



2021-20 STEM Influencer Report – Teachers & Career Advisors

Prepared by YouthInsight for the
Department of Industry, Science,
Energy and Resources

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Executive summary

Building on from the [Youth in STEM research](#), the Department of Industry, Science, Energy and Resources (DISER) has expanded the research to incorporate parents, teachers and career advisors. These audience segments have been identified as key influencers of young people's choices when it comes to education and career selection. Understanding their perceptions and attitudes towards STEM can assist families, educators and policy makers in supporting girls throughout their STEM education and consider future STEM-related careers.

Separate online surveys were conducted among parents and educators (teachers and careers advisors) from September to October 2020 with a representative sample of 1,492 parents and 844 educators across the country. Respondents were sourced from a range of online panels and through direct partnerships with the Australian Academy of Technology and Engineering (ATSE) and Education Services Australia (ESA).

This report outlines the detailed findings from the *Teachers & Career Advisors 2020/21* research and highlights some of the key comparative findings from the *Parents 2020/21* research and the *Youth in STEM 2019/20* research.

To begin, it's important to observe the composition of survey respondents were 85% women and 15% men, which is reflective of Australia's school education sector. Two thirds of the respondents were primarily classroom teachers, while a third reported working in other roles such as teacher support / aides, school coordinators and assistant / deputy principals. Overall, 7% of the sample were career advisors, although many classroom teachers also advise students on careers. There was considerable role crossover, with a third of teachers reporting to have other roles in addition to classroom teaching. The survey also included 9% of educators from the tertiary sector.

While the research is vastly detailed, this report focuses on a set of key metrics used to evaluate educators' understanding, attitudes and perceptions of STEM. A summary of the findings for each of these key metrics is outlined below.

Teaching roles and STEM

Reflecting the multiple roles that teachers have, significant overlaps were seen between educators who specialise in STEM and those who do not. A quarter of secondary teachers reported teaching only STEM subjects, while a third teach both STEM and non-STEM subjects, and 42% do not teach STEM at all.

Regarding teaching roles held by men and women, the survey found that men were more likely to be teaching STEM subjects compared to women across both primary and secondary school settings. Among secondary teachers, 44% of men taught only STEM subjects compared to 20% of women. Among primary teachers, the overall gender skew was not significant, but still skewed towards men, with 31% having a STEM specialisation compared to 26% of women. These insights suggest that students are more likely to see men in STEM teaching roles, potentially influencing their associations between gender and STEM careers or STEM expertise.

Relevance of STEM to teaching practice

While not all educators specialise in STEM, the majority acknowledged that teaching STEM skills was relevant in their role. STEM as an integrative set of skills, technology and mathematics skills were seen as the most relevant, followed by science skills. Engineering was perceived to be the least

relevant skill, which follows the trend seen in the *Youth in STEM 2019/20* research where engineering recorded the lowest levels of interest compared to other STEM subjects.

STEM qualifications and further education

Among all respondents, around a third had obtained a STEM qualification prior to entering the education sector. Secondary school teachers were more likely to report having some form of prior STEM qualification than primary school teachers. Among secondary teachers, as expected, STEM teachers were the most likely to have prior STEM qualifications (60%) compared to 31% of secondary teachers who do not teach STEM. When splitting the results by gender, the survey revealed that men were more likely to have obtained a STEM qualification prior to teaching compared to women.

Feelings of qualification and confidence in teaching STEM

Beyond formal qualifications, educators were also asked to rate how qualified they *feel* to teach STEM subjects. Feelings of qualification to teach mathematics and science were the highest followed by technology and STEM as an integrative set of skills. Feelings of qualification to teach engineering were the lowest, with only a third of educators feeling qualified to teach this subject.

Educator's feelings of being qualified to teach STEM followed much the same pattern as prior STEM education, with 90% of men selecting at least one STEM topic area in which they feel qualified to teach compared with 80% of women. However, this difference was driven by women's lower scores for technology and engineering; both men and women felt equally qualified to teach mathematics, science and STEM as an integrative set of skills.

When teachers in STEM-relevant roles were asked how confident they feel in teaching STEM, top confidence scores were considerably low. Confidence was highest in mathematics and lowest in engineering. The main reason given for not feeling confident in teaching STEM was a lack of formal training and practical teaching experience in STEM topics. STEM teachers showed strong interest in improving their STEM knowledge, with six in ten having taken formalised STEM professional development, although this was again driven by higher scores among men compared to women.

Confidence in connecting STEM content with real-world applications and careers

The educators' confidence in their ability to connect STEM content with real-world applications was also investigated. While, overall, one in five educators feel very confident in doing this, the results were strongly driven by teachers with prior STEM qualifications, who are nearly four times as likely to feel very confident compared to those without STEM qualifications. Men reported greater confidence in making these STEM connections compared to women, which is likely attributed to the higher proportion of men having prior STEM qualifications.

Another method of measuring educators' confidence in STEM education was to understand educators' ability to explain what different STEM careers involve. The survey found that around a third of educators rate their ability to explain as high or very high, with men rating themselves higher in their ability compared to women. This again is likely to be attributed to a higher proportion of men having STEM qualifications compared to women.

STEM awareness and understanding

A question used to gauge the understanding of STEM across all audience groups was to ask if respondents could identify the four subjects of the STEM acronym. Awareness was high among educators, with nine in ten (87%) correctly identifying all subjects. A further 9% were able to correctly identify three out of the four subjects, with engineering being the subject that was incorrect most often, which follows the trend seen in both the *Youth in STEM 2019/20* research and the *Parents 2020/21* research. Only 4% of educators were unsure or able to identify fewer than three subjects.

As expected, the proportion of correct responses recorded by educators was significantly higher compared to those of parents and young people, with only half (52%) of all parents and 58% of young people able to identify all four subjects.

The survey also found that Aboriginal and / or Torres Strait Islander teachers were less likely to be able to correctly define the full acronym compared to other teachers surveyed.

The survey also tested educators' understanding of the types of jobs associated with STEM qualifications and found that scientist was the profession with the highest association, followed by teacher / educator / academic, engineering and information technology.

Comparing these results to the Parents' research, educators were just as likely to mention engineer, information technology and mathematician. However, as expected, educators showed a broader awareness of STEM-related jobs with only 2% unable to answer the question compared to 19% of parents.

Life skills associated with STEM education

To further investigate educators' understanding of STEM, they were asked about the life skills which are developed through the study of STEM. The results revealed that both educators and parents selected the same top three life skills: problem solving, critical thinking and design thinking. These alignments help develop a consistent narrative for young people around the life skills which can be developed through STEM education.

Perceived importance of STEM

Overall, there was a broad recognition among educators that STEM education is important, irrespective of whether a teacher is actively teaching STEM subjects or not. Almost all educators agree that STEM skills are important for the Australian economy and nine in ten agree that STEM skills will provide job security to future workers.

Regarding employment prospects, there was a consensus among educators that STEM subjects are important to acquire a good job in the future. While engineering again ranked last, three quarters of educators still recognised it as somewhat or very important. Some gender differences were also noted, with men being more likely to say science and engineering are very important to acquire a good job in the future compared to women.

Educators' views were closely aligned with those of parents, however, when comparing with the views of young people from the *Youth in STEM 2019/20* research, it was evident that both parents and educators place a higher level of importance on STEM subjects compared to young people.

Gender bias

The majority of educators recognise that a gender bias towards men in STEM exists in the media, with high levels of agreement that the media portrays more men as STEM role models and that there is a lack of role models in STEM who are women.

Educators also acknowledged that there is a gender bias within STEM that needs to be addressed, however the nuances of educators' own biases are apparent. As an example, engineering and information technology are the top recommended careers for both boys and girls, however, educators are significantly more likely to recommend engineering and information technology careers to boys than girls. Educators also hold strong gendered associations with specific occupations such as labourer, farmer and machine operator being skewed towards boys and nurse, office support and teacher being skewed towards girls. Only a few occupations were considered gender neutral (pharmacist, lawyer and accountant).

While gender biases are evident, it is also clear that there is a large cohort of educators who are focused on being as gender neutral as possible. When asked about student confidence and ability across different subjects, the statement that boys and girls are equally confident was the most common answer for most subjects, ranging from 57% for technology up to 66% for science. However, this leaves a sizeable proportion of educators who do see gendered differences in students. These educators see boys as more confident than girls in engineering, sport, technology, mathematics and science. Conversely, they see girls as more confident in social science, arts and English.

Career advice

Most secondary school teachers claim to provide some level of career advice to students throughout the school year. With regards to advice around STEM careers, advisors place most emphasis on the abundance of job opportunities for graduates, providing examples of real employers and scholarships and other financial support specially for women studying STEM at university.

A critical insight uncovered around career advice was the inconsistency in STEM career suggestions given to boys and girls. While the top recommended roles are similar for boys and girls, advisors were more likely to recommend engineering and IT to boys and science and health to girls.

Continuing this trend, career advisors' estimation of the proportion of girls and boys who are likely to enter STEM careers also differ, with advisors estimating 34% of boys will enter a STEM career, compared to 24% of girls.

The barriers for students entering into a STEM career are also strongly gendered, with girls more likely to present the barrier that there are not enough women in the field, there is a lack of role models who are women in the field, as well as not feeling confident in engineering, technology and / or science. When asked what educators believe would help improve the girls' attitudes towards STEM, the most common suggestion was to have more women role models visible, followed by a greater focus on positioning STEM in a more relevant manner that aligns with their interests.

In conclusion

The insights presented in this report have established critical benchmarks for the future tracking of this key influencer group. The research provides the necessary information for policy makers to take a data driven approach in addressing the gender imbalance existent in STEM education and related careers. This research, along with the *Parents 2020/21* research, compliments the insights uncovered through the *Youth in STEM 2019/20* research, providing much-needed context around young people's perceptions of STEM.

In addition to this research, DISER has also commissioned a deep dive study to understand the experiences of those teaching STEM to Aboriginal and / or Torres Strait Islander students, with a specific lens on uncovering gender differences within this cohort. This study includes qualitative feedback gathered through a series of in-depth interviews among educators from an Aboriginal and / or Torres Strait Islander background or among those who work closely with large groups of this cohort.

Moving forward, DISER will continue tracking key measures around STEM from both young people and their key influencers. The next round of research will be conducted in 2021 and will be the third wave of the *Youth in STEM* research.

Notes on interpreting the report

Significant differences – Differences between demographic groups cited in the report refer to statistically significant differences based on a 95% confidence interval. Charts in this report show statistically significant differences between subgroups using black or white arrows alongside the percentage results. If a difference is described as indicative, the difference is not statistically significant.

Weighted data and rounding – To ensure the survey results are representative of the population, weighting was applied to correct for under or over representation of the sample. Where the weighted population or proportions do not add up to 100%, this is due to rounding of decimal places up or down to the nearest whole number.

Multiple choice questions (MC) – Multiple choice questions will not add to 100% as respondents could select more than one answer. All multiple-choice questions have been labelled within the question text as MC.

Educators – This term is used throughout the report to refer to all respondents who completed this survey. This term is used to cover the broad range of respondents to the survey from across the education sector. For instance, the sample includes career advisors and co-ordinators who do not teach in the classroom but are classed as educators.

Teachers – This term is used when the survey question was asked only of those who teach within a primary or secondary classroom setting.

Advisors – This term is used when the survey question was asked only of those who provide career advice to students at least once per month or more often. This group includes full time career advisors as well as teachers and other educators who provide career advice in addition to their main role.

Non-binary respondents – Data was collected from survey respondents who did not identify with binary genders. While these respondents make up the overall sample size, due to low numbers, this report excludes any analysis based on these respondents.

Location / area – When referring to location or metropolitan vs. regional areas, this refers to the location of the school where the educators work, not the home location of the educators.

Socioeconomic status – Lower or higher socioeconomic status (SES) has been determined by using the Australian Bureau of Statistics Socio-Economic Indexes for Areas (SEIFA) which ranks areas in Australia according to relative socioeconomic advantage and disadvantage into deciles. The indexes are based on information from the five-yearly census. This survey employs the Index of Education and Occupation (IEO). Postcodes supplied by respondents have been mapped to the corresponding IEO decile. This report has grouped deciles one to five and classified this group as lower SES and deciles six to ten as higher SES.

STEM classifications: Below is a list of how STEM has been classified in this research report.

- **STEM definition in the context of this report:** STEM stands for science, technology, engineering and mathematics. In this survey, science refers to topics such as biology, chemistry, physics, and earth and environmental sciences. It does not include medicine, nursing, psychology or health sciences. However while reporting on perceptions, medicine and nursing are often linked by respondents to STEM.

- Technology refers to topics related to information technology and programming, mechanics, electronics, and all other types of technology. Some technology courses could also be called engineering. There are many types of engineering, like aerospace and environmental engineering, and many types of mathematics, such as geometry, logic and statistics.
- **STEM subjects at primary school:** mathematics, science, technologies
- **STEM subjects at secondary school:**
 - **General STEM subjects:** mathematics, biology, chemistry, earth and environmental science, physics, geography, design and technologies and digital technologies
 - **Year 9-10 elective STEM subjects:** geography elective, agricultural technology, design and technology, food technology, graphics technology, industrial technology, information and software technology
 - **Year 11-12 elective STEM subjects:** agriculture, biology, chemical world science, chemistry, computing applications, design and technology, earth and environmental science, earth and space science, electrotechnology (VET), engineering studies, geography, human society and its environment, industrial technology, information and digital technology (VET), information processes and technology, investigating science, living world science, marine studies, mathematics, mathematics advanced, mathematics extension, metal and engineering (VET), physical world science life skills, physics, science extension, software design and development
- **STEM subjects at higher education:** agriculture, computing and information technology, engineering and technology, environmental studies, mathematics, biology, chemistry, physics, earth and environmental sciences.
- **STEM qualifications:** computing or information technology (IT), data analyst, engineering, mathematics, science
- **STEM jobs / careers:**
 - **Qualifying jobs / careers:** computing or information technology (IT), data analysis, engineer, mathematician, scientist
 - **Potential qualifying jobs / careers, depending on specific role:** entrepreneur, machinery operator or driver, professor, lecturer or teacher, public servant (includes Army, Airforce, Navy), technician or trade worker (mechanic, electrician, carpenter)

Project background

Background

Building on from the [Youth in STEM Research](#), the Department of Industry, Science, Energy and Resources (DISER) has continued the collection and reporting of attitudes and perceptions of young Australians towards STEM. The objective of the research is to understand more about the perceptions of young Australians (12 to 25-year-olds) towards STEM skills and careers, particularly those of girls (women).

With the previous *Youth 2019/20* research showing that girls' perceptions of, and engagement with, STEM are strongly influenced by parents, teachers and career advisors, DISER made the decision to expand the research to provide insights into the attitudes and perceptions of these key influencer groups. From 2020 onwards, the Youth in STEM research will track both the 12 to 25 year-old group of young people and the influencer groups of parents and educators. Each survey is conducted biennially as below, with results released early the following year:

- 2019: People aged 12-25 ([completed report](#))
- 2020: Parents ([companion report](#))
- 2020: Teachers & Career Advisors ([current report](#))
- 2021: People aged 12-25
- 2022: Parents
- 2022: Teachers & Career Advisors

The research focuses on any differences and similarities in data outcomes based on gender, as well as investigating the intersection of other demographics which may further influence STEM engagement and participation.

Given the substantial differences between the experiences and perspectives of parents and educators, the research was split into two surveys to enable more customisation of the questionnaire and to establish the key metrics by which to track these influencer cohorts.

This is the establishment report for the teacher and career advisor survey. Key differences between the insights from this report and the *Parents 2020/21* research and the *Youth 2019/20* research have been noted.

Objectives

This study establishes the STEM related awareness and perceptions of teachers and career advisors who engage with students in primary and secondary schools across the country. The study aims to understand how they influence the decision-making process of students' future education and career paths. The underlying theme of the research is to uncover key gender differences and biases. There is also a small component of educators from vocational education and training (VET) and higher education institutions included in the study.

More specifically, the study aims to:

- Understand levels of awareness and understanding of STEM and associated skills among educators
- Evaluate key metrics such as interest, confidence to teach STEM and the perceived importance of STEM for future employment
- Understand educators' general attitudes towards STEM education and careers
- Assess differences in perceptions of STEM among a range of educator groups
- Understand behaviours which impact student disposition towards STEM
- Uncover gender biases in teachers' perceptions about STEM.

Methodology

YouthInsight conducted a 20-minute online survey among a representative sample of teachers and career advisors of students in primary and secondary schools. Teachers and career advisors completed the survey via computer, tablet or mobile phone.

Sampling

The total unweighted sample for the teacher and career advisor survey was 844. The sample was sourced via a combination of online panel providers and partnerships among organisations with robust educator databases. The partnerships included the Australian Academy of Technology and Engineering (ATSE) and Education Services Australia (ESA).

Sample quotas were placed on state to ensure the research captures representation of teachers across all states and territories in Australia.

To determine socioeconomic status, the survey uses Socio-Economic Indexes for Areas (SEIFA) developed by the Australian Bureau of Statistics (ABS). SEIFA ranks areas in Australia into ten equally sized groups according to relative socioeconomic 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 the Index of Education and Occupation (IEO).

To ensure survey results represent the educator population as closely as possible, weighting has been applied for any under or over representation within the sample. The weighting was based on socioeconomic deciles of the school/institution the respondent works at, school jurisdiction to match the ABS (government, Catholic and independent schools) and geographic representation that aligns to the population of each state/territory in Australia.

Below are the summary tables of the unweighted sample and weighted population with applied weighting factors.

Table 1: Total unweighted sample and weighted population.

EDUCATOR PROFILE	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
Total	844	100%	844	100%
Gender				
Man	122	14%	127	15%
Woman	718	85%	717	85%
Other / non-binary	4	1%	0	0%
Main role				
Classroom teacher	518	61%	528	63%
Career advisor	59	7%	56	7%
Other	196	23%	188	22%
VET or higher education educators	71	8%	72	9%
Length of time in role				
Under 4 years	170	20%	165	20%
4 – 7 years	195	23%	198	23%
8 – 11 years	151	18%	156	18%
12 – 19 years	162	19%	157	19%
20 or more years	166	20%	168	20%
Employment type				
Relief	49	6%	50	6%
Casual	78	9%	84	10%
Part-time	203	24%	189	22%
Full-time	504	60%	511	61%
Other	10	1%	11	1%
Aboriginal and / or Torres Strait Islander				
Aboriginal and / or Torres Strait Islander	19	2%	21	2%
Non-Aboriginal and / or Torres Strait Islander	816	97%	814	96%
Prefer not to say	9	1%	9	1%

*Where weighted sample or proportions do not add up to 100%, this is due to rounding of decimal places up or down to the nearest whole number.

SCHOOL PROFILE	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
School type				
Government	508	66%	500	65%
Catholic	101	13%	149	19%
Independent	153	20%	112	15%
Other	11	1%	11	1%
School level*				
Primary	307	36%	316	37%
Secondary	259	31%	273	32%
Combined (P-12)	123	15%	114	14%
Special school	28	3%	24	3%
Other	56	7%	45	5%
Tertiary / higher education	71	8%	72	9%
Single sex or co-ed				
Co-ed	722	93%	725	94%
Single sex (girls)	30	4%	25	3%
Single sex (boys)	21	3%	22	3%

*Within the survey sample, 91% work within a primary or secondary school while 9% work in the VET / tertiary sector.

LOCATION AND SOCIOECONOMIC STATUS	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
State				
NSW	188	22%	270	32%
VIC	280	33%	219	26%
QLD	180	21%	169	20%
WA	85	10%	59	7%
SA	55	7%	84	10%
ACT	21	2%	17	2%
TAS	22	3%	8	1%
NT	11	1%	17	2%
Location of school				
Capital city / major metropolitan area	549	65%	504	60%
Regional or remote / rural	295	35%	340	40%
Socioeconomic status of teachers' school (SES)*				
Lower SES (Decile 1 - 5)	343	41%	414	49%
Higher SES (Decile 6 - 10)	484	57%	414	49%
Unknown	17	2%	17	2%

*Socioeconomic status (SES) – 17 respondents provided postcodes that did not match our existing lists of socioeconomic deciles and as such, these respondents are unweighted within the sample.

Educator profile

Educator role

Around two thirds of the survey sample (63%) are employed as classroom teachers in their main role, while 29% work in other roles such as teacher support / aides (14%), career advisors (7%), school coordinators (6%) and assistant / deputy principals (2%). Overall, the survey also included 9% of educators from the tertiary sector.

People who work in the education sector but have purely administrative roles or other roles determined to have no influence on student decision making were not included in the research.

Among classroom teachers, one in three (33%) reported to also have a secondary role as either a school coordinator, teacher support / aide, career advisor or an unspecified educator role. Overall, when combining main and secondary roles, 86% of respondents were classroom teachers or teacher support / aides.

Role crossover among educators was not evenly balanced, with 53% of career advisors also doubling up as classroom teachers, while only 1% of classroom teachers were also career advisors. It was also found that 42% of principals / deputy principals also work as classroom teachers.

