International Journal of Gender, Science and Technology
http://genderandset.open.ac.uk

Developing women scientists, engineers and technologists – and helping them stay!

Meg Munn MP

House of Commons, London

ABSTRACT
Meg Munn is a British Member of Parliament. She has represented the Sheffield Heeley constituency in South Yorkshire since 2001. During the last administration she held several government posts including that of Minister for Women and Equality. Here she offers a UK policy perspective on women in Science, Engineering and Technology from her time in parliament and discusses, from the perspective of a constituency MP, policy implementation at a more local level.

KEYWORDS
Science; technology; engineering; women; UK; policy

This journal uses Open Journal Systems 2.2.2.0, which is open source journal management and publishing software developed, supported, and freely distributed by the Public Knowledge Project under the GNU General Public License.

The Open University

Developing women scientists, engineers and technologists – and helping them stay!

The sectors in the British economy needing science, engineering and technology (SET) graduates are affected with serious skills shortages, with reports from many businesses that they struggle to recruit qualified staff. Yet more than 70% of female science, technology, engineering and mathematics graduates don't end up working in their chosen field.

As a Member of Parliament (MP) representing a Sheffield constituency – in a city with a proud engineering and manufacturing heritage – I understand how the lack of trained and skilled workers can hold a company back. I'm not a trained scientist, engineer, or technologist, but I do recognise a huge amount of wasted time, investment and talent when I see it.

The business case for valuing these trained women to keep them at work seems obvious to me. Adopting some of the measures put in place in other industries, and found to be successful in retaining women, and attracting back those on a career break, would be a start. It's no longer rocket science – flexible working, better managed career breaks for maternity leave for instance.

Part of the longer term solution is attracting more young people into these professions. But how can you dream of being an engineer if you don't know what one is? It's a problem for both genders but is most acute for girls due to the traditional image of engineering, combined with the paucity of role models.

This means ensuring that these issues are addressed early enough in schools. Children learn just what a "woman's job" and a "man's job" are and make their choices accordingly. Once set on a particular educational path it can be hard to change and complete a new set of subjects.

Also, offering suitable work experience gives girls and boys a chance to see some of the amazing things engineers do. Some businesses are keen to pursue this option if only schools could see the value for their pupils. It's not just the chance of employment but well paid employment – mechanical engineers were the highest paid of any Sheffield University graduates recently.

SLOW PROGRESS

Some areas are making progress, far too little and far too slowly. However, worryingly, some areas are going backwards.

- In 2008, there were 620,000 female science, technology, engineering and mathematics (STEM) graduates of working age in the UK, yet only 185,000 were employed in science, engineering and technology (SET).
- Between 1997 and 2004, female participation in the UK's technology workforce plummeted – from 27% to 21%.

- Perhaps most shocking of all, between 2002 and 2008 there was an overall reduction in the percentage of women working in all SET occupations – from 14.5% to 14.2%.

The statistics hide a number of disparities in the different professions. In some areas the representation of women is good (such as health) or has improved ever so slightly (such as engineering, despite it being the area with the lowest proportion of women). But if we are to tackle the skills shortages that businesses tell me they suffer, even in this downturn, we need to do more.[1]

The outflow of skilled women, coupled with the derisory number of girls and young women choosing to study these subjects, is a huge loss of talent. Who can know the innovations that remain undiscovered, the improvements in manufacturing that could produce better for less? The situation threatens the country's chance of keeping pace with the rapidly growing leading-edge economies of the world.

We know the issues and the problems, and have done for some time, but the culture that perpetuates this situation has not fundamentally changed. We still have a situation where too often SET professions are portrayed with men only in mind; they are not '*what women do'.* Issues, such as sexist remarks aimed at young women starting out in the workplace, remain unchallenged by colleagues and managers alike.

The following quotes are from an online consultation carried out by the Parliamentary Office of Science and Technology, in 1999.

