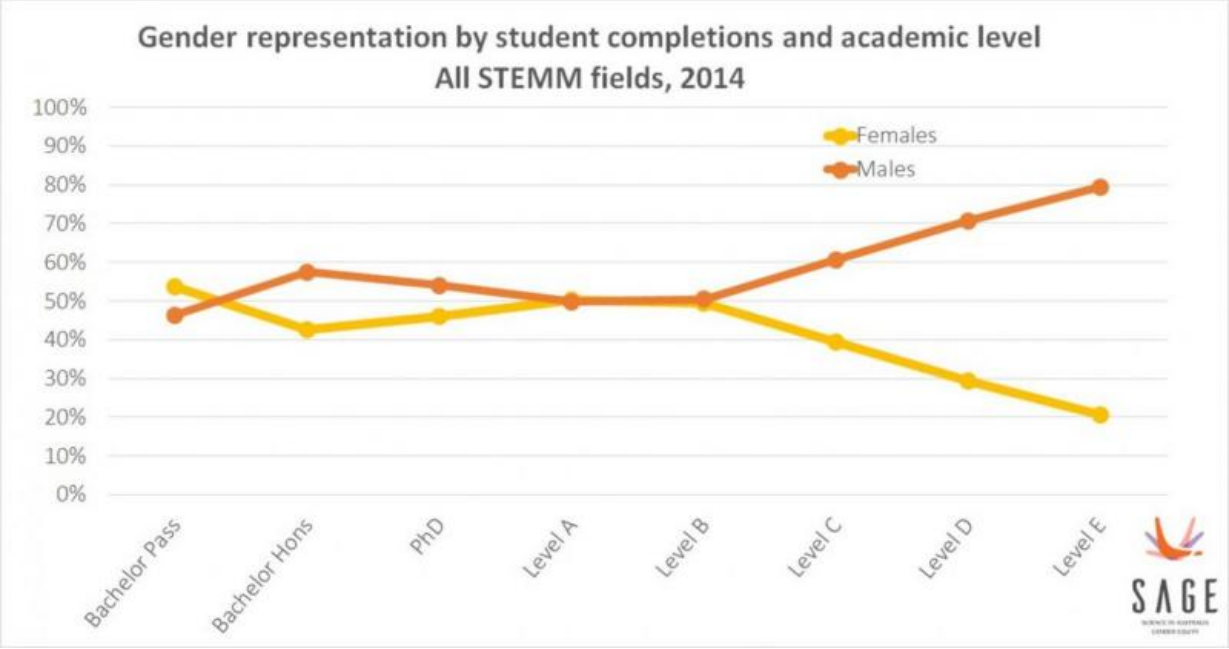
How to keep more women in science, technology, engineering and mathematics (STEM)

July 13 2016, by Merryn Mckinnon, Australian National University



Gender disparity in STEM fields at the higher academic levels (C-E) based on Higher Education Research Data, 2014. Credit: Science in Australia Gender Equity (SAGE)

There have been myriad promises made by the major political parties over the years focused on funding programs aimed at increasing the number of women pursuing careers in science, technology, engineering

and mathematics (STEM).

Although some of the policies do target disciplines where women are underrepresented, there seems to be very little acknowledgement of the bigger problem.

Attracting women to STEM careers is one issue, retaining them is another. And that does not seem to get the same level of attention.

Simply trying to get more women into STEM without addressing broader systemic issues will achieve nothing except more loss through a leaky pipeline.

Higher Education Research Data from 2014 shows more females than males were being awarded undergraduate degrees in STEM fields. Early career researchers, classified as level A and B academics, are equally represented in the genders.

At senior levels, though, the gender disparity plainly manifests – males comprise almost 80% of the most senior positions.

A biological and financial conundrum

Studies in the United States found that women having children within five to ten years of completing their PhD are less likely to have tenured or tenure-track positions, and are more likely to earn less than their male or childless female colleagues.

Angela (name changed) is a single parent and a PhD student in the sciences. She told me she is determined to forge a career for herself in academia, despite the bureaucratic and financial hurdles she has to overcome.

Finding ways to get enough money to afford childcare […] jumping through bureaucratic hoops […] It was ridiculous and at times I wondered if it was all worth it.

It may be just one reason for women leaving STEM, especially those with children, and doubly so for single parent women.