Educator gender

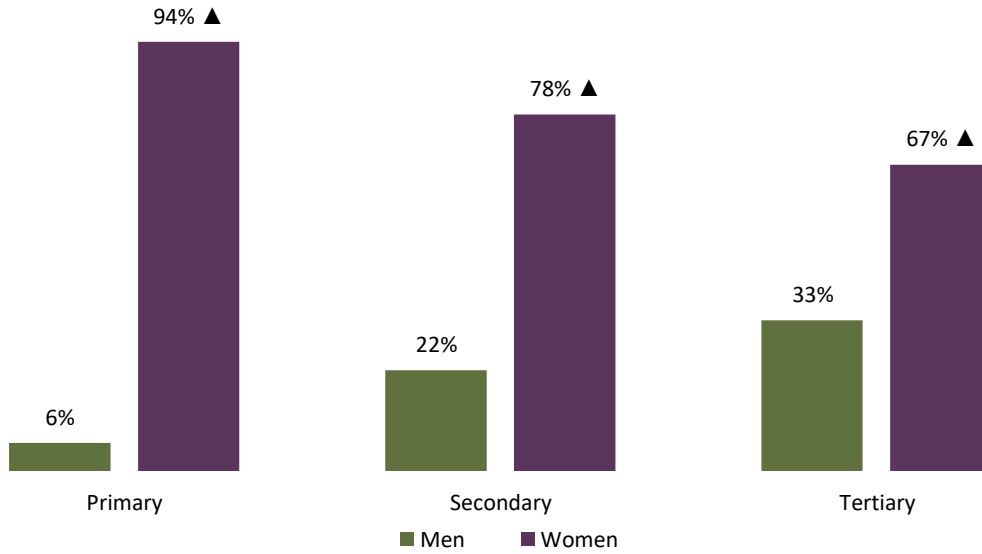
Among all educators surveyed, 85% were women and 15% were men. This gender imbalance is reflective of Australia's school education sector, which recorded 74% women (compared to 26% men) in full-time equivalent (FTE) roles according to the 2019 National Report on Schooling data portal, produced by the Australian Curriculum, Assessment and Reporting Authority (ACARA)¹.

In line with the National Report on Schooling data portal, the survey data shows that the proportion of men among teachers increases along with the schooling year levels, with men making up 6% of primary school teachers, 22% of secondary school teachers and 33% of tertiary educators.

¹ <https://www.acara.edu.au/reporting/national-report-on-schooling-in-australia/national-report-on-schooling-in-australia-data-portal/staff-numbers#View1>

Figure 1: Gender balance among teachers within education levels.

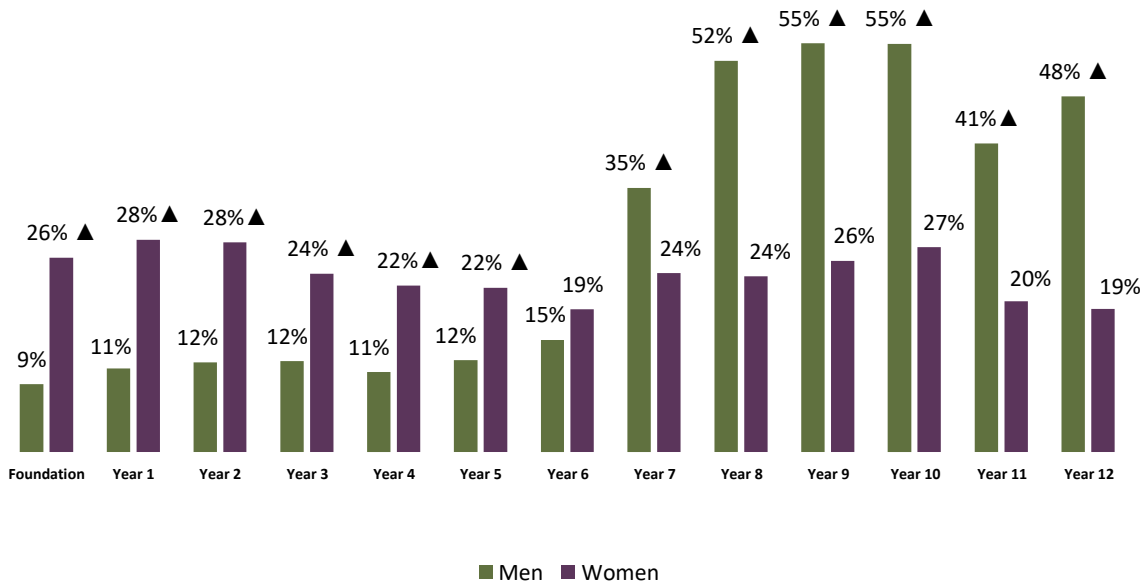
Q. Which year level(s) do you currently teach? (MC).



Base: teachers; men – 89, women – 622 (not shown due to low base size: non-binary teachers – 4), tertiary educators; men – 23, women – 47. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Figure 2: Teacher gender distribution by year level taught.

Q. Which year level(s) do you currently teach in your school? (MC).



Base: teachers; men – 89, women – 622 (not shown due to low base size: non-binary teachers – 4). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The survey found that at secondary schooling level men are more likely to teach STEM subjects compared to non-STEM subjects (68% vs 56%). The opposite was true for women, with 80% teaching non-STEM subjects and 55% teaching STEM subjects. Physics was the subject most taught by men (29% vs 10% for women), followed by chemistry (28% vs 11% for women) and biology (26% vs 13% for women).

When it came to qualifications of educators, men are 41% more likely to have attained a STEM qualification prior to entering the education system (47% men have STEM qualification vs 33% of women).

Mainstream vs specialist education settings

Of the educators surveyed, 87% work within a mainstream education setting, and 13% at a school with a specialised or singular focus. Within the mainstream education setting, specific support programs or assistance are common. Of the institutions/schools where the surveyed educators work, 82% provide disability / special needs support services, 59% provide English as Secondary Language (ESL) programs and 55% provide Indigenous programs.

Thirteen percent of educators are at schools / institutions where the Aboriginal and / or Torres Strait Islander student population is 20% or more. The specific needs of Aboriginal and / or Torres Strait Islander students are explored in detail in a separate report which also includes a qualitative deep dive with educators who are from an Aboriginal and / or Torres Strait Islander background or work closely with this cohort. However, statistically significant differences found in this survey have been noted.

STEM specialisation

Primary teachers

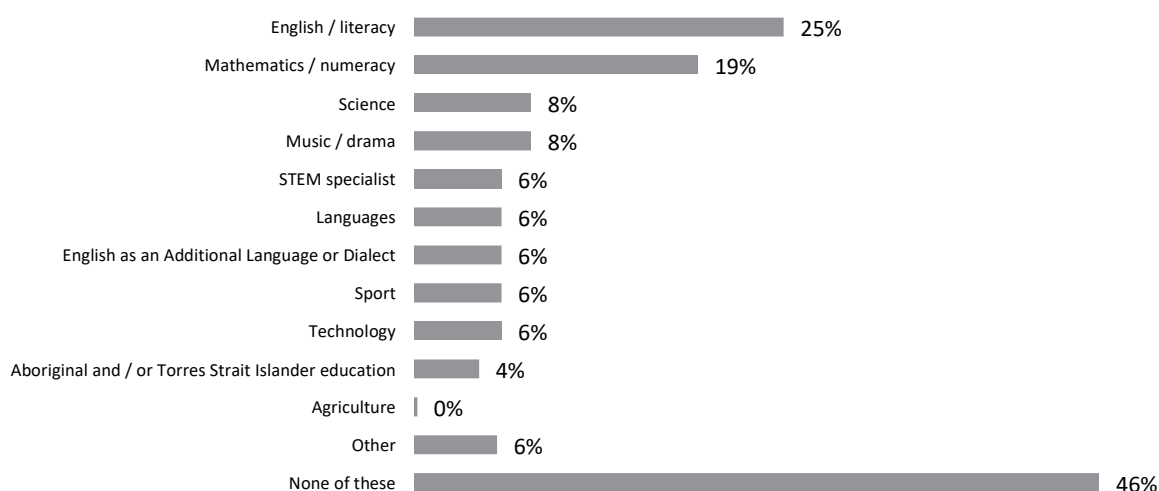
When asked about their specialisations, around half of primary school teachers (47%) reported to have a specialisation in at least one subject area. Focusing specifically on STEM subjects, 26% of primary teachers have a STEM specialisation, with mathematics ranking as most common (19%), followed by science (8%) and only 6% reported to be STEM specialists.

Among primary school teachers, no significant difference was found between genders when combining all STEM related specialisations, although, indicatively, men were more likely to have STEM specialisations (31%) compared to women (26%). However, a higher proportion of men (13%) reported having specialisations in technology compared to women (5%). In contrast, women teachers were more likely to have a specialisation in English / literacy (27%) compared to men (7%).

It was also noted that primary school teachers in metro areas were more likely to have some form of specialisation (53%) compared to their regional counterparts (38%), with 32% reporting to have STEM specialisations compared to only 18% in regional areas.

Figure 3: Primary teacher specialisation.

Q. In your role(s) as a primary school teacher, do you specialise in any of the below subject areas? (MC)

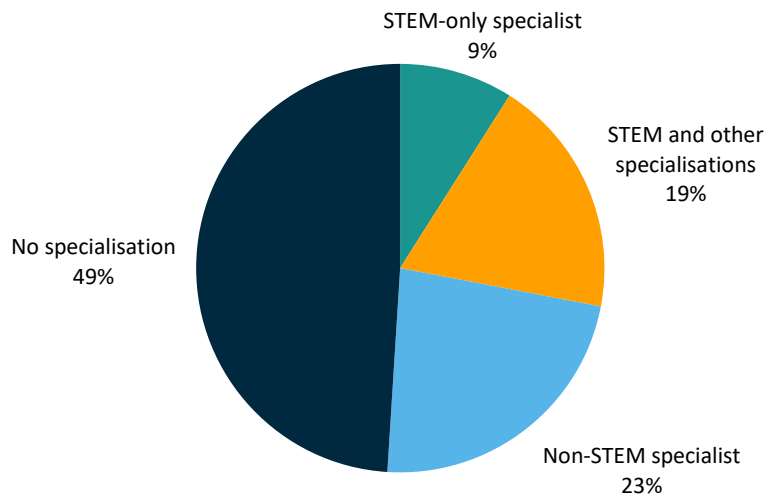


Base: primary school teachers – 382. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The need for primary teachers to be across a wide range of different subject areas within the curriculum is reflected in the number of teachers who have multiple specialisations. The survey found that among teachers who have a STEM specialisation, 69% of those also have a specialisation in a non-STEM subject area.

Figure 4: Primary teacher specialisation (segments).

Q. In your role(s) as a primary school teacher, do you specialise in any of the below subject areas? (MC)



Base: primary school teachers – 382. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

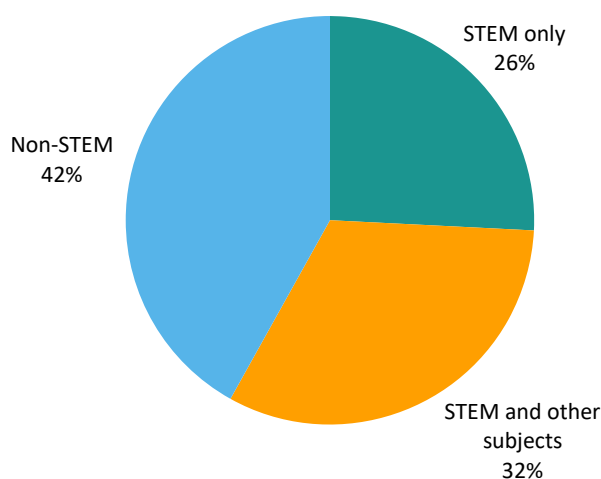
These results highlight a variability of skillsets and training among primary teachers. It was also found that teachers with less than 12 years teaching experience were more likely to have at least one specialisation (54%) compared to more experienced teachers with over 12 years' experience (43%).

Secondary teachers

Within secondary schools, the survey explored teachers who specialise in STEM education and those who do not. Reflecting the multiple roles that teachers have, it was evident from the data that a significant overlap exists between those who specialise in STEM and those who do not. Among the secondary teachers surveyed, 26% teach only STEM subjects, 32% teach STEM subjects and non-STEM subjects and 42% do not teach STEM at all.

Figure 5: Secondary subjects currently taught.

Q. Which of the below subjects do you currently teach in your main role? Subjects listed from the Australian Curriculum. Please select the subjects that most closely describe the subjects you teach. (MC)



Base: secondary teachers – 296. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Within each of these teaching segments there is a diversity of experience and behaviour with regards to previous STEM qualifications, engagement with ongoing STEM-focused professional development and / or previous teaching experience in STEM areas. This diversity reinforces the finding that there are no clear distinctions between STEM and non-STEM teachers (i.e. there are teachers who do not currently teach STEM, who have STEM qualifications (31%) or have taught STEM in the past (51%). Inversely, there are teachers currently teaching STEM who do not have STEM qualifications or training (40%).

Based on teachers' entire career, the survey found that 58% of secondary teachers currently teach at least one STEM class, 21% have taught at least one STEM class in the past and 21% have never taught STEM.

With eight in ten (79%) secondary teachers teaching a STEM class at least once in their career, it is important they are equipped and supported to be able to do this confidently.

When looking closely at each of these teaching segments, the survey found that STEM-only teachers are more likely to be men (44% vs 20% of women). The gender skew was also evident among teachers who teach at least one STEM subject, (26% of men vs 15% of women). From the student perspective, this means they are more likely to see men STEM teachers, which can potentially influence their gender associations with STEM careers.

The survey also found that schools in higher socioeconomic areas had a larger proportion of teachers who are not currently teaching STEM but had previously taught a STEM subject (30% vs 13% for lower socioeconomic areas). This may indicate a greater knowledge of STEM skills among non-STEM teachers in these areas.

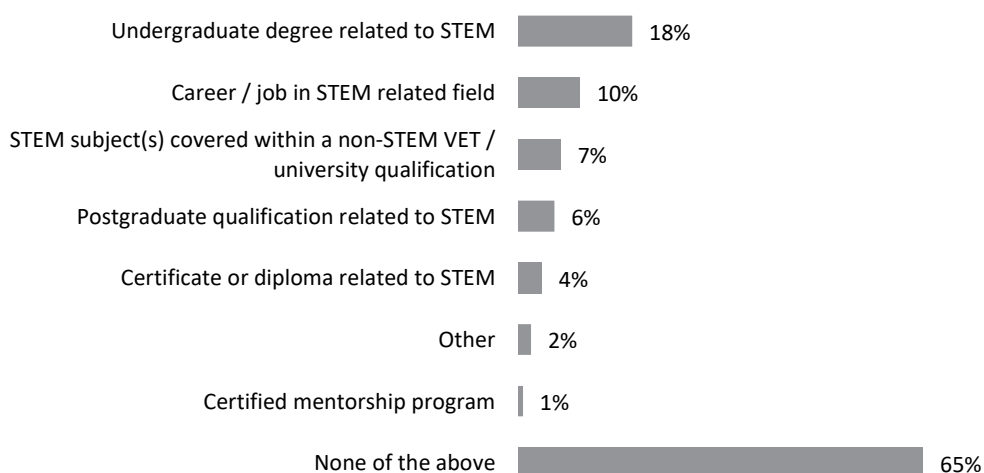
Qualifications and training

Prior STEM qualifications

Thirty five percent of survey respondents had obtained a STEM qualification before entering the education sector, the most common being an undergraduate degree (18%). One in ten (10%) had work experience in a STEM related field.

Figure 6: STEM qualifications / experience obtained prior to entering the education sector.

Q. Which of the following qualifications or experiences related to STEM did you have prior to working in the education sector? (MC)



Qualification	%
Net: Had prior STEM qualification(s)	35%
Did not have a STEM qualification	65%

Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Exploring these results in further detail, men were more likely than women to have obtained a STEM qualification prior to teaching (47% of men vs 33% of women). Prior STEM qualifications were also more commonly found in secondary school teachers (46%) compared to primary school teachers (21%). The gap in qualifications attained was even wider when comparing to secondary teachers who are currently teaching STEM, with 60% reporting to have prior STEM qualifications compared to 31% of teachers who do not teach STEM.

STEM qualifications were also more prevalent among teachers working at independent schools (44%) compared to those working at government (31%) and Catholic (32%) schools.

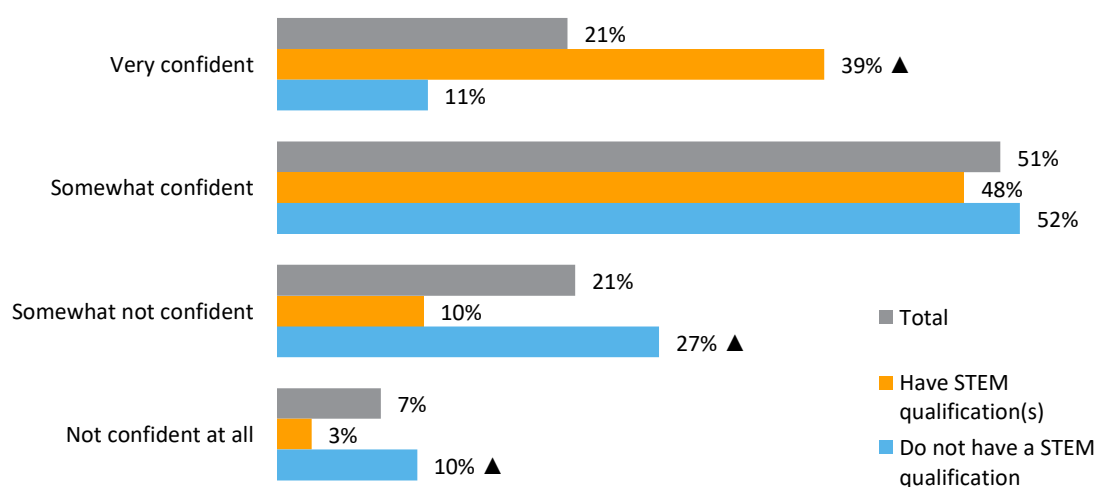
These prior STEM qualifications and experience are particularly impactful in the context of bringing relevant, real-world applications and career examples into the classroom. Among secondary school teachers currently teaching STEM, 23% have prior career experience in a STEM-related field.

Confidence in connecting STEM content with real-world applications

As seen in the chart below, one in five (21%) teachers feel very confident connecting STEM content with real-world applications, however, this is strongly driven by teachers with prior qualifications, who are nearly four times as likely to feel very confident compared to those who do not have prior STEM qualifications (39% vs 11%).

Figure 7: Confidence in connecting STEM content with real-world applications.

Q. How confident are you to connect STEM content with relevant, real-world applications and career examples?



Confidence	Total	Have STEM qualification(s)	Do not have a STEM qualification
Net: very / somewhat confident	72%	87%	63%
Net: somewhat not confident / not confident at all	28%	13%	37%

Base: those with STEM qualifications – 314, those without – 530. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Teachers with prior qualifications are nearly four times as likely to feel very confident connecting STEM content with real-world applications, than those who do not have prior STEM qualifications.

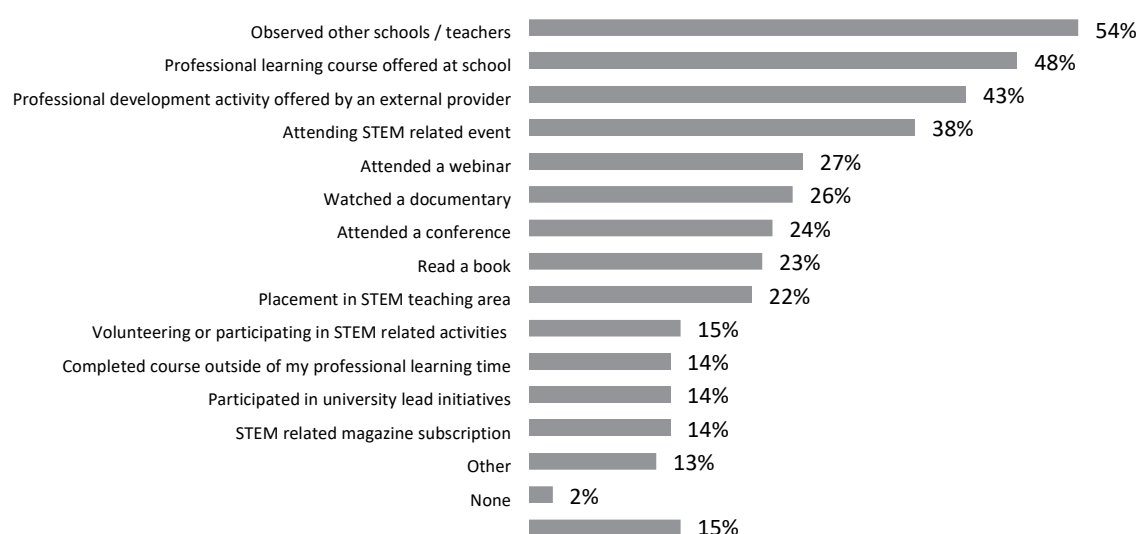
With a higher proportion of men having obtained STEM qualifications prior to teaching, it is understandable that men feel more confident to connect STEM content with relevant, real-world applications and career examples compared to women (83% vs 70%). A similar pattern can be observed among primary and secondary school teachers, with a higher proportion of secondary teachers (78%) feeling confident with making STEM connections compared to primary teachers (65%).

