Close the Gap

Close the Gap briefing for the Scottish Government debate: Trustworthy, Ethical and Inclusive Artificial Intelligence – Seizing Opportunities for Scotland's People and Businesses

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Close the Gap is Scotland's policy advocacy organisation working on women's labour market participation. We have more than 20 years' experience of working with policymakers, employers and unions to influence and enable action to address the causes of women's inequality at work.

1. Introduction

Artificial intelligence (AI) undoubtedly creates opportunities for the Scottish labour market and society. However, it also presents a number of key challenges around women's labour market equality, built-in discrimination and bias, and future skills challenges. **These critical issues have not been addressed in Scottish Government's AI strategy, and there is a substantive risk that current policy around AI will entrench women's inequality.**

2. The risk of bias and discrimination in artificial intelligence

Women are under-represented in tech in Scotland, accounting for just 30% of those in technology jobs.[1] There are also patterns of occupation segregation within tech sub-sectors with women further under-represented in AI and in its subsets of machine learning and deep learning.[2] The House of Lords Select Committee on Artificial Intelligence recommended that the UK Government encourage greater diversity in the training and recruitment of AI specialists.[3]

Technology is not fundamentally sexist, but its design rarely takes account of women's lives. The tech sector is heavily male-dominated, and characterised by a culture of sexual harassment, discrimination, inflexibility and pay inequality that makes many tech

[1] Skills Development Scotland (2018) *Digital Economy Skills Action Plan 2023-2028: Key issues and priority actions*, available at: https://www.skillsdevelopmentscotland.co.uk/media/50035/digital-economy-skills-action-plan.pdf
[2] Thomson, Clive (2019) *Coders: Who they are, what they think, and how they are changing the word*
[3] House of Lords, Select Committee on Artificial Intelligence (2018) *AI in the UK: Ready, willing and able? (Report of Session 2017-9)*

workplaces feel non-inclusive to women.[4] This culture starts at the top and permeates every level of tech companies, which has implications not only for women working in the sectors, but also for the design of systems and products. Where platforms and systems are designed by men, and with men's lives as the default context, they are often ignorant of, or indifferent to, women's lives and experiences.

There is **evidence that the design of robots is reinforcing traditional and harmful gender norms and stereotypes.**[5] For example, 'care-bots' have been developed to resemble women, or to have stereotypically female traits, and subservient female virtual assistants are the default interface for consumers' interactions with machines.

AI can be a useful tool to automate decisions, however, **many algorithms exhibit bias and discrimination against women and racially minoritised people**. The under-representation of women working in AI, and therefore among engineers developing algorithms that determine how a decision is made, is a contributing factor in this, as is the use of biased training data on which the AI is built. The result is that bias and discrimination are often baked into the design, which in turn replicates existing discrimination and inequality. High profile examples of unintentionally racist image recognition algorithms include the Google search engine auto-tagging Black women as having "unprofessional hair" and auto-tagging Black people as "gorillas".[6] The UK Centre for Data Ethics Innovation's interim report into AI in decision-making noted that as the volume and variety of data used to inform decisions increases, and the algorithms used to interpret the data become more complex, concerns are growing that without proper oversight, AI risks entrenching and potentially worsening bias. This is particularly true in areas or sectors where there is evidence of historical bias in decision-making.[7]

ChatGPT, the generative AI chatbot developed by OpenAI, has recently received a large amount of coverage resulting in extensive analysis, discourse and speculation about the impact of this technology on jobs, the value of human labour, the economy and wider society. Its algorithm has been trained using vast amounts of text-based data, much of which is scraped from the open internet and involves ingesting large volumes of inaccurate or toxic content.[8] **Deep rooted sexist stereotypes[9] and racism[10] have been**

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[4] Graham, Helen, Vanesa Fuertes, Valerie Egdell and Robert Raeside (2016) *Women in ICT and digital technologies: An investigation of the barriers to women entering, staying and progressing in the sector, and actions to ameliorate this – Executive Summary,* Employment Research Institute, Napier University; Chang, Emily (2018) *Brotopia: Breaking up the boys' club of Silicon Valley;* Be It (2017) *Sexism in the IT Industry: Survey results* available at https://www.scotlandis.com/news/2017/december/sexism-in-it-in-scotland-the-report/ accessed November 2019

