

Women in Science, Technology, Engineering and Mathematics (STEM) – A case for intervention

A workshop on 'Women in Science, Technology, Engineering and Mathematics (STEM) – A case for intervention' was organised by British Council in partnership with UK Science and Innovation Network and Department of Science and Technology (DST) on 12th February 2015 at The Lalit Hotel, New Delhi. The half day event secured participation from a wide range of stakeholders and subject matter experts from UK and India to share knowledge and best practices for promoting and supporting participation and progression of women in STEM education and careers. The workshop was organised to take forward the initial dialogue between both countries who agreed to explore opportunities to develop future work through the Newton-Bhabha Fund (2014) in the area of Diversity in Science, particularly the representation of women in leadership roles. The event was divided into three sessions preceded by an opening session.



Opening Session:

Speakers:

Ms. Gill Caldicott, Director Operations at British Council India

Dr. HB Singh, Officer in charge, Department of Science and Technology

Dr. Manju Singh, former Secretary, Department of Biotechnology



Highlights:

- DST has been playing an active role in women leadership and inclusiveness since last 13 years. The workshop is the first opportunity where DST has been able to internationalise the issue and take it to the next level.
- There are three issues surrounding women in STEM - entry of women in science; retention, respect and recognition of women in STEM; and obstacles faced by women in STEM.
- DST launched the first scheme for women in 2002 and has been engaging in similar programmes for women ever since then.
- Issues around women, particularly inclusiveness and leadership that were discussed in the UN Conference in 1935, are discussed till date. The same problems and challenges continue to persist in the 21st century.
- A key question that remains to be answered is how much has the society succeeded in addressing the issues highlighted decades ago – are women scientists being nurtured, are there enough opportunities for them, are academies honouring women?

- There should be representation of women in all delegations, committees and programmes, not because of gender parity but because of their merit.
- Government agencies and international organisations should earmark scholarships for women in STEM and facilitate the mobility of women for wider exposure.
- Mechanisms should be created to generate awareness among women about the schemes and orient them to the programmes being led by the Government of India.

Session I: Status of women in STEM – identifying successes and challenges

Moderator:

Dr. Amanda Dickins, Head Science and Society, Department for Business, Innovation and Skills

Speakers:

Prof Rohini M Godbole, Professor, Centre for High Energy Physics, Indian Institute of Science

Prof Barbara McInnes Crossouard, Senior Lecturer in Education, University of Sussex



Highlights:

- Prof. John Perkins' Review of Engineering Skills was one of the major studies conducted in the UK to review the provision of engineering skills in the country. It highlighted the lack of diversity in engineering education and careers.
- According to the review, the UK has the lowest proportion of female engineers in the European Union, less than one in ten engineering professionals is a woman.
- The review suggested that funds should be generated by employers to support women who want to come back after a career break.
- The review also stated that the need of the hour is to tackle gender perception of science in schools. It suggested that a STEM teaching capital fund of £200 million should be set up.
- ECU's Athena SWAN Charter (2005) focuses on gender equality in STEM in the UK. It demands the institutions to focus on the organisation and organisational structure and culture rather than the individual.
- A review by Roberts (2006) found that STEM doctoral candidates lacked transferrable skills. As a result, Vitae was set up in the UK to support career development of researchers. The Research Councils provided funding to support generic and transferrable skill development.
- The policy in UK is not consistent with respect to promoting education and careers in STEM. There remain ambiguities in the programmes and there is a need to bring together the programmes and schemes in a coherent manner.
- At the policy level, serious attention to gender mainstreaming was paid in India 2001 onwards.
- The INSA Report (2004) led to the formation of the DST Taskforce for women in science and the recommendations of the report were presented to the Ministry of Science and Technology in 2009.
- Presence and performance of women in schools and colleges is high in India. However, the numbers are dismal in IISc, IITs and IISERs. 14 out of 416 Shanti Swaroop Bhatnagar awards have been given to women which highlights the dismal representation of women in STEM.
- DST started the Women Scientists scheme in 2002 to support women who have taken a career break. The programme has been in operation since a decade, and has had an impact at the individual level. 'Lilavati's Daughters – Women Scientists of India', a collection of essays of about nearly 100 Indian women scientists from India, aims to highlight the issue and seeks remedies for the same.



