scottish science advisory council

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Royal Society of Edinburgh

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Dear Susan

WOMEN IN STEM IN SCOTLAND 2018 – Consultation

The Scottish Science Advisory Council (SSAC), the body responsible for providing science advice to the Scottish Government, is pleased to be able to respond to this consultation on Women in STEM. The relative position of women in science requires that positive steps are taken to help redress the imbalances that are perennial. The inequalities experienced in Scotland match those in many other countries, although it is intriguing that the participation of women in different STEM disciplines varies in some countries, raising interesting questions about local cultural attitudes towards different types of academic and work contexts. Hence, this is an issue that requires attention from early school years, right through the education system. It is also important to realise that women from less advantaged social backgrounds are particularly unlikely to study STEM subjects. And, recent research points to an interesting paradox where countries with greater gender equality appear to have fewer women taking degrees in STEM subjects than countries which appear to be less gender equal.

The SSAC strongly agrees that work is required to help rectify STEM-related gender inequality. However, we would also note that there are issues in some other non-STEM disciplines where women are less likely to participate. These disciplines, such as Economics, should not be ignored; indeed, we must also work hard to help rectify some of the opposite imbalances that exist in some disciplines which are female dominated, including subjects allied to medicine and veterinary science.

Yours sincerely

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Women in STEM - questions

Section 1: *In brief*

Q1 Do you believe progress has been made towards achieving gender equality in the STEM workplace in Scotland since 2012?

Yes, albeit slowly.

Q2 If yes, what action(s) do you believe have had the greatest impact on improving gender equality in STEM in Scotland? (List maximum of 3).

- **Athena SWAN initiatives and 'threat' of requirement to hold a SWAN award to apply for research funding have pushed universities to take action. The expansion of the Charter in 2014 to include Research Institutes had particular impact. The Silver Award was the benchmark in 2012. 'Raising of the bar' in accreditation probably makes it more difficult to attain in 2018 than in 2012. That said, it is felt to be important to achieve. There are issues with Athena SWAN as it currently operates, which have resulted in sectoral pushback, including a view that it is becoming a tick box exercise, producing a sectoral drive to gain the badge rather than truly change culture. It has also become a significant time burden for those who lead documentation preparation (estimated at several hundred hours). Ironically as many of these are women and the scale of this additional workload has not always been recognised, this has led to an impact on their career development. Even so, without bold initiatives such as these, we would not have seen some of the recent changes that have transpired.**

Q3 Where you do not believe progress has been made, or could be improved upon, what do you believe have been the key limiting factors? (List maximum of 3).

- **Retention and promotion of women to the highest levels is still lacking, despite excellent representation in many STEM fields in early careers.**
- **A key limiting factor is the need for long-term stability in the early stages of scientific careers that coincides with many people starting their families. This encompasses the need for better childcare provision and to address the short-term contracts postdoctoral scientists must work on during the early stages of their careers, which inhibit career and leadership development planning and result in the loss of women (and some men) from STEM.**
- **Some universities have found that mentoring women and encouraging them to put themselves forward for promotion can have a positive impact**

Q4 Which of the recommendations made in the 2012 *Tapping All Our Talents* report do you believe should be prioritised going forward? (List maximum of 3).

- **Improvement of provision of high quality, accessible child care.**
- **Although reporting on the gender pay gap was addressed in 2017 for most employers with >250 staff, the data submitted by March 2018 demonstrate that considerable improvement still needs to be made. The methodology needs to be extended to all employers.**
- **Attention to, and support of, SMEs to tackle gender inequality.**

Q5 What further recommendations (if any) would you make to policy-makers, educators or employers to tackle gender inequality in STEM in Scotland? (List maximum of 3).

- **Early intervention in early years and schools is critical to break down some of the current cultural barriers. If a single group were to be prioritised, it would be mothers, who can have a profound influence on early bias.**
- **The university sector and funding agencies need to take a hard look at how early career researchers are treated in terms of contract length and how this impacts on career development. The consideration of career advancement after breaks, including but not limited to maternity, and the consideration of the impact of such breaks on career progression metrics is particularly relevant.**
- **Gender inequality also affects transgendered people, as well as women. In many cases, there are fewer or no policies in place to address.**

Section 2: *In detail*

Women in STEM in Scotland 2018

Q6 What lessons do you believe have been learned from initiatives undertaken since 2012 to tackle gender inequality in the STEM workforce across the public, academic and/or industry sectors? Examples of good practice would be useful.

