



YouthInsight
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YOUTH IN STEM RESEARCH 2019/20

Department of Industry, Innovation and Science
Summary of Results

Executive summary

With futuristic concepts like artificial intelligence and consumer space travel now a reality, it should come as no surprise that skills in science, technology, engineering and mathematics (STEM) are at the forefront of driving innovation and meeting future job requirements.

Australia's labour force data shows that STEM-related occupations are growing significantly faster than other occupations and that this trend is set to continue.¹ With this accelerated demand for STEM skills, the Australian Government is committed to upskilling young Australians to ensure that our future workforce is well equipped to take on the challenges of the future.

Over the past two years, the Department of Industry, Innovation and Science has been tracking young Australians' understanding and perceptions of STEM education and related careers. The research, which reached over 3,000 people aged 12 to 25 in the 2019/20 survey, provides the department with a means to monitor key metrics with regard to STEM subjects, such as subject selection, awareness, interest, confidence and perceived importance. While a plethora of research currently exists about the importance of STEM skills for the future workforce, this research consults directly with the future workforce participants themselves.

In 2019/20, the study found that six out of ten young Australians can correctly identify all of the four subjects which comprise the 'STEM' acronym, with the youngest respondents (12 – 17) outperforming their senior counterparts (18 – 25), suggesting that awareness and understanding of the STEM acronym is being well communicated during the early years of high school, noting that this awareness/understanding is lower in older age groups (on average) in the later years of high school.

Analysis of key minority groups indicates lower levels of awareness of what STEM stands for among low socioeconomic groups, regional/remote residents and Aboriginal and Torres Strait Islanders (ATSI). The ability to quantify disparities in awareness and other STEM engagement measures among these minority groups is an important first step in understanding where additional support is required. Another key minority group investigated in this study included culturally and linguistic diverse (CALD) young people, who outperformed non CALD youth in STEM awareness and other key metrics such as interest and confidence, raising the question about what drives these differences, and what can be learnt from them and shared with the wider community.

Although *engineering* continues to be the subject that most confuses people when trying to identify the subject components of the STEM acronym, year-on-year it is the area of employment young people most closely associate with a STEM qualification. Over the past two surveys, *engineering* has also been the subject young people engage with the least, recording lower levels of interest, confidence and perceived importance for future employment, findings which are all amplified among the cohort of girls and women. This lower level of engagement, coupled with the close association with STEM careers, creates a potential barrier for young people in considering STEM careers, indicating that work is required to improve young people's understanding of the subject.

The survey also records young people's current subject selections and subjects they are considering taking in future, and the latest findings show some positive signs of a narrowing gender gap in relation to STEM subject attitudes. In the 2019/20 survey, more Year 9 and 10 girls have stated that they take elective STEM subjects compared to just one year ago

¹ <https://www.employment.gov.au/newsroom/stem-jobs-are-growing-faster-other-jobs>

(2019/20: 50 per cent vs 2018/19: 32 per cent), largely driven by uptake of *design and technology*. Year 7 and 8 girls and boys have also recorded considering taking elective STEM subjects at a higher proportion year on year (73 per cent vs 64 per cent in the 2018/19 survey).

At a higher education level, the three most popular STEM-related courses students are currently enrolled in include *engineering and technology*, *computing and information technology* and *biology*. There are currently double the proportion of men enrolled in STEM-related courses compared to women (42 per cent vs 19 per cent), a gap that has slightly widened year-on-year (35 per cent vs 18 per cent in the 2018/19 survey). Fortunately, however, there are signs of this gap beginning to close, with 27 per cent of Year 11 and 12 girls considering STEM-related subjects in higher education compared to 23 per cent in 2018/19. Boys remained consistent year-on-year with 48 per cent.

When asked about careers, around a third of young people are considering STEM-related roles in the future, although this continues to be driven by boys with 41 per cent of boys considering STEM related roles vs 24 per cent of girls. STEM career consideration was slightly higher among younger girls (12 – 17) compared to older (18 – 25), which was also reflected when comparing subject selections at a higher education level with junior years of secondary school, suggesting that the STEM gender gap becomes more pronounced as they get older.

