



Response to the consultation on the STEM strategy for education and training

January 2017

1 INTRODUCTION

Close the Gap is a policy and advocacy organisation working in Scotland on women's labour market participation. We work with policymakers, employers and employees to encourage and enable action to address the causes of women's inequality at work.

Women's under-representation in STEM is a prominent feature of occupational segregation, where men and women do different types and levels of work, and is a major cause of the gender pay gap. The gender gap in employment is not only an equalities issue but also an economic issue as many women are working in jobs below their skill level which contributes to skills shortages, particularly in those sectors which are segregated by gender. Closing the gender gap in employment could add £17bn to Scotland's economy.¹

Occupational segregation is a cradle to the labour market problem which requires targeted action along the skills pipeline from the early years setting to the workplace. It is therefore self-evident that mainstreaming must be part of any solution. At present, activity to tackle occupational segregation, where it happens at all, is an addition to business-as-usual delivery, in spite of the gender mainstreaming requirement of the public sector equality duty. Meaningful mainstreaming would therefore represent a radical shift in approach.

¹ Close the Gap (2016) *Gender Equality Pays: The economic case for addressing women's labour market inequality* <https://www.closesthegap.org.uk/content/resources/Gender-Equality-Pays.pdf>

2 ANSWERS TO SPECIFIC QUESTIONS

Q2. Do you think the aims of this strategy and the four priority themes are the right ones to address the challenges identified?

Women's and girls' under-representation in STEM subjects in education, among those who have STEM qualifications, and in STEM jobs is well-rehearsed. Despite a myriad of short-term, targeted initiatives to address the gender imbalance, women and girls continue to experience stark occupational segregation, and progress to address this has been extremely slow. Close the Gap therefore welcomes the prioritisation of reducing gender inequality in STEM.

Q3. Are the success criteria right? If not, tell us what criteria we should use instead?

We welcome the inclusion of an outcome on improved gender balance which is essential to realising meaningful change for women. However, in order for women to gain, and retain, employment in Scotland's STEM sectors there needs to be significant change at the enterprise level in employment practice. Poor employer equalities practice is a key reason for many women leaving STEM related jobs. This manifests in a range of ways that disproportionately affect women, which are described under Q4. The strategy will have limited long-term impact without a change in women's employment experiences.

It is critical that an additional outcome be included to prioritise change at the end point of the education and skills pipeline – the labour market. This could be, for example, employers have better gender-sensitive employment policies and practice to improve women's attraction and retention.

Q4: Do you think the scope of the strategy is right? Tell us if you think it should exclude something or include anything else. For example, should it include training and development that employers provide for their workforce?

Close the Gap welcomes the focus on different points along the skills pipeline which is key to reducing occupational segregation. While this includes young people as they move into employment, there should be more emphasis on changing workplace culture, with specific actions to influence employer

practice on gender equality. The workplace is the key drop-off point for the scandalously high 73 per cent female attrition rate from STEM industries².

The gendered barriers that women experience across the labour market but which are more pronounced in male-dominated STEM industries include:

- A lack of flexible working which makes it difficult for women to combine work with their caring responsibilities;
- A dearth of quality part-time jobs, resulting in many women working below their skill and qualification level;
- A culture of presenteeism which wrongly equates long hours with commitment, and disbenefits women who are more likely to have caring responsibilities;
- Pay discrimination;
- Biased or untransparent recruitment practices;
- Development and progression opportunities based on informal networks rather than transparent policies and practice;
- Informal networks based around stereotypical male activities such as football and golf, to which women are less likely to have access; and
- Hostile and sexist workplace cultures that are do not feel inclusive to women.

Close the Gap delivered a project which developed the Women in Renewable Energy Scotland (WiRES) network. Research undertaken with women in the network found that only 39 per cent said that flexible working was available in their workplace; 25 per cent reported feeling out the loop because of their gender; 20 per cent felt that their contributions were valued less than their male counterparts; and 11 per cent reported working on fewer higher visibility major revenue projects than male colleagues³.

Across the labour market, disabled women, and some groups of black and minority ethnic (BME) women are more likely to be under-employed in terms of skills, and experience higher pay gaps. Disabled, BME and lesbian, bisexual and trans women are more likely to report higher levels of discrimination, bullying and harassment.