> *"There is still a perception that engineering implies being stuck in a factory on the shop floor with a lot of men."*
>
> *"Large companies should have no problem in providing these [family friendly] conditions. Unfortunately, when I have mentioned this to my employer in the past, my personnel department's response is that 'this is not a big problem because they don't have many women engineers!'"*

A 2010 survey by the trade union Prospect heard from a range of women. One spoke of usually being the only woman in meetings and while she didn't feel that the environment was hostile she said, *"...it can be intimidating and draining to be constantly championing a different perspective to the rest of your colleagues."* Others voiced views that clearly strike a chord, *"I am becoming more frustrated with what feels like fighting everyday"* and *"I'd like to get out of SET as soon as possible. It feels like being trapped in a dead end."*

Despite the reams of research, the good work of all the professional bodies, the UK Resource Centre for Women in Science, Engineering and Technology (UKRC) and initiatives like the Big Bang Fair, we still fail to attract and retain girls and women into SET professions.

UK GOVERNMENT POLICIES

Since 1993, the under-representation of women in STEM has been identified by successive governments as an important economic and social issue. A succession of policies and measures were introduced to increase the participation of women in education and the professions.

In 1993 the White Paper, 'Realising our potential', demonstrated the importance of SET for the UK's economic growth and recognised that women are the single biggest undervalued and under-used human resource. A year later, the 'Rising Tide' report presented a number of recommendations, with the Office of Science & Technology subsequently setting up the Promoting SET for Women unit, to bring about change. It documented the loss of women to SET at every stage and highlighted factors that were preventing women from entering SET professions.

The 'Science and Innovation' White Paper in 2000 made a number of recommendations regarding women in SET. These included work-experience days for 15-16 year old girls, achieving 40% membership on SET- related advisory bodies and boards by 2005, and initiating a study of the numbers of women returning to SET after a career break and the barriers they face, resulting in the Maximising Returns Report published in 2002.

Further reports were produced, including the Roberts Review (2001) and the Greenfield report (2002), which made recommendations that include centralising the sources of advice for women; encouraging the introduction of carer-friendly working practices, and gender balance targets for certain, SET organisations.[2]
In response to the Greenfield report, the previous government published 'A strategy for women in science, engineering and technology '(2003) which took forward many of the recommendations. The government's wider equality agenda also had many important implications for women in SET.

A few years later, in 2004, the then Department for Trade and Industry, in partnership with Intellect – the trade association for the UK IT industry – published a research report on how to retain women in the IT industry. It found that women in their mid 40s were leaving the sector, at arguably one of the most productive points in their careers. The main reasons given were poor work-life balance and an industry culture that did not value the skills of coaching and team working.
2004 was also the year in which the last government established the UK Resource Centre for Women in Science, Engineering and Technology (UKRC). They have been working with employers, professional bodies and education institutions to promote gender equality by promoting role models of women scientists and supporting the removal of organisational barriers to the employment and retention of women. Tackling what is known as "unconscious bias" has been a key aspect of their work.

The current UK government have recognised that *"despite positive progress, there are still too many groups under-represented in the* [STEM] *sector",* however they decided to fund their policies in a very different way – by trying to embed good practice on gender issues within other programmes and phase out funding for the UKRC. They awarded the UKRC £500,000 in 2011-12, extending the funding from

April 2011, to give time for them to secure alternative funding. In my opinion the decision to cut the funding, while at the same time stating its determination to protect the science budget, was a clear failure by government to understand the importance of investing in both women and science.

At the end of 2011, the Department for Business, Innovation and Skills (BIS) asked the Royal Society and the Royal Academy of Engineering to jointly lead a programme to tackle the issue of diversity in STEM. They intend to set-up and run three to five pilot projects to raise the diversity of engineers, and aim to begin by the summer of 2012. The government have committed to the work of a number of organisations and initiatives including STEM NET and the STEM Ambassadors, the National Academies' fellowships, Research Councils' PhD and fellowships awards, the Big Bang Fair and the National Science and Engineering Competition.

The Athena Swan Charter recognises and celebrates good employment practice for women working in SET in higher education and research. The Department of Health announced last year that all medical schools who wish to apply for NIHR Biomedical Research Centres and Units funding need to have achieved an Athena SWAN Charter for women in science Silver Award. It's likely that other UK Research Councils will follow suit.

While these initiatives are welcome the allocation made to the Royal Academy of Engineering for the new Diversity in Engineering Programme is just £200,000 a year, less than 10% of the £2.5 million previously allocated to the UKRC. This represents a miniscule proportion of the total science and research allocation of £4.6 billion per year.