- **There has been good practice in academia in mentoring women in STEM and in ensuring equality within boards and panels.**

Q7 In 2018's economic, political and social context, what do you consider to be the key influencers (positive and negative) on gender equality in STEM in Scotland?

- **There is still unconscious bias against women, particularly in the male dominated higher echelons of academia. Unconscious bias training should therefore be mandatory for those involved in career development and selection.**
- **#metoo and #timesup reflects a growing social movement, fuelled by publication of the gender pay gap, which is also likely to influence STEM**
- **The lack of stability for early career researchers is a negative influencer on gender equality.**

Q8 To what extent to you believe that the issue of gender inequality in STEM is being recognised as a priority and to what extent do you believe that rhetoric is being met with action?

- **Gender inequality is being recognised and some efforts are being made to change the inequalities.**
- **Gender equity is an important facet of the Scottish Government's STEM Strategy for Education and Training.**

Education

Q9 What do you believe should be done to encourage more girls and young women to engage with STEM subjects in early years, primary and secondary education?

- **Role models are an excellent vehicle. Continue to recruit female STEM Ambassadors and STEM qualified teachers at all stages to address this. The new STEM Leaders programme, to be delivered by young people under 17 years to their younger peers, is an important aspect of this delivery. Gender balance and age-appropriate training in unconscious bias will be important.**

- **A key challenge is early intervention in Schools to ensure that 21st century STEM is seen as an exciting career for all. Often many activities (e.g. creative design, building with Lego, natural environment) are not clearly recognised and labelled as STEM activities. Raising awareness of what truly constitutes STEM during initial teacher training is essential. Moreover, linking STEM to contemporary societal issues (e.g. clean energy, health and social media technologies) can connect broader personal interests with a future STEM career. Many of these interventions will require a long-term, potentially generational commitment to overcome preconceptions of what STEM is, and who pursues a career in STEM.**

Q10 What innovative or impactful practice do you know of or believe should be taking place in universities and colleges to tackle issues of gender disparities in STEM subjects?
Perhaps contentious. Many universities and colleges have policies in place to address wider access targets. Could gender disparity now be addressed with the same tenacity? Reflecting the clear differences in the size of the gender gap across STEM subjects, the need to identify best practice, and to address issues at the career stages they arise, this could involve a focus on developing and applying a suite of the most appropriate practices from across the STEM sector.

What do you think can be done to embed STEM gender equality thinking across universities and colleges?

- **The Scottish Funding Council developed its own Gender Action plan (2016). It requires universities and colleges to submit institutional plans, which are of variable quality. A requirement to share and act on 'best practice' is now a priority.**
- **Summative data for any institution neglects substantial inequality of uptake in some subjects (some male, e.g. veterinary and some caring professions; and some female, e.g. engineering and computing sciences). These still need to be addressed.**

Cultural Change

Q11 In what ways do you believe industry can lead by example to tackle inequality within workplace culture?

- **the larger companies have already responded to legislative pressure and so should have good exemplars to offer**.
- **Recent reporting structures have exposed the extent of the gender pay gap in larger organisation. Action on this could be exemplary.**
- **Equate Scotland has an important role to play but its reach is currently limited by its funding envelope**.

Q12 What do you believe are the most effective ways to challenge and change deep-rooted attitudes and institutional culture in order to improve gender equality in STEM?

- **Reporting back, to enable progress to be celebrated and disseminated and roadblocks to be identified, highlighted and addressed, but the 'ask' has to be precise, concise, realistic in scale and timescale, not burdensome, consistent and persistent for effective culture change. Too much time and enthusiasm can be lost in gathering data that are not used!**

Q13 How do you suggest culture change can be measured in a meaningful way?

- **The SFC and other Government Agencies have been collecting data. They need to be reviewed to check if they are fit for purpose and, if so, evaluate where progress is being made and where the roadblocks are.**

'14'- a postscript. The Scandinavian countries, particularly Finland, have addressed gender equality in STEM for a number of years. They are many years ahead of us in recognising the issue. They have the most 'gender-equal' indexes for all countries and a social system that supports generous maternity leave and childcare until 7-years old. Yet they are still struggling for parity of females in the workplace, especially in STEM and this is most apparent in the recruitment of women to college and universities. Part of the problem (OECD comment) seems to be the uptake in early years, despite the availability of facilities. We need to analyse these observations, so that we do not simply continue to follow the Scandinavian actions and timelines and find the same situation in Scotland in the near future, after taking affirmative action. Unpicking the Scandinavian experience and reflecting on it will be very important to the ultimate success of the Scottish initiative.