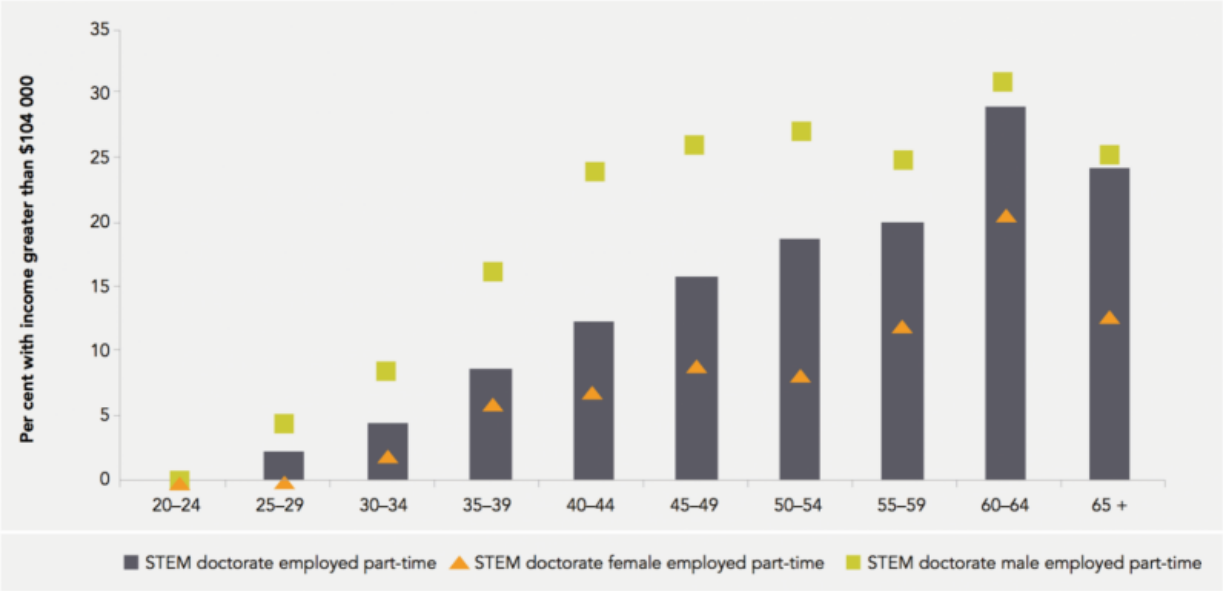
Women tend to be the primary caregivers for children, and are more likely to work part time, so perhaps this could explain the financial disparity. But according to the latest report from the Office of the Chief Scientist on Australia's STEM workforce, men who also work part time consistently earn more, irrespective of their level of qualification.

The same report also shows that women who do not have children tend to earn more than women who do, but both groups still earn less than men.

Perhaps children do play a part in earning capacity, but the pay disparities or part-time employment do not seem to fully explain why women leave STEM.

Visible role models

The absence of senior females in STEM removes a source of visible role models for existing and aspiring women scientists. This is a problem for attracting and retaining female scientists.



Percentage of doctorate level STEM graduates working part time who earned more than $104 000 annually, by age group and gender. Credit: Australia's STEM Workforce March 2016 report from the Office of the Australian Chief Scientist., CC BY-NC-SA

Having female role models in STEM helps younger women envision STEM careers as potential pathways they can take, and mentors can provide vital support.

Yet even with mentoring, women in STEM still have higher attrition rates than their male colleagues.

So what else can we do?

There are many programs and initiatives that are already in place to attract and support women in STEM, including the Science in Australia Gender Equity (SAGE) pilot, based on the United Kingdom's Athena SWAN charter.

But women's voices are still absent from leadership tables to our detriment.

Homeward Bound

This absence is especially noticeable in STEM and policy making arenas, and was the impetus for Australian leadership expert, Fabian Dattner, in collaboration with Dr Jess Melbourne-Thomas from the Australian Antarctic Division, to create Homeward Bound.

Dattner says she believes the absence of women from leadership "possibly, if not probably, places us at greatest peril".

To address this, Homeward Bound is aimed at developing the leadership, strategic and scientific capabilities of female scientists to enhance their impact in influencing policy and decisions affecting the sustainability of the planet.

Initially, it will involve 77 women scientists from around the world. But this is only the first year of the program, and it heralds the beginning of a global collaboration of 1,000 women over ten years.

These women are investing heavily – financially, emotionally and professionally – and it is clearly not an option for everyone.

Flexible approaches

There are other simple ways to support women in STEM, which anyone can do.

Simply introducing genuinely flexible work arrangements could do a lot towards alleviating the pressure as Angela shows:

My supervisor made sure that we never had meetings outside of childcare hours […] or I could Skype her from home once my child was in bed. They really went above and beyond to make sure that I was not disadvantaged.

We have already attracted some of the best and brightest female minds to STEM.

If keeping them there means providing support, publicly celebrating high-achieving women, and being flexible in how meetings are held, surely that's an investment we can all make.

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