Some of the key measures being tracked in the study include interest, confidence of doing well and perceived importance of each STEM subject. Year-on-year interest levels were fairly consistent with around two thirds of respondents showing interest towards *science and technology*, with *engineering* recording the lowest levels of interest with around 43 per cent and *maths* being the only subject showing a drop in interest from 50 per cent to 46 per cent.

Around six in ten young people feel confident they can do well in *science*, *technology* and *maths* while only 38 per cent have the same confidence for *engineering*. Apart from *engineering*, confidence levels for all other STEM subjects were marginally lower compared to the 2018/19 survey.

When asked how important it is to have skills in each STEM subject to get a good job in the future, 8 out of 10 say technology skills are important, 7 out of 10 agree that science and maths are important and 6 out of 10 feel engineering is important. Similar to the confidence scores, science, technology and maths importance levels have all marginally dropped year-on-year.

While further investigation into these findings are necessary to determine whether some of these year-on-year shifts are part of an emerging trend or an anomaly due to other factors, close monitoring of these metrics and all other data captured in this research will allow us to understand how STEM is positioned in the minds of the young people and enable us to improve how we engage with them in the future.

Background

In 2018/19 the Department of Industry, Innovation and Science launched Australia's first National Youth in STEM study, where over 2,000 people aged 12 to 25 were asked about their understanding and perceptions of science, technology, engineering and mathematics (STEM) education and related careers. The research helped establish benchmarks of how STEM is positioned in the minds of young people and was instrumental in quantifying the gender gap which currently exists in the disposition to study and work in STEM-related fields.

This year the department commissioned the second survey of the Youth in STEM Research, to measure changes in young people's understanding and perception about STEM since the 2018/2019 survey. In this survey, the department increased the sample size from 2,000 to 3,000 respondents to allow for more in-depth analysis of subsegment groups. All respondents were aged between 12 and 25 years and the sample was nationally representative based on state, age and gender, which was consistent with the initial 2018/19 survey.

The increased sample size provided valuable insight into key minority groups such as people of culturally and linguistically diverse backgrounds (CALD), people from lower socio-economic backgrounds, people living in regional/rural areas and people identifying as Aboriginal and Torres Strait Islander. It should be noted that the group surveyed provide an indication of broader attitudes and perceptions, rather than an absolute dataset of all young Australians.

A key focus of the research is to quantify and track the development in awareness and perceptions among genders and key minority groups in relation to STEM education and careers. With the demand for a STEM skilled workforce on the rise², it's critical that we increase the pool of talent with the right skills to support the Australian economy. A key step to do so will be to close existing gaps among these identified subsegments of the population.



² <https://www.employment.gov.au/newsroom/stem-jobs-are-growing-faster-other-jobs>

Objectives

The principal objective of the study is to track changes in awareness and perceptions of STEM subjects and STEM-related careers held by young Australians compared to the 2018/2019 survey, with a particular focus on the difference between boys and girls.

More specifically, the study looks at:

- evaluating the perceived importance of STEM subjects to students
- determining student interest in considering further STEM education
- determining student interest in STEM careers
- assessing young Australians' engagement with STEM outside of education
- understanding student awareness of STEM-related careers
- identifying barriers and access points to STEM careers
- understanding the factors that influence career choices

Methodology

To meet the research objectives, YouthInsight has conducted a nationwide online survey among a representative sample of people aged 12 – 25. A 15-minute survey of 3,021 students was conducted online using the Student Edge Youth Panel and other accredited online sample providers. This represents a 45 per cent increase in sample size, compared to the initial survey in 2018/19 (n=2,093).

Sampling

To ensure survey results were representative of the population, rim weighting was used to correct for under or over representation of sub-groups. Gender, age, location, country of birth and socioeconomic deciles, which are key measures of socioeconomic status, were the factors rim weighting was used for.

To determine low and high socioeconomic status, the Socio-Economic Indexes for Areas (SEIFA) developed by the Australian Bureau of Statistics (ABS) were used. SEIFA ranks areas in Australia into ten equally sized groups according to relative socio-economic advantage and disadvantage. These are known as socioeconomic deciles. The indexes are based on information from the five-yearly Census of Population and Housing.