² Royal Society of Edinburgh (2012) *Tapping all our talents* <http://www.raeng.org.uk/publications/other/tapping-all-our-talents> accessed 30 January 2017

³ Close the Gap (2015) *How women's networks and mentoring can address occupational segregation: What policymakers can learn from WiRES* https://www.closesthegap.org.uk/content/resources/1480883421_CtG-How-womens-networks-and-mentoring-can-address-occupational-segregation.pdf

Gendered experiences of training and development

Women have different experiences of employer training and development which reveal a range of gendered issues around training provision. Often training is scheduled to take place without considering the working patterns of part-time workers, and the responsibilities of those who care, the majority of whom are women. This can result in training being held at times and locations that are difficult for women to attend.

As training budgets reduce in the current economic climate, there has been an increase in the number of employers implementing a freeze on non-essential training. This may seem gender-neutral but it has a disproportionate impact on women who may be seeking to move into a different type of role, as they require training on skills outside of their current role to make this move.

Many employers do not have transparent practice around development and progression. It is not uncommon, particularly in the private sector, for decisions around development and progression to be based on informal networks, to which women are less likely to have access⁴.

By its nature, work-based learning is intrinsically linked to employment, and it is essential that the strategy includes analysis of, and actions around, training and development delivered by employers.

Untapped levers to improve employer practice

There is considerable potential for the strategy to use public procurement and conditionality to lever improved employment practice from those businesses accessing support from public bodies. At present, there is little evidence of public procurement being used in this way in Scotland's public sector⁵.

In implementing its equalities action plan for Modern Apprenticeships, Skills Development Scotland has taken the first tentative steps to including conditionality around action on equality to the funding it provides to Modern Apprenticeship training providers. This conditionality should be extended to the employer engagement function of the organisation, targeting those private

⁴ Close the Gap (2012) *Response to the Equal Opportunities Committee inquiry into Women and Work*; and Close the Gap (2015) *How women's networks and mentoring can address occupational segregation: What policymakers can learn from WiRES* https://www.closesthegap.org.uk/content/resources/1480883421_CtG-How-womens-networks-and-mentoring-can-address-occupational-segregation.pdf

⁵ See, for example, Sarter, K. (2016) *Public Procurement and the Public Sector Equality Duty: Equality Sensitive Tendering in Scotland*, Women in Scotland's Economy research centre, Glasgow Caledonian University

sector businesses which benefit from the products and services of Skills Development Scotland.

Scotland's enterprise agencies should also include a conditionality on equalities action to companies accessing its account management function. At present, companies are encouraged to voluntarily sign up the light-touch Scottish Business Pledge. Of the optional pledges relates to improving gender equality, although only 35 per cent of Pledge companies have signed up to take action on gender⁶, the least popular of all the pledges. Including a conditionality would provide a strong lever to improve equalities practice among STEM employers.

Women's experiences of the workplace are the key component in addressing the gender imbalance in STEM. Unless labour market inequality is addressed actions relating to education settings will be undermined.

Q5: Give us your views on whether you think the actions already underway across the sectors on STEM fit well within the strategy and will contribute positively to it.

While there are specific actions under the "equity" priority, it must be recognised that all the actions have a gender equality dimension because women and men will be affected by each. All of the proposed actions have the potential to differentially impact on women or men, which is why equality impact assessment is an important tool for advancing equality. Our response highlights the actions where there is a known lack of gendering and/or the action will have a differential impact on women and girls.

Equity actions

- *Review the impact and effectiveness of numeracy and STEM related activity funded through the Attainment Scotland Fund, in order to help inform future decisions by schools and local authorities on their use of funding.*

There is no equality impact assessment of the Attainment Scotland Fund. Without considering gender in the design of fund, it is very likely that it will not address gender differences in attainment which contribute to girls' and young women's under-representation in STEM subjects. It is essential that an equality

⁶ <https://scottishbusinesspledge.scot/information/scottish-business-pledge-statistical-overview-november-2016/> accessed 30 January 2017

impact assessment of the fund is undertaken to ensure that there is no differential impact on girls. Unless this is carried out, it is likely that activity delivered through the fund will reinforce the gender and class imbalance.