Session II: Working together – Fostering and Supporting Women in STEM

Moderator:

Mr. Mark Sinclair, Head UK Science and Innovation Network

Speakers:

Dr. Rajeshwari Raina, Principal Scientist, National Institute of Science Technology and Development Studies (NISTADS)

Dr. Sudha Nair, CEO Biotech Park for Women

Prof. Minkashi Bhardwaj, Liverpool School of Tropical Medicine

Dr. Shobhana Narsimhan, Professor JNCASR

Highlights:

- Piece meal strategy for women in STEM cannot work. There is a requirement of a coordinated and coherent approach at the policy level.
- There is increasing evidence that men are moving out of STEM careers due to lucrative options in other fields.

- There is gradual realisation that there should be greater number of women in STEM. Flexible timings, issues of travelling and safety, personal and familial issues are some problems that need to be addressed for promoting and facilitating women in STEM careers.
- A joint study by WISAT and OWSD titled The Framework on Gender Equality and the Knowledge Society (2012) highlighted the gender imbalance in science and technology. Retention, recruitment, re-entry, R&D, recognition, reward and remuneration were the areas that were addressed. India fared quite well among 6 countries namely, South Korea, Brazil, South Africa, USA, EU and Indonesia.
- A serious concern that came to fore was the lack of data and statistics in India. The parameters of data could not be compared to those of other countries. The problem of outdated data persists in India till date.
- The suggested way forward for data retention was following the pillars of data, document, design and domain.
- International mobility, both personal and institutional, is an essential pillar for career development of women.
- The enablers of career mobility are mobility as a heritage, equal opportunities of decision making, support and guidance, attitudes to careers, family and societal values.
- Barriers to mobility include institutional impediments (visas, sponsorships, age barriers, travel limitations), lack of family support (reluctance and safety issues), lack of formal and informal networks, deskilling challenges, centrality of career progression around male working patterns and dangers of negative stereotyping among others.



Session III: Proposals and Recommendations

Moderator:

Ms Lynne Heslop, Senior Education Adviser, British Council India

Panellists:

Dr. Shashi Bala Singh, OS and Director, Defence Institute of Physiology and Allied Sciences, DRDO

Dr. HB Singh, Officer in Charge, Department of Science and Technology

Dr. Shailja Gupta, Director, International Cooperation, Department of Biotechnology

Dr. Nafees Meah, Director, Research Councils UK – India

Mr. Patrick Johnson, Head of Equality and Diversity, University of Manchester

Dr. Amanda Dickins, Head Science and Society, Department of Business, Innovation and Skills



Recommendations – Women in early career research and support systems

- Institutional support from women in STEM careers required such as technical training courses, facilitation and support, awareness and orientation courses, support for flexible working hours and national/international mobility.
- Government of India departments provide childcare leave to women, however this facility should be extended to include men.
- Women should be allowed to attend conferences and seminars during maternity leave. Emulate UK's 'Keep in touch' programme for women on career breaks.
- It should be stated in grants for research projects that women scientists in the project teams are encouraged.
- Learn from best practices in other countries - learn from the case study of Portugal.
- Government of India should collect state wise data and analyses of women in STEM to understand why women face disparities.
- UK India collaboration for women students to study in UK for Masters and PhD courses should be facilitated.

- Alternate career options for women in STEM, assistance in career progression, encouraging women entrepreneurship etc. should be undertaken by the Government.

Recommendations – The missing data

- Revisit the 2002 Task Force recommendations to include the problem of dismal statistics and missing data. A wider audit of the gender policy should be undertaken and the focus should be on improving institutional culture and mechanisms for women in STEM.
- A unit could be formed within DST to undertake a 24 months project to collect and collate data, statistics and information on women in STEM within the country.
- After the data is collected, a report needs to be commissioned by the Government of India that suggests how to influence the existing policy using data.
- There is an urgent need to evaluate existing retention programmes and analyse what has worked and what did not work in the past.



Recommendations – International Mobility and Networks

- Propose better exchange programmes for doctoral and post doctoral programmes which should also include female specific programmes.

- Awareness needs to be generated among women about the programmes and schemes run by the Government. Orientation programmes and workshops should be organised for women students and scientists.
- Special fellowships for women scientists for attending conferences and short term visits abroad should be facilitated. Wherever possible, child day care and elderly care facilities should be provided during conferences and workshops.
- The Government should mandate that every delegation has women representation.
- There should be relaxation in age for women scientists in existing programmes and projects.
- Visiting professors – women scientists should be encouraged and promoted to go and teach in foreign universities as understanding diversity is important for progress.