

WESTMINSTER BUSINESS SCHOOL

# Diversity in STEMM: establishing a business case

Report of research by the University of Westminster for the Royal Society's diversity programme  
*'Leading the way: increasing diversity in the scientific workforce'*  
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# EXECUTIVE SUMMARY

## Background

This report sets out the results of research commissioned by the Royal Society as part of their BIS-funded programme entitled 'Leading the way: increasing diversity in the scientific workforce'. The research explored whether there is a business case for diversity in STEM occupations (scientific, technical, engineering, mathematical and medical roles) and whether diverse teams are more likely to do 'good' science. The research focused on three of the nine protected characteristics in the Equality Act 2010: gender, ethnicity and disability.

The research was conducted in late 2013 and included:

- A review of existing empirical data on diversity
- Examination of quantitative data regarding the diversity of the UK and STEM workforces
- Focus groups discussion with individuals in STEM occupations
- Interviews with organisational representatives of employers with substantial STEM workforces

The definition of the scientific workforce used in this research is taken from the Royal Society's diversity programme: 'For the purposes of the project, the 'scientific workforce' is taken to comprise all those for whom scientific knowledge, training, and skills are necessary for the work that they do'. This research used the Royal Society's diversity programme classification of STEM occupations using Standard Occupational Classification (SOC) codes. These were then added to the Royal Society's 'possibly STEM' category to create a broader one called 'STEMM+' which has been used for the purposes of this research.

The research explores what diversity means to people in the sector, examines the fundamentals of the business case, describes diversity policies and initiatives used by organisations, and considers the issues and difficulties of measuring diversity and performance. The conclusions summarise what we know, what is new, what we have learnt and what is missing from research regarding the business case for diversity.

## Findings

As expected the business case is complicated, subtle and highly contextual. However, the research presents some interesting insights into the potential business case for diversity in

the scientific workforce along with some useful recommendations on how to increase and promote diversity in STEMM.

Interviews and focus groups revealed that the discourse on 'diversity' has moved away from 'equal opportunities', and is now associated with inclusiveness, with recognising, valuing and respecting differences. The global nature and reach of science provides a specific context within which diversity has distinct meanings for those in STEMM occupations: for the participants in this research, 'diversity' is a broad and complex concept, with a strong 'international dimension'.

In STEMM diversity initiatives tend to focus on gender equality and there is a general lack of visibility of ethnicity. Ethnicity is seen in global, nationality terms rather than in UK-based minority ethnic terms. Disability issues also have little visibility in the sector, outside of the health service.

## **Fundamentals of the Business Case**

- Research participants were unanimous in their acknowledgement of a moral and social case for diversity, arguing that the moral case is part of the business case. The business case derives from recruitment and retention of talent and the range of perspectives arising from diverse, as opposed to homogeneous teams.
- Potential business benefits of diversity can be classified as 'external' and 'internal'. 'External' benefits include reduced costs, improved resourcing of talented personnel, better products and services, and enhanced corporate image; 'internal' benefits are where a greater range of perspectives leads to increased creativity, innovation and problem-solving.
- Defining and measuring diversity in a consistent way across organisations, and measuring meaningful business outcomes that demonstrate a business case, is difficult.
- Research indicates that diversity within teams could lead to business improvements, however, effective team collaboration not only depends on the diversity of team members but on how well they understand and communicate with one another and, crucially, on how the team is organised and led.
- The potential benefits of diversity are highly contextual and it is unlikely that there is a uniformly relevant business case for all organisations. This means that simple copying of diversity strategies utilised by other employers will not guarantee success.
- Effective leadership and the role of men are paramount to changing culture with respect to diversity.

- There are problems of definition in what constitutes ‘good science’ and ‘good performance’ that need to be overcome to build a convincing measurable business case for diversity and many employers do not systematically collect, or use, reliable diversity or performance data. In the absence of definitions and measurements, it will be difficult for STEMM employers to calculate a business case for diversity, or to definitively state that diverse teams do better science. However, inability to conceptualise and measure does not equate to the absence of a business case for diversity, merely the absence of quantitative data.

## **The UK STEMM Workforce**

- Compared with the EU and the USA the UK STEMM workforce is less diverse. ‘Vertical’ and ‘horizontal’ segregation is evident in the STEMM sector in terms of gender, ethnicity and disability, where these under-represented groups cluster in particular occupations and lower levels in organisations.
- The health sector is much more diverse than other parts of the STEMM workforce with regards to the employment of women, minority ethnic groups and people with disabilities. This sector also has more policies and practices that encourage diversity, for example, encouraging female staff to return from maternity leave and minority ethnic and disabled applicants to apply for jobs. Some NHS employers measure and benchmark diversity and use the idea of ‘inclusion’ to signify a strategic intention to build a workforce representative of the community served.

