

STEM Equity Monitor Data report 2024



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Contents

STEM Equity Monitor data report	5
STEM definitions and gender data labels	6
Data interpretation and methodology	6
STEM and gender definition references	7
Schooling	8
Attitudes and perceptions towards STEM	9
NAPLAN numeracy results	12
Year 12 enrolments	12
Schooling data references	14
Higher education	15
VET and university enrolments and completions	16
Higher education data references	17
Graduate outcomes	18
VET and university graduate outcomes	19
Longitudinal outcomes of graduates	21
Graduate outcomes data references	23
Workforce	24
Research workforce and grant outcomes	25
Industries and occupations	26
Workforce data sources	30



Acknowledgement of Country

Our department recognises the First Peoples of this Nation and their ongoing cultural and spiritual connections to the lands, waters, seas, skies, and communities.

We Acknowledge First Nations Peoples as the Traditional Custodians and Lore Keepers of the oldest living culture and pay respects to their Elders past and present. We extend that respect to all First Nations Peoples.

Meeting Place icon by DISR employee Amy Huggins.

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We would also like to thank:

- the Office of the Chief Scientist (OCS)
- · case study participants
- all those who contributed support and advice to the development of the monitor.





STEM Equity Monitor data report

The STEM Equity Monitor (the monitor) is an annual national data resource of girls' and women's participation in science, technology, engineering and mathematics (STEM). It also includes some data for other underrepresented groups in STEM.

This data report summarises the main points of the 2024 edition of the monitor. The <u>online version</u> of the monitor has more detailed data insights and interactive visualisations.

The monitor presents the current state of gender equity in STEM in Australia. It can be used for further analysis, including measuring changes and trends over time in key sectors and career phases of girls' and women's engagement with STEM.

The monitor follows girls' and women's participation pathway in STEM through:

- schooling
- higher education
- graduate outcomes
- the workforce.

STEM definitions and gender data labels

The monitor defines STEM as science, technology, engineering and mathematics. It uses the education fields defined by the Australian Standard Classification of Education (ASCED). This is consistent with the <u>Australia's</u> <u>STEM workforce</u> report (Office of the Chief Scientist 2020).

The monitor also matches education fields to research fields from the Australian and New Zealand Standard Research Classification (ANZSRC). It considers an occupation or industry to be STEM-qualified if the majority of people in the occupation or industry reported a STEM qualification in the 2021 *Census of Population and Housing* (ABS 2022).

However, the monitor recognises that STEM-qualified graduates work in wide range of sectors, including health fields. The monitor does not include health in its definition of STEM but recognises it as a closely related field that people with STEM qualifications may enter. The full web version of the monitor lets users combine health and STEM data for results on STEMM – science, technology, engineering, mathematics and medicine.

The terms 'women' and 'men' (and 'girls' and 'boys' for minors) include cisgender (someone whose gender corresponds to their birth sex), transgender, non-binary and intersex people who identify as women/girls or men/boys. Some data may have been collected and recorded by sex. However, consistent with the <u>Australian Government guidelines on the recognition of sex and gender</u> the terms 'gender', 'women' and 'men' are used throughout the monitor.

Data interpretation and methodology

The monitor collects data from a range of sources and applies a common STEM definition. Each section highlights areas of interest and high-level observations from the data.

Data custodians have used different methods to generate the data at each stage of the pathway (for example, surveys, Census responses and count data). This means data should not be compared between sections.

If you want to use data from the monitor to analyse changes and trends over time, you should:

- consider the original data generation method
- apply appropriate statistical techniques where necessary.

No significance testing has been carried out on data unless otherwise indicated.

See the <u>methodology section of the online monitor</u> for our full methodology of classifying into a standard STEM definition, as well as a list of sources and definitions.

STEM and gender definition references

Australian Bureau of Statistics (ABS) (2022) <u>Census of Population and Housing</u>, ABS, Australian Government, accessed 16 November 2022.

Attorney-General's Department (AGD) (2015) <u>Australian government guidelines on the recognition of sex and</u> <u>gender</u>, AGD, Australian Government, accessed 13 January 2022.

