unfamiliar with the concept of gender sensitivity in research and admitted that the gender aspects of research had never occurred to them. Some argued that research benefits men and women equally, but others agreed on the need to mainstream gender issues in research agendas. Key opinions are summarised below.

Reasons why women don't benefit equally from SET

- Very few women participate in setting research agendas;
- Gender issues are a low priority in current research preferences, priorities and funding;
- A lack of consideration of the ultimate beneficiaries of research results.

How to ensure that women benefit more from SET research

- Make scientists more aware of the importance of gender in all research;
- More practicing female scientists will help ensure that more research is geared to benefit women (therefore female scientists must be attracted and retained more effectively);
- Introduce gender based quotas for research teams and mandate the articulation of possible gender issues in research proposals.

Recommendations to overcome obstacles facing women in SET and to boost SET research output with an explicit gender perspective

Policymakers must align gender issues with other key transformation issues in the SET arena. They should also assess the potential impact of all new policies upfront and develop transformation targets. Once implemented, the impact of the policy interventions must be thoroughly monitored and publicised. The report concludes with the following recommendations:

In the SET community

- A targeted communication strategy to “change minds” about women in science, and science for women;
- A process to consider gender issues and impacts in research planning;
- Meaningful female representation on large-scale research projects.

For girls and young women

- Curb and mitigate the effects of science anxiety by reviewing and implementing effective interventions;
- Use the positive influence of parents and provide educators with training and resources to encourage girls to take up science and maths;
- Expose young women to relevant career and work information and environments;
- Provide gender-specific performance incentives;
- Support women role models and mentoring schemes.

In the SET sector

- More money for science via bigger bursaries and grants, more venture capital, and significant prizes for outstanding achievements in R&D;
- Higher salaries and better benefits for scientists.

In the SET workplace

- Create women-friendly physical work environments;
- Help women reconcile family and career demands by offering flexible working hours and affordable, quality day care;
- Retain women in SET jobs via professional development, opportunities for career advancement, networking and accommodating lifestyle imperatives.

Funding interventions

- Provide bursaries and scholarships that specifically target women, as well as research grants favouring representation of women researchers on project teams (along with effective publicity for such funding sources);
- Make the consideration of potential gender impacts a basic condition of funding for research.