# 45 Addressing gender imbalance in STEM graduate apprenticeships.

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## Research Domains

Technical, Professional and Vocational Higher Education (TPV)

## Abstract

There is currently significant gender imbalance within Science, Technology, Engineering and Mathematics (STEM) graduate apprenticeship (GA) programmes in Scotland. This is a considerable, ongoing issue for both higher education institutions and the labour market as there is a shortfall in skilled, qualified employees within these sectors which will have a significant impact on Scotland's economy and productivity. The problem of gender imbalance in STEM is also a wider social issue, as women are more likely to be unemployed (Scottish Government, 2022), or working in low paid, unskilled jobs than men, which results in them being left behind in a rapidly growing post pandemic digital world. This paper will outline an ongoing research study which explores some of the reasons and factors which may cause or contribute to the problem of gender imbalance in STEM GA programmes and investigates the role that Scottish government policy can play in mitigating these.

## Full paper

### Introduction

Graduate apprenticeships (GA's) are Scotland's higher education apprenticeships, which are delivered in partnership between higher education institutions, national skills agencies, and employers. The Science, Technology, Mathematics and Engineering (STEM) sector is one of the most rapidly growing sectors in the world which has led to predictions of significant future skills shortages, meaning that demand for skilled, qualified workers will outstrip supply. It is estimated that by 2030 there will be a shortfall of 173,000 workers in the UK STEM sector alone, which equates to a £1.5 billion cost to the UK economy annually (The Institute of Engineering and Technology, 2021). Whilst a diverse engineering sector is thought to be vital for the UK economy currently demand for these skills is not being met effectively through education and training pipelines (Engineering UK, 2018). One small factor in this is gender imbalance within graduate apprenticeships. For example, as of 2022, only 21.2% of STEM graduate apprentices were female (Henderson, 2022).

Globalisation makes this problem even more significant, as there have been profound changes in the global workforce as a whole due to rapid advancements in technology, particularly in STEM industries (Waite & McDonald, 2019). Therefore, it is crucial that more women are encouraged to develop skills in computing and technology which will afford them the ability to participate fully in the global workforce. This is also critical for the welfare of society as a whole, as the freedom to work (and to choose meaningful rewarding work) is integral to human welfare (International Labour Organisation, 2022).

The main aim of this research study is to explore the information landscapes (Lloyd & Wilkinson, 2019) of young people in Scotland to identify the sources of gender stereotyping influencing apprenticeship choices and their salience for different groups and individuals (Bourdieu, 2000). Key objectives of the study are to gather and synthesise existing work in occupational segregation, with regard to apprenticeships, and to investigate young people's situated experience of potentially gendered information related to graduate apprenticeships and its influence on their choices.

The research questions for the study are:

RQ1. To what extent are apprenticeships segregated by gender in Scotland and internationally?

RQ2. What are the main current and recent policies and strategies to address gender stereotyping and disparities in young people's choices around apprenticeships?

RQ3. What theories address occupational segregation in apprenticeships, and how do these fit with educational timelines from early years to leaving school?

RQ4. What gendered influences do young people identify when looking back over their choices of apprenticeships?

**Methodology**

Initial reviews of related literature and Scottish policy relating to gender balance and apprenticeships is currently in progress. Data collection will employ a mixed methods approach, incorporating a survey and focus groups. The survey will be carried out with a sample of STEM apprentices, and the focus groups (recruited through the questionnaires) will each consist of around 3-5 apprentices who will be asked to map their routes into and through their apprenticeships in visual format e.g., Rich Pictures. Data collection will begin in October 2023 and will be analysed using thematic and discourse analysis. Finally, an evaluation process will be applied to ensure validity of the data, this will include sharing initial findings with participants. This will be part of a wider study into gender balance in apprenticeships.

**Results of pilot**

A pilot study was conducted in the summer of 2022. Focus groups were conducted . with 12 careers advisors from Skills Development Scotland. The purpose of the data collection was to establish their perspectives and opinions on how gendered information landscapes may influence young people's (aged 13 to 17) choices around apprenticeships. Some of the findings from this were:

1. Most of the young people in question were not thought to have the maturity/cognitive abilities to exercise much agency in their information landscapes and would need someone to act as a facilitator to know how to use information effectively for the purposes of decision-making.

2. Whilst young people tend to favour digital sources of information, these do not have as great an impact as non-digital sources.

3. Gender stereotypes and cultural norms are prevalent throughout the life of young people, with the influence of these seen in children as young as two years old.

**Implications**

Findings from the study will be used to create outputs for Scotland's national skills agency, Skills Development Scotland who are funding this research, to help them develop their apprenticeship policies and inform their practice.

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