Office of the Chief Scientist (OCS) (2020) <u>Australia's STEM workforce</u>, OCS, Australian Government, accessed 13 January 2022.







Schooling

STEM Equity Monitor 8

Attitudes and perceptions towards STEM

Confidence and interest in STEM develops at a young age and can be influenced by many factors. Understanding girls' perceptions and attitudes to STEM can help families, educators and policymakers support girls to engage in STEM and consider STEM careers.

We commissioned YouthInsight to survey about 3,000 young people aged between 12 and 25 years on their attitudes and perceptions toward STEM.

Key data from YouthInsight's 2023-24 Youth in STEM Survey

Australia's 2023–24 Youth in STEM Survey by YouthInsight explored young people's awareness and perceptions of STEM subjects and careers. This was a survey of about 3,000 young people aged between 12 and 25 years.

Interest in STEM

Science was the most interesting STEM subject for girls in 2023-24.

- 63% of girls were interested in science in 2023–24, compared to 62% in 2021–22.
- 62% of boys were interested in science in 2023–24, compared to 64% in 2021–22.

Girls continue to be least interested in engineering.

- 29% of girls were interested in engineering in 2023–24, compared to 31% in 2021–22.
- 56% of boys were interested in engineering in 2023–24, the same as 2021–22.

Confidence in STEM

Girls are most confident in science and least confident in engineering. This has remained the same since the survey program began in 2018–19.

Generally, girls' confidence in all STEM subjects fell as they got older.

The following table shows girls' confidence in STEM subjects at different ages.

Subject	12–13 years	14-17 years	18–21 years	22–25 years
Science	69%	66%	57%	60%
Technology	74%	48%	49%	59%
Engineering	31%	30%	24%	30%
Mathematics	54%	65%	51%	50%

Source: YouthInsight (2023)

Importance of STEM knowledge for jobs

Girls considered technology and mathematics to be important to future employment. This is consistent with results across the survey program.

- Technology was the most important subject for girls in 2023–24. 80% of girls thought it was important, compared with 85% of boys.
- Engineering remained the least important subject for girls. Just 55% of girls thought it was important to get a good job in future, compared with 69% of boys.

Intention to study STEM in the future

Consistent with previous surveys, girls in years 6 to 8 were less likely than boys to choose STEM elective subjects overall in future (60% compared to 81%).

In years 9 and 10, there was no significant difference in intention to study STEM elective subjects overall in the future. The likelihood of choosing specific STEM electives was skewed by gender, but not as much as in the 2021–22 survey.

Girls were significantly more likely to choose biology, which was also found in the 2021–22 survey. While girls were also indicatively more likely to choose chemistry in 2023–24, this difference is no longer significant.

Boys were significantly more likely to choose industrial technology, which was also found in the 2021–22 survey.

In years 11 and 12, the significant difference between girls and boys reappears. Girls in years 11 and 12 were less likely than boys to choose STEM elective subjects overall in future (31% compared to 47%). As people in these year levels are considering their higher education study intentions, this finding suggests that girls are more likely than boys to complete their formal STEM education at high school. Girls who continue their studies are less likely to choose STEM fields of education.

Reasons for not studying STEM in the future

Respondents who indicated they were not considering further study in STEM were asked for their reason.

Most girls in this group agreed they wouldn't study STEM in the future because it did not lead to the career they wanted and they weren't interested in the subjects.

Girls' agreement with the following reasons was significantly higher than boys:

- It's not related to the career I want (76% compared to 69%)
- I'm not really interested in the subjects (72% compared to 59%)
- They are too hard for me (52% compared to 40%)
- I'm not very good at math (48% compared to 39%)
- Don't think I'm smart enough (42% compared to 31%).

Aspirations for a STEM career in the future

Girls were half as likely as boys to aspire to a career in STEM – this is similar to previous surveys. 22% of girls wanted a STEM career compared to 43% of boys.

Key data from YouthInsight's 2022–23 STEM Influencers Survey

Effect of the COVID-19 pandemic

In 2022–23 parents were asked, for the first time, if the COVID-19 pandemic influenced how likely they would be to encourage their child to study or work in each STEM area. Technology had the highest likelihood, with 51% of parents saying the COVID-19 pandemic made them more likely to encourage their child to study or work in technology. Other STEM areas had 41% likelihood or lower.