## **Individual and Organisational Perspectives of Diversity**

- For focus group participants, barriers to entering STEMM careers operated from childhood and continued through education with a dearth of relevant role models for girls, the tendency for employers to recruit graduates from specific (‘high class’) universities, and the stereotypically male associations with certain occupations and work environments (e.g. engineering and surveying) that made professions appear unattractive or unobtainable. Figure 1 summarises the diversity aspects of pathways into and progression within careers in STEMM.
- Barriers to progression included the absence of part-time roles and flexible working arrangements, the disproportionate use of fixed term contracts for women and minority ethnic academics, opaque promotion processes, long-hours’ cultures, operation of the ‘old boys’ networks’, the difficulty in balancing parenthood with a career, inadequate provision for individuals requiring physical adjustments to the work environment, organisational cultures and expectations unattractive to members of minorities, and the

absence of effective networking, mentoring and 'sponsorship' between, and of, individuals.

- Diversity initiatives, although positive, are often just gender-related, with fewer focused on ethnicity and, outside the health sector, on disability.
- Focus group participants were often critical of these organisational diversity policies, highlighting a range of organisational factors getting in the way of increased diversity in STEMM, including senior management and employee involvement, and problems integrating diversity values into organisational cultures.
- Diversity needs to be integrated strategically into business, however this is context specific and not a simple process; whilst some private sector organisations view diversity as a strategic means to successfully deliver carefully targeted products and services to customers, in the public sector there are broader social or community diversity objectives. In all sectors the diversity mindset of the (mainly) white male leaders of organisations is crucial to successful change.

## **Moving Diversity Forward**

- Overall, the findings support a business case for diversity, though one founded more on conviction than organisational evidence, with potential 'external' and 'internal' benefits recognised but difficult to measure.
- The research indicates that 'external' benefits related to skills and clients/users and customers have relevance in STEMM. While diverse teams and collaborations are valued in positive terms, for the potential creativity and innovation they bring, the dynamics of communication and leadership of teams are recognised as either constraints or enablers of positive outcomes.
- There is some evidence that the STEMM sector (outside of the health service) is taking fewer actions to improve diversity, via diversity policies and processes, than organisations outside STEMM. More flexible employment practices, including shorter working hours, greater employment security (implying less use of fixed term contracts which have an adverse diversity impact) and attention to child care responsibilities can help to redress these.
- While integration of diversity issues with the organisation's business strategy is seen as important to success in some contexts, it is not the only essential factor; cultural and leadership factors and management systems inhibit progress to diversity.
- Many of the key change agents in organisations, in the STEMM sector and in society as a whole, are white able-bodied men. Without their commitment to change organisational

cultures, strategies and practices, and their desire to lead the change process, the STEMM workforce will remain largely as it is.

Leaders with a diversity mindset can break away from traditional patterns and model inclusive thinking and behaviour; doing this, they are instrumental in modifying norms, values and expectations embodied in organisational cultures. Training interventions for organisational leaders are therefore considered an essential part of the journey to increased diversity.

## **Recommendations**

- More strategic central co-ordination of both initiatives and information on diversity in STEMM is required.
- A consistent and comparative benchmarking framework needs to be developed that is relevant for different sectors across the STEMM community.
- Increased monitoring of information on employment practices and career progression such as the use of fixed-term contracts, flexible working arrangements and requests, and the progression of different groups through the organisation.
- Creation and encouragement of social networks accessible to people working or aspiring to work in careers in STEMM, as well as sponsorship and mentoring opportunities, will facilitate entry and progression in STEMM careers.
- Increased development and use of retention policies such as making reasonable adjustments in the workplace to account for disabilities, enhancing flexible working opportunities to achieve better work-life balance, encouragement for women to return after maternity leave, and offering better development and networking opportunities.
- Encouragement to employers to foster (or make visible) employment opportunities to potential recruits studying at universities not routinely targeted by employers.
- Monitor and evaluate training programmes and share across the sector when training interventions are effective, this would be particularly helpful to SMEs.
- Increased co-operation and coherence of diversity initiatives between professional bodies operating in STEMM professions to increase communication and awareness of diversity issues.

Figure 1: Pathways to a career in STEMM

### **School, Family & Community Networks**

- Awareness of and access to 'good' science
- Encouragement by teachers
- Influence of parents & wider family & friends
- Community perceptions of science
- Choice of school
- School's approach to science
- Choice of science subjects
- Career guidance regarding opportunities in science

### **School to Work Transition: Perceptions & Choices**

#### **Facilitators for STEMM careers:**

- Positive image / reputation of science
- Positive family views of science
- Encouragement to see beyond traditional career options
- Mentoring
- University choices leading to STEMM career

#### **Barriers to STEMM careers:**

- Absence of positive role models
- Traditional views on segregated roles
- Discouragement / no encouragement
- No mentoring
- Incorrect / poor career guidance
- Funding concerns

### **Employment Barriers & Enablers**

#### **Entry Level:**

- Selection procedures & practices impact on diversity positively or negatively
- Traditional occupational roles by gender, ethnicity or class accepted or challenged
- Consistent or inconsistent actions on diversity by professional bodies

#### **Career progression within STEMM:**

- Invisibility / visibility of diversity
- Diversity mindset of leaders
- Diversity friendly or unfriendly organisational culture & practices
- Role of clients & research funders
- Diversity impact: post-doc choices
- Flexible work / hours in practice
- Career break availability & post-maternity support