

Women in science: Statistics you need to know

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The Science Council defines science as the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence. When it comes to women in science, most literature refers to the fields classified as STEM (science, technology, engineering, and mathematics). STEM fields include natural sciences (physical, biological and agricultural sciences), engineering and engineering technologies, computer and information sciences, and mathematics (Chen and Weko, 2009). Some literature includes social science and psychology fields, however, most research excludes these fields

Women in Science

Research about women in science mainly focuses on the fact that women are a minority when it comes to science and research. Various measures have been applied to try and improve the statistics worldwide over the years. The numbers are improving (Blickenstaff, 2005), however, there is still a long way to go. As a woman in science, I can attest that there are many opportunities targeting women in science to motivate their involvement in the field. However, these opportunities have not been able to increase the numbers at the expected rate.

It is proposed that there is a leakage of women in science in the pipeline that starts at high school, going on to university, and up to jobs in industry and academia. At each stage, the number of women decreases such that at the top of the pipeline, there are very few women in the science field. Various reasons are said to be the cause of this pipeline leakage. Some studies suggest that discrimination and denial of access for females in the science field is the cause (Lawal, 2007). From as early as primary school, boys are encouraged to keep on pushing until they get things right whilst girls are allowed to give up. Teachers are said to be biased towards males, paying more attention to their scientific interests than they do to females. Also, fields such as engineering tend to be perceived as masculine fields and girls eventually end up moving away from these fields.

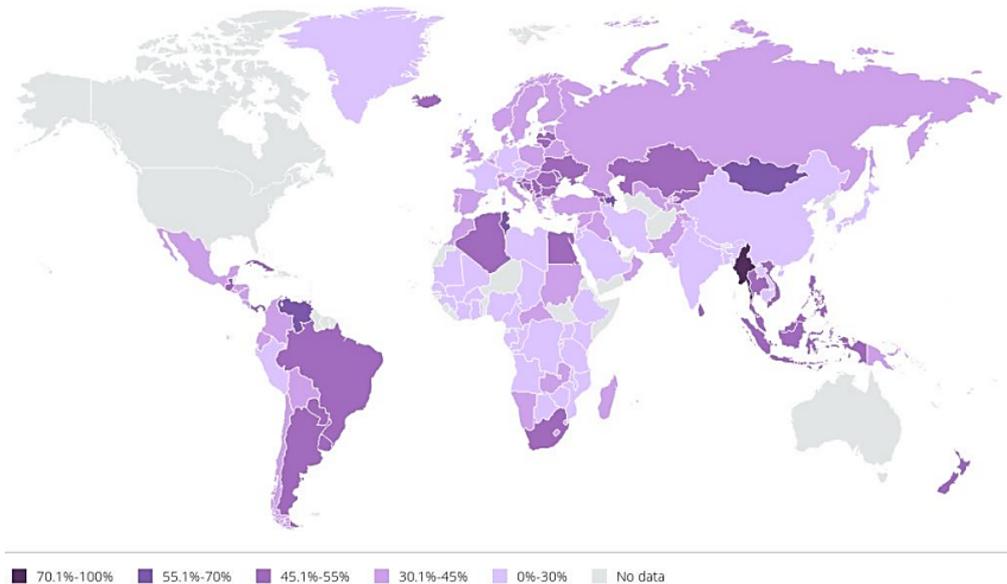
Other studies suggest a theory of self-concept (Lawal, 2007) as a cause of the challenges. Self-concept inspires how one views themselves as either fitting or unfitting in a certain role. Students may end up making choices based on their gender, according to whether they view certain roles as fitting for their gender or not (Eagly, 1987; Eccles, 1987; Raty, Vanska, Kasanen & Karkkarnen, 2002).

When I applied for my undergraduate studies, I wanted to study Electronic Engineering, but I obtained a place for Computer Science. During the process of trying to switch to Electronic Engineering, I met with the Engineering department's head. She talked me into accepting what I had obtained because engineering jobs in industry were difficult for females, and even gave examples of jobs that would be better suited for males than females. This changed my self-concept at the time and clearly shows how some females leak from the pipeline.

Statistics

The UNESCO Institute for Statistics (UIS) gives a summary of statistics for women in scientific research:

Notes: Data in this map are based on headcounts (HC), except for Congo, India and Israel which are based on full-time equivalents (FTE). Data for China are based on total R&D personnel instead of researchers. Data for Brazil are based on estimations.
Source: UNESCO Institute for Statistics, June 2019.