STEM importance

Most parents (90%) agreed that a STEM-skilled workforce is important for the Australian economy. While this was slightly less than the previous STEM influencer survey in 2020–21 (which saw 92% agreement), the difference was not significant.

In the 2022–23 survey, a lower proportion of parents agreed that their child needed the following skills to get a good job in future:

- STEM as a general set of skills (81% in 2022–23, down from 86% in 2020–21)
- science skills (76% in 2022-23, down from 81% in 2020-21)
- engineering skills (72% in 2022-23, down from 75% in 2020-21)
- mathematics skills (83% in 2022–23, down from 89% in 2020–21).

The proportion of parents who thought technology skills were important for future employment did not change significantly (87% in 2022–23, down from 89% in 2020–21).

98% of all educators, regardless of whether they teach STEM subjects or not, agreed that STEM skills are important for the Australian economy. 89% also thought these skills will help give job security for future workers. These results have no statistically significant differences to the previous educators' survey in 2020–21.

Most educators saw STEM as an integrated set of skills, with all 4 STEM areas important for getting a good job. These results are similar to the 2020–21 survey outcomes.

- 58% said technology skills are very important.
- 48% said mathematics skills are very important.
- 33% said science skills are very important.
- 22% said engineering skills are very important.

STEM engagement

80% of parents said they had a general interest in STEM, with technology (81%) and science (77%) the most popular subjects. This is slightly higher than in 2020–21, but the changes are not statistically significant.

Almost half of all parents (47%) reported having at least weekly discussions with their children about STEM topics. There were no significant differences in weekly conversations about STEM topics among fathers compared to mothers, or parents of boys compared to parents of girls.

However, there have been changes among these groups since the last survey. Weekly conversations have increased significantly for mothers (46%, up from 38% in 2020–21) and parents of girls (48%, up from 42%). Meanwhile there were no significant differences for fathers (48%, down from 51%) or parents of boys (46%, down from 47%).

For educators across all teaching settings, 90% of men felt qualified to teach at least one STEM topic, compared to 83% of women. Across all teaching settings and STEM subject areas, educators felt least qualified to teach engineering, with only 30% saying they feel qualified to teach this subject.

NAPLAN numeracy results

In 2023, average numeracy scores were higher for boys than girls across all year levels.

Average numeracy scores in 2023 were closest in Northern Territory, with boys scoring 9 points higher than girls when averaged across all year levels. They were furthest apart in the Australian Capital Territory, where boys scored 17 points higher than girls when averaged across all year levels.

Between 12% and 15% of boys at each year level were in the 'exceeding' proficiency level for numeracy in 2023. For girls, the range was 8% to 10% – girls were consistently lower than boys across all year levels. The largest differences between genders were in years 3 and 5. For each of these year levels, 15% of boys and 9% of girls were exceeding in numeracy.

Year 12 enrolments

The number of enrolments in year 12 STEM subjects increased from 2021 to 2022 for both girls (up 9,423 enrolments or 5.5%) and boys (up 11,079 enrolments or 5.8%). Enrolments also increased for non-STEM subjects, by 2.6% (8,119 enrolments) for girls and 4.9% (12,073 enrolments) for boys.

Enrolments in year 12 STEM subjects represented 38% of total year 12 enrolments in 2022. This remained similar to 2021, where STEM subject enrolments were 37% of total year 12 enrolments.

The proportion of STEM subject enrolments from girls has slightly increased over time. From 2013 to 2022, the proportion of STEM enrolments by girls increased from 45% to 47%. In contrast, the proportion of non-STEM enrolments by girls slightly decreased from 57% to 55% over this time.

In 2022, girls made up a large proportion of student enrolments in:

- biological sciences (65%, similar to 64% in 2013)
- other natural and physical sciences, such as general or mixed science (57%, down from 61% in 2013)
- chemical sciences (50%, similar to 49% in 2013)
- earth sciences (49%, similar to 48% in 2013)
- mathematical sciences (48%, the same as 2013)
- agriculture, environmental and related studies (48%, similar to 49% in 2013).