[5] Kenway, Emily. (2023). "Care Bots: a dream for carers or a dangerous fantasy?", *The Guardian,* 21 March 2023, available at: https://www.theguardian.com/society/2023/may/21/care-bots-care-tech-uk-robots-carers-emily-kenway

[6] Hern, Alex (2018) "Google's solution to accidental algorithmic bias – ban gorillas", *The Guardian,* 12 January 2018, available at: https://www.theguardian.com/technology/2018/jan/12/google-racism-ban-gorilla-black-people

[7] Centre for Data Ethics and Innovation (2019) *Interim Report: Review into bias in algorithmic decision-making*

[8] Equality Now, "ChatGPT4 reinforces sexist stereotypes by stating a girl cannot 'handle technicalities and numbers' in engineering", 23 March 2023

[9] Equality Now, (2023) "ChatGPT4 reinforces sexist stereotypes by stating a girl cannot 'handle technicalities and numbers' in engineering", 23 March 2023, available at: https://www.equalitynow.org/news_and_insights/chatgpt-4-reinforces-sexist-stereotypes/

[10] Vock, Ido (2022) "ChatGPT proves that AI still has a problem with racism", *New Statesman*, 9 December 2022, available at: https://www.newstatesman.com/quickfire/2022/12/chatgpt-shows-ai-racism-problem

exposed in ChatGPT's output reinforcing concerns about bias and discrimination.[11] Leading AI policy and human rights experts at Alliance for Universal Digital Rights, founded by Women Leading in AI and Equality Now, have called on OpenAI's to collaborate on tackling risks and governance issues accompanying ChatGPT.[12]

The Women Leading in AI Network has recommended that organisations using algorithms should carry out regular quality assurance checks against discrimination and unfair treatment; carry out algorithmic auditing; and ensure that contractual assurance is in place for third party algorithms.[13] This transparency is a necessary prerequisite to ensure ethical use of new technologies.

3. Artificial Intelligence and recruitment decision-making

AIs can automate, or partially automate, recruitment decision-making. Proponents of this technology argue that an AI is more objective than humans. There is indeed widespread evidence of non-transparent and biased recruitment processes discriminating against women. However, if the data used to develop these AIs is based upon existing discriminatory decision-making in recruitment, this gendered bias will be replicated in the AI.

For example, Amazon abandoned an AI recruiting tool, developed in Edinburgh, when it was revealed to discriminate against women.[14] Amazon's computer models were trained to vet applicants by observing patterns in CVs submitted to the company over a 10-year period. Most came from men, a reflection of male dominance across the tech industry. In effect, Amazon's system taught itself that male candidates were preferable. It penalised CVs that included the word "women's," as in "women's chess club captain", and downgraded graduates of two all-women's colleges. Additionally, a study by Carnegie Mellon University in the US found that on job listing sites, men were being shown six times as many adverts as women were for high-paying jobs of $200,000 and up.[15]

4. Scottish Government's AI strategy

Scottish Government published its AI strategy in 2021 which sets out its ambitions for Scotland to become a leader in the "development and use of trustworthy, ethical and

[11] Alba, Davey (2022) "OpenAI chatbot spits out baised musings, despite guardrails", *Bloomberg*, 8 December 2022, available at: https://www.bloomberg.com/news/newsletters/2022-12-08/chatgpt-open-ai-s-chatbot-is-spitting-out-biased-sexist-results; and

[12] Ibid.

[13] Women Leading in AI (2019) *10 Principles of Responsible AI*

[14] Business Insider *Amazon built and AI tool to hire people but had to shut it down because it was discriminating against women* https://www.businessinsider.com/amazon-built-ai-to-hire-people-discriminated-against-women-2018-10?r=US&IR=T

[15] Thompson, Clive (2019) *Coders: Who They Are, What They Think, and How They Are Changing Our World*, London: Picador

inclusive AI" [16]. There is a welcome acknowledgment that there is a need for *"people to be assured that products, services and decision enabled by AI are safe and secure and protect their rights and are free of discrimination that biased data or inadequate design or use might otherwise create"*. However, **the strategy does not mention women, gender or equality, existing gendered bias and discrimination, or potential risks to women's equality as the use of AI is expanded**.