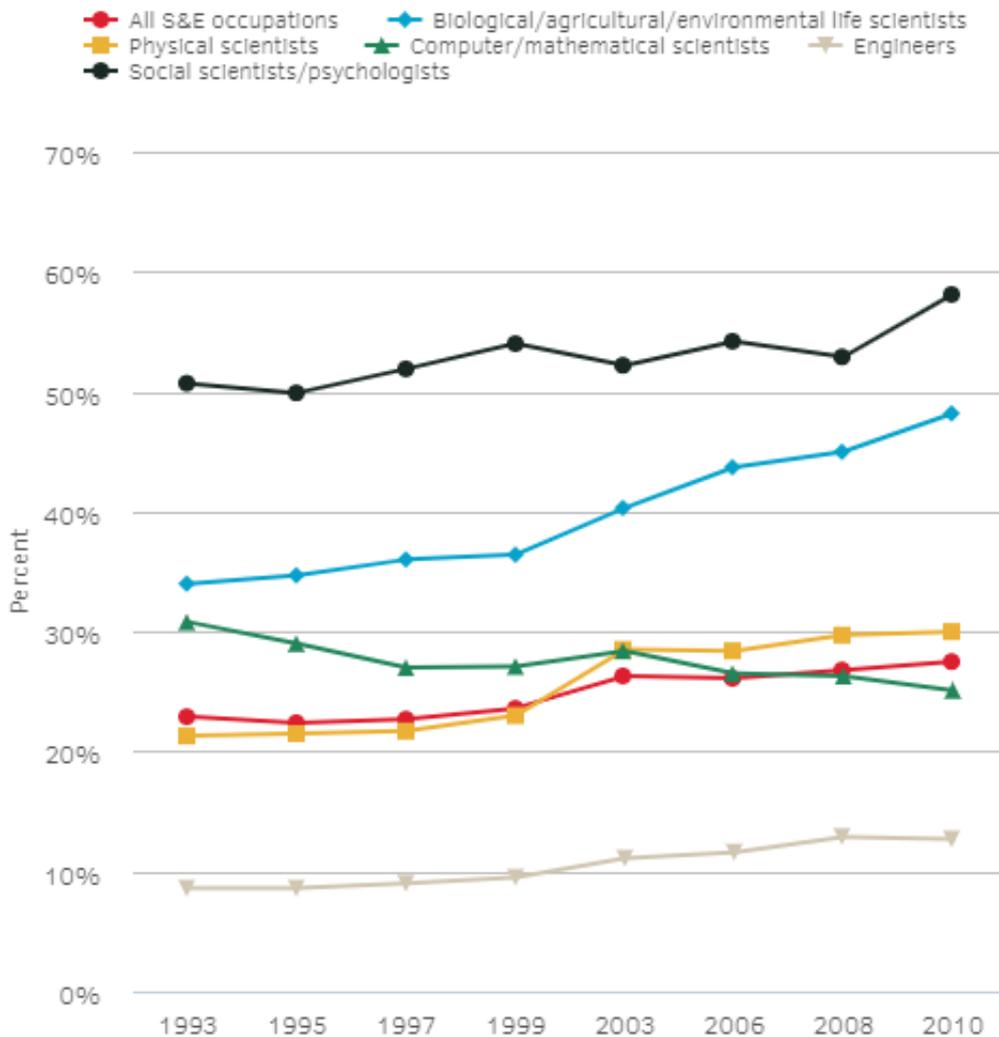


Obtained from <http://uis.unesco.org/sites/default/files/documents/fs55-women-in-science-2019-en.pdf>

- UIS (2019) shows that less than 30% of the world's researchers are women.
- UIS (2019) shows that in 2016:
 - There were 48.2% female science researchers in Central Asia
 - There were 45.1% female science researchers in Latin America and the Caribbean
 - There were 41.5% female science researchers in the Arab States
 - There were 39.3% female science researchers in Central and Eastern Europe
 - There were 32.7% female science researchers in North America and Western Europe
 - There were 31.8% female science researchers in Sub-Saharan Africa
 - There were 23.9% female science researchers in East Asia and the Pacific
 - There were 18.5% female science researchers in South and West Asia
- A survey by WISE (2017) shows that 11% of the engineering workforce in the UK is female, which is an increase from 9% in 2015
- Peers (2018) states that the UK has the lowest percentage of women in engineering professions in Europe. The UK has less than 10% whilst Latvia, Bulgaria and Cyprus has almost 30%
- Peers (2018) shows that over 30% of engineering students in India are women
- A study by the Institution of Engineering and Technology (IET) (2015) shows that 15.1% of engineering undergraduates in the UK are female
- An article by ComputerWorld (2015) states that there is a decrease in the percentage of women in computing degrees in the UK, from 14% in 2010 to 13% in 2014
- Research by the Institute of Physics (2014) shows that around 20% of females are taking A level physics studies in the UK and this has been constant for 25 years

- Ong et al (2011) shows that in 2006, 46.21% of STEM bachelor's degrees were awarded to women
- Ong et al (2011) shows that for the 46.21%, 31.55% were white women, 4.62% were Asian American, 5.31% were African American, 0.4% were Native American and 4.33% were Hispanic women
- The Nobel Prize organization website shows that only 23 women were awarded Nobel Prizes in the sciences out of a total of 58 prizes awarded to women and 603 total prizes (including men) since the beginning of the Nobel prizes in 1901.
- Research by the National Science Foundation shows an improvement of women in science in America:

**Women as a percentage of all workers in S&E occupations:
1993–2010**



Obtained from <https://nsf.gov/nsb/sei/edTool/data/workforce-07.html>

Conclusion

Women are underrepresented in science fields. Most statistics in this article show women being less than 50% of the science fields that are discussed. Universities and organizations have been taking steps to improve the numbers of women in STEM fields and there has been an improvement. However, there is still a long way to go. Some studies have shown that women earn less in science careers and fewer women are in leadership positions in these fields. For human resources teams, this could suggest that they should create policies that do not discriminate against women. For example, they could ensure gender balance in departments, especially for the departments in STEM. This means that hiring processes should factor in such issues. Universities could have different cut-off grades for males and females which encourage more females to apply for STEM fields. Hiring processes at companies could be inspired by such examples to create gender balance in science careers.

Main References

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