Girls remained underrepresented in:

- information technology (26% of enrolments, up from 22% in 2013)
- physics and astronomy (24%, similar to 23% in 2013)
- engineering and related technologies (24%, down from 26% in 2013).



Sources: Department of Education (2023); Australian Bureau of Statistics (2001); Australian Institute of Family Studies (2016)

The Australian Mathematical Sciences Institute (AMSI) identified 4 levels of maths subject. From lowest to highest, they are:

- elementary (generally non-ATAR)
- elementary (ATAR)
- intermediate
- higher.

The total number of enrolments in maths subjects at all levels has decreased for both girls and boys since 2013.

The proportion of enrolments for girls has remained similar for most levels of mathematics subjects since 2013.

For higher mathematics subjects, the proportion of enrolments for girls remained similar, from 36% in 2013 to 37% in 2022. Higher mathematics has the lowest proportion of girls out of all levels.



Schooling data references

Australian Bureau of Statistics (ABS) (2001) <u>Australian Standard Classification of Education (ASCED), 2001,</u> cat no. 1272.0, ABS, Australian Government, accessed 6 October 2022.

Australian Curriculum, Assessment and Reporting Authority (ACARA) (2023) <u>National Assessment Program</u> <u>– Literacy and Numeracy (NAPLAN) Achievement in Reading, Writing and Numeracy: National Results 2023,</u> ACARA, accessed 15 December 2023, ACARA, accessed 15 December 2023.

Australian Institute of Family Studies (AIFS) (2016) <u>School subject coder</u>, AIFS, Australian Government, accessed 18 October 2022.

Australian Mathematical Sciences Institute (AMSI) *(unpublished)* (2021) *Maths subject classification,* data set supplied to the Australian Government Department of Industry, Science and Resources, AMSI, accessed 1 November 2022.

Department of Education (unpublished) (2023) Year 12 enrolments by subject, key learning area and gender, data set supplied to the Australian Government Department of Industry, Science and Resources, Department of Education, accessed 20 November 2023.

YouthInsight (2023) <u>2023–24 Youth in STEM survey</u>, report to the Australian Government Department of Industry, Science and Resources, YouthInsight , accessed 3 November 2023.

—— (2022) <u>2022-23 STEM Influencer – Teacher and career adviser survey</u>, report to the Australian Government Department of Industry, Science and Resources, YouthInsight, accessed 13 October 2022.

—— (2022) <u>2022–23 STEM Influencer – Parents survey</u>, report to the Australian Government Department of Industry, Science and Resources, YouthInsight, accessed 13 October 2022.





Higher education

STEM Equity Monitor 15

VET and university enrolments and completions

Students who study STEM at primary and secondary school may choose to continue their STEM studies through university or vocational education and training (VET). Understanding how women participate in STEM higher education can help the government and other sectors give targeted support for women as they progress from schooling to the workforce. It can also help focus support on particular fields and education types. The National Centre for Vocational Education Research and the Department of Education collect data that informs this understanding.

Key data on enrolments and completions

Between 2015 and 2022, the number of enrolments from women in university STEM courses increased from 70,378 to 89,842. This was a 28% increase, compared to a 9% increase for men. This saw the proportion of STEM enrolments from women increase by 3 percentage points (37% compared to 34% in 2015).

Since 2020, the proportion of STEM enrolments from women has remained stable at 37%. This proportion remained the same despite total domestic enrolments (men and women in all fields of education) decreasing 5% from 2021 to 2022.

From 2021 to 2022, the proportion of university STEM course completions from women remained the same, at 39%. The number of STEM course completions by women increased slightly however, from 18,406 in 2021 to 18,509 in 2022 (this includes both undergraduate and postgraduate completions).

The number of women enrolled in STEM vocational education and training has been steadily increasing since 2018. The proportion of women VET STEM enrolments remained at 17% in 2022.

The number of men and women who have completed VET STEM qualifications decreased in 2022. The proportion of women completing VET STEM qualifications decreased to 19% in 2022 after a peak of 20% in 2021.

Natural and physical sciences remained the VET STEM field with the greatest proportion of women enrolments (66%) and completions (68%) in 2022. These proportions have remained between 61% and 71% every year from 2015 to 2022, showing strong and consistent representation for women in natural and physical sciences at VET level.

