

Written evidence submitted by Louise Juliff, Team Leader (STEM Facilitation), Blaenau Gwent County Borough Council

(DIV0109)

Introduction

As a female that has been involved in STEM for my whole career, I felt it necessary to submit a personal submission to the inquiry on diversity in STEM.

I completed an undergraduate degree in Design and Technology with Qualified Teacher Status in 2007 and then studied for a Masters in Education: Leadership and Management whilst teaching. As a former secondary school teacher and Head of Design and Technology department in a deprived South Wales valleys school, I have taught all aspects of Technology, Engineering and some elements of Mathematics. I also work for WJEC as a reviewer, moderator and examiner. I am now Team Leader for the STEM Facilitation Programme in Blaenau Gwent County Borough Council, which is funded by Welsh Government as part of the Tech Valleys Initiative.

I would be happy to give additional evidence to the committee if required.

UK STEM Industry

Figures from the All-Party Parliamentary Group on Diversity and Inclusion in STEM demonstrate the issue of the gender gap in STEM is still too prevalent; they carried out a data analysis which was published in November 2020.

In the UK only 27% of the STEM workforce is female. In Wales there has been an increase in the number of females employed in STEM occupations but Wales still has the lowest proportion of females in STEM occupations. In London 29% of the workforce is female and in Northern Ireland 30% are female.

It is clear that STEM careers will experience some of the highest levels of growth of any industry and if the skills gaps are going to be filled half of the population cannot be ignored.

Within the areas that the Tech Valleys initiative is focussing on:

In engineering the stand-out figure is that 91% of the engineering workforce is male. However, in the technology sector 79% of the workforce is male.

[Download.ashx \(britishscienceassociation.org\)](#)

Why is there an issue with Diversity and Inclusion in STEM?

I have outlined a range of reasons which may contribute to the issue of diversity and inclusion in STEM. These are from my own experience of working in four secondary schools in disadvantaged areas, and from teacher feedback.

- Educational experiences are still very much a postcode lottery. Some schools benefit from a range of initiatives that are implemented but these are not common across all authorities; this immediately causes a variation in learner experience and can have quite an impact on the likelihood of entering a STEM pathway.
- Teachers aren't aware of new STEM careers. Some have studied their subject at university and then returned to the classroom as a teacher. Opportunities aren't given to teachers to research the changing world of careers.

- Many teachers aren't specialists in what they are teaching – this doesn't engage disaffected learners and they are lost from STEM.
- Subjects are taught to learners to pass examinations. GCSE and A Level specifications do not have enough links to the real world. A lot of the knowledge still on some STEM related specifications is dated. Disaffected learners do not respond well to this and it doesn't inspire them to consider STEM related subjects or careers.
- Some aspects of STEM related specifications have too much focus on irrelevant aspects such as 'evaluating', producing extended answers or links to Wales. Surely it would be more relevant to have content that prepares the learners for the world of work, especially as many employers report that learners lack the 'work readiness' that they need.
- STEM subjects are still linked with being a 'builder', 'mechanic' for some – teachers and parents aren't aware of new STEM related jobs, especially in disadvantaged areas where there are high levels of unemployment. They need educating on the world of work and to be encouraged to use different language. With the introduction of the new 3-16 Curriculum for Wales, this is essential from early years' education.
- Some aspects of STEM are still not looked upon as 'academic' by some staff and higher ability learners are not encouraged to opt for D&T, Food and Nutrition and Engineering courses. Some schools only have low ability learners studying some STEM subjects and higher ability are alienated from them.
- Some schools offer courses that aren't relevant to the priorities of the local area and learners are studying subjects that are unlikely to translate to jobs. This does not engage or capture them.
- Adding a 'STEM Day' or 'STEM Week' is not sufficient. If this approach is taken, then learners view STEM as a novelty subject and don't see the wide range of career and subjects linked with it. STEM opportunities need to be firmly embedded within the everyday teaching and learning.
- Pathways to careers are not explained enough. Teachers are not aware of the changing industries – there should be a programme added that makes this a regular form of CPD for teachers. Inset/twilight sessions could be used for different Areas of Learning.
- Careers Wales guidance is minimal. No work experience is provided anymore and this used to make a considerable difference to many learners.
- The use of role models is essential to ignite the spark. Teachers cannot always access STEM ambassadors, or don't have the time to source them. There needs to be an overarching body in each region of the UK to coordinate the STEM activities.

So many learners in deprived areas rely on their schooling to expose them to different experience and ideas. The phrase may be sometimes overused but "You can't be what you can't see" certainly rings true and needs to be addressed on a consistent basis across the UK.

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