- *Expand the successful Improving Gender Balance in STEM project, and share learning through Education Scotland's National Improvement Hub, My World of Work, CIAG advisers and Equate Scotland.*

It is unclear which aspects of this project have been successful, and how it will be expanded. The project has involved piloting resource-intensive activity with pilot cluster schools. It is unclear what the theory of change is for this project, and difficult to see how such work can be scaled up to national level given the resource implications.

- *Work with schools and employers to prevent career bias or career choice, and encourage more diverse subject choices in order to meet the participation improvement targets set out in the MA action plan for women, minority ethnic communities, carer leavers and disabled people.*

Close the Gap has welcomed Skills Development Scotland's equalities action plan for Modern Apprenticeships; action on occupational segregation in the programme is long overdue, with evidence of extreme segregation first highlighted by gender equality organisations 15 years ago. We are aware that at least one of the key activities set out in the plan has failed to deliver its intended outcome, and we are keenly awaiting the evaluation of the plan to identify whether change has been achieved for young women.

Inspiration actions

- *Use the Career Education Standard (3-18) and Work Placements Standard (senior phase) to embed STEM awareness within STEM learning, teaching courses and training programmes. This will be part of the enhanced career long professional learning offer to teachers, recognising the crucial role that teachers have in inspiring and enthusing young people about STEM.*

The Career Education Standard (3-18) and Work Placement Standard both contain a very generic, tokenistic commitment to equality. Neither include specific information on, nor commitments to, reducing gender segregation in subject choice or occupational segregation. Without gender equality, and consideration to tackling occupational segregation being mainstreamed into

the standards, it is difficult to see how they will contribute to an increase in the number of girls and young women studying STEM subjects and entering STEM jobs.

Early years and schools

- *Improving Careers Information, Advice and Guidance through Skills Development Scotland's recently launched 'Future Me' campaign to support STEM careers information and guidance and provide parents, teachers and pupils with a range of specific advice prior to subject choice.*

Gender stereotyping in subject choice remains a significant barrier to girls studying STEM subjects in pre and post-16. Careers information advice and guidance is a major opportunity to influence, challenge stereotypes, and create change by widening and positively challenging stereotypical choices. There is, however, no evidence of a mainstreamed, gendered approach to career information advice and guidance in Scotland. Close the Gap's *Be What You Want* has developed interventions to build capacity in careers advisers on gender stereotyping and occupational segregation, which is detailed under Q6.

There is no information about the "Future Me" campaign on the Skills Development Scotland website, so it is difficult to say whether or not it will support an increase in girls and young women studying STEM subjects. A gender-blind campaign will not reduce gender segregation, and will instead entrench existing inequalities.

Modern Apprenticeships

If an education or skills programme does not actively engage with the issue of occupational segregation, and gender stereotyping and assumptions and "men's work" and "women's work", it is very likely to further entrench these. The Modern Apprenticeship Programme is characterised by acute and persistent occupational segregation, which is the key entry point into the labour market for young people not in further and higher education. Just 0.1 per cent of engineering and energy-related and 0.02 per cent of construction MA starts in Q2 2016/17 were women⁷. Women are more likely to be in stereotypically female frameworks such as early years education and care,

⁷ Skills Development Scotland (2016) *Modern Apprenticeship Statistics: Up to the end of quarter 2, 2016/17* <http://www.skillsdevelopmentscotland.co.uk/media/42484/modern-apprenticeship-statistics-up-to-the-end-of-quarter-2-2016-17-final.pdf> accessed 30 January 2017

beauty and hairdressing. There are significant public spending implications for the programme as male-dominated frameworks are longer in average duration and therefore more resource intensive, attract higher rates of pay, have lower drop-out rates, and are associated with better labour market outcomes than female-dominated frameworks. The average spend per male apprentice is 53 per cent higher per female apprentice.⁸

There is an emerging tension between the target culture created by the drive to deliver 30,000 apprenticeships each year and delivering quality, effective initiatives to reduce occupational segregation. This is compounded by the prioritisation of Modern Apprenticeships for those aged under 24 years as women are more likely to consider training or retraining at an older age.

Actions to improve employer practice are particularly pertinent to reducing occupational segregation in Modern Apprenticeships because the majority of apprentices are already employed before they take up their apprenticeships.