Further STEM education

Among educators where STEM is relevant to their teaching, 85% have undertaken some level of further education to improve their knowledge of STEM. This includes a wide range of activities, from formal courses through to less formalised professional development such as reading books, magazines, websites or watching documentaries. In regard to formalised training, 62% of teachers have undertaken further STEM education in a formalised setting (completed course outside of my professional learning time, professional learning course offered at school, professional development activity offered by an external provider or participated in university lead initiatives).

Figure 8: Engagement with further education to improve STEM knowledge.

Q. Which of the following further education have you undertaken to improve your knowledge of STEM since you started working in the education sector? (MC)



Further education	%
Net: Undertaken further STEM education	85%
Undertaken formalised training in STEM	62%
Have not undertaken further STEM education	15%

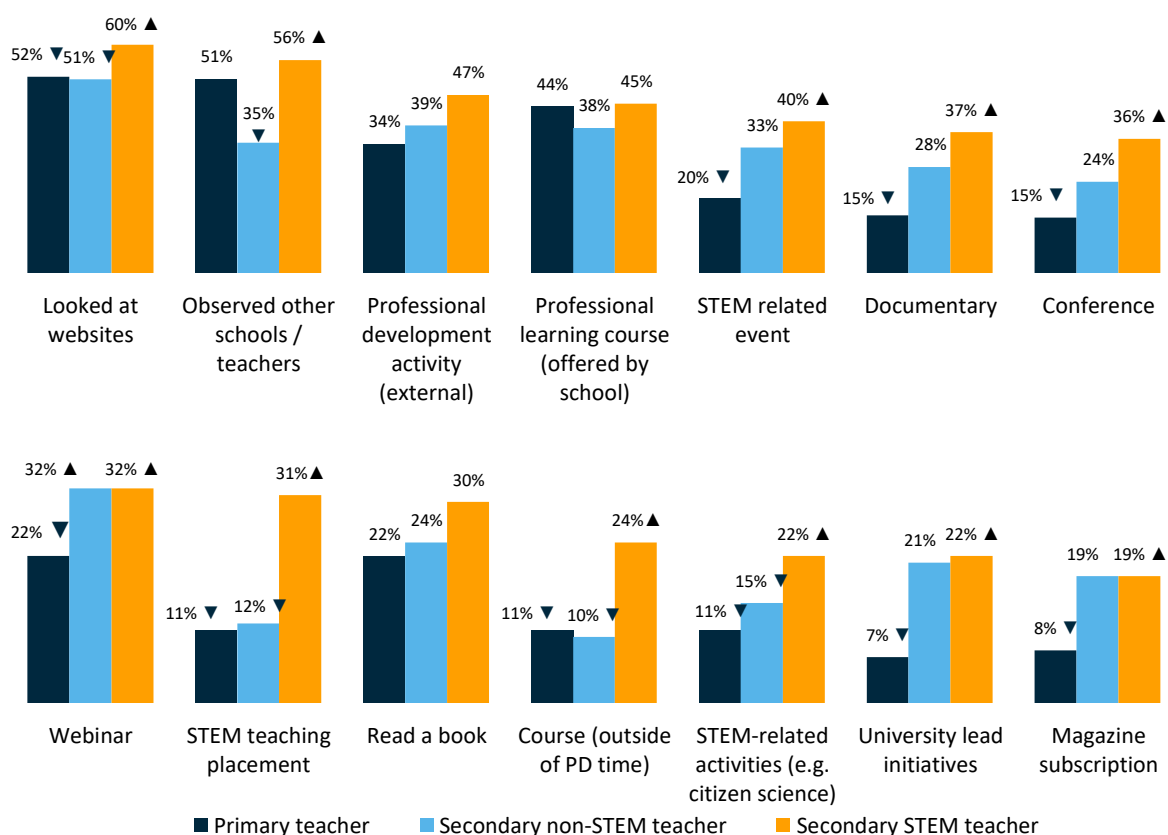
Base: Those who said that STEM skills are relevant to their role – 692. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Differences in gender were observed in the undertaking of further STEM education, with 39% of men reporting to have attended a STEM-related event, compared to 25% of women. Furthermore, 44% of men attended a STEM-related conference compared to 19% of women. Men were also more likely to have done a placement in a STEM teaching area (28% vs 13% of women).

As shown in Figure 9, the survey also found that there was little difference overall among primary teachers and non-STEM secondary educators in terms of the further education they had engaged with to improve their STEM knowledge. However, as expected, there was a clear difference in the level of further STEM education when comparing STEM secondary teachers compared to other teachers, with 91% having undertaken at least some form of further STEM education and 68% having undertaken formal STEM training.

Figure 9: Engagement with further education to improve STEM knowledge.

Q. Which of the following further education have you undertaken to improve your knowledge of STEM since you started working in the education sector? (MC)



Further education	Primary teachers	Secondary non-STEM teachers	Secondary STEM teachers
Net: Undertaken further STEM education	84%	82%	91%
Undertaken formalised training in STEM	59%	63%	68%
Have not undertaken further STEM education	16%	18%	9%

Base: primary teachers – 362, secondary non-STEM teachers – 156, secondary STEM teachers – 174. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The survey also revealed a few other distinct differences between teacher cohorts. Firstly, those teaching in higher socioeconomic areas were more likely to have attended a professional development activity offered by an external provider compared those working in lower socioeconomic areas (44% vs 33%). Teachers working in single sex schools were more likely than co-ed teachers to have attended a conference (40% vs 21%), to have had a placement in a STEM teaching area (29% vs 15%) and to have participated in university-led initiatives (30% vs 12%). Finally, metro teachers over-indexed on having STEM-related magazine subscriptions compared to regional teachers (15% vs 9%).

Educator attitudes towards STEM

Awareness and understanding

To get an indication of their understanding of STEM, educators were asked to write what they believe STEM stands for. Nine in ten (87%) correctly answered with science, technology, engineering and mathematics (although not necessarily in that order). A further 9% were only able to correctly identify three out of the four subjects, with engineering proving to be the subject that most got confused with (63% among those who got only three correct).

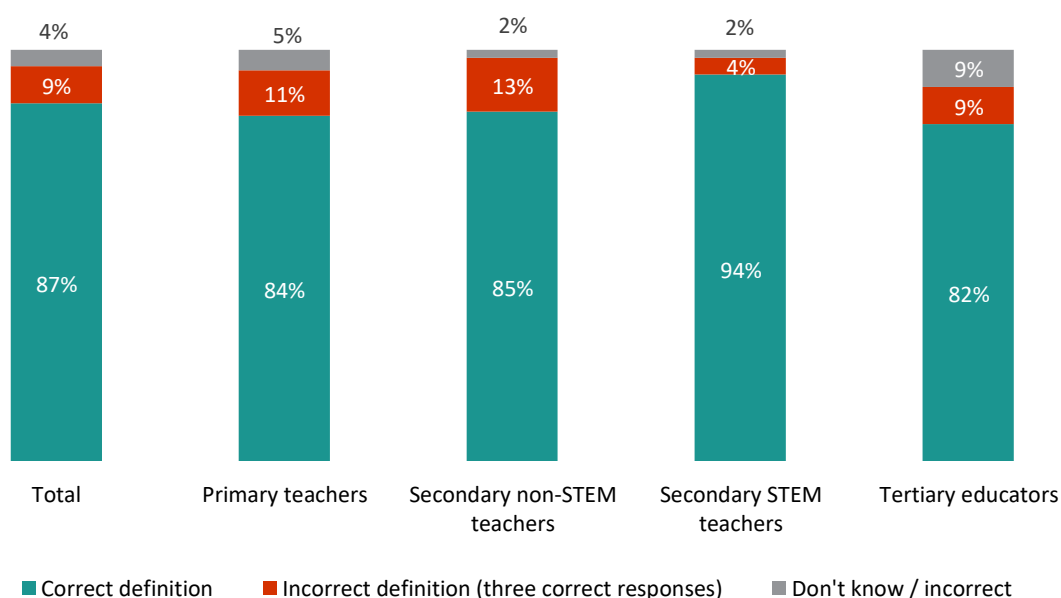
These results were significantly higher compared to the results of both the parent and student survey where the same question was asked. Among parents, only half (52%) were able to identify all four subjects (*Parents 2020/21* research), while 58% of students got all subjects right (*Youth in STEM 2019 / 20* research).

Only 4% of respondents were incorrect in their definition of all four subjects or acknowledged they didn't know. No differences were recorded between men and women.

Secondary STEM teachers recorded the highest score of correct responses (94%), followed by other secondary non-STEM teachers (85%), primary teachers (84%) and lastly the tertiary educators (82%). Those in government and independent schools (89% and 88% respectively) were also more likely to give a correct definition compared to Catholic schools (80%). The survey also found that Aboriginal and / or Torres Strait Islander teachers were less likely to be able to correctly define the full acronym compared to other teachers surveyed (28% vs 9%).

Figure 10: Understanding of the term 'STEM' (coded).

Q. Please write below what you believe the term STEM stands for.



Base: total educators – 844, primary teachers – 362, secondary non-STEM teachers – 156, secondary STEM teachers – 174, tertiary educators – 71. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

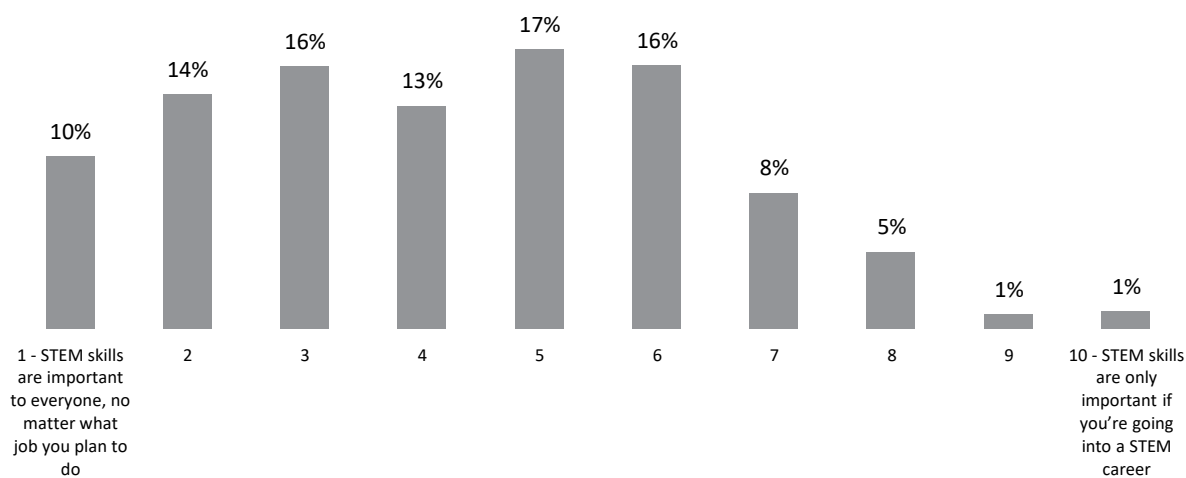
Educators were asked to place themselves on a 10-point scale with two opposing statements about STEM skills: STEM skills are important to everyone, no matter what job you plan to do, and STEM skills are only important if you're going into a STEM career. The scale purposefully did not have a midpoint to force respondents to pick a side.

Seven in ten (70%) selected a position on the left side of the scale, agreeing that STEM skills are important to all. The strength of this agreement was varied with a relatively even spread of positions. Three in ten (30%) took the opposing view, that STEM skills are only important if you are going into a STEM career. However, the strength of agreement with this opposing statement was lower, with point six on the scale the most frequently selected choice.

A higher proportion of secondary school teachers selected a position on the left side of the scale compared to primary school teachers (77% vs 65%). The same results were seen when comparing teachers with different levels of teaching experience, with a higher proportion of teachers with 12+ years of experience selecting a position on the left side of the scale compared to those with less than 12 years' experience (77% vs 65%). Teachers at single sex schools were also more likely than co-ed teachers to feel more strongly about STEM skills being important to everyone, regardless of career (88% vs 70%).

Figure 11: Distribution of perceived importance of STEM skills for future work.

Q. When discussing skills and careers opportunities with students, where do you place yourself on the scale below?



Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Seven in ten educators believe that STEM skills are important for everyone, regardless of career path.

The average score out of ten for all respondents was 4.3 (where 1 = totally agree with the left statement and 10 = totally agree with the right statement). The below table shows the average scores among groups of educators who most strongly agreed that STEM skills are important to all, compared to the average for all teachers.

Table 2: Average scores of perceived importance of STEM skills for future work by teacher type.

Teacher type	Average score
All teachers	4.3
Secondary STEM teachers	3.6
Non-classroom educators	3.9
Teachers with STEM qualifications	4.0

Life skills associated with STEM education

When asked in an open-ended question, what broader life skills does STEM education provide students, the most common skills mentioned by respondents were problem solving (17%), creativity (15%), collaboration / teamwork (15%) and critical thinking (10%).

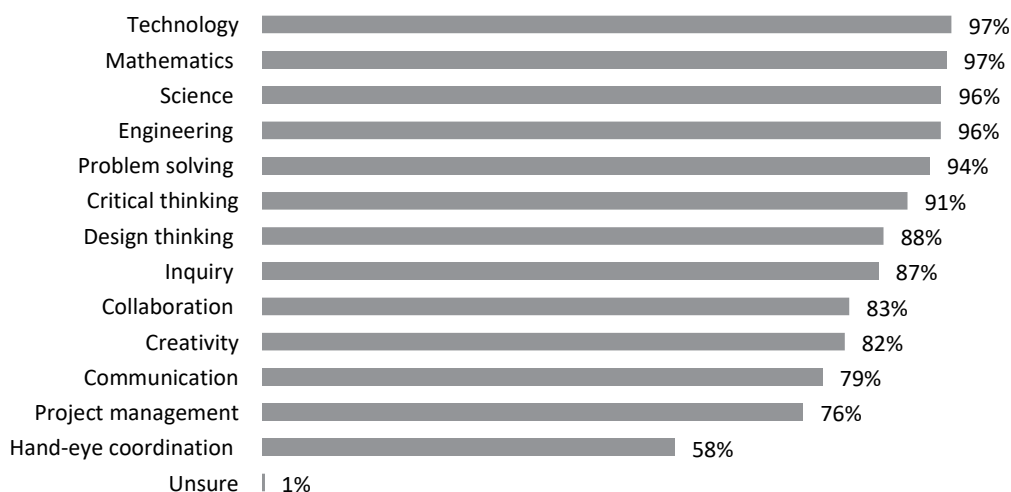
Respondents were then provided with a list of skills and asked to identify which ones they believe are STEM skills. Over 96% of educators identified the core STEM skills (science, technology, engineering and mathematics), while between 94% and 82% correctly identified other life skills such as problem solving and critical thinking, which closely aligned to their open-ended responses.

More than half of respondents also identified skills unrelated to STEM, such as communication (79%), project management (76%) and hand-eye coordination (58%). Despite these skills ranking lowest compared to all others, these results suggest there is a wide interpretation of the skills derived from STEM education.

When grouping all unrelated STEM skills, the survey revealed that teachers from mainstream settings were more likely to select these skills compared to teachers from specialised school settings (91% vs 76%). Similarly, regional teachers were also more likely to select these skills compared to their metro counterparts (91% vs 85%). Interestingly, teachers with more years of experience (12+) were more likely to select non-related STEM skills compared to their less experienced (less than 12 years) peers (91% vs 85%)

Figure 12: Skills that educators associate with STEM.

Q. Which of the below are STEM skills? (MC)



Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

In the *Parents 2020/21* research, parents were asked a similar question regarding what they believe are skills developed through the study of STEM, excluding skills directly related to science, technology, engineering and mathematics. The results revealed that both parents and teachers selected the same top three life skills: problem solving, critical thinking and design thinking. This alignment among key influencer groups is beneficial for students to ensure the narrative around STEM skills is consistent at school and at home.

STEM careers and opportunities

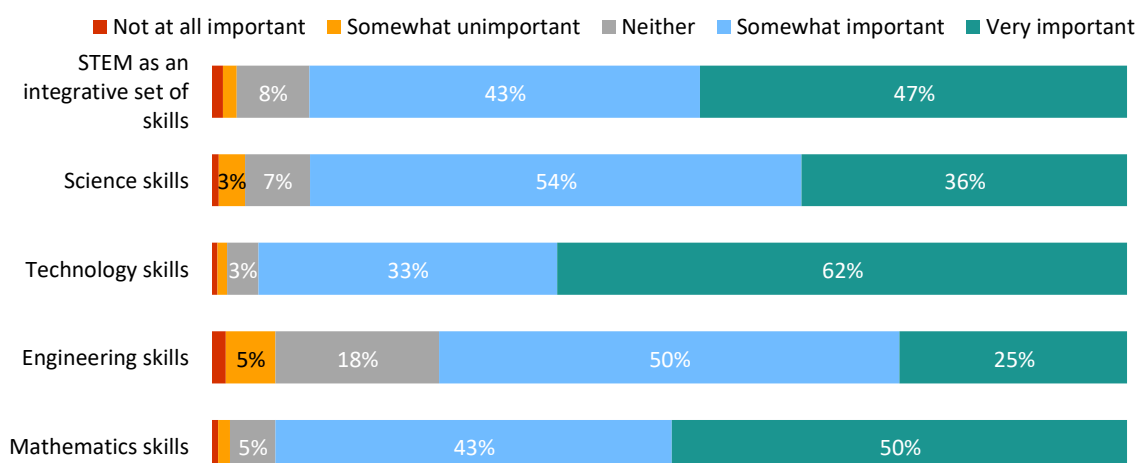
Importance of STEM skills for employment

Most educators saw all four individual STEM skills and STEM as an integrative set of skills as being important to acquire a good job in the future. The greatest importance was placed on technology with almost two thirds (62%) saying these skills are very important, followed by mathematics skills (50% said these skills are very important). In contrast, only 25% of educators said that engineering skills are very important.

When comparing perceptions between genders, the survey found that men were 31% more likely to say science is very important to acquire a good job in the future compared to women. Men were also 43% more likely to say the same about engineering, compared to women.

Figure 13: Importance of STEM skills in relation to future job opportunities.

Q. In your opinion, how important is it for your students to have STEM skills in order to acquire a good job in the future?



STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: somewhat / very important	89%	89%	95%	75%	93%
Net: somewhat / very unimportant	3%	4%	2%	7%	2%

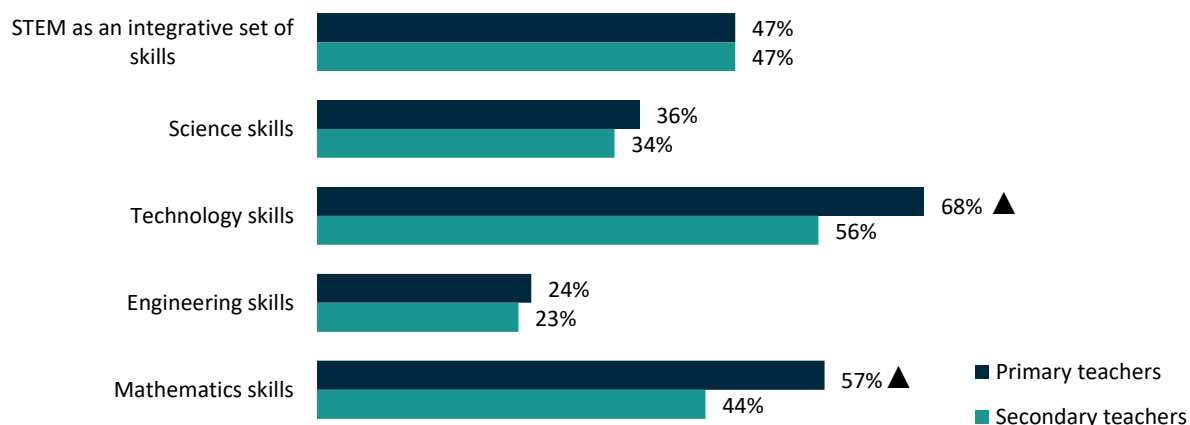
Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Educators place the greatest importance on technology skills, followed by mathematics skills and science skills. Engineering skills are seen as the least important, with only one quarter of educators saying that engineering skills are very important.

The survey found that primary teachers place significantly greater importance on technology skills compared to secondary teachers (68% vs 56%). The same pattern was found for mathematics skills (57% vs 44%).

Figure 14: Importance of STEM skills for future job opportunities (% very important).

Q. In your opinion, how important is it for your students to have STEM skills in order to acquire a good job in the future?