Engineering and related technologies makes up the majority of total VET STEM enrolments for both men and women. However, it remained the VET STEM field with the lowest proportion of enrolments from women in 2022. Women have made up 11% or less of enrolments in this field since 2015.



Sources: Department of Education (2024); National Centre for Vocational Education Research (2023)

Higher education data references

Department of Education (2024) <u>Student enrolments and award completions by field of education, gender</u> <u>and year</u>, Department of Education, Australian Government, accessed 16 January 2024.

National Centre for Vocational Education Research (NCVER) (2023) <u>Total VET students and courses [data set]</u>, DataBuilder, NCVER website, accessed 23 November 2023.





Graduate outcomes

VET and university graduate outcomes

A successful transition into the workforce can be impacted by job availability, relevance of training to jobs, working conditions and pay. Understanding graduate employment outcomes for STEM-qualified women can give valuable insights into factors that continue to affect women's progression and retention in STEM.

The National Centre for Vocational Education Research collects data on these indicators for VET students. Data from the annual Quality Indicators for Learning and Teaching (QILT) Graduate Outcomes Survey helps build a picture of skills use and university graduate satisfaction.

Key data on VET and university graduate outcomes

VET graduates

In 2023, 65% of women VET STEM graduates reported their training had some or high relevance to their jobs, this is an increase from 63% in 2022. A higher proportion of men than women reported their training had some relevance or was highly relevant to their jobs (79% of men compared to 65% of women).

STEM graduates were more likely to report their training was highly relevant to their job than non STEM graduates (53% compared to 51%) or health graduates (53% compared to 50%).

In 2023, the proportion of women whose employment outcomes improved (by gaining employment or being employed at a higher skill level) after graduating in a VET STEM field remained consistent from the previous year, at 58%. However, this was still lower than the proportion of men whose employment outcomes improved (71%).

Across all VET STEM fields, women's median full-time annual income was \$59,000 in 2023, a significant increase from \$55,000 in 2022. Men's median full-time annual income was \$72,000, a significant increase from \$67,000 in 2022. The larger increase in income for men saw the income gap for VET graduates widen in 2023.



Source: National Centre for Vocational Education Research (2023)

University graduates

In 2023, similar proportions of employed women and men undergraduates in each STEM field felt their skills weren't being fully used in their jobs. The largest difference between genders was in computing and information systems, where 38% of employed men graduates felt they weren't using their skills, compared to 29% of employed women graduates.

Median full-time income for women STEM graduates remained the same or increased in all undergraduate STEM fields from 2022 to 2023. The largest increases were:

- engineering (\$71,000 in 2022 compared to \$75,000 in 2023)
- computing and information systems (\$69,000 in 2022 compared to \$73,000 in 2023).

Median incomes for men graduates in STEM fields also increased from 2022 to 2023.

In 2023, the proportion of women undergraduates employed part-time was higher than men in each of the STEM fields.

In every year since 2016, women undergraduates employed part-time were equal to or higher than men in each of the STEM fields. The exceptions were engineering in 2016 and 2020 and computing and information systems in 2017 and 2019.



Sources: National Centre for Vocational Education Research (2023); Social Research Centre (2024)

Longitudinal outcomes of graduates

Longitudinal data can give insights into the career progression of people after graduation. We commissioned the Australian Bureau of Statistics (ABS) to perform longitudinal analysis of a cohort of 162,000 people who graduated with a university qualification in 2011, and can be shown in linked datasets. The analysis explored the characteristics and outcomes of graduates in the 10 years since their graduation.

Key data on longitudinal career outcomes

Occupation outcomes

In 2011, about 162,000 people graduated with a university qualification. About 26,000 people received a STEM qualification, this represents 16% of all 2011 graduates.

While women comprised 61% of all graduates, they made up 38% of STEM graduates.

Following the 2011 cohort over time shows that in 2016 (5 years after graduating), when not including graduates whose occupation was not stated or not applicable:

- 31% of women STEM graduates were working in STEM occupations
- 57% of men STEM graduates were working in STEM occupations.