The data captured in the survey has been mapped to two sets of indexes: The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) and The Index of Education and Occupation (IEO). While both indexes are available in the data, for reporting purposes the IEO index has been used.

Age and gender: An equal balance of boys and girls was sought within each age group. Data was also collected among participants who did not identify with binary genders, however due to limited sample size, reporting on this group was not viable.

State: The sample was also weighted to align with the population distribution by state and territory, in line with Australian Bureau of Statistics records.

Below is a summary table of the sample with applied weight factors for age, gender, location, country of birth (Australia or overseas) and SES decile.

Age and gender

GENDER	AGE	SAMPLE	SAMPLE %	WEIGHTED SAMPLE	WEIGHTED SAMPLE %
Boys/men	12 - 13	205	7%	144	5%
Boys/men	14 - 17	436	14%	420	14%
Boys/men	18 - 21	324	11%	462	15%
Boys/men	22 - 25	497	16%	505	17%
Girls/women	12 - 13	64	2%	144	5%
Girls/women	14 - 17	594	20%	399	13%
Girls/women	18 - 21	547	18%	440	15%
Girls/women	22 - 25	337	11%	490	16%
Non-binary	12 - 13	2	0%	2	0%
Non-binary	14 - 17	5	0%	5	0%
Non-binary	18 - 21	9	0%	9	0%
Non-binary	22 - 25	3	0%	3	0%

Location

STATE OR TERRITORY	SAMPLE	SAMPLE %	WEIGHTED SAMPLE	WEIGHTED SAMPLE %
NSW	965	32%	950	31%
VIC	812	27%	768	25%
QLD	551	18%	623	21%
WA	358	12%	321	11%
SA	229	8%	210	7%
ACT	52	2%	54	2%
TAS	41	1%	62	2%
NT	15	0%	34	1%

Key minority groups

KEY MINORITY GROUPS	SAMPLE	SAMPLE %	WEIGHTED SAMPLE	WEIGHTED SAMPLE %
Regional/rural areas	622	21%	877	29%
Born overseas	550	18%	665	22%
Low SES (1-4 SES Deciles)	884	29%	1209	40%

STEM overview

The survey results indicate that *science, technology, engineering and mathematics* (STEM) subjects and careers are seen as valuable and interesting to young Australians, and that skills in these areas are considered important to achieving a good job across any industries in the future.

STEM awareness

General awareness of the term STEM remains stable among young Australians aged 12 – 21, with 66 per cent correctly identifying all four subjects. A slight drop is evident among the oldest age group with 45 per cent of people aged 22 – 25 correctly recognising all STEM areas compared to 51 per cent in the 2018/19 survey. A drop was also evident among boys and men in general who recorded a total of 51 per cent correct responses (down from 59 per cent in the 2018/19 survey), while 64 per cent of girls and women correctly identified all four areas (up from 63 per cent in the 2018/19 survey).

Variances in STEM awareness were also observed among different demographic groups with low SES, regional/remote and Aboriginal and Torres Strait Islander (ATSI) groups all registering lower levels of correct responses. People born overseas recorded higher awareness levels compared to people born in Australia (64 per cent and 56 per cent respectively), reflecting similar results captured in the 2018/19 survey.

Among the respondents who did not correctly identify all four areas, *engineering* continues to be the subject most commonly mistaken as *English, economics or education*. *Maths* was also frequently mistaken as *medicine*. Out of the four STEM areas, *science* was the most correctly attributed.

“Engineering needs good problem-solving skills and coming up with effective solutions, which can be transferred to any type of job.” ♀, 15

Job association

When asked what types of jobs are associated with a STEM qualification, half of all students (53 per cent) mention some form of engineering profession. Despite a lower engagement with the subject, the association with engineering was driven more by girls and women (60 per cent) than boys and men (46 per cent). Stronger associations with engineering were also noted among people whose parents had attained higher education qualifications compared to the first-in-family group (60 per cent vs 48 per cent).

Other popular career associations included *scientists* (40 per cent), *educators* (22 per cent), *mathematicians* (22 per cent) and *IT* (16 per cent).

In the 2018/19 survey, respondents were provided with a definition of STEM prior to being asked about STEM job associations. However, in 2019/20 survey the definition was provided after the association question and despite this change, engineering still ranked as the most closely associated job.