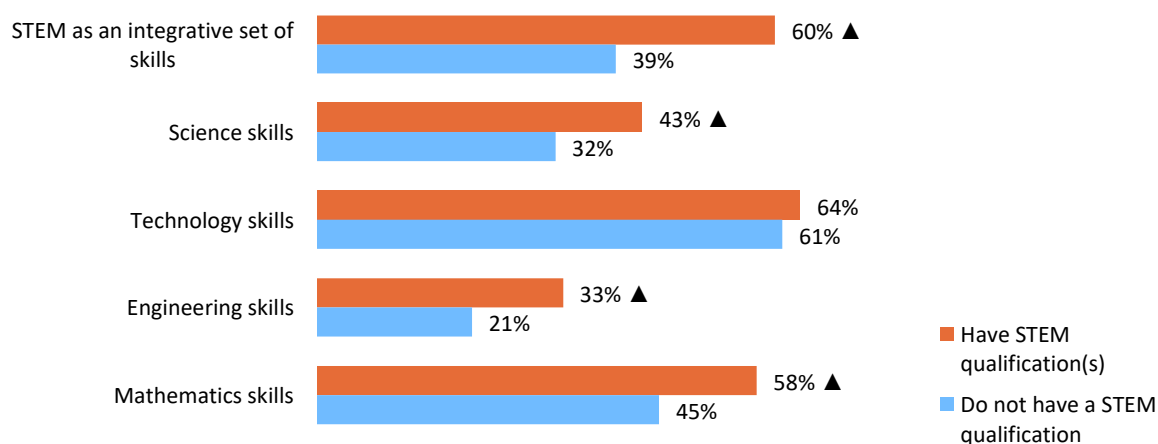


Base: primary school teachers – 362; secondary school teachers – 330. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Those with prior STEM qualifications were also significantly more likely to identify STEM skills as very important to acquire a good job in the future (60% say integrative STEM skills are very important, compared to 39% of those without STEM qualifications). The only skill which was seen as equally important was technology (64% for those with STEM qualifications vs 61% for those without STEM qualifications).

Figure 15: Importance of STEM skills for future job opportunities (% very important).

Q. In your opinion, how important is it for your students to have STEM skills in order to acquire a good job in the future?



Base: those with prior STEM qualification(s) – 313, those without – 531. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The survey also revealed that teachers from government schools placed a higher importance on mathematics skills (56%) compared to independent (43%) and Catholic (40%) school teachers. They also placed a higher importance on science skills (40%) in comparison to Catholic school teachers (25%).

When comparing with the *Parents 2020/21* research results, parents’ perceptions around the importance of STEM skills for future employment was closely aligned with those of educators across all subjects. However, when comparing with the views of young people from the *Youth in STEM 2019/20* research, it is clear that parents and educators place a higher level of importance across all STEM subjects compared to young people.

Table 3: Perceived importance of STEM skills for future career (net: somewhat / very important).

Net: somewhat / very important	STEM in general	Science topics	Technology topics	Engineering topics	Mathematics topics
Parents	86%	81%	89%	75%	89%
Educators	89%	89%	95%	75%	93%
Youth (2019/20)	N/A	69%	79%	58%	72%

Educators who disagreed that STEM skills are important to acquire a good job in the future were asked why they held this opinion. The open-ended responses can be grouped into the following main themes:

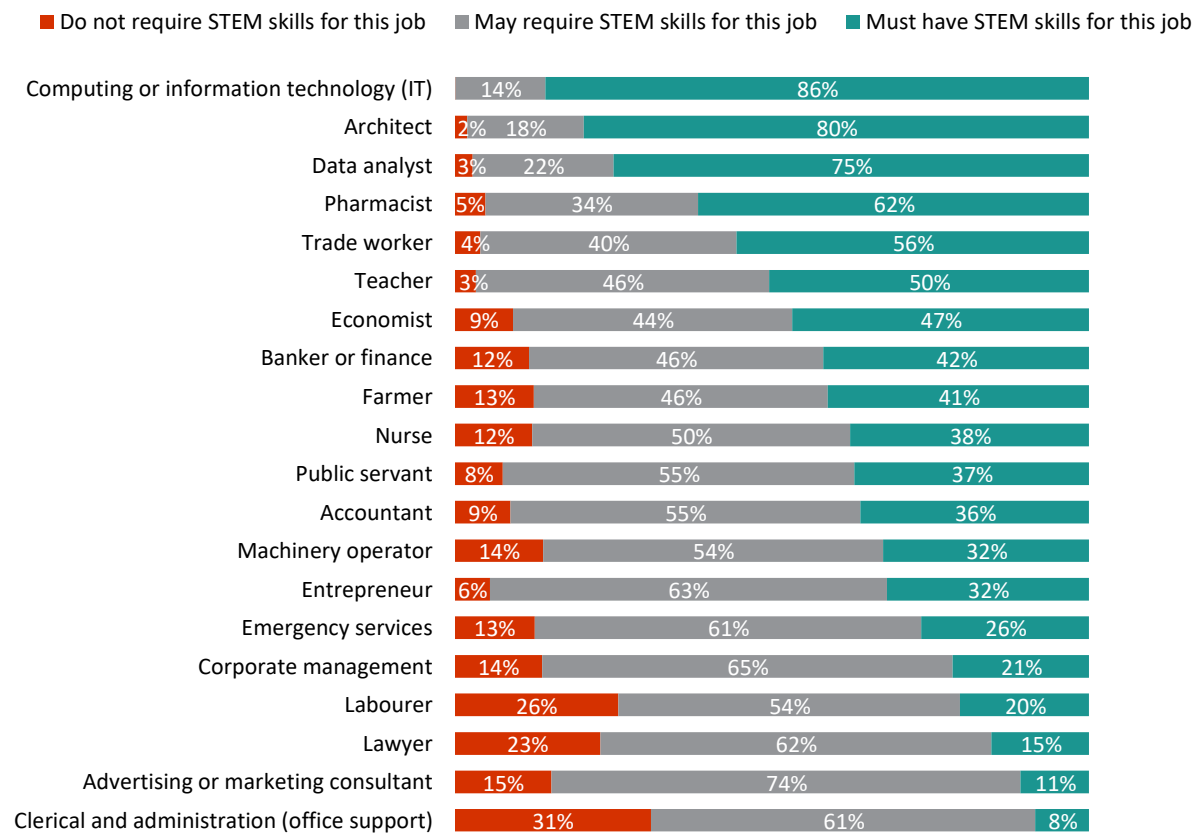
- STEM isn’t required for all jobs
- There are lots of other industries that require a different set of skills
- Not all students have the skills / interest / aptitude for STEM but can excel in other subject areas and careers instead
- Most jobs require on the job learning so what you study isn't overly important as long as you study something
- Technology skills are important as they apply to all roles but the other STEM topics are specific so only apply to those entering those fields
- Their students are unlikely to enter into highly skilled STEM careers (i.e. teachers in special needs schools)
- Questioning the definition of a "good job" and its use within the question
- The lack of science career opportunities in Australia compared with other countries.

To further understand educators’ association of STEM skills and their importance for certain jobs, respondents were presented with a list of jobs and were asked to evaluate whether STEM skills were required for each role. The list was purposefully developed to include jobs with varying degrees of STEM skill involvement. The survey found that most educators believe many common jobs may or must require STEM skills and only a small proportion assessed some jobs as not requiring STEM skills at all.

The results suggest that educators have a good understanding of the breadth of the value that STEM skills can provide in any occupation. Even a role such as a clerical and administrative worker had at least seven out of ten (69%) educators acknowledging that it may or must require STEM skills.

Figure 16: Perceptions of how essential STEM skills are for specific careers.

Q. How essential do you think STEM skills are to the following careers?



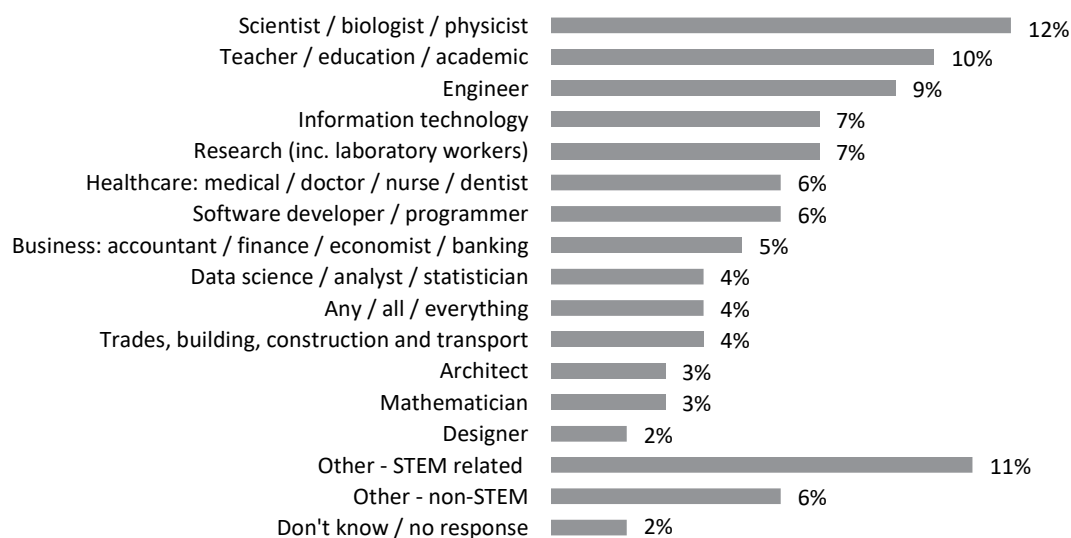
Base: total – 844. Sample was split in half to reduce survey fatigue (a maximum of 428 saw each answer option). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Jobs associated with STEM qualifications

When asked what jobs they think people with a STEM-related qualification can achieve, three out of the top four responses focused directly on the attributes of STEM. Jobs related to being a scientist topped the list (12%), various forms of engineering ranked third (9%) and jobs related to information technology ranked equal fourth alongside research (7%). One in ten (10%) cited teaching roles as a job a person with STEM qualifications can attain.

Figure 17: Jobs associated with STEM qualifications (coded).

Q. What type of jobs do you think people would be able to get if they have a STEM related degree or certificate? Please place a single job in each box. Please enter as many as you can think of.



Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Other roles educators associated with STEM among smaller proportions of educations were:

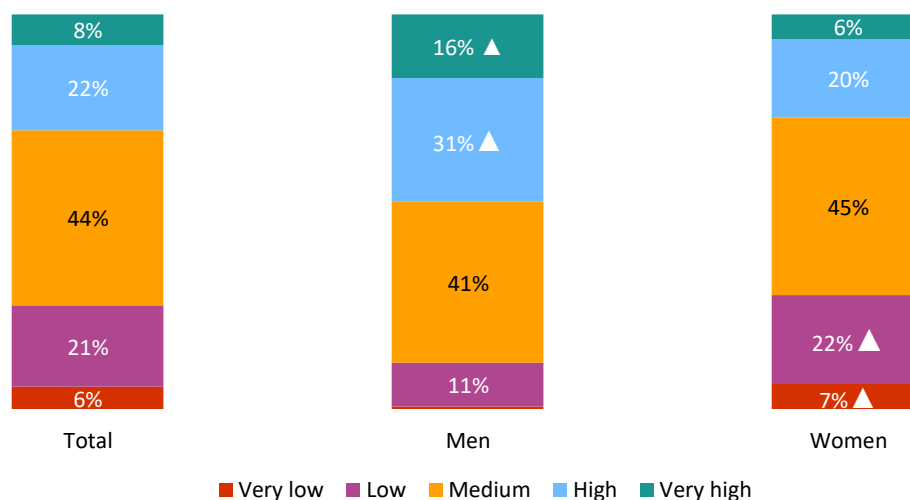
- **STEM-related:** robotics, automation, manufacturing, aviation, space, rockets, drones, chemist, pharmacy, pharmaceuticals, technology, sustainability and climate, agriculture, mining, energy, environmentalist, conservationist
- **Not typically STEM-related:** receptionist, professional, socialisation, hairdresser, cooking, community help, project management, leaders.

In comparison with the *Parents 2020/21* report, a similar proportion of parents and educators cited engineering (10% of parents vs 9% of educators), information technology (5% of parents vs 7% of educators), and mathematician (3% of parents vs 3% of educators). However, as expected, teachers showed a broader awareness of STEM related jobs with only 2% unable to answer the question compared to 19% of parents.

As part of the survey, educators were asked to self-assess their ability to explain what different STEM careers involve. Only three in ten (29%) would rate their ability as high or very high. Higher self-assessments were driven more by men (47%) compared to women (12%), although this is also related to a higher proportion of men who have STEM qualifications compared to women (47% vs 33% of women).

Figure 18: Educators' self-rated ability to explain what different STEM careers involve.

Q. How would you rate your ability to explain what different STEM careers involve / what the people in those careers do?



Self-rated ability	Total	Men	Women
Net: high / very high	29%	47%	26%
Net: low / very low	26%	12%	29%

Base: total – 844, men – 122, women – 718. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Below are other significant differences among key demographic groups.

Table 4: Educators' self-rated ability to explain what different STEM careers involve (net: high / very high)

Audience	WEIGHTED %
Teacher type	
Primary teachers	19%
Secondary teachers	38%
STEM qualifications	
Have STEM qualification(s)	51%
Do not have a STEM qualification	18%

Educators' self-rated ability to explain what different STEM careers involve is generally low, with only three in ten rating their ability as high or very high. Men were more likely to rate their ability as high than women, which may be related to men being more likely to have STEM qualifications.

The STEM teaching experience

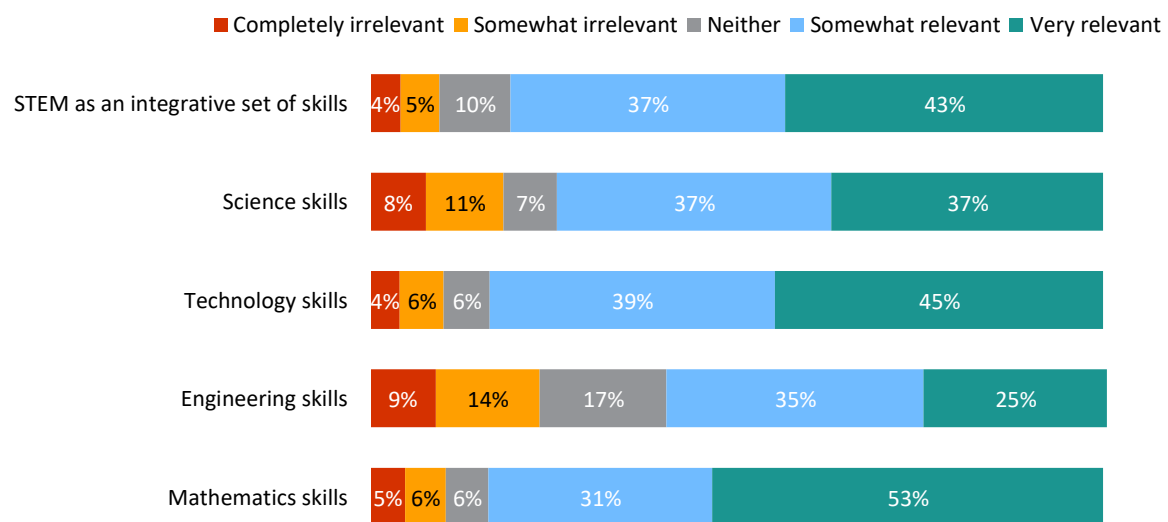
Relevance of STEM to teaching practice

Most educators surveyed identified the teaching of STEM skills as being relevant to their role. STEM as an integrative set of skills, technology and mathematics skills were all selected as relevant to the role of 80% or more of respondents. This speaks to the universal nature of these topics, irrespective of the type of teacher or the year levels they teach.

Relevance was slightly lower for science skills (74%) and significantly lower for engineering skills, which was only relevant to 60% of respondents. This follows a trend seen throughout the survey results with mathematics and technology potentially seen as more familiar concepts given their broader relevance, while science and engineering skills are potentially viewed as more niche and therefore less relevant at a general level.

Figure 19: Relevance of teaching STEM skills.

Q. In your main role, how relevant is the teaching of STEM skills?



STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: somewhat / very relevant	81%	74%	83%	60%	84%
Net: somewhat / completely irrelevant	10%	18%	10%	23%	10%

Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

In contrast, in the Youth in STEM research, young people were asked about their interest levels for each of the four subjects. Technology (64%) and science (62%) recorded the highest interest levels and mathematics (46%) and engineering (44%) the lowest. The main difference between educators and students is that educators place higher relevance on mathematics but the young people show low interest levels. However, when it comes to engineering, both educators and young people see the subject as the least relevant and least interesting.

In addition to their individual answers shown above, respondents were grouped based on their answers to the relevance of the four STEM subject areas (science, technology, engineering, mathematics) and STEM as an integrated set of skills.

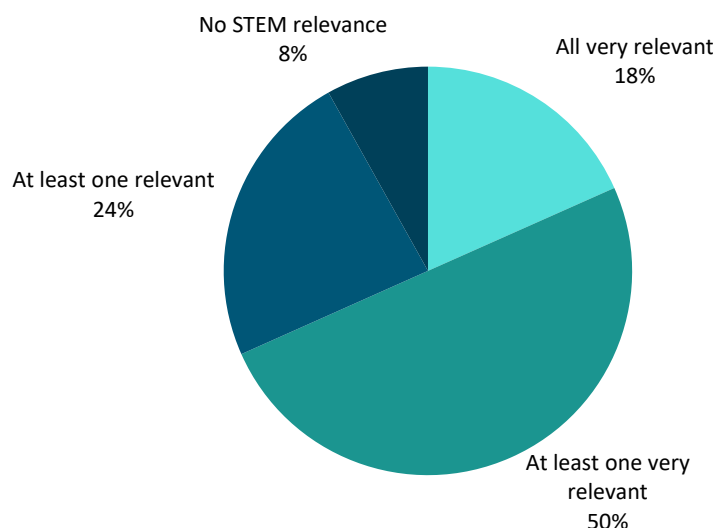
These groupings created the following segments:

- Those who find all five topics very relevant to their teaching
- Those who find at least one topic very relevant to their teaching
- Those who have at least one topic relevant to their teaching, but none are very relevant
- Those whose teaching has no relevance to any STEM topics.

These segments show that two in ten educators are in a teaching role that is fully STEM integrated (18%), half find at least one STEM subject highly relevant to their teaching (50%), while a quarter have some connection to STEM in their teaching (24%) and only 8% see no relevance with STEM in their main role.

Figure 20: Relevance of teaching STEM skills (segments).

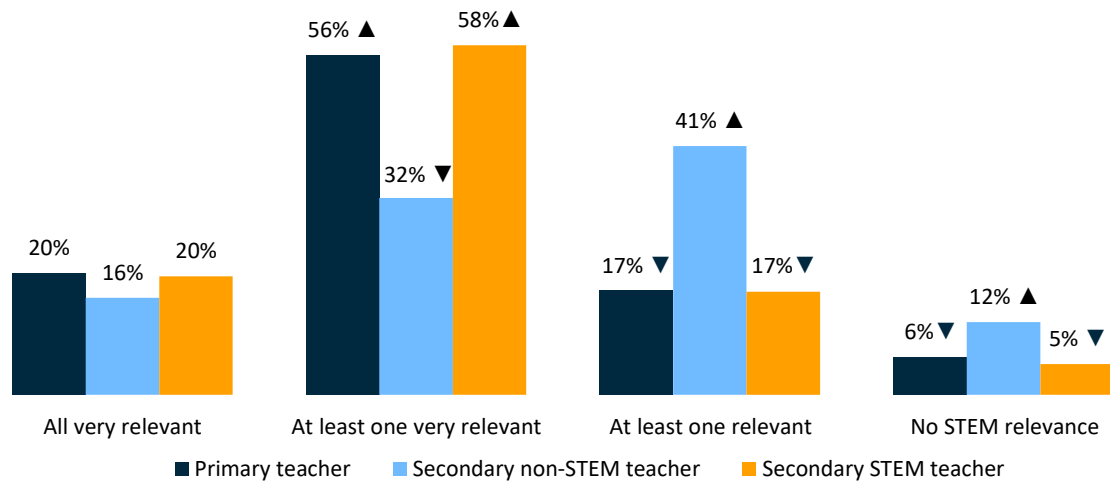
Q. In your main role, how relevant is the teaching of STEM skills? Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.



Exploring these segments further, we see that primary and secondary STEM teachers have similar relevance scores to one another. While relevance is equal, secondary STEM teachers can focus purely on this topic, while primary teachers need to address STEM alongside all other aspects of the curriculum.

Figure 21: Relevance of teaching STEM skills.