Following the same cohort to 2021 (10 years after graduating), shows:

- 31% of women STEM graduates were working in STEM occupations
- 56% of men STEM graduates were working in STEM occupations.

For both women and men STEM graduates, health-qualified occupations become more prevalent in the years after graduation.

- For women, 4% of 2011 graduates were in health occupations in 2012–13, but this increased to 18% in 2020–21.
- For men, 1% of 2011 graduates were in health occupations in 2012–13, compared to 7% in 2020–21.

This shows that attraction to STEM occupations is low for women STEM graduates. It also shows that while STEM occupations do retain STEM graduates over a 10-year timeline, there is a gradual decrease over time for both genders.

Industry outcomes

Looking at industry, only 10% of employed women with a STEM qualification worked in a STEM-qualified industry in 2021 (783 out of 7,979 employed women graduates). By comparison, 22% of men with a STEM qualification were in a STEM-qualified industry in 2021 (2,886 out of 13,360 men graduates).

The only 2021 STEM industry with a higher number of women 2011 STEM graduates than men was scientific research services. In 2021, 259 women STEM graduates were working in scientific research services (33% of women 2011 STEM graduates employed in a STEM industry) compared to 205 men STEM graduates (7% of men 2011 STEM graduates employed in a STEM industry).

Employment status

In 2021, employed STEM-qualified women were more than twice as likely to work part time as STEM-qualified men (23% of women, 10% of men).

For women, this was lower than:

- women with non STEM qualifications (27% part time)
- women with health qualifications (39% part time).

There were lower rates of part time employment for men. 10% of men with STEM qualifications worked part time, compared to:

- men with non-STEM qualifications (12% part time)
- men with health qualifications (17% part time).

Income over time

In 2012–13, about 2 years after graduating with their STEM qualification:

- 67% of employed women earned less than \$50,000 annually, compared to 45% of employed STEM-qualified men.
- 11% earned \$75,000 or more, compared to 23% of men.

By 2020–21, the proportion of employed men who earned \$75,000 or more was 78%. That was 1.4 times higher than the proportion of women with that income, at 57%. This increased further with men 1.8 times more likely to have earned \$100,000 or more than women (55% and 30% respectively).

STEM participation among diversity groups

Analysis of outcomes for intersectional groups is shown below. It highlights the pervasive impact of gender on STEM occupation outcomes.

For women who graduated with a STEM qualification in 2011 and were born in another country, STEM occupation outcomes 10 years later in 2021 were similar to women who were born in Australia.

- 31% of women born overseas who graduated with a STEM qualification in 2011 were working in a STEM occupation in 2021.
- This is the same proportion as for women born in Australia or not stated (31%).

For men who graduated with a STEM qualification and were born in another country, a lower percentage were working in STEM occupations in 2021 (54%) compared to men born in Australia or not stated (56%).

These proportions and relationships are similar for the language and disability diversity groups. However, there is a slightly larger difference between men graduates with a disability (47% working in STEM occupations) and men graduates with no disability (54% working in STEM occupations).

For Aboriginal and/or Torres Strait Islander people who graduated with a STEM qualification in 2011:

- There was a higher proportion of women working in STEM occupations in 2021 (34%) than non-Indigenous women (30%).
- There was a lower proportion of men working in STEM occupations in 2021 (40%) than non-Indigenous men (56%). This difference of 16 percentage points between Aboriginal and/or Torres Strait Island men and non-Indigenous men is the largest of any group shown in this analysis.

Child care

Among women who gained a STEM qualification in 2011 and were unemployed or not in the labour force in 2021, the majority had child care responsibilities (53%). This was different to men, where 18% of STEM-qualified men who were unemployed or not in the labour force in 2021 had child care responsibilities.

This is similar when looking at graduates from other fields of education.

- 55% of women with a 2011 non-STEM qualification who were unemployed or not in the labour force in 2021 had child care responsibilities, compared to 22% of men.
- 61% of women with a 2011 health qualification who were unemployed or not in the labour force in 2021 had child care responsibilities, compared to 25% of men.

This could suggest that the reason for women to be unemployed or not working 10 years after graduation is their child care responsibilities.

