



## JOB MARKET

# Why maths (and social skills) matter

Considering the looming threat of automation, is job security more guaranteed for those in science, technology, engineering and mathematics (STEM) jobs compared to those in fields that require more advanced interpersonal skills?

The world of work is changing. Skills that were valuable only a decade or two ago seem less valuable nowadays, displaced by newer trends and technologies. Every few weeks a news article on the threat of automation, and how it will destroy millions of jobs, including yours, pops up. A YouTube video of a robot jumping over obstacles confirms that the inevitable is only a few months away.

The answer, many seem to think, is to become like computers. Students, locally and elsewhere, are encouraged to pursue STEM – science, technology, engineering and mathematics – careers.

Humanities degrees, or those in the social sciences, in contrast, are often considered less prestigious. We know that the best-paying jobs are still those where a decent amount of maths is required. In South Africa, this is of particular concern, as the gender and racial composition of those enrolling for STEM degrees differs significantly from those enrolling for degrees in the humanities, exacerbating inequality.

But the story is more complicated than that. A new paper by David Deming, published in the *Quarterly Journal of Economics* (QJE), suggests that, at least in the US, STEM graduates are not doing very well.

In fact, between 2000 and 2012, STEM jobs shrank by 0.1 percentage points, after growing by 1.3 percentage points in the previous two decades. In contrast, all other 'cognitive occupations', jobs like managers, teachers, nurses, physicians, lawyers and economists, grew by 2.9 percentage points between 2000 and 2012, faster than the 2 percentage points in the previous decade. Only 36% of STEM occupational categories had positive growth, compared to 85% of other professional occupations.

The reason for this, Deming argues, is that managers, teachers and physicians all require significant interpersonal skills. And because of the technological change – the same technological change we all fear! – these social skills are increasingly in demand.

Deming explains: "The skills and tasks that cannot be substituted away by automation are generally complemented by it, and social interaction has, at least so far, proven difficult to automate. Our ability to read and react to others is based on tacit knowledge, and computers are still very poor substitutes for tasks where programmers don't know 'the rules!'"

Using a wide variety of sources, Deming finds that jobs that require high levels of both cognitive and social skills have fared particularly well, while high maths, low social skill jobs (including many STEM occupations) have fared especially poorly. "Social skills were a much stronger predictor of employment and wages for young adults age 25 to 33 in the mid-2000s, compared to the 1980s and the 1990s."

There is a revolution in the job market underway that no-one is talking about.

Where do these social skills come from? Deming speculates that much of them are formed during early childhood development, although this is difficult to prove. **The latest research that has followed children from a young age into adulthood has found strong correlations between kids' socio-emotional skills in kindergarten and adult outcomes such as employment and earnings.**

The demand for social skills may also have implications for gender imbalances in the workplace. Women often choose careers that require more social interaction. If these jobs are in greater demand, with faster earnings increases, the gender gap may close quicker.

The optimism about the closing of the gender gap, though, is thrown into question by another study published in the next issue of the QJE, by authors Matthew Wiswall and Basit Zafar. They tested a group of New York University students about their preferences for flexible hours when they enter the job market, and find that students are willing to give up 2.8% of their annual earnings for a job with a percentage point lower probability of job dismissal.

They also find that students are willing to give up 5.1% of their salaries to have a job that offers

the option of working part-time hours. But there is a large gender difference: female students have a much higher average preference for flexible hours – 7.3% – compared to men – 1.1%.

The authors then track the students after they graduate, and record their actual earnings four years later. Wiswall and Zafar find that those students with a high preference for work flexibility do actually end up in occupations with greater flexibility.

But because women already prefer more flexible hours even before they've started working, they also tend to earn less once they've entered the labour market, choosing jobs with lower pay and greater flexibility. At least a quarter of the gender gap in the labour market, the authors argue, can be explained by just these differences in preference.

These studies show how our social skills and preferences affect our labour market outcomes. Policies that aim to address labour market distortions, like race or gender gaps, should know that the roots of the problem may lie in preferences and skills moulded in the early years of development.

That is not to say that nothing can be done: for those going to university this year, perhaps one thing to keep in mind is that your future earnings depend not only on attending maths class, but also on developing your social skills.

Here's one formula to remember: Maths + beer = success. ■

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