Q. In your main role, how relevant is the teaching of STEM skills?



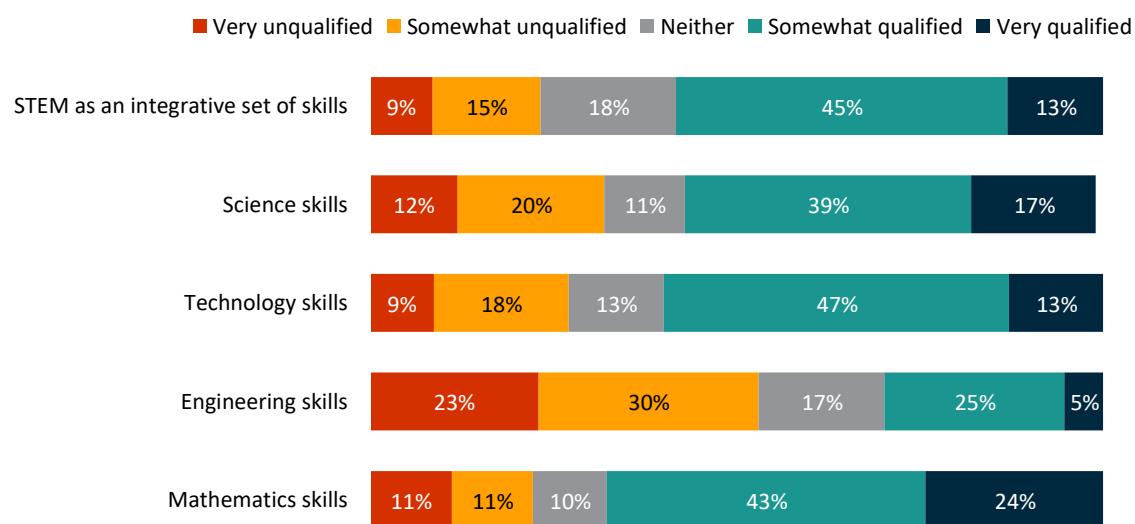
Base: primary school teachers – 362, secondary non-STEM teachers – 156, secondary STEM teachers – 174. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Feelings of qualification to teach STEM

When asked which STEM subjects they feel qualified to teach, mathematics was the clear leader with 67% feeling qualified to teach it. Next was technology (60%), followed by science (56%), and STEM as an integrative set of skills (58%). Feelings of qualification to teach engineering skills was significantly lower, with only three in ten who feel they are qualified to teach this (30%).

Figure 22: How qualified educators feel about teaching each STEM subject.

Q. How qualified do you feel to teach STEM subjects?



STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: somewhat / very qualified	58%	56%	60%	30%	67%
Net: somewhat / very unqualified	23%	32%	27%	53%	22%

Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Looking at the data at a more detailed level, men generally feel they are more qualified to teach STEM, with 90% selecting at least one topic area in which they feel qualified compared with 80% of women. In terms of specific skills, men are significantly more likely to feel qualified to teach technology skills (70% vs 58% of women) and engineering skills (47% vs 27% of women). There were no significant differences between men and women in terms of feeling qualified to teach mathematics, science, or STEM as an integrative set of skills.

There were also significant differences in feelings of qualification to teach STEM between primary teachers, secondary STEM teachers and secondary non-STEM teachers, with secondary STEM teachers generally feeling the most qualified. The exception to this rule was for mathematics, where primary teachers feel slightly (although not significantly) more qualified.

Table 5: Proportions of teachers who feel qualified to teach STEM by teacher type (net: somewhat / very qualified).

Q. How qualified do you feel to teach STEM subjects?

STEM subject	Primary teachers	Secondary STEM teachers	Secondary non-STEM teachers
STEM as an integrative set of skills	59%	65%	41%
Science	59%	65%	35%
Technology	64%	67%	39%
Engineering	30%	39%	9%
Mathematics	80%	73%	30%

Base: primary school teachers – 362, secondary non-STEM teachers – 143, secondary STEM teachers – 174.

Within secondary schools, most teachers feel qualified to teach the STEM skills that align to the subjects they currently teach. For example, 93% of biology teachers feel they are qualified to teach science, 98% of digital technology teachers feel qualified to teach technology skills.

Table 6: Proportions of teachers who feel qualified to teach STEM by subject taught (net: somewhat / very qualified).

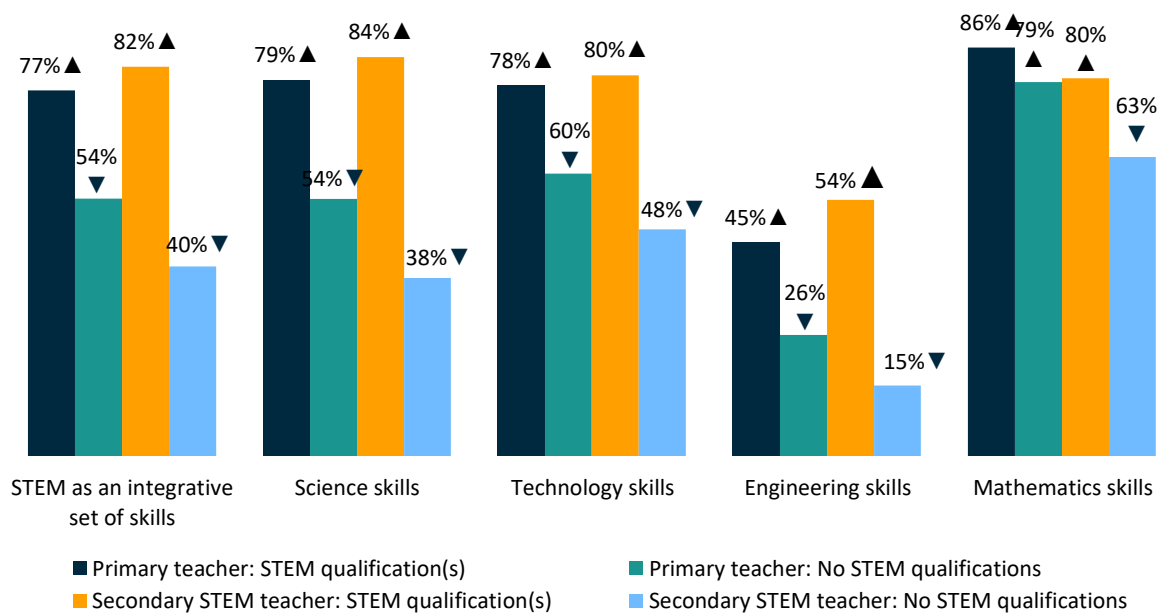
Q. How qualified do you feel to teach STEM subjects? / Which of the below subjects do you currently teach in your main role? *Note: small base size.

STEM subject	Subject taught									
	General Mathematics	Mathematics Methods	Specialist Mathematics	Biology	Chemistry	Env. Science	Physics	Geography	Design & Tech	Digital Technology
STEM as an integrative set of skills	59%	61%	61%	82%	86%	88%	88%	38%	70%	80%
Science	61%	56%	78%	93%	97%	86%	99%	41%	50%	56%
Technology	58%	57%	73%	82%	82%	77%	87%	53%	75%	98%
Engineering	37%	45%	56%	50%	55%	53%	64%	7%	49%	54%
Mathematics	86%	92%	100%	84%	87%	87%	92%	45%	76%	79%
Base	69	19*	4*	51	48	29*	43	40	32	22*

As expected, qualifications in STEM prior to entering the education sector positively impact educators' feelings of being qualified to teach STEM skills. The impact of prior STEM education is most noticeable in the areas of engineering, science, and STEM as an integrative set of skills. The gap between those with and without prior STEM education narrows for mathematics and technology (however, a gap still exists).

Figure 23: Proportions of teachers who feel qualified to teach STEM (net: somewhat / very qualified).

Q. How qualified do you feel to teach STEM subjects?



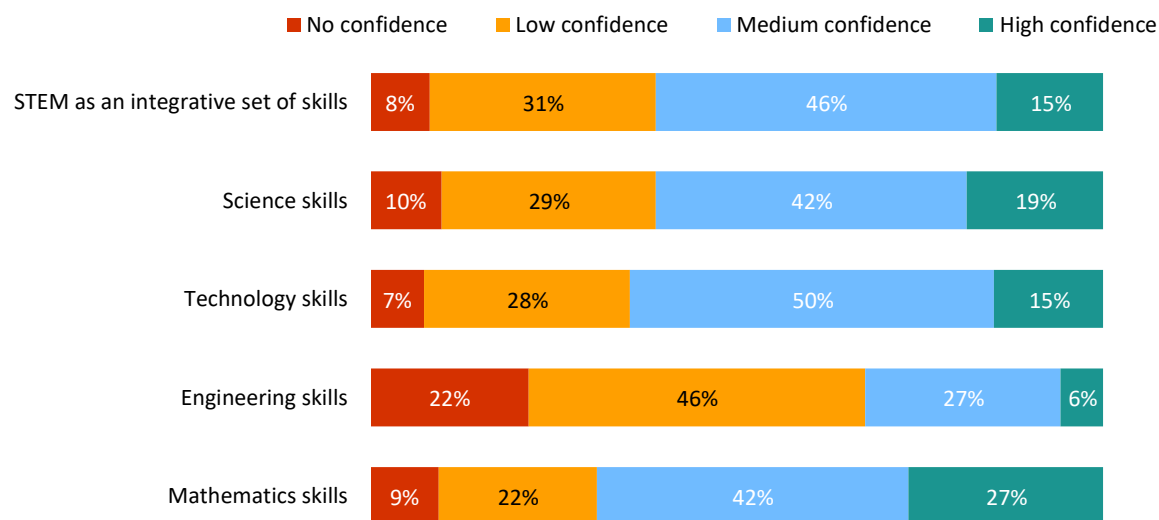
Base: educators with STEM-relevant role: primary teachers with prior STEM qualification(s) – 84, primary teachers with no prior STEM qualifications – 278, secondary STEM teachers with prior STEM qualification(s) – 109, secondary STEM teachers with no prior STEM qualifications – 65. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Confidence in teaching STEM

Overall, teachers did not report having high levels of confidence in teaching STEM-related subjects. Confidence was highest in mathematics (69%), followed by technology (64%), the integration of STEM as a set of skills (61%) and science (61%). Confidence in teaching engineering was significantly lower compared to all other subject areas, with only 32% saying they feel confident.

Figure 24: Confidence in teaching STEM.

Q. What is your confidence in teaching STEM-related subjects?



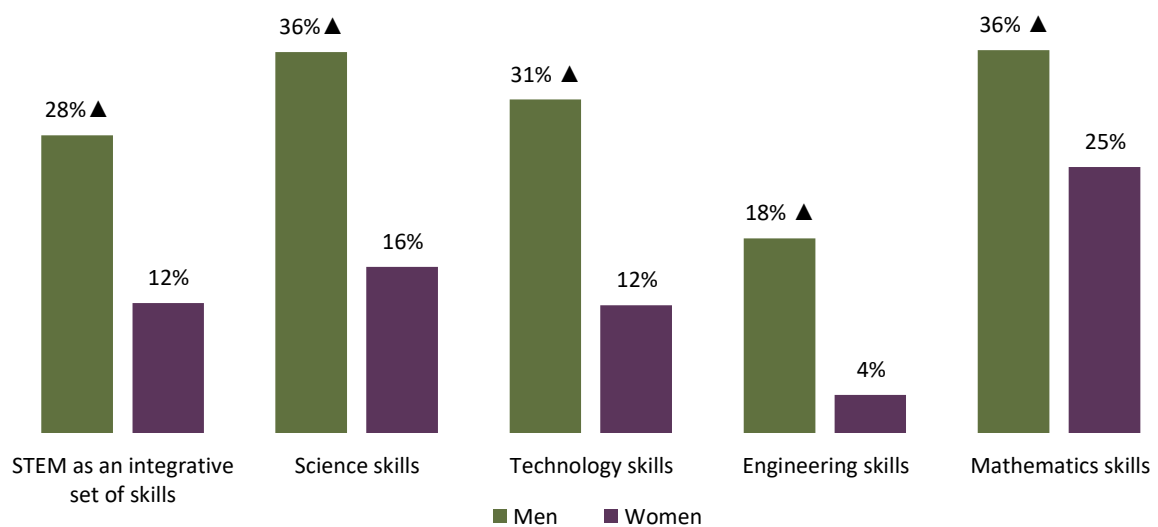
STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: medium / high confidence	61%	61%	64%	32%	69%
Net: low / no confidence	39%	39%	36%	68%	31%

Base: Base: those who currently teach or previously taught STEM subjects, those who say STEM is relevant to their role, or primary teachers, total – 812. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Reflecting some of the earlier results, the survey found major differences in confidence levels between men and women teachers in teaching STEM-related subjects, with men significantly more confident across all STEM subjects. Three in five men (60%) were confident with at least one STEM subject, compared to 39% of women. This potentially reflects the larger proportion of men teaching STEM subjects, the larger proportion of men with STEM qualifications and / or a greater tendency for men to claim confidence than women.

Figure 25: Confidence in teaching STEM (% high confidence).

Q. What is your confidence in teaching STEM-related subjects?

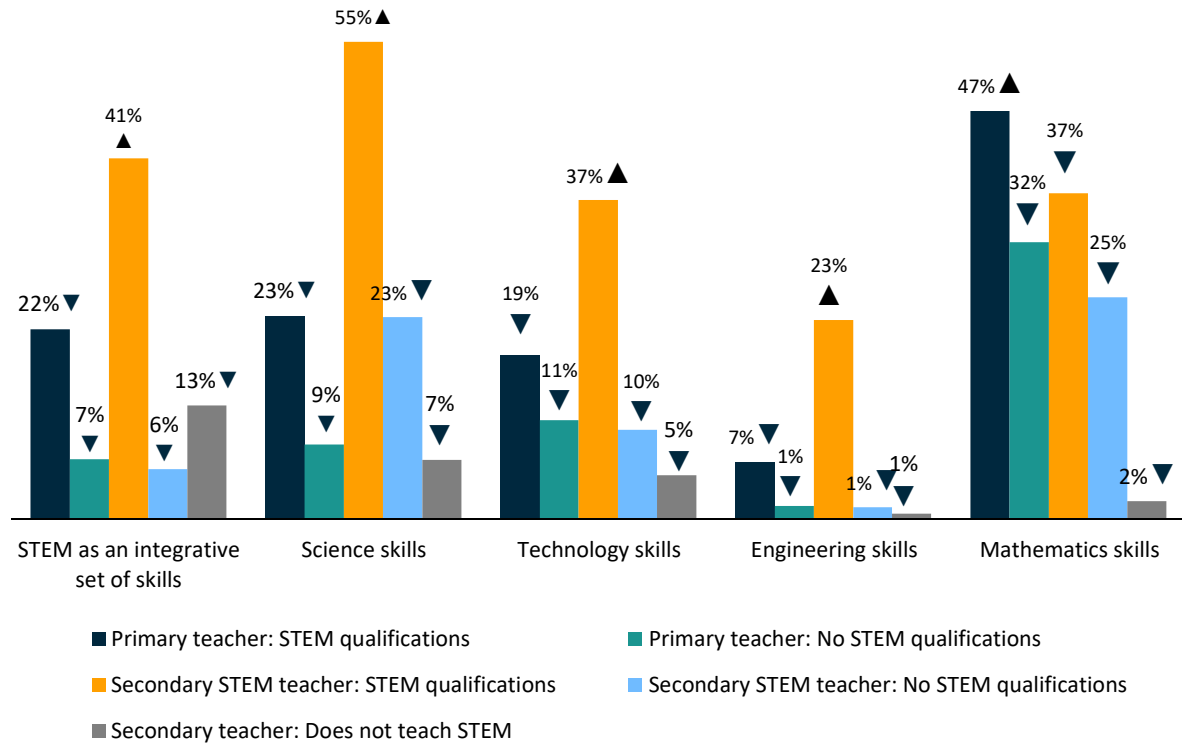


Base: those who currently teach or previously taught STEM subjects, those who say STEM is relevant to their role, or primary teachers, total – 812, men – 117, women – 691. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Prior qualifications in a STEM field also had a strong positive impact on how confident teachers are at teaching STEM skills.

Figure 26: Confidence in teaching STEM (% high confidence).

Q. What is your confidence in teaching STEM-related subjects?



Base: primary teachers with prior STEM qualifications – 84, primary teachers with no prior STEM qualifications – 278, secondary STEM teachers with prior STEM qualifications – 109, secondary STEM teachers with no prior STEM qualifications – 65, secondary teachers who do not teach STEM – 143. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Similar to the previous results regarding feeling qualified to teach STEM, those teaching specialist high school subjects have greater confidence in their ability to teach STEM than those teaching more generalised subjects. Outside of their specialisations, teachers are significantly less confident in their ability to teach STEM as an integrative set of skills.

Table 7: Confidence in teaching STEM (% high confidence).

Q. What is your confidence in teaching STEM-related subjects?

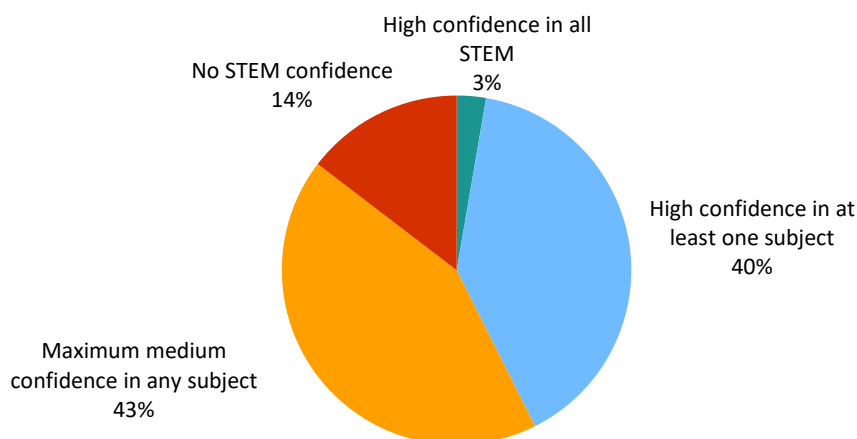
STEM subject	Subject taught									
	General Mathematics	Mathematics Methods	Specialist Mathematics	Biology	Chemistry	Env. Science	Physics	Geography	Design & Tech	Digital Technology
STEM as an integrative set of skills	27%	49%	34%	36%	40%	43%	49%	7%	41%	35%
Science	36%	45%	61%	82%	81%	73%	87%	6%	26%	18%
Technology	24%	36%	34%	30%	30%	35%	38%	6%	53%	57%
Engineering	15%	26%	34%	17%	15%	20%	27%	3%	24%	18%
Mathematics	52%	65%	100%	36%	47%	38%	46%	8%	17%	30%
Base	69	19*	4*	51	48	29*	43	40	32	22*

Base: secondary school teachers, see table for base sizes. *Note: small base size.

To get an overall view of educators’ confidence levels across all STEM subject areas, respondents were grouped together based on their confidence in the four STEM subject areas as well as STEM as an integrated set of skills. The segments created are those who are highly confident in all subjects (3%), those who are highly confident in at least one subject (40%), those whose highest level of confidence in any subject was medium (43%) and finally those without confidence in any area (15%). The results show us that very few educators are confident across the entire STEM curriculum.

Figure 27: Confidence in teaching STEM (segments).

Q. What is your confidence in teaching STEM-related subjects?



Base: those in STEM-relevant roles; total – 774. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Other statistically significant differences between these segments were:

Table 8: Confidence in teaching STEM (net: high confidence in at least one subject): significant differences by audience.

Audience	WEIGHTED %
Gender	
Men	60%
Women	40%
STEM qualifications	
Have STEM qualification(s)	61%
Do not have a STEM qualification	32%
Teacher type	
Primary school teacher	45%
Secondary non-STEM teacher	19%
Secondary STEM teacher	64%

Secondary school STEM teachers have the highest confidence of any teachers: six in ten are highly confident in at least one area (64%), likely reflecting the classes they teach and their specialisations. While this is a positive result, there remains one in three (31%) high school STEM teachers who have only medium confidence in the classes they are teaching and five percent who say they have no STEM confidence.

In the primary school setting, the 10% of teachers who have no confidence with any of the STEM subjects raises a certain level of concern.

Educators who were not confident teaching STEM were given the opportunity to explain why they feel this way in an open-ended text box. The question was asked of anyone who indicated that STEM education was relevant to their teaching and if they said they lacked confidence teaching any of the STEM topic areas.

Despite stating earlier that STEM education was relevant to them, many clarified that that the reason they are not confident is because they do not teach STEM subjects or are in non-teaching / support roles. This highlights that even teachers who do not teach STEM subjects still find it has some relevance to their role.

However, the cohort that do teach STEM revealed that a lack of formal training and practical teaching experience in STEM topics contributed to their lack of confidence teaching STEM concepts.

Additional feedback, specifically related to delivering technology-focused learning, highlighted individuals' lack of confidence with computers in general, that the curriculum changes much faster than other subjects and that technology is an area where students are ahead of them in their knowledge. Others also mentioned feeling confident with the basics but feel that coding and robotics are too advanced and beyond their skillset.

In terms of lack of confidence to deliver STEM as an integrative set of skills, potentially owing to its broader nature, there was additional feedback beyond the lack of formal training highlighted above. This included a lack of time to correctly plan and prepare for integrated lessons, not knowing how to integrate across or into current curriculum and the lack of existing resources or curriculum to deliver these types of lessons.

Among STEM teachers, a lack of formal training and practical teaching experience in STEM topics contributed to their lack of confidence teaching STEM concepts.