Energy Skills Partnership

Close the Gap carried out an equality impact assessment of the Scottish Government's *2020 Routemap for Renewable Energy in Scotland*⁹, and as part of this work reviewed the gender impact of a range of initiatives related to the renewable energy industry, the including Energy Skills Partnership. There is no evidence that the design and delivery of this initiative has given consideration to the gender. There also does not appear to be any specific work being undertaken by the Energy Skills Partnership that will result an increase in the number of women represented in STEM. Rather, seemingly generic initiatives such as the Energy Skills Partnership that do not consider are very likely to entrench occupational segregation.

Skills Investment Plans

SIPs are "*created through a process of labour market and skills supply research and analysis, industry consultation, and action planning with industry and partners across Scotland's education and skills system*". Yet the consideration that has been given to gender, and increasing women's representation in STEM industries, is very weak. For example, the energy SIP acknowledges that more

⁸ Sosenko and Netto (2013) *Scotland focused analysis of statistical data on participation in four UK countries*, Heriot Watt University

⁹ Close the Gap (2015) *Equality impact assessment of skills, community benefits, and supply chain and infrastructure policy in the 2020 Routemap for Renewable Energy in Scotland* <http://www.gov.scot/Resource/0048/00485408.pdf> accessed 26 January 2017

women must be attracted to the industry but makes no mention of improving retention¹⁰; the life sciences SIP acknowledges occupational segregation within the sector but has no actions to reduce it¹¹; and the ICT and digital technologies SIPs mentions a need to encourage more women into the sector but only has one action relating to gender around establishing a computer club for girls¹².

This nugatory consideration of gender fails to provide a comprehensive, gendered analysis and overview of Scotland's skills challenges and opportunities, and is very unlikely to create meaningful change on women's representation in STEM.

Regional Skills Assessment

RSAs are described as providing "robust" and "comprehensive" data on current and projected skills demand, supply and investment. However, there is no gender-disaggregated data in RSAs, including those which relate to workforce profile, and people and skills-supply. Furthermore, there is no acknowledgment that these significant data gaps exist in the national and regional skills evidence base, and therefore action plan to address the gaps. This a serious failing, especially given the extremely high attrition rate of women with STEM skills. The lack of gender analysis will do nothing to reduce occupational segregation in STEM, and serves only to reinforce the gender-blind skills analysis which contributes towards women's under-representation.

Colleges and universities

Through the outcome agreement process, Scottish Funding Council asks colleges to:

"Work with local authorities to map STEM provision in their area and where appropriate, prioritise the development of relevant new vocational pathways on this area. These pathways should focus on labour market need (drawing on information from Skills Investment Plans and Regional Skills Assessments and direct engagement with employers;

¹⁰ Skills Development Scotland (2015) Skills Investment Plan for Scotland's Energy Sector http://www.skillsdevelopmentscotland.co.uk/media/35691/sds_energy_sip_digital.pdf accessed 30 January 2017

¹¹ Skills Development Scotland (2015) Skills Investment Plan for Scotland's life sciences sector http://www.skillsdevelopmentscotland.co.uk/media/35685/life_sciences_sip_april14.pdf accessed 30 January 2017

¹² Skills Development Scotland (2015) Skills Investment Plan for Scotland's ICT and digital technologies sector http://www.skillsdevelopmentscotland.co.uk/media/35682/ict_digital_technologies_sector_skills_investment_plan.pdf accessed 30 January 2017

prioritise STEM subjects if there is an identified skills gap in the region; and be developed in a way that achieves gender balance and supports key equality groups.”

Universities are asked to:

“Evidence how the institution meets the needs of current and future skills requirements of employers outlined in Skills Investment Plans, other labour market information, and through their partnerships with employers.”

It is very difficult to see how work undertaken by colleges and universities that is based on the evidence in SIPs and RSAs, which both have a distinct lack of gender-disaggregated data and gender analysis, will result in a meaningful reduction in gender segregation in STEM subjects.

Q6: Tell us about activity currently ongoing, either included in this document or not, that you think could be adapted or stopped and why.