Subject selection

Six out of ten Year 9 and 10 students surveyed currently undertake at least one STEM elective subject. Overall, *design and technology* is the most popular, followed by *information and software technology*.

The gender gap has narrowed year-on-year among the Year 9 and 10 students, with 50 per cent of girls now undertaking at least one STEM elective compared to 32 per cent in 2018/19, while boys have remained stable at 71 per cent. The uptick was driven largely by an increase in girls taking *design and technology* this year (25 per cent vs 13 per cent in the 2018/19 survey).

Among the youngest students in Years 7 and 8, 73 per cent are intending to undertake STEM elective subjects when they get to Year 9 and 10, slightly up from the 2018/19 survey (64 per cent). The uptick was driven by both boys and girls with 87 per cent of boys and 56 per cent of girls intending to take STEM compared to 78 per cent and 50 per cent in the 2018/19 survey respectively. *Information and software technology* was the subject that saw the largest increase in popularity year-on-year (34 per cent vs 21 per cent).

In Year 11 and 12, consistent with the 2018/19 results, 95 per cent of students undertake at least one STEM subject. With *mathematics* becoming an elective in the senior years of high school, it remains the main STEM elective subject with eight out of ten students selecting either *basic*, *advanced* or *extension mathematics*. Following *maths* are *chemistry* (35 per cent), *biology* (34 per cent) and *physics* (20 per cent).

Among the Year 9 and 10 students, 95 per cent are considering STEM subjects in their senior years of high school, which is on par with the 2018/19 survey. The subject with the largest year-on-year difference was chemistry, which dropped from 52 per cent to 37 per cent, mostly driven by boys (46 per cent in 2018/19 vs 29 per cent in 2019/20).

Among higher education students, *business and management* remained the most popular course with 12 per cent of students enrolled in this area (14 per cent in the 2018/19 survey). Overall, 30 per cent of students are enrolled in STEM-related courses, up from 26 per cent in the 2018/19 survey.

Of the top ten higher education courses students are currently enrolled in, three are STEM-related, including *engineering and technology*, *computing and information technology* and *biology*. Enrolment in STEM-related courses among men is 42 per cent, a marked improvement from 35 per cent in the 2018/19 survey, while women remained consistent with 19 per cent this year compared to 18 per cent in the 2018/19 survey.

Almost two out of five Year 11 and 12 students (37 per cent) are considering enrolling in STEM-related higher education courses, a similar result seen in the 2018/19 survey (36 per cent). *Engineering and technology* was the only STEM-related course that recorded lower consideration compared to the 2018/19 survey (10 per cent vs 17 per cent). However, *engineering and technology* was the most popular course being considered in higher education along with *computing and information technology*.

“Technology is everything in this century and it will indeed improve overtime. All the jobs in future are likely to merge with tech and will create better future for everyone. One has to have basic knowledge of technology in order to go ahead with any field.” ♂, 21

Consideration of studying stem in the future

Unchanged from the 2018/19 survey, when asked directly about considering studying STEM related subjects in the future, 45 per cent of people said yes. The gender gap has reduced year-on-year with a difference of 9 per cent compared 12 per cent in the 2018/19 survey between boys and girls (2019: boys 49 per cent, girls 41 per cent; 2018: boys 52 per cent, girls, 40 per cent).

There is an inverse relationship between age and considering studying STEM in the future with students aged 12 – 13 recording the highest levels with 54 per cent, down to 51 per cent among 14 – 17 year-old students, 44 per cent among 18 – 21 year-olds and 39 per cent among those aged 22 – 25. Similar to the results on STEM awareness, consideration to study STEM-related subjects in the future is also higher among high SES and people born overseas.

The main reasons for seeking to study STEM in the future continues to be driven by a general interest in the subjects, and many have plans of pursuing STEM-related careers in the future. Some girls were also motivated by the concept of balancing out the unequal representation of genders.

Of the 29 per cent of students not considering studying STEM, the majority of them are pursuing specific careers unrelated to STEM and have low levels of interest in STEM subjects. Lack of confidence appears to be a more critical issue in 2019/20, as a higher number of students said STEM subjects are ‘too hard for them’ (46 per cent vs 39 per cent in 2018/19) and that they did not think they were ‘smart enough’ (37 per cent vs 31 per cent in 2018/19).