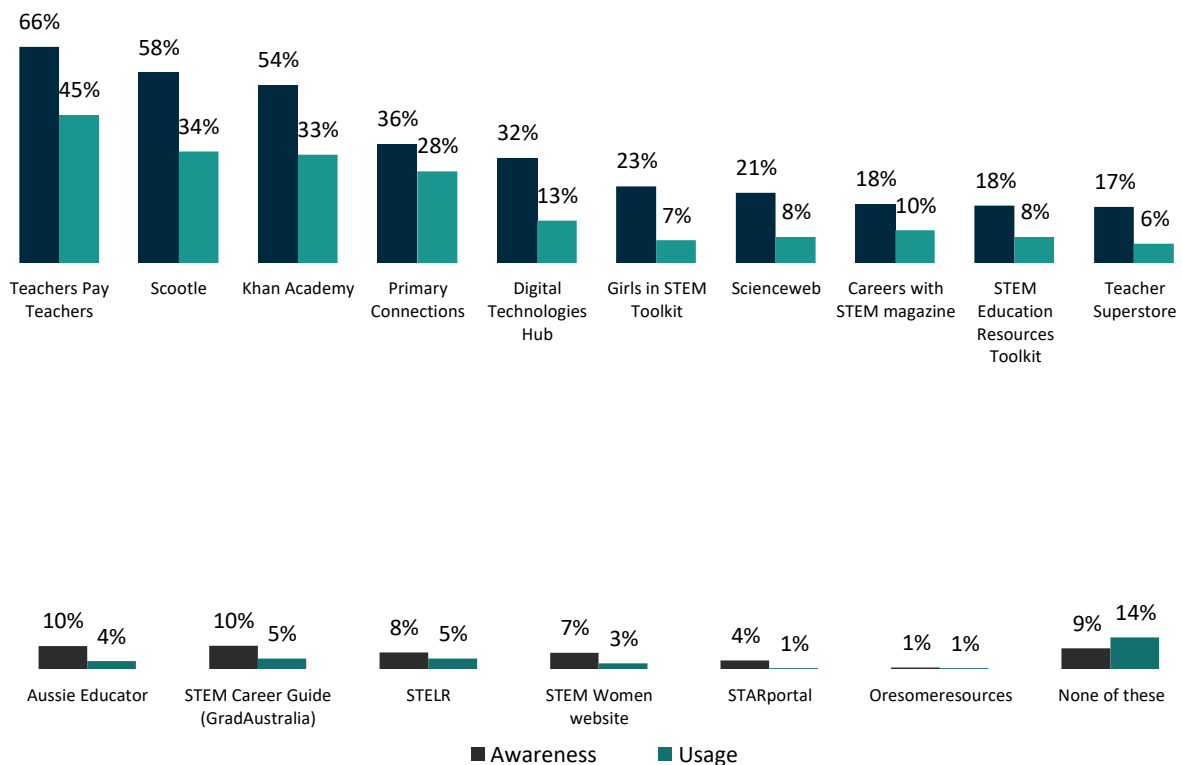
STEM teaching resources

To support in the teaching and learning of STEM, educators have access to a wide range of resources. As part of this research, educators were asked about their awareness, usage and the perceived usefulness across a list of different teaching resources.

The survey found that Teachers Pay Teachers, Scootle and Khan Academy are the most popular online resources for teachers. These sites had much higher awareness than others and a large proportion of users within those who are aware of the respective sites. Although ranking fourth, Primary Connections had the highest conversion score of awareness to usage, with 75% of those aware of the resource also having used it before.

Figure 28: Awareness and use of STEM teaching resources.

Q. Below is a list of STEM resources. Please select which of the following you've heard of before. / Q. And which of the following STEM resources have you used before? (MC)

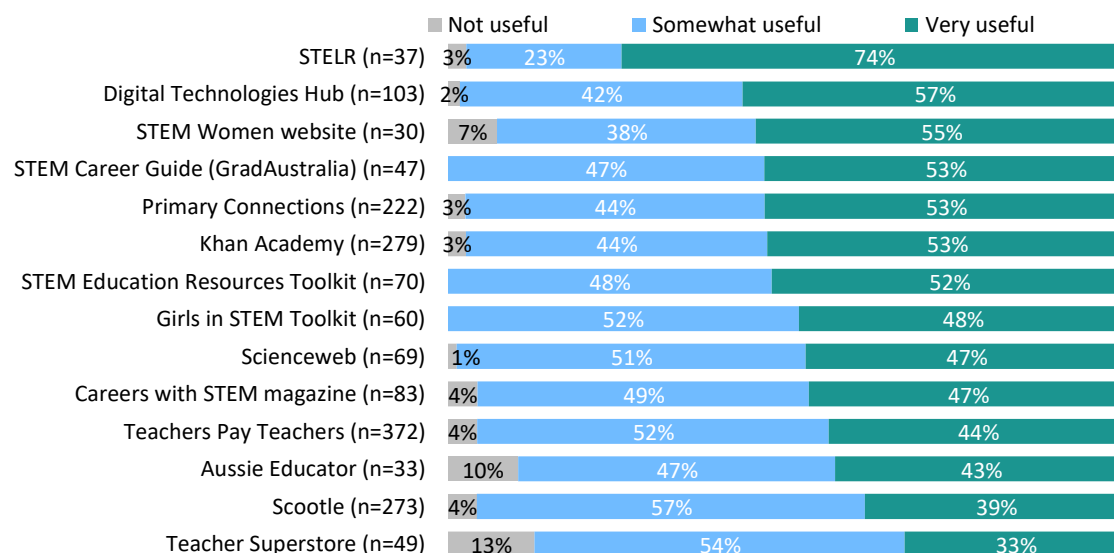


Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

While based on a small group of users (37), STELR (Science and Technology Education Leveraging Relevance) – which is a national initiative of the Australian Academy of Technology and Engineering (ATSE) – ranked as the most useful resource, with 74% of users declaring it to be very useful. For STEM Career Guide (GradAustralia), STEM Education Resources Toolkit and Girls in STEM Toolkit, 100% of users confirm that they found the resource either somewhat or very useful.

Figure 29: Usefulness of STEM teaching resources.

Q. How useful did you find the STEM resources that you have used?

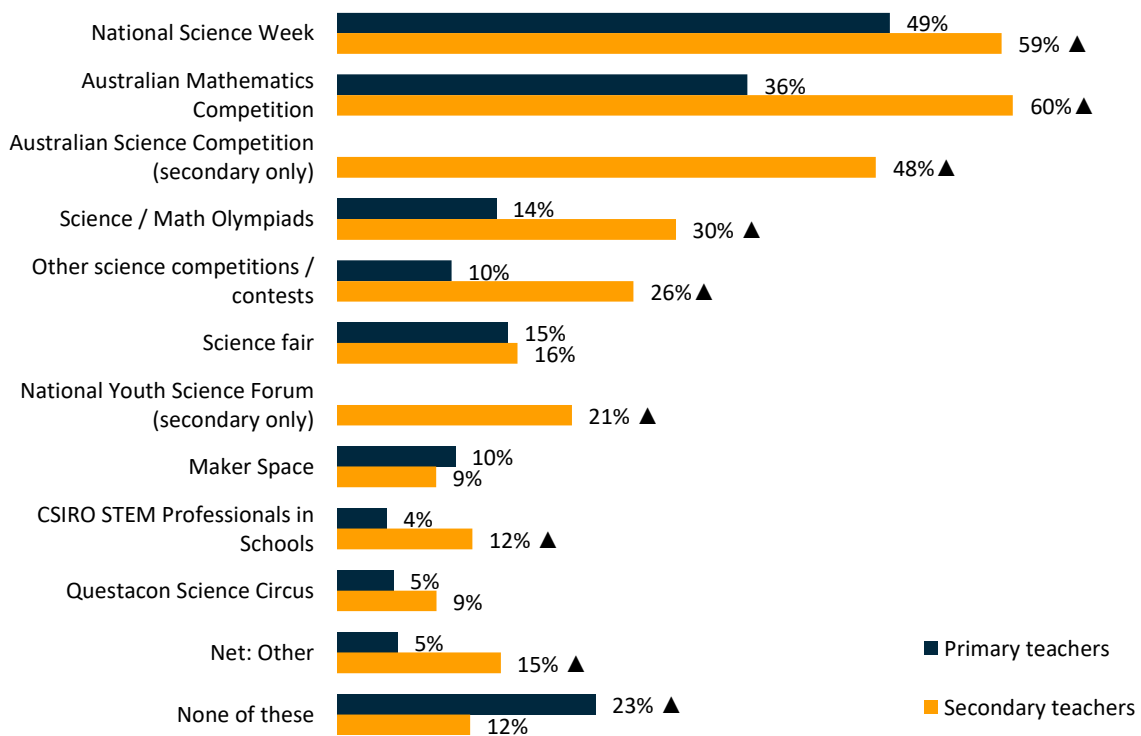


Base: those who have used each resource before (see chart). Resources with a base size of less than 30 have been removed from the chart. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The survey also investigated which STEM related activities and events schools participate in. The survey found that STEM focused events are more popular among secondary schools (driven by secondary STEM teachers), with significantly higher participation in National Science Week (59% vs 49% for primary schools), Australian Mathematics Competition (60% vs 36% for primary schools), Australian Science Competition (48% vs 19% for primary schools), and Science / Math Olympiads (30% vs 14% for primary schools), among others.

Figure 30: School / institution participation in STEM events.

Q. Which of the following activities / events does your school / institution participate in? (MC)



Base: primary teachers – 362, secondary teachers – 336. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Media portrayals of STEM

Gender bias in the media

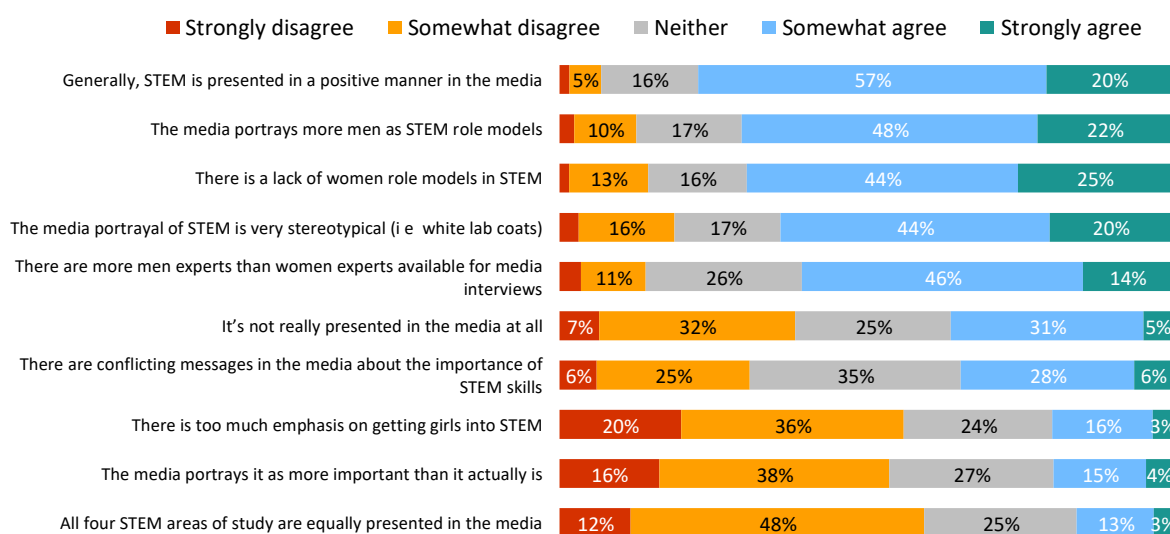
Respondents were asked how strongly they agree or disagree with a range of statements relating to how STEM is currently presented to young people in the media. The survey found that although educators generally agree that STEM is presented in a positive manner (77%), one in seven (70%) agree that the media portrays more men as STEM role models. Possible explanations for this are that the majority of educators agree (69%) there is a lack of women role models in STEM or that 60% agree that there are more men experts available for media interviews.

With most educators acknowledging this gender bias in the media, it is understandable that over half (56%) disagree that there is too much emphasis on getting girls into STEM.

However, while most agree STEM is presented positively, two thirds (64%) agree that the portrayal of STEM in the media is very stereotypical (i.e. white lab coats) and a further 60% disagree that all four STEM areas of study are equally presented in the media.

Figure 31: Agreement with statements about STEM portrayals in the media.

Q. Below is a list of statements of how STEM is currently presented to young people in the media (e.g. in television, social media, books etc.). Please indicate how much you agree or disagree with these statements.



Statements about media portrayal of STEM	Net: somewhat / strongly disagree	Net: somewhat / strongly agree
Generally, STEM is presented in a positive manner in the media	7%	77%
The media portrays more men as STEM role models	13%	70%
There is a lack of women role models in STEM	15%	69%

Statements about media portrayal of STEM	Net: somewhat / strongly disagree	Net: somewhat / strongly agree
The media portrayal of STEM is very stereotypical (i.e. white lab coats)	19%	64%
There are more men experts than women experts available for media interviews	14%	60%
It's not really presented in the media at all	39%	36%
There are conflicting messages in the media about the importance of STEM skills	31%	34%
There is too much emphasis on getting girls into STEM	56%	19%
The media portrays it as more important than it actually is	54%	19%
All four STEM areas of study are equally presented in the media	60%	15%

Base: total – 844. Sample was split in half to reduce survey fatigue (a maximum of 418 saw each answer option). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

There are very few demographic differences in attitudes towards media presentation of STEM. The only difference of note was for those with STEM qualifications, of which 78% agreed that the media portrayal of STEM is very stereotypical. Only 56% of those without STEM qualifications agreed with this statement.

There are conflicting views about STEM in the media; although the majority of educators agree that STEM is presented in a positive manner, a similar proportion agree that the media portrays more men as STEM role models.

Gender biases

Bias in careers

To attain educators' perspectives on the relationship between STEM skills and future career opportunities, respondents were presented with a list of statements and asked how much they agreed or disagreed with each one. The results revealed a general consensus that STEM skills are important for the Australian economy (97% agree). Similarly, more than 90% agreed that STEM skills are applied in everyday life, that there is an increasing number of jobs requiring these skills and that STEM is cultivated from a young age.

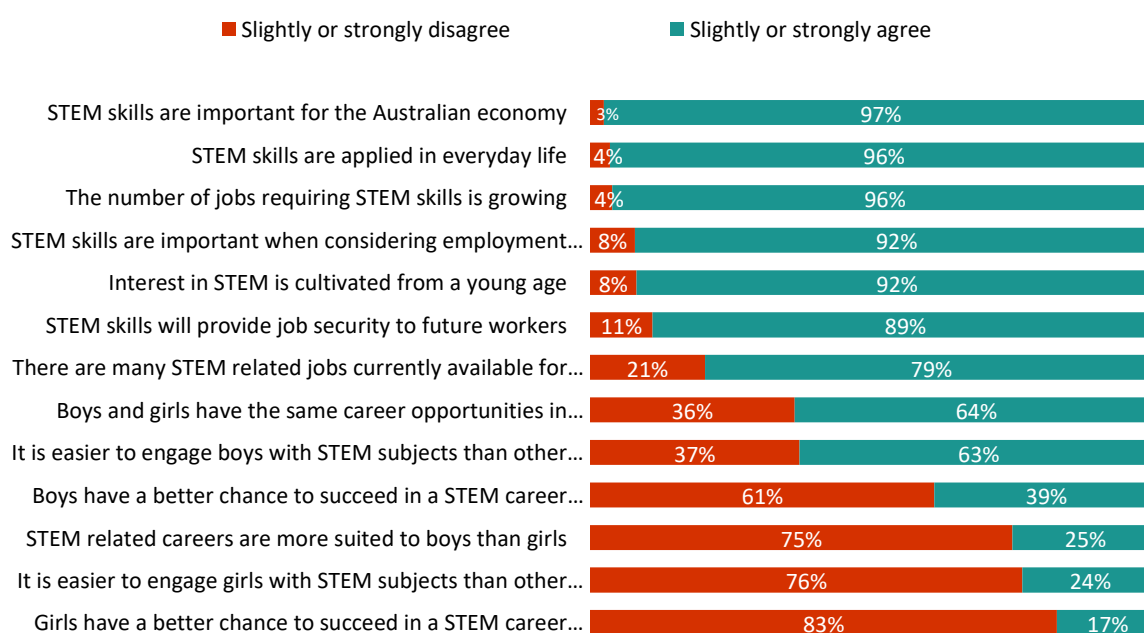
However, one in ten (11%) disagreed that these skills will provide job security in the future and two in ten (21%) disagreed that there are many STEM graduate roles available.

When it came to understanding the role that gender plays in STEM careers, two thirds of educators (64%) agreed that boys and girls have the same career opportunities in STEM fields. However, a higher proportion of educators (63%) acknowledged that it is easier to engage boys with STEM than other subjects compared to only 24% who believe the same for girls.

Despite this perception, the majority of educators disagreed that either gender has a better chance to succeed in a STEM career (61% disagree for boys and 83% for girls). Furthermore, three quarters of all educators surveyed (75%) disagree that STEM related careers are more suited to boys than girls.

Figure 32: Agreement with statements about STEM skills and future careers.

Q. Below is a list of statements about STEM skills and how they translate into future jobs / careers. How much do you agree with each of these statements?



Base: total – 844. Sample was split in half to reduce survey fatigue (a maximum of 427 saw each answer option). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

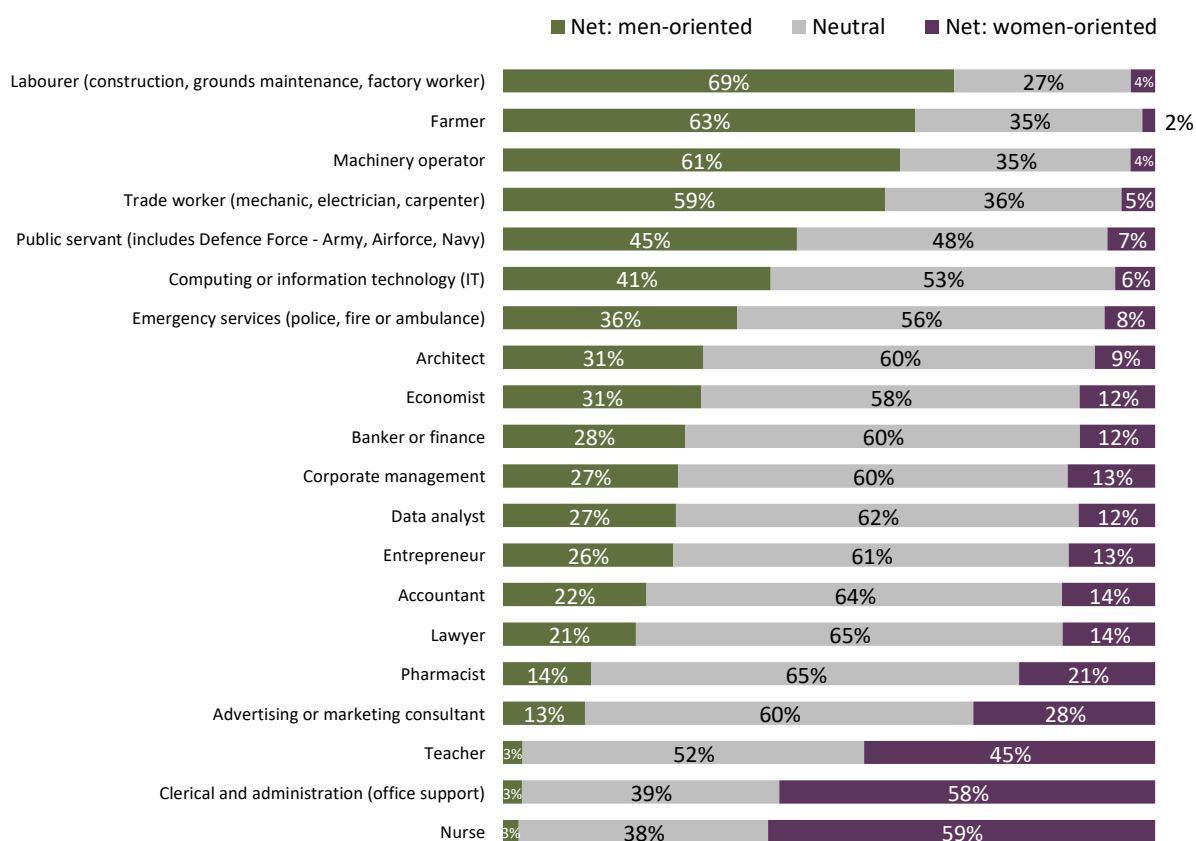
To further investigate gender bias related to STEM careers respondents were asked the degree to which they felt each of a range of occupations were oriented towards men or women. The sliding scale they were presented with displayed “very male” on the left (score of -10), “neutral” in the centre (score of 0) and “very female” on the right (score of 10).

The survey results indicate that there are very strong gender associations with occupations. This inherent bias in how occupations are perceived and positioned, is likely to inform students’ perceptions of these careers, the opportunities that are available to them and which careers are most suitable to their skillset.

Pharmacist, lawyer and accountant were the professions with the least gender bias. The top three roles most skewed towards women were nurse, office support and teacher, while labourer, machinery operator and farmer topped the list for being most skewed towards men.

