

Diversity makes the difference

Innovations resulting from the fields of Science, Technology, Engineering and Mathematics touch almost every aspect of our lives. As this year's International Women's Day celebrates women's achievements and pushes forward towards gender equality, we explore how a diverse range of voices working in STEM is good for all of us.

You don't have to look very far to see the huge impact that STEM subjects have on our everyday lives. Pretty much everything that we take for granted has been influenced by a STEM worker: the physics behind our cell phones, the chemistry of our soap; the Teflon® material coating our frying pans; the coding that brings our favourite apps to life. STEM is literally all around us. But scientific innovations don't spring from nowhere. They're brought alive through the hard work, dedication and ingenuity of those working within the family of STEM subjects. The quality of scientific research – its ability to meet our needs and desires and positively impact our lives – can be wholly attributed to the STEM workforce.

BRIDGING THE GAP

With society's heavy reliance on STEM, the need to recruit to the STEM workforce is steadily increasing. Unfortunately, however, supply is steadily declining. This mismatch of supply to demand is seen across all STEM subjects. In a recent survey of British firms employing engineers and IT staff by the Institution of Engineering and Technology (IET), more than half reported that they couldn't find the employees they were looking for. Almost two-thirds said that the shortage is 'a threat to their business in the UK'. According to the IET, this 'skills gap' has worsened for the ninth year in a row.

Surely our best chance of bridging this gap is if everyone participates, including those from backgrounds that are traditionally under-represented as well as those who are well-represented. Diversity in STEM could include a mixture of gender, ethnicities and nationalities, as well as a wide spectrum of scientific disciplines, backgrounds and work

experience. There's interesting evidence that points to many advantages when a STEM workforce has a more diverse mix.

TEAM SPIRIT

Although we often portray achievements in STEM as the result of the ingenuity of individuals (Thomas Edison, Marie Skłodowska-Curie, Albert Einstein...), great science usually relies on successful teams, rather than just one person working in isolation. Studies show that research groups, and groups of people tackling problems, are more effective and have higher morale when they're diverse.

DARWIN: DIVERSITY INCREASES PRODUCTIVITY

Charles Darwin wondered about the extraordinary richness and diversity of the natural world. In 1859, in his 'On the Origin of Species', he predicted that a plot of land growing distantly related grasses would be more productive than a plot with a single species of grass. His theory has since been proven correct – both for grasses and for people! Evidence points to positive links between diversity and collective problem-solving. Diversity sparks new discoveries by incorporating new perspectives, tackling

problems from a number of different angles, asking varied questions, injecting fresh ideas. Group performance is shown to be higher than the sum of the IQs of individual group members. If we think about excellence in STEM as being about group problem-solving then diversity is crucial.

STEM involves a huge amount of creativity – formulating ideas, generating hypotheses, designing experiments. Diverse teams are known to be more creative. Creating an environment where a diverse mix of people can work well together should be fundamental. Only then can we harness this power of diversity.

There's no denying how important the role of STEM is for all of us. Any kind of imbalance – be it gender, nationality, ethnicity – should be an issue that concerns us all, because we all benefit from diversity in the laboratory. Encouraging greater diversity is not only the right thing to do, it opens doors to new discoveries and innovations. After all, science by its very nature is diverse. The scientific workforce needs to reflect that to produce even better research.

Rachel Perrin, PhD, is a science communication writer based in Bristol, UK.

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