“STEM is a way to understand the world better and to solve the world’s problems. With it, we can make the world a better place, and it is becoming increasingly relevant.” ♀, 17

Influencers

Parents continue to be the most influential people when it comes to subject selections with almost half of all young people (46 per cent) ranking Mum and Dad at the top of the influencer list. Parental influence was highest at the age of 12 and 13 (61 per cent) and drops as students get older (while ‘successful businesspeople’ became more influential). After parents, teachers (24 per cent) and friends (22 per cent) rank in second and third for most influential people.

Other than people, the main factors for subject selection include ‘personal interests’ and ‘own skills and ability’ while ‘potential earning’ was a distant third.

Careers in STEM

When asked about careers, two-thirds of young people have some level of certainty about their future career with boys and men showing more certainty compared to girls and women (70 per cent vs 63 per cent). Career certainty is understandably influenced by age with only 58 per cent of people under 18 saying they are certain about future careers compared to 71 per cent of those aged 18 – 25.

Consistent with the 2018/19 results, a third of young people are considering STEM-related roles in the future, although this continues to be driven more by boys (41 per cent vs 24 per cent). *Engineering, computing and information technology* and *scientist* are the most popular STEM careers ranking in the top 10 preferences which was similar to the previous rankings.

People born overseas generally recorded higher intentions towards pursuing STEM-related careers (42 per cent) compared to people born in Australia (30 per cent).

When considering future employment, there is a unanimous view across genders and age groups about the most important factors when considering future employment with 'good working conditions', 'job security' and 'interesting work' ranking as the top three most critical factors. 'Positively impacting society' is another important factor, especially among girls and women (48 per cent of girls and women vs 35 per cent of boys and men).

This year, we also asked students about their biggest influencers when it comes to career decision-making, which had similar results to education influencers with 'personal interests', 'own skills and ability' and 'potential earning' ranked first, second and third, respectively.

Some notable differences in career-influencing factors were observed between genders, with girls and women placing more emphasis on matching careers with their personal interests (68 per cent vs 49 per cent), own skills and abilities (58 per cent vs 48 per cent) and the ambition to change the world (26 per cent vs 19 per cent). Men and boys were more influenced in career choices than girls and women by YouTube (14 per cent vs 6 per cent), although personal interests (49 per cent) and skills and abilities (48 per cent) were still reported as the most influencing factors.



STEM subjects in focus

KPI summary tables

Total KPI summary table

STEM SUBJECTS	GENERAL INTEREST		CONFIDENCE (IN GETTING GOOD RESULTS)		IMPORTANCE FOR EMPLOYMENT	
	2019/20	2018/19	2019/20	2018/19	2019/20	2018/19
SCIENCE	62%	64%	58%	62%	69%	73%
TECHNOLOGY	64%	65%	61%	64%	79%	85%
MATHS	46%	50%	57%	63%	72%	79%
ENGINEERING	44%	42%	38%	38%	58%	60%

Red font signifies a statistically significant difference compared to previous year's results

Boys/men KPI summary table

STEM SUBJECTS	GENERAL INTEREST		CONFIDENCE (IN GETTING GOOD RESULTS)		IMPORTANCE FOR EMPLOYMENT	
	2019/20	2018/19	2019/20	2018/19	2019/20	2018/19
SCIENCE	63%	67%	59%	65%	69%	72%
TECHNOLOGY	76%	75%	69%	73%	79%	84%
MATHS	52%	55%	60%	65%	73%	77%
ENGINEERING	57%	55%	50%	49%	66%	66%

Red font signifies a statistically significant difference compared to previous year's results

Girls/women KPI summary table

STEM SUBJECTS	GENERAL INTEREST		CONFIDENCE (IN GETTING GOOD RESULTS)		IMPORTANCE FOR EMPLOYMENT	
	2019/20	2018/19	2019/20	2018/19	2019/20	2018/19
SCIENCE	61%	61%	56%	60%	69%	75%
TECHNOLOGY	52%	54%	53%	56%	79%	86%
MATHS	40%	45%	54%	60%	72%	80%
ENGINEERING	30%	28%	26%	26%	50%	54%

Red font signifies a statistically significant difference compared to previous year's results

Science

General interest was high for *science* again this year, with almost two thirds (62 per cent) of young Australians saying they are 'very' or 'somewhat' interested (64 per cent in 2018/19). *Science* currently ranks second in 'general interest' among the four STEM subjects and this was consistent across both genders with 63 per cent of boys and men and 61 per cent of girls and women saying they are 'very' or 'somewhat' interested.