Figure 33: Educators’ gender associations with occupations.

Q. Of these jobs, where would you place them on the scale below?



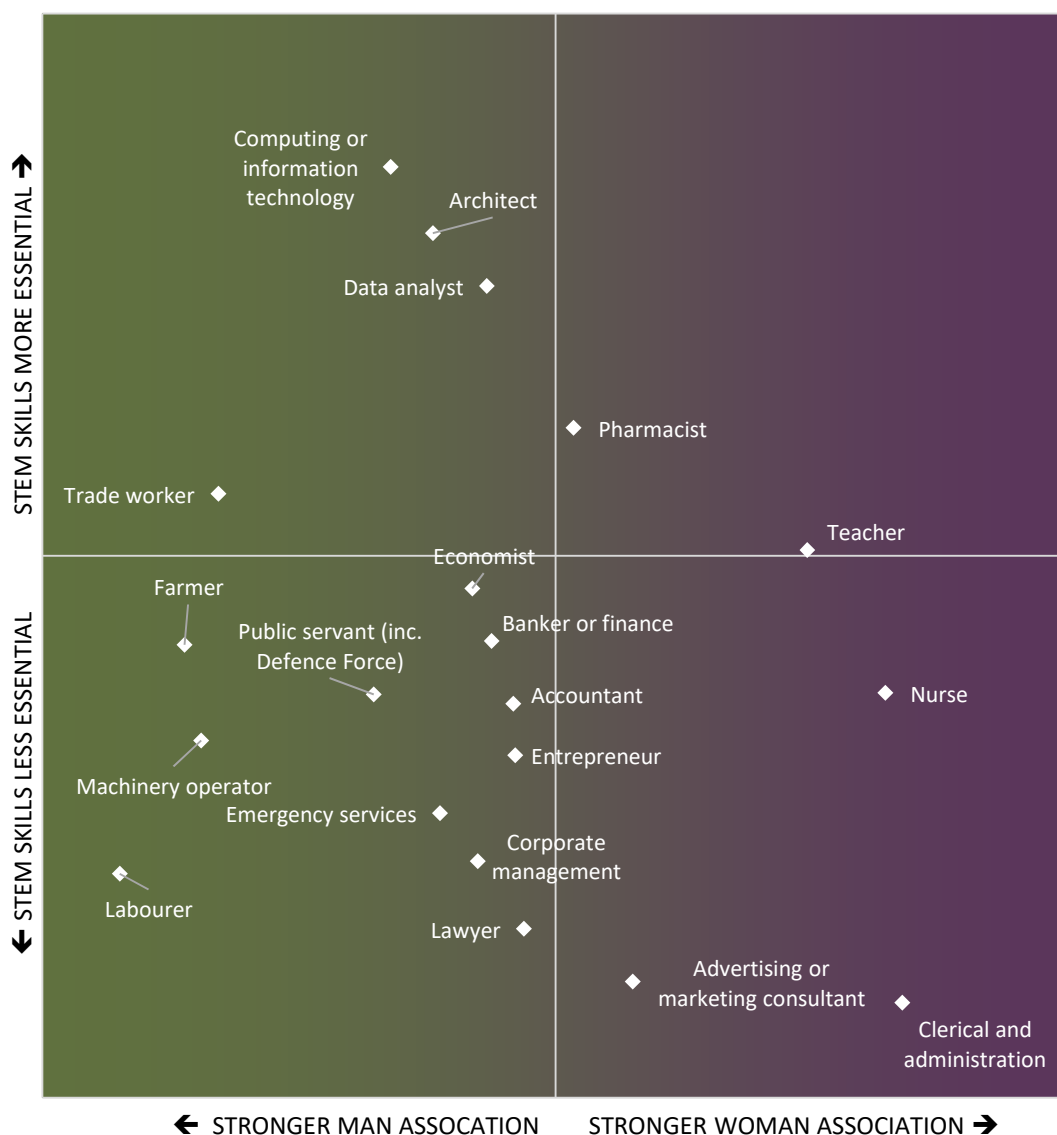
Base: total – 844. Sample was split in half to reduce survey fatigue (a maximum of 428 saw each answer option). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Despite two thirds of educators agreeing that boys and girls have the same career opportunities in STEM fields, these survey results indicate that there is an unconscious or inherent bias in how occupations are perceived.

By cross tabulating educators' perceptions of how essential STEM skills are for careers and gender occupation associations, most jobs where STEM skills are deemed a necessity are also more skewed to men. Conversely, the most gendered roles, particularly those for women, are roles where STEM skills are deemed not important. Pharmacist and teacher were the only two occupations where STEM skills are seen as more essential and skewed towards women.

Figure 34: Matrix of occupations plotted by gender association and perceived requirement of STEM skills.

Q. Thinking about what you know, do you think these jobs are more for boys, more for girls or for both? / Q. How essential do you think STEM skills are to the following careers?



Base: total – 844.

Student ability and engagement

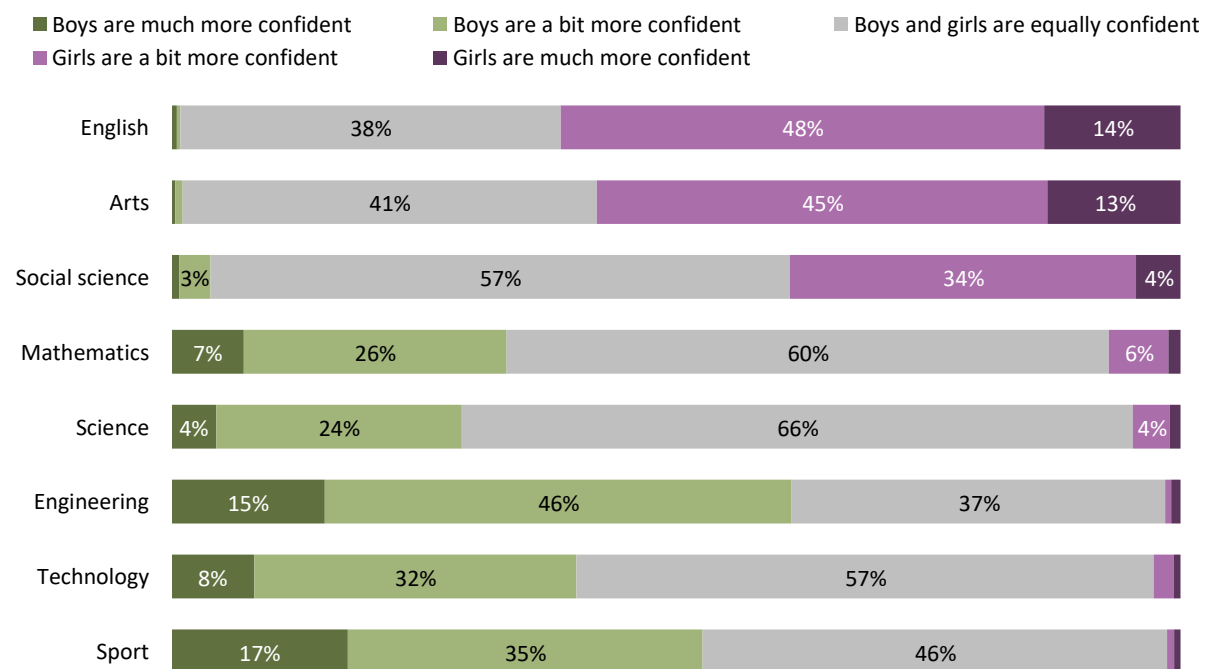
Educators report large differences in the confidence of girls and boys in different subject areas. Girls are perceived to be more confident in English, arts and social science while boys are more confident in science, mathematics, technology, engineering and sport.

The skew towards boys was less prominent for science and mathematics with the majority of educators feeling that girls and boys are equally confident in science (66%) and mathematics (60%). Men were more likely than women to say that girls are more confident in mathematics (15% vs 6%) and science (12% vs 3%). Similarly regional teachers were also more likely than metro teachers to agree with the same (science – regional: 7% vs metro: 3% and mathematics – regional: 10% vs metro: 5%).

The survey also found that a higher proportion of secondary teachers compared to primary teachers believe boys are more confident in technology (48% vs 33%) and engineering (67% vs 58%).

Figure 35: Gender differences in student confidence.

Q. Who do you believe are more confident in the following subjects?



Subjects	Net: boys are more confident	Net: girls are more confident
English	1%	61%
Arts	1%	58%
Social science	4%	39%
Mathematics	33%	7%
Science	29%	5%
Engineering	61%	2%
Technology	40%	3%
Sport	53%	1%

Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

When comparing this to the results from the *Parents 2020/21* research, across both surveys there was a general similarity in perceptions regarding which genders are more confident across each subject. Parents also believe boys are more confident in all the listed subjects, with the exception of arts, English and social science. However, a higher proportion of educators believe girls are more confident in English (61%) compared to parents (38%) and similarly, a higher proportion of educators also believe boys are more confident in mathematics (33% vs 23% of parents) and engineering (61% vs 51% of parents).

Gender disparity in university research roles

In addition to the more explicit questions regarding gendered differences in students, the survey also included a customised version of a question taken from Harvard's implicit association test for gender bias. For this question respondents were presented with the statement, "women currently hold a smaller proportion of the science and engineering faculty positions at top research universities than men". They were then provided with a list of reasons as to why this disparity exists.

Respondents could select the degree to which they believe each reason was valid or invalid. The scale options were purposefully unbalanced, with three varying options of classifying statements as valid and only a single option to classify them as invalid. The objective was to measure levels of unconscious gender bias among educators.

The results revealed that almost half of all educators (48%) reject the notion that there is a greater proportion of men with the highest levels of mathematics ability. A further 42% disagree that men and women differ naturally in their scientific interest and 46% saw no validity in the statement that men and women differ in their willingness to devote the time required by such high-powered positions.

However, it should be noted that more than half of respondents still see at least some validity to these statements. Therefore, a bias towards men's ability, interest and availability to dedicate time to a career exists for a proportion of educators.

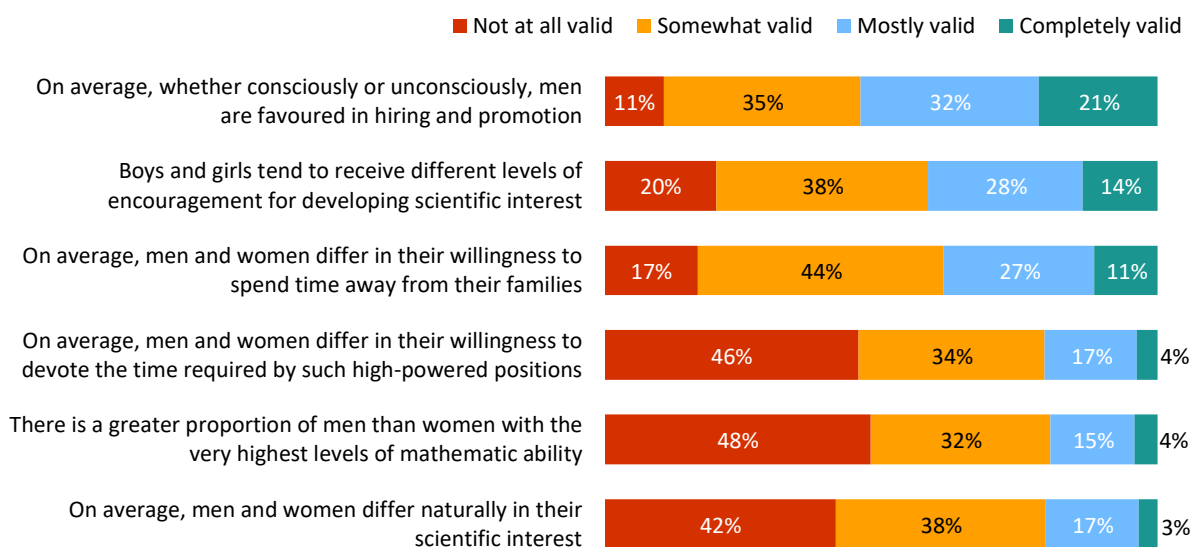
The reasons most validated by educators were that men are favoured in hiring and promotion (54% mostly or completely valid), boys and girls tend to receive different levels of encouragement for developing scientific interest (41% mostly or completely valid) and because they differ in their willingness to spend time away from their families (39% mostly or completely valid).

Interestingly, despite these three reasons being the most validated, within these statements are some notions that refer to attitudes that can be changed over time by increasing encouragement of girls for developing scientific interest and addressing the issue of favouritism of men in employment situations.

Conversely, there were significantly lower levels of validation of statements which question men's and women's inherent abilities to engage with STEM, such as, 'there is a greater proportion of men than women with the very highest levels of math ability' and 'on average, men and women differ naturally in their scientific interest.'

Figure 36: Validity of reasons for gender differences at top research universities.

Q. Women currently hold a smaller proportion of the science and engineering faculty positions at top research universities than men. The following factors are sometimes given as a reason for this difference. How valid do you think each of these reasons are?



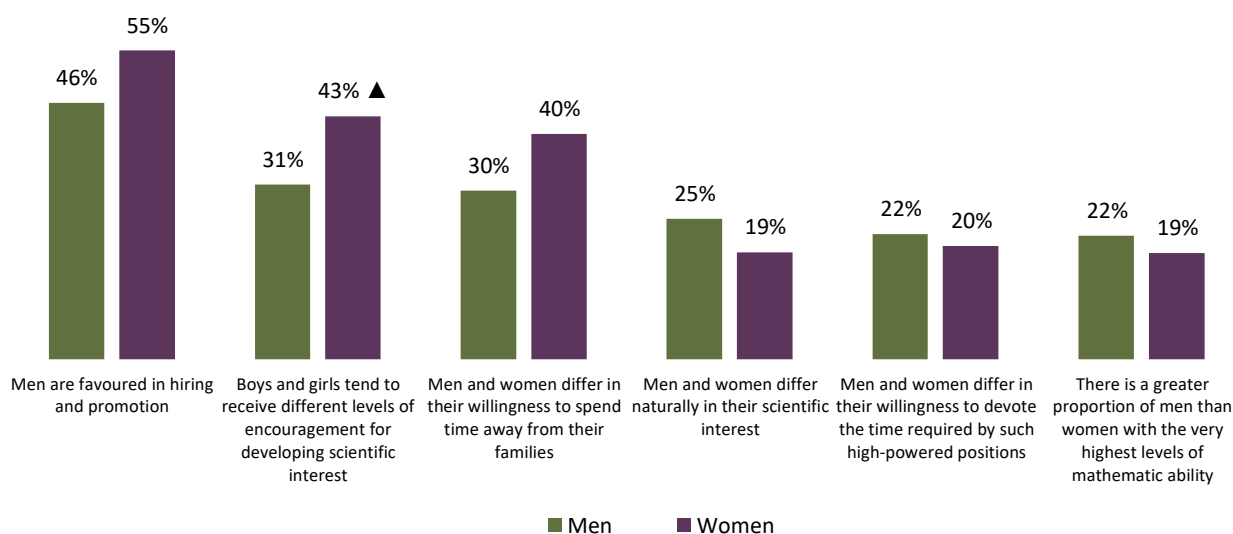
Statements	Net: mostly / completely valid
On average, whether consciously or unconsciously, men are favoured in hiring and promotion	54%
Boys and girls tend to receive different levels of encouragement for developing scientific interest	41%
Boys and girls tend to receive different levels of encouragement for developing scientific interest	41%
On average, men and women differ in their willingness to spend time away from their families	39%
On average, men and women differ in their willingness to devote the time required by such high-powered positions	20%
On average, men and women differ naturally in their scientific interest	20%
There is a greater proportion of men than women with the very highest levels of mathematics ability	19%

Base: total – 844. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

When looking at these results by the gender, women were more likely to agree that the gender disparity is impacted by differing levels of encouragement given to boys and girls for developing scientific interest (43% vs 31% of men). However, there were no other significant differences in perceived validity between genders of educators.

Figure 37: Validity of reasons for gender differences at top research universities, split by gender of teacher (net: mostly / completely valid).

Q. Women currently hold a smaller proportion of the science and engineering faculty positions at top research universities than men. The following factors are sometimes given as a reason for this difference. How valid do you think each of these reasons are?



Base: men – 122, women – 718. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

More than half of the educators see at least some validity towards differences in men’s ability, interest and availability to dedicate time to a career.

When comparing these results to the *Parents 2020/21* research, a general similarity in perceptions is evident. However, a higher proportion of parents compared to educators felt that the statements around differing scientific interest, willingness to devote time to high-powered positions and differing levels of mathematics abilities were valid.

Table 9: Perceptions of validity of reasons for gender imbalance in STEM research roles. Total valid scores (net: somewhat, mostly, completely valid) among educators and parents.

Total valid scores (net: somewhat, mostly, completely valid)	Educator	Parent
On average, men and women differ in their willingness to spend time away from their families	83%	83%
On average, whether consciously or unconsciously, men are favoured in hiring and promotion	89%	80%
Boys and girls tend to receive different levels of encouragement for developing scientific interest	80%	79%
On average, men and women differ naturally in their scientific interest	58%	72%
On average, men and women differ in their willingness to devote the time required by such high-powered positions	54%	70%
There is a greater proportion of men than women with the very highest levels of math ability	52%	64%

Perceptions of what would help improve the attitudes of girls towards STEM

The survey asked all educators in an open-ended format what they believe would help them improve the attitudes of students who are girls towards STEM. While there was a wide range of responses, the most common improvement was to have more female role models visible, followed by greater focus on positioning STEM in a more relevant manner that aligns with their interests.

Role models and visibility (114 mentions)

- “Providing more female role models and representation”
- “Let them see real life examples of women in stem careers.”
- “More exposure to role models and real-world career examples”

Interest and relevance (80 mentions)

- “Honing in on their interests and making the learning relevant”
- “More control over the direction of their stem learning towards areas of interest”
- “Hands on activities that are suited to their interests.”
- “More relatable activities to their likes. STEM generally focuses on cars and helicopters that are more male orientated.”
- “Making activities more applicable to their interests and/or real-world application.”

More women teachers (54 mentions)

- “More female teachers passionate about the subjects.”
- “More female teachers and single sex classrooms for STEM.”
- “Having suitably qualified, experienced and enthusiastic female teachers.”
- “Teachers qualified to teach this area.”

Improved resources (48 mentions)

- “Better resources”
- “More resources”
- “Resources that show female students that scientists and peoples working in these careers can be women.”
- “More resources and access to resources would improve attitudes for ALL my students. STEM needs to be highly hands-on.”

More activities / range of activities (45 mentions)

- “More time to plan and prepare activities that could be more inclusive. Doing STEM well requires time to plan and prepare.”

Careers pathways (46 mentions)

- “Career days with talks from professional women.”
- “Seeing career paths that could achieve by taking on STEM.”
- “More promotion of career opportunities through stem and links to future jobs available.”

Encouragement (44 mentions)

- “Given equal opportunity and encouragement from families and institutions”
- “Stronger encouragement & perhaps some proof as to what it will enable them to achieve in employment long term”

Higher exposure (30 mentions)

- “Just exposing them to stem appears to improve their attitude. Expose them early should help.”
- “More exposure in primary and early high school years.”

Girls only activities / classes / (31 mentions)

- “Making some girls only stem activities because when integrated with the boys the boys tend to take over and the girls lose interest.”
- “Offer more relatable activities for girls and have a collaborative atmosphere between boys and girls. Girls tend to give up when boys take over their projects.”
- “Female only technology and engineering lessons so not inhibited from trying in front of males and so males don't dominate and take over activities.”
- “Single sex classes to allow the girls to not to be overshadowed by the sometimes over enthusiastic boys!”

Career advice

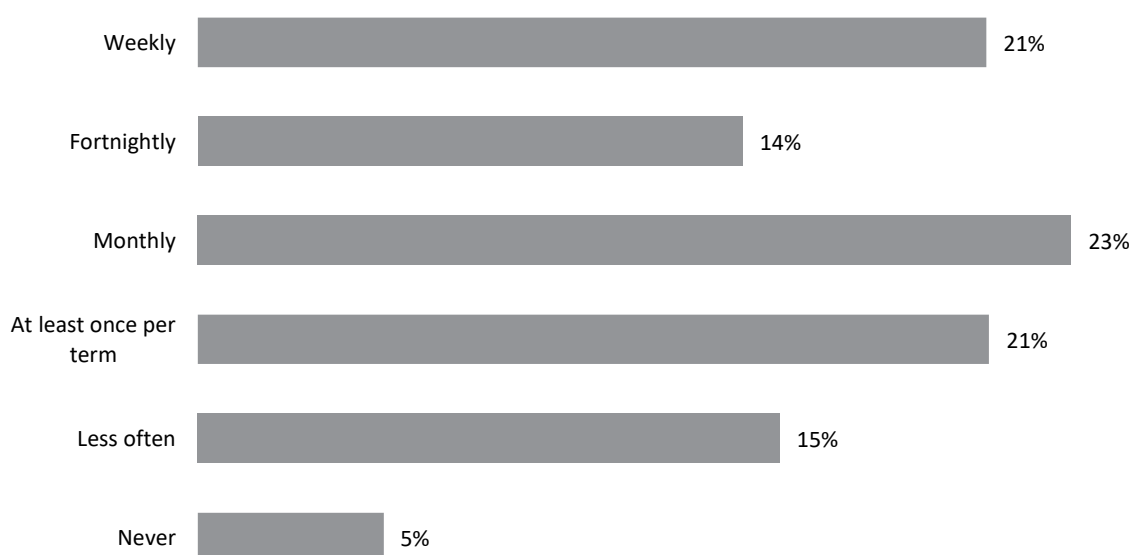
The final section of the survey explored the topic of career advice given to students. While some questions were directed at all respondents, most were answered only by career advisors and teachers who regularly provided career advice to their students (i.e. those who provide advice at least monthly).