The AI strategy notes the need to align with a number of other related action plans and strategies including the gender pay gap action plan in which Scottish Government has committed to ensuring that addressing the causes of the gender pay gap are central to policies on automation and artificial intelligence.[17] However since the pay gap action plan has been subsumed into the more narrowly focused fair work action plan[18], it is not clear if and how this action is being implemented. **AI may accelerate digital disruption in the jobs market and research and analysis has shown that this disruption is expected to have a gendered impact.**[19] Women workers are concentrated at the extreme ends of the automation spectrum, with women over-represented in jobs that are at the highest risk of automation, such as retail or secretarial roles, and under-represented in the sectors where job growth is likely as a result of automation, such as STEM. Occupations most at risk of automation for men have the lowest earnings, whereas there is considerable risk to 'women's jobs' in better paid occupations, which has the potential to reverse gender equality gains.

The State of the AI Report 2022-23[20] very briefly sets out the progress that has been made in implementing the strategy's commitments. Again it does not mention women, gender or equality. The very high level information provided offers no insight into how the gendered skills gap in AI will be addressed, nor the risk around gendered bias and discrimination in products and services mitigated. The report commits to developing a skills plan "to ensure everyone has access to AI learning opportunities in our education system and improve the way businesses use, develop and adopt AI", and in particular "support upskilling and reskilling displaced workers and people vulnerable to exclusion". There is no detail on the action that will be taken to ensure gender-sensitive upskilling and reskilling, and activity that targets the women workers that have been displaced. This is important because evidence shows that unless gendered solutions are explicit, action plans and strategies are unlikely to tackle women's inequality.

Policy responses need to include action to mitigate the impact of potential job losses, and provide for opportunities for upskilling and reskilling for women and men. Skills interventions should take account of gendered patterns of training and development.

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[16] Scottish Government (2021) *Scotland's Artificial Intelligence Strategy: Trustworthy, ethical and inclusive*, available at: https://www.scotlandaistrategy.com/

[17] Scottish Government (2019) *A Fairer Scotland for Women: gender pay gap action plan*

[18] Scottish Government (2022) *Fair Work Action Plan: Becoming a fair work nation by 2025*, available at: https://www.gov.scot/publications/fair-work-action-plan-becoming-leading-fair-work-nation-2025/

[19] World Economic Forum (2018) *The Global Gender Gap Report 2018*

[20] Scottish Government (2023) *The State of AI Report,* available at: https://www.scottishai.com/foreword-2223

Currently, women are less likely to receive employer training than men, and are more likely to receive generic training such as equality and diversity and health and safety, while men are more likely to be given supervisory and management training.[21] Part-time workers, the majority of whom are women, are significantly less likely than full-time workers to receive any workplace development and support opportunities, particularly in relation to opportunities to perform tasks outwith their job role.[22]

Furthermore, the attrition rate of women working in tech, and in STEM more broadly is high; 70% of women with STEM graduate qualifications are not working in the industry.[23] This represents a significant loss of female talent to Scotland's economy. Developing initiatives that support women to upskill, especially women returning from a career break, is one part of the solution. However, it is critical that upskilling and reskilling interventions disrupt occupational segregation more broadly, which means targeting women in female-dominated occupations, particularly those which are at high risk of automation.

5. Conclusion

Based on the current trajectory, the development and adoption of AI is likely to reinforce women's labour market and economic inequality as a result of the gender-blind technology development, replication of bias in decision-making and potential job losses from automation. There is a significant risk that this will undermine Scottish Government's ambitions on the gender pay gap and women's equality more broadly.

Scottish policy responses to AI and automation have so far failed to recognise the importance of understanding women's experiences of skills acquisition, training and the labour market. Scottish Government's AI strategy has prioritised the need for AI to be trustworthy, ethical and inclusive, however, **policymakers must also pay attention to gender so that advancements in AI do not entrench women's inequality.**

[21] Aldrige, Fiona and Corin Egglestone, (2015) *Learning, Skills and Progression at Work: Analysis from the 2015 adult participation in learning survey*, UK Commission for Employment and Skills

[22] House of Commons Women and Equalities Committee (2016) *Inquiry into the gender pay gap*

[23] Royal Society of Edinburgh (2018) *Tapping All Our Talents: A progress review of science, engineering, technology and mathematics in Scotland*