Close the Gap’s *Be What You Want* project¹³ aims to help young people make informed decisions about subject choice with the wider aim of encouraging them to consider non-traditional subjects and careers. Outputs since its inception in 2011 have included campaign materials and a teachers resource which were disseminated to every primary and secondary school in Scotland; ongoing delivery of school visits to deliver classroom sessions on gender stereotyping, occupational segregation and the gender pay gap; and a CPD resource for teachers and careers advisors on gender stereotyping and occupational segregation.

Close the Gap recognises that women’s under-representation in STEM is caused by gender inequality. Evidence from *Be What You Want* and elsewhere shows that attitudes and assumptions around gender roles, and girls’ and boys’ interests become entrenched from a very early age. The next phase of *Be What You Want* will scope the development of a CPD resource for early years practitioners, the aim of which would be to challenge gender norms and stereotyping, and assumptions about gender and work.

Q7: Do you agree with the principles set out for implementation?

Close the Gap broadly agrees with the principles set out for implementation. Improving data collection and analysis is crucial to inform effective delivery and evaluation. At present, there are critical gender-disaggregated data gaps in the national skills intelligence outputs, SIPs and RSAs, as discussed under Q6.

¹³ www.bewhatyouwant.org.uk

We are strongly of the view that the governance mechanism must have gender competence. Specialist gender equality expertise should be included to ensure accountability around the actions which relate to addressing women's and girls' under-representation in STEM. Where strategies have been implemented in other policy areas without including gender competence in the governance function, implementation has been less robust and has failed to deliver change for women.

Q9: Overall do you think the strategy is clear and action focused? Do you think that the actions that we propose to take nationally will achieve the aims and intended outcomes?

Overall the aims and outcomes of the strategy are clear. It is action focused, although some of the actions are lacking in detail. For example:

- *Investigating and developing new strategies to tackle gender stereotyping in STEM education through our collaboration with the Institute of Physics.*

This action is potentially welcome, but it is extremely vague and lacking in any clarity about what specific change it will achieve.

- *Work together with national and local partners to take action to address gender bias in young people's career options, including raising awareness of gender bias with parents, families and teachers so that they can better promote the importance for career options with young people.*

This action is vague but the broad thrust is welcome. It also mirrors activity being delivered by Close the Gap under its *Be What You Want* project, which is described under Q6.

Q10: Will this strategy improve equity of outcomes? If not, tell us what else it should include, in particular for women and girls and other groups of people – disabled people, care leavers and minority ethnic communities.

Close the Gap has concerns around the theory of change of the strategy which seems to be predicated on the notion that if more girls and women acquire STEM education, training and skills they will go on to work in STEM industries and address the gender imbalance. Women's experiences of the workplace tell us this is not true. Without addressing the gendered barriers that women face in entering and progressing at work, occupational segregation will persist.

There continue to be myriad of short-term initiatives which aim to address girls' and women's under-representation in STEM subjects and jobs. Even where successful, these initiatives effect change for small numbers of women and girls. They are also usually resource intensive which creates challenges in scaling up to national level.

There is no evidence that action to reduce gender inequality in STEM will be mainstreamed. The majority of the actions (those in priorities other than "equity") do not appear to consider gender. Without taking account of the gendered barriers that girls and women face in STEM, it is very likely that these actions will reinforce occupational segregation, and will not improve the gender balance nationally.

Q11: What could schools, colleges, universities, community learning and development, the voluntary sector, science engagement providers and museums do to support areas for action?

Public bodies such as schools (education authorities), colleges and universities are required under the public sector equality duty to mainstream activities to advance gender equality, and consider how in the delivery of services, they can take action on reducing occupational segregation. Research by Close the Gap found that there is very little evidence of this happening in practice¹⁴.

A specific link to the public sector equality duty could usefully be included in the strategy to encourage public bodies to strategically align their work to address girls' and women's under-representation in STEM with ongoing work the meet the gender equality aspects of the duty.

¹⁴ See Close the Gap (2015) *Making Progress? An assessment of public bodies' compliance with the public sector equality duty* and Close the Gap <https://www.closesthegap.org.uk/content/resources/Making-Progress---An-assessment-of-employers-compliance-with-PSED-November-2015.pdf> (2013) *Monitoring public bodies compliance with the public sector equality duty* https://www.closesthegap.org.uk/content/resources/1450180414_CTG-Working-Paper-12---Monitoring-Scottish-public-bodies-compliance-with-the-public-sector-equality-duty.pdf