Providing career advice

Almost all (95%) secondary teachers said that they provide career advice to students throughout the school year. Overall, six in ten (59%) provide career advice at least monthly, with 36% providing advice at least once a fortnight.

Figure 38: Frequency of secondary school teachers providing career advice.

Q. In your experience as an educator, how often do you provide career advice to your students?

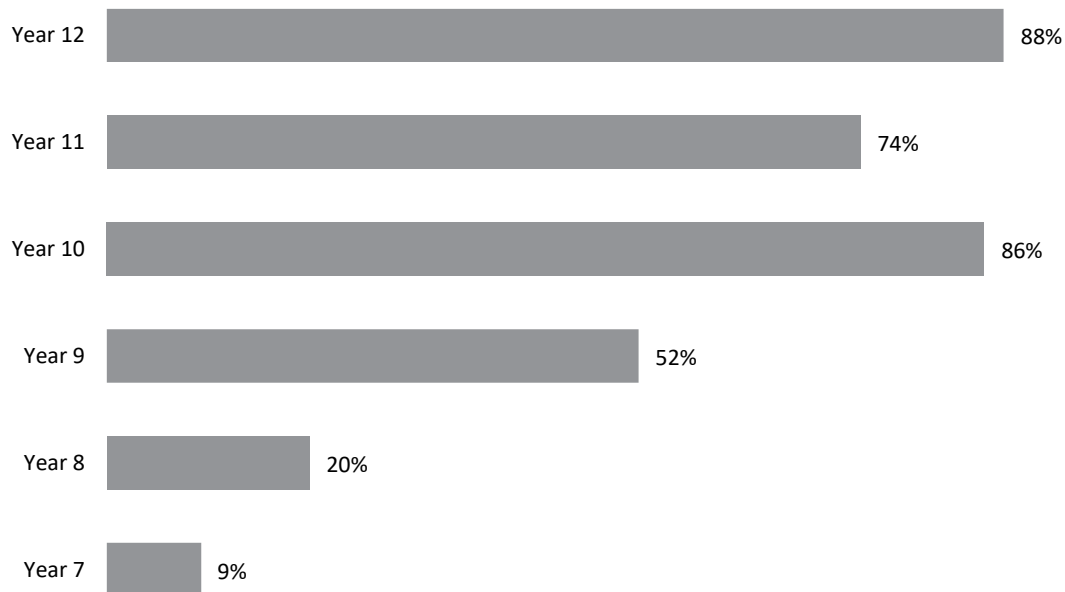


Base: high school teachers – 282. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The proportion of students that advisors provide career advice to increases with the age of students. Only a small proportion of Year 7 and 8 students are engaging teachers and career advisors for advice while in senior secondary school most students are engaging with teachers and advisors about their future careers. Year 10 and Year 12 are the year levels where provision of career advice is highest.

Figure 39: Proportion of students in each year level that career advisors provide advice to.

Q. In your experience and to the best of your recollection, what proportion of students from each year level do you provide personalised career advice to in a school year? (MC)



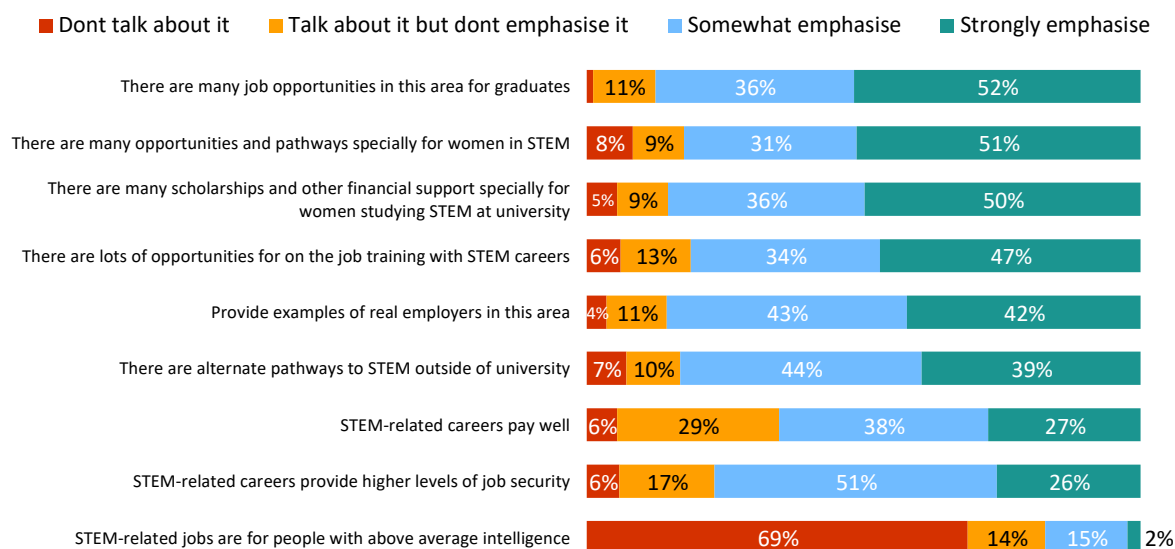
Base: career advisors – 35. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

When providing STEM advice to students, advisors place the greatest emphasis on the abundance of job opportunities for graduates (88%), the scholarships and financial support specifically for women studying STEM at university (85%) and the opportunities and pathways specifically for women in STEM (82%).

Advisors place less emphasis on talking about STEM related careers that pay well (35%) or that STEM-related careers provide higher levels of job security (23%). The majority of advisors (69%) don't talk about STEM-related jobs being for people with above average intelligence.

Figure 40: Level of emphasis placed on STEM career-related topics by advisors.

Q. When speaking to students about STEM-related careers, how much do you emphasise the following points?



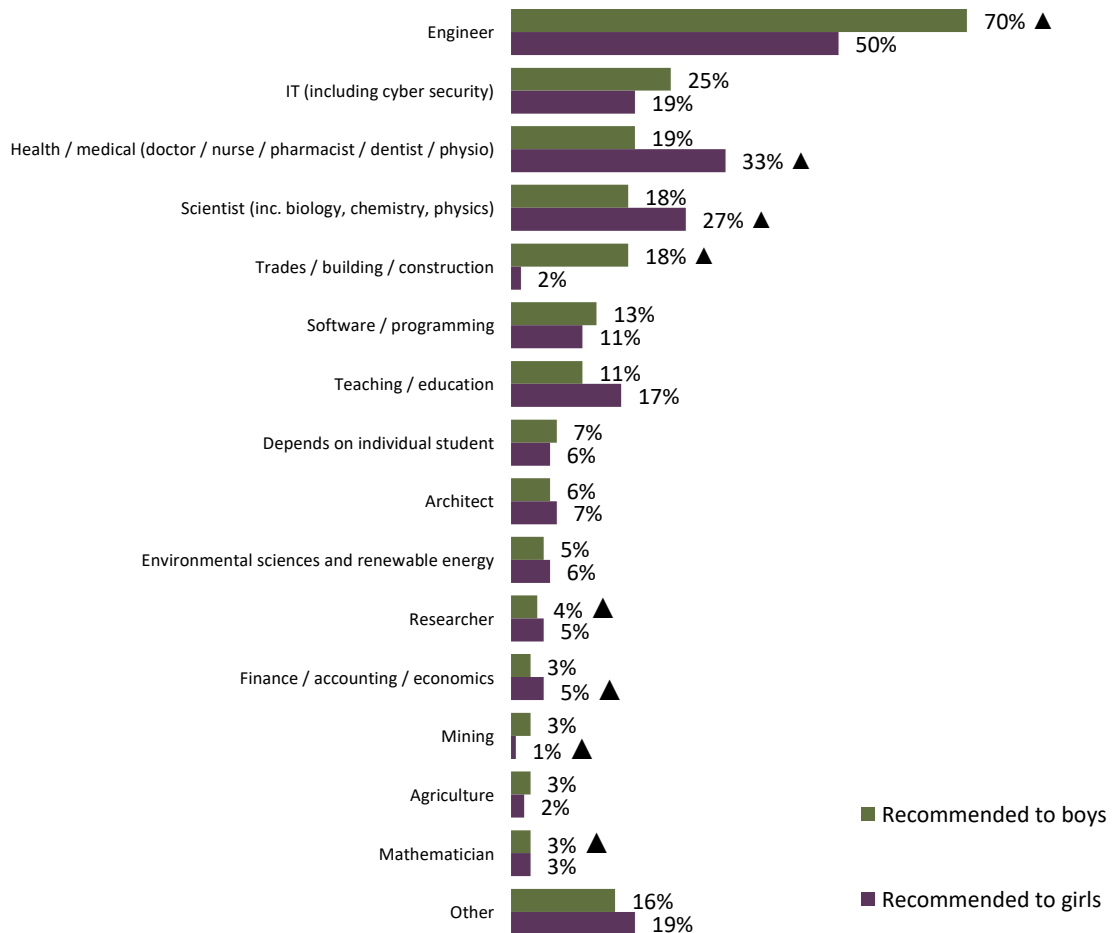
STEM-related career topic	Net: don't talk about it / talk but don't emphasise	Net: somewhat / strongly emphasise
There are many job opportunities in this area for graduates	12%	88%
Provide examples of real employers in this area	14%	86%
There are many scholarships and other financial support specially for women studying STEM at university	15%	85%
There are alternate pathways to STEM outside of University	17%	83%
There are many opportunities and pathways specially for women in STEM	18%	82%
There are lots of opportunities for on the job training with STEM careers	19%	81%
STEM related careers provide higher levels of job security	23%	77%
STEM related careers pay well	35%	65%
STEM related jobs are for people with above average intelligence	83%	17%

Base: career advisors – 59. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The survey found that advisors do not provide the same STEM career suggestions to girls as they do to boys. While the top recommended roles are similar for boys and girls, advisors are more likely to recommend engineering and trades to boys and science and health to girls. The skew towards women in the teacher profession we noted earlier is also reflected in the career advice that girls are given.

Figure 41: STEM careers recommended to students.

Q. What are the top 3 STEM careers you recommend to students? (MC)



Base: career advisors and teachers who regularly provide career advice to girls – 215, to boys – 205. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

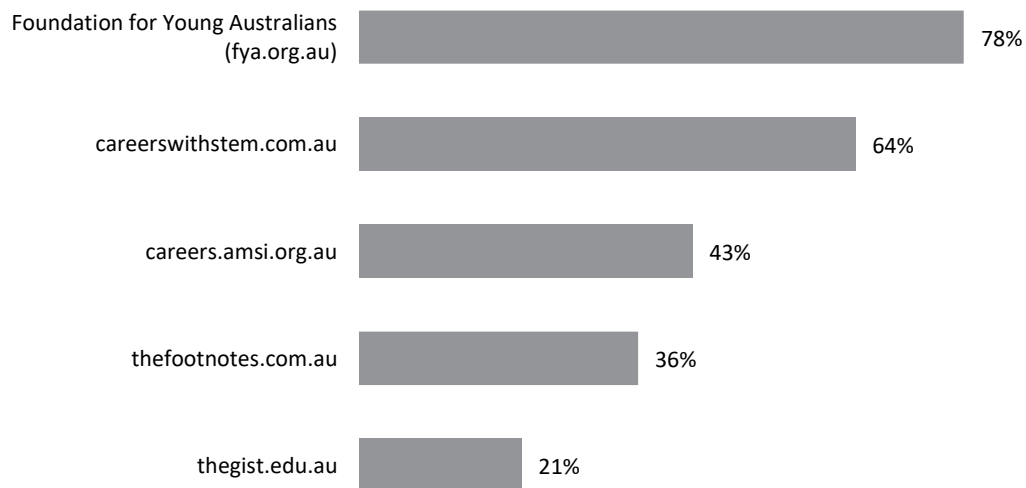
Advisors do not provide the same STEM career suggestions to girls as they do to boys. Advisors are more likely to recommend engineering and trades to boys than girls and more likely to recommend science and health careers to girls than boys.

Advisors' use of resources

In addition to general STEM resources, advisors were asked about their awareness and usage of five STEM websites, which specifically aim to provide information about STEM related careers. The survey found that advisors are most aware of Foundation for Young Australians (78%), followed by careerswithstem.com.au (64%).

Figure 42: Awareness of STEM career-related websites.

Q. What is your awareness and use of each of the following STEM careers websites?

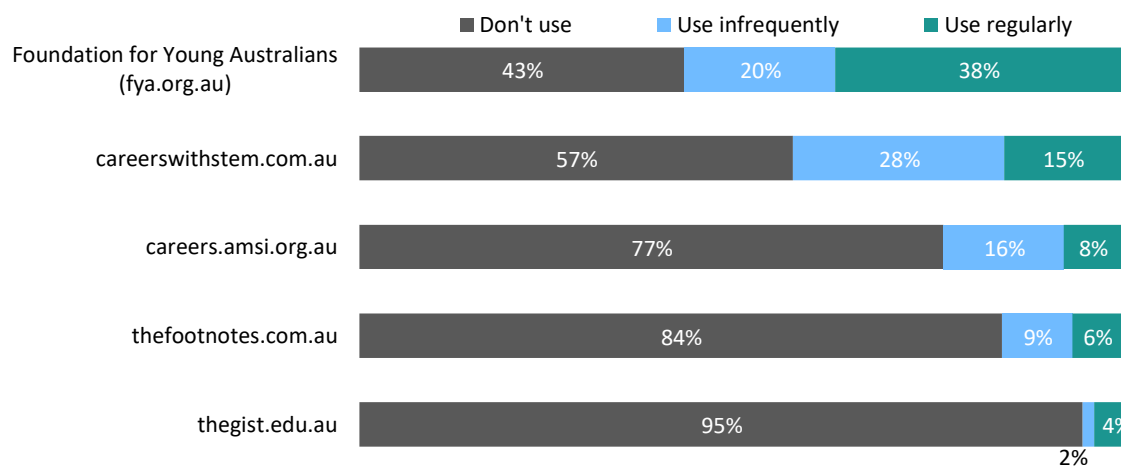


Base: career advisors – 59. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Regarding frequency of use of career-related websites, usage is directly related to awareness. Three in five (57%) use Foundation for Young Australians, two in five (43%) use careerswithstem.com.au and one in five (23%) use careers.amsi.org.au. Regular use was highest for Foundation for Young Australians (38%).

Figure 43: Use of STEM career-related websites.

Q. What is your awareness and use of each the following STEM careers websites?



STEM career-related websites	Net: usage
Foundation for Young Australians (fya.org.au)	57%
careerswithstem.com.au	43%
careers.amsi.org.au	23%
thefootnotes.com.au	16%
thegist.edu.au	5%

Base: career advisors – 59. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Expectations of students' future intentions

Advisors expect that 50% of their senior students (years 10 to 12) will continue to university upon completion of secondary school, 14% are expected to extend their studies through TAFE or other vocational education, while 27% are expected to go straight into the workforce (14% through apprenticeships).

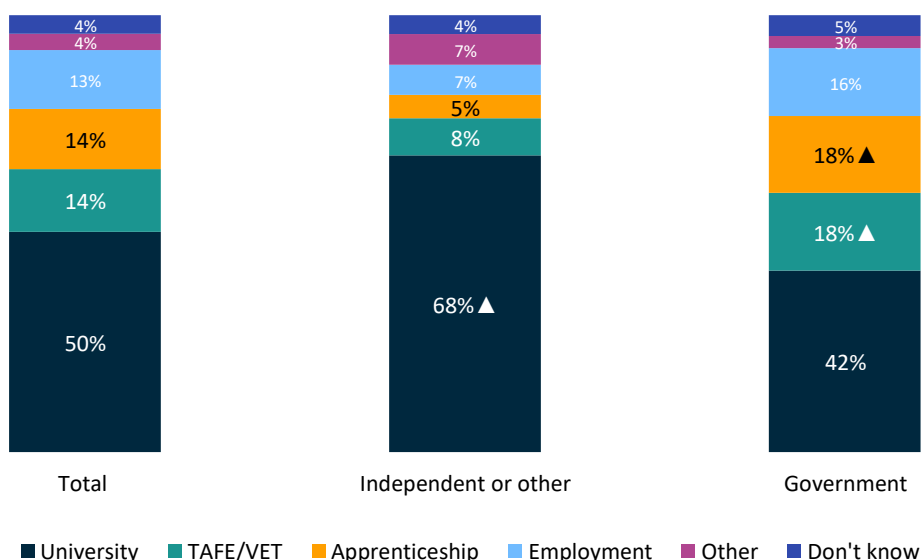
There were significant differences in expectations between government schools compared with independent schools. Within government schools, the average estimate was for 42% of students to continue to university with 18% completing an apprenticeship. For independent schools, the average expectation for university as a next step was 68%, with only 5% taking up an apprenticeship.

Regional differences were also evident with those outside of metropolitan areas expecting a larger proportion of their students (22%) to enter directly into the workforce (excluding apprenticeships) compared with metropolitan school advisors who expect only 6% of their students to go straight into employment.

It was also found that teachers from higher socioeconomic areas expect larger proportion of their students to go to university (59%) compared to teachers from lower socioeconomic areas (42%). On the other hand, teachers from lower socioeconomic areas expect a higher proportion of their students to go directly into employment (19% vs 8% for higher SES) or take an apprenticeship (17% vs 9% for higher SES).

Figure 44: Advisors' expectations for students after secondary school.

Q. Thinking about your senior students from year 10 to 12, to the best of your knowledge what proportion are considering the following after high school?

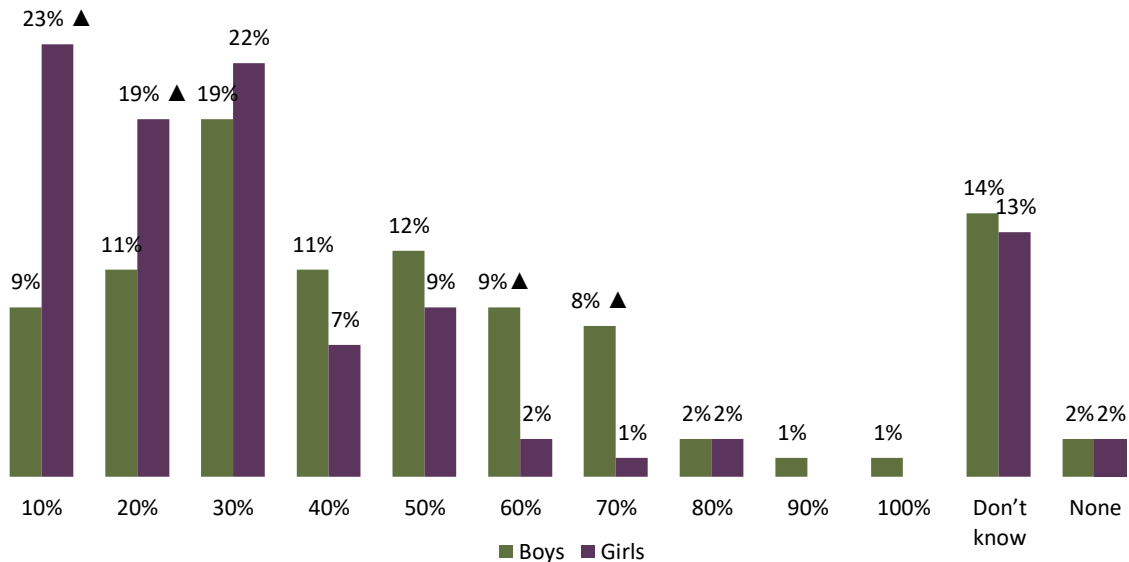


Base: career advisors total – 59, career advisors at independent or other schools – 17*, career advisors at government schools - 35. Excludes Catholic schools – 7. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number. *Note: small base size.

Advisors were also asked what proportion of their students they believe are seriously considering a career in STEM. The question was asked separately of boys and girls to understand gender differences. On average, teachers estimated that 34% of boys are considering a STEM career, compared to an average estimation of 24% for girls.

Figure 45: Proportion of students who are considering a STEM career.

Q. What proportion of students at your school / institution are seriously considering a career in STEM?



Gender	Average proportion of students who are considering a STEM career
Boys	34%
Girls	24%

Base: career advisors and teachers who regularly provide career advice; advisors of boys – 207, advisors of girls – 216. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The results also found that advisors in metropolitan schools believe there are a higher proportion of girls seriously considering a career in STEM (28%) compared to their regional counterparts (20%), highlighting that there is additional work required in regional areas to increase girls’ consideration of STEM careers.