Looking at all employed people shows the group with the lowest proportion of child care responsibilities is STEM-qualified women. Of the cohort of all employed STEM-qualified women, 36% reported they provided unpaid child care to their own or other children in 2021. This was lower than:

- employed STEM-qualified men (38%).
- employed people with non-STEM qualifications (44% of women had child care responsibilities and 40% of men).
- employed people with health qualifications (52% of women had child care responsibilities and 46% of men).

STEM was also the only field of education where the proportion of men with child care responsibilities was higher than women with child care responsibilities.

This could further suggest that child care responsibilities are an important factor determining workforce participation for women who have STEM qualifications and/or work in STEM occupations.

Graduate outcomes data references

Australian Bureau of Statistics (ABS) (2024) <u>Women in STEM longitudinal employment analysis of the 2011</u> <u>higher education cohort, 2021 outcomes,</u> analysis supplied to the Australian Government Department of Industry, Science and Resources, ABS, Australian Government, accessed 12 January 2024.

National Centre for Vocational Education Research (NCVER) (unpublished) (2023) *VET student outcomes,* data set supplied to the Australian Government Department of Industry, Science and Resources, NCVER, accessed 20 December 2023.

Social Research Centre (unpublished) (2023) *Median salary, skill utilisation, and part time employment*, data set supplied to the Australian Government Department of Industry, Science and Resources, Social Research Centre, accessed 21 December 2023.



Workforce

STEM Equity Monitor 24

Research workforce and grant outcomes

STEM skills are important for people in the research workforce, including academic staff who do research and have teaching responsibilities.

Understanding women's participation in the STEM research workforce can help build inclusive and diverse workplaces. These workplaces have been shown to produce higher quality science with greater impact.

Key data on research workforce and grant outcomes

In 2022, Department of Education data showed that 30% of university staff in STEM teaching and research roles (by headcount) were women. This is lower than the proportion of teaching and research roles across all subjects (including STEM, health, and non-STEM) which were held by women, at 47%.

Men outnumbered women at all academic staffing levels for STEM teaching and research roles. In other fields, men only outnumbered women at the higher levels, rather than all levels.

- In non-STEM teaching and research roles, men only outnumbered women at staffing levels D and E.
- In health roles, men only outnumbered women at level E.

Fewer women than men were named on grant applications for STEM research starting in 2023.

Across all STEM fields, 25% of applicants for ARC funding were women and 34% of NHMRC applicants were women.

As fewer women than men applied, fewer women than men gained funding.

- 760 women received ARC funding, with 562 as chief investigator. In comparison 2,055 men received ARC funding, including 1,465 as chief investigator.
- 116 women received NHMRC funding, with 56 as chief investigator. 181 men received NHMRC funding, including 82 as chief investigator.

A higher proportion of women were named in applications for Health research than STEM research.

- Women represented 47% of ARC applicants and 44% of NHMRC applicants in these fields.
- Women were named as chief investigators on 48% of ARC applications and 46% of NHMRC applications in these fields.

Success rates for women and men in STEM fields were similar, with women's success rates being slightly higher.

- 28% of women investigators who applied for an ARC grant were successful. 26% of men were also successful.
- 26% of women chief investigators who applied for an ARC grant were successful. 23% of men were also successful.
- 17% of women investigators who applied for an NHMRC grant were successful, compared to 14% of men.
- 18% of women chief investigators who applied for an NHMRC grant were successful, compared to 16% of men.

Industries and occupations

STEM skills are widely valued and can be used in many different occupations and industries. Understanding women's participation in STEM-qualified occupations, and how STEM-qualified industries are taking action to support women's participation, can highlight industries that are leading the change and industries where more effort is needed.

The monitor uses data from relevant employers that reported to the Workplace Gender Equality Agency (WGEA). We source data on occupations and participation rates from the Australian Labour Force Survey.

Key data on industries and occupations

Workforce gender equality and pay gaps

Based on data reported to WGEA, women made up 29% of workers in STEM industries in 2023. This increased by 1 percentage point from 2022 (28%).

Women made up 78% of workers in health industries and 51% of workers in all industries (which includes STEM, health and non-STEM industries). These results were similar to 2022.