When looking deeper into specific age and gender cohorts, there was a decline in interest levels in *science* among 12 – 17 year-old boys when compared to the 2018/19 results (63 per cent in 2019/20 vs 71 per cent in 2018/19), however this had a minimal impact on the overall interest in science.

Around six out of ten people (58 per cent) feel confident that they could achieve good results in *science*. Like *technology* and *maths*, the levels of confidence in getting good results in *science* have marginally decreased from the 2018/19 results (62 per cent) which has been driven by a steeper decline in confidence levels among 14 – 17 year-old boys. Consistent with 2018/19 results, confidence in *science* is lower among women aged 18 – 25 (53 per cent) compared to girls aged 12 – 17 (62 per cent). Those with a CALD background have higher levels of confidence in their science abilities compared to those with non-CALD backgrounds (61 per cent vs 55 per cent).

Of those who feel low confidence in *science*, the main reasons include a lack of interest in science subjects and the perception that science subjects are too complex. Overall, both genders had similar confidence levels in achieving good results in science (59 per cent of boys and men vs 56 percent of girls and women).

Sixty-nine per cent of young Australians believe knowledge and skills in science are important for getting a good job in the future, slightly down from the 2018/19 survey (73 per cent). Science ranked third, behind technology and maths in importance.

Key reasons for and against studying science

REASONS IN FAVOUR	REASONS AGAINST
Science is shaping the future	Not relevant skills for most jobs
Helps understand how the world works	The field of science is too specific
Science is broad/teaches various skills	They are not interested in science

Overall, 9 per cent of people expressed interest in a *science* career in the future. *Biology* fields were most popular, followed by *earth and environment science*. When compared to the 2018/19 survey, there was a lower proportion of people seeking careers in *chemistry*. Besides the conventional science careers, there is a higher proportion of young Australians compared to the 2018/19 survey, seeking more specialised science careers such as *neurobiology*, *data science*, *forensic science* and *food chemistry*.

“Science knowledge exists in every field (even in non-science fields) & scientific skills are readily transferable and are an asset to any job.” ♀, 23

Technology

Technology is again the subject with the highest level of interest among young Australians with around two thirds (64 per cent) saying they are ‘very’ or ‘somewhat’ interested. This was similar to the 2018/19 survey, with (65 per cent). Along with *engineering*, *technology* has the largest discrepancy in interest levels between boys and men and girls and women with 76 per cent boys and men interested compared to only 52 per cent of girls and women. This gender gap has slightly widened year-on-year by 3 per centage points.

As with interest levels, *technology* again recorded the highest proportion of people (61 per cent) who feel confident they can achieve good results in *technology* (64 per cent in the 2018/19 survey). Boys and men show higher levels of confidence (69 per cent) compared with girls and women (53 per cent).

In Year 9 and 10, *design and technology* and *information and software technology* are the only STEM subjects to make top 10 elective subject selections. The number of Year 9 and 10 girls electing *design and technology* has increased from 13 per cent to 25 per cent, and it is driving the overall increase in STEM subject enrolment in Year 9 and 10.

At higher education level, *computing and information technology* has seen a significant increase in course enrolment among men, from 10 to 15 per cent. However, gender discrepancy for this course had widened with no increase in enrolment for women, remaining at 4 per cent year-on-year.

Overall, 10 per cent of respondents are interested in a career in *computing or information technology* in the future. Boys and men were more likely to consider a career in this field at 15 per cent, compared with only 5 per cent of girls and women.

Around eight out of 10 young Australians (79 per cent) believe knowledge and skills related to technology are important for getting a good job in the future. This was again the highest among all STEM subjects but down from the 2018/19 survey (85 per cent).