I believe it is time for a thorough review of spending to identify, in all its many areas of work, where greater emphasis could be given to ensuring women both enter and remain in SET. It is still far from clear that the importance of this issue has been grasped. It is no co-incidence that skills shortages are found in the areas where women are under-represented.

Why are medicine and law successfully recruiting so many women when the SET professions fail so dreadfully? Every science and engineering institution knows about the problem, and many words in many reports have analysed it. A number of initiatives have been developed, and good practice exists, in pockets. But despite this the figures change little, and in the area of technology the situation has gone from bad to worse.

Changes to university departments over the last few years have also had an impact. In particular, some changes have left some parts of the country with limited STEM courses. In the context of increases in tuition fees, students who decide to live at home rather than move away might find their local university no longer offers the science subjects they once did.

Over the last 15 years there's been a growing body of reports, evidence and research on women in SET. I added to this last year, when I edited a pamphlet

published by the Smith Institute – *Unlocking Potential* – *perspectives on women in science, engineering and technology*. A recent paper for this journal (Barnard et al., 2010), showed that research in the field does not always offer practical solutions for change, and that they have a tendency to situate women as part of the problem. Despite all this work, the changes in government and government policies, funding and commitments for different initiatives we are still a long where from where we'd want to be.

MAKING A DIFFERENCE

We need a concerted effort to get change. That's why I'm working with others in South Yorkshire to make our county first choice for women and girls who want to study STEM subjects and work in SET professions.

The University of Sheffield have already made this part of their strategy, and the new University Technical College (UTC), due to open in 2013, is going to work with Sheffield Hallam University and others on how to attract more girls to their courses. The Sheffield University and Boeing Advanced Manufacturing Research Centre (AMRC) will be recruiting apprentices and opening up new career routes for aspiring engineers.

We have companies who are keen to play their part - one local engineering company that took on their first female apprentice didn't have any showers and pondered what to do. They discussed it with the new recruit and agreed that her first project would be to build the shower. Problem solved.

Ideally, we'd like to conduct research to measure what's working and what's been achieved. Whilst national research can be applied at a local level, having local data will add further evidence that we can learn from and share.

I'm challenging companies to have women comprise 50% of their apprentices, and for 50% female admissions to the new University Technical College. I'd like to see the UTC encourage and welcome students from all our diverse communities and open young people's eyes to just what science, engineering and technology do in society.

Increasing the part played by role models, people who are willing to enthuse the next generation, cannot be underestimated when there is little understanding of what engineers do either amongst girls or boys. During a recent meeting with a local education coordinator for Science, Technology, Engineering and Maths (STEM), I was told that when many young people are asked *"Who is the most famous engineer you've heard of?"* most said *"Kevin Webster from Coronation Street"* [Kevin is the car mechanic in the long-running British television soap opera].

The figures for women in science, engineering and technology careers remain stubbornly low. The skills shortage is well known, and the importance of these disciplines to our future economic growth is uncontested. Nothing less than a concerted, determined and persistent approach by all will be sufficient to achieve the transformation that is required. And that is what we aim to achieve.

We want South Yorkshire to be the first choice for women scientists, engineers and technologists – but there's nothing stopping anyone else saying *'they're not as far ahead as we are – let's make our area first choice'.* A bit of competition is after all no bad thing.

To be honest I don't care who's first, I just want us to be able to say we got there; that SET careers are more attractive to young women and girls wherever they live, and that more women stay in SET professions, that some go on to make the next great discovery or next technological improvement which benefits us all.

REFERENCES

Barnard, S., Powell, A., Bagilhole, B., and Dainty, A., (2010) Researching UK Women Professionals in SET: A Critical Review of Current Approaches. International Journal of Gender, Science and Technology, Vol. 2, No. 3.

DTI (2004) Flexible working in the IT industry: Long hours and work-life balance at the margins?, Report to Department of Trade and Industry and the Women in IT Forum, carried out by Flexecutive. London: DTI.

ENDNOTES

[1] These statistics and many more relating to women in SET in the UK can be found at UKRC (2010) *Statistics; Women and Men in SET; the UK statistics guide 2010,*Bradford, UKRC

[2] Greenfield, Susan, Peters, Jan, Lane, Nancy, Rees, Theresa, and Samuels, Gill(2002) *SET Fair, A Report on Women in SET*, London: HMSO. Reference to and discussion of these government reports can be found in the 'SET Fair' report.