Scientific research services remained the STEM industry with the largest representation of women. Women made up 65% of workers in that industry. 58% of Heads of Business in this industry were women, as well as 47% of senior managers, and 63% of other managers.

The highest proportion of women in senior STEM management positions were in Key Management Personnel roles (27%) and other manager roles (26%). The lowest proportion were in CEO positions. Women made up 10% of CEOs across all STEM industries, compared to 47% of CEOs in health industries and 24% of CEOs across all industries.

In 2023, the pay gap between women's and men's full-time total remuneration (which includes discretionary pay) in STEM industries was \$26,420, or 16%. This pay gap is slightly lower than it was in 2022, when it was \$27,012 (17%). In 2016, the gender pay gap was 22%, 6 percentage points higher than the 2023 result.

The gender pay gap for all industries (which includes STEM, health, and non-STEM industries) also decreased from 20% in 2022 to 19% in 2023. For health industries, the pay gap decreased from 17% in 2022 to 16% in 2023.

In 2023, the STEM industries with the largest percentage gender pay gaps were:

- machinery and equipment repair and maintenance (24%)
- oil and gas extraction (23%)
- architectural, engineering and technical services (22%)
- electricity generation (22%).



Source: Workplace Gender Equality Agency (2024)

Australian labour force

Based on the ABS *Labour Force Survey*, the number of women in STEM-qualified occupations increased by around 16,000 (7%) from 2022 to 2023. The number of men increased by around 72,000, a 5% increase.

The proportion of women in STEM-qualified occupations was 15% in 2023, up from 10% in 2003. In comparison, women have made up about 50% of people in non-STEM occupations and 75% of health occupations for 20 years, since 2003.

In the 10 years from 2013 to 2023, women in STEM-qualified occupations rose from around 151,000 to about 265,000 – about a 76% increase. The number of men in STEM-qualified occupations increased by about 25% during this time.



Source: Australian Bureau of Statistics (2023)



Source: Australian Bureau of Statistics (2023)

Australian Public Service (APS) workforce

Responses to the 2023 APS Employee Census give an insight into STEM roles in the APS.

Only 36% of APS employees working in STEM roles were women. This proportion has remained stable since 2020. In comparison, women made up 66% of employees in non-STEM roles and 78% of health roles.

Most STEM roles in the APS had a classification level of APS 5 or 6. The proportion of women in STEM roles at that level and above was substantially lower than men.

- Women working at APS 5 or 6 level made up 17% of all STEM roles in the APS. Men at APS 5 or 6 level made up 26%.
- Women at Executive Level 1 (EL1) made up 11% of all STEM roles. EL1 men made up 20%.
- Women at Executive Level 2 (EL2) made up 4% of all STEM roles. EL2 men made up 9%.

Overall there was a higher proportion of women in EL1 and EL2 roles (57%). However, only one third (34%) of EL1 and EL2 STEM roles were filled by women.

The overall proportion of women and men at Senior Executive Service (SES) levels was about equal (55% women compared to 45% men). However, only 38% of SES-level STEM roles were filled by women.

Please note, the APS Employee Census now collects science and health as one job family. For the STEM Equity Monitor we have split these. They were split using benchmarks from APS Employee Census data in previous years, where science and health were collected individually.



Source: Australian Public Service Commission (2023)

Publicly funded research agencies (PFRAs) workforce

In 2023, 70% of all people working in the sampled PFRAs were in STEM occupations. This is the same as 2022.

Women made up 30% of people in STEM occupations, a 1 percentage point increase from 2022. In comparison, women made up 60% of non-STEM occupations in PFRAs.

The largest number of women in STEM were working at the EL1 level (974, or 35% of total women in STEM occupations). The largest number of men in STEM were also at the EL1 level (2,301 or 35% of total men in STEM occupations).

The gender split for STEM employees at the EL1 level was 30% women and 70% men. Although the EL1 level has the highest number of STEM employees, it has one of the lowest proportions of women in STEM roles.

The EL2 level had the largest difference between men and women in STEM roles – 22% of EL2 STEM roles were held by women and 78% were held by men. This was a slight improvement on 2022, where the gender split was 20% women and 80% men.

Workforce data sources

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