As a career, *computing or information technology* is perceived by 24 per cent of respondents to be a more male-oriented career compared to only 5 per cent who believe it is more

female-oriented. However, the majority (67 per cent) believe it is gender neutral. A career in *data analysis* was considered more gender neutral, with 75 per cent saying it is a profession for either gender.

Key reasons for and against studying technology

REASONS IN FAVOUR	REASONS AGAINST
Keeping up with the pace of technology	Not important for employment
Requirement for good jobs	Only basic knowledge is required
Technology is everywhere	Not interested and don't like it

"Technology is taking over the world and certain industries have been revolutionised by technology so it's important to keep up." ♀, 15

Engineering

Engineering remains the subject with the lowest interest levels among all STEM subjects with only 44 per cent of respondents showing interest in the subject (42 per cent in the 2018/19 survey). As with the 2018/19 study, it also recorded the lowest levels of confidence, importance and understanding factors that interact and reinforce each other to make the idea of studying *engineering* a significant barrier to those considering further study or a career in STEM. Moreover, there was a large discrepancy in general interest between boys and men (57 per cent) and girls and women (30 per cent).

Only 38 per cent of young people felt confident that they could achieve good results when it comes to *engineering*. Low levels of understanding of *engineering* coupled with perceptions of it being a very difficult subject are major factors for the overall lower levels of confidence levels for this subject. This was seen with both genders but was more pronounced among girls and women. Boys and men were more likely to say they are 'very' or 'somewhat' confident (50 per cent) compared to girls and women at only 26 per cent. Levels of interest and confidence in engineering remained consistent year-on-year.

Despite the lower interest than other STEM subjects, course enrolment in *engineering and technology* at higher education was ranked second overall at 10 per cent, just behind *business and management*. *Engineering and technology* was the number one course selected by men with 17 per cent enrolment, compared to only 4 per cent of women. Perceived gender superiority in favour of men was highest for studying *engineering*, when compared to other STEM subjects, with 30 per cent of respondents believing 'males are better than females' in *engineering*.

Overall, 11 per cent of people are interested in a career in *engineering* in the future. Sixty-six per cent of boys and men believe knowledge and skills related to engineering are important in getting a good job in the future, compared to only 50 per cent of girls and women.

It was also found that people from an ATSI background had higher levels of interest and confidence in studying *engineering*, 56 per cent and 57 per cent respectively for general interest and confidence compared to non-ATSI with 43 per cent expressing interest in the subject and 37 per cent having confidence in their engineering abilities.

Key reasons for and against studying engineering

REASONS IN FAVOUR	REASONS AGAINST
Problem solving skills essential for workforce	Many jobs don't require these skills
Promotes, creativity, innovation and logical thinking	Too specific
Important to have basic knowledge	Unrelated to my career choice

"Engineers are the most creative people on planet. No matter what field we choose we constantly have to learn and adopt new skills." ♂, 21

Mathematics

General interest for *maths* was only marginally higher than *engineering* but well below *science* and *technology*, with 46 per cent of young Australians saying they are 'very' or 'somewhat' interested in the subject. These results were slightly down from the 2018/19 survey which recorded interest levels of 50 per cent. The drop was more pronounced among girls and women with 40 per cent interest in the 2019/20 survey vs 45 per cent in 2018/19, while boys and men recorded more consistent year-on-year results (55 per cent in 2018/19 vs 52 per cent in 2019/20)

Fifty-seven per cent of respondents feel confident that they could achieve good results in *maths*, which was also slightly down from the 2018/19 survey (63 per cent). Low confidence in *maths* was more closely related to students' mindsets, believing they are simply 'not good with numbers'.

Among higher education students, 2 per cent are currently enrolled in a *maths* course and 4 per cent of Year 11 and 12 and considering it in the future.

Maths was identified as an important skill to have for future employment by 72 per cent, the second most important skill after technology according to young Australians.

Key reasons for and against studying maths

REASONS IN FAVOUR	REASONS AGAINST
Basic maths knowledge is important for all jobs	Many jobs don't require these skills
Essential life skill	Too specific
Foundation for all STEM subjects	Unrelated to my career choice

"Maths is important in daily life as well as in a job. Everyone should have some sort of knowledge of maths to be able to solve problems in their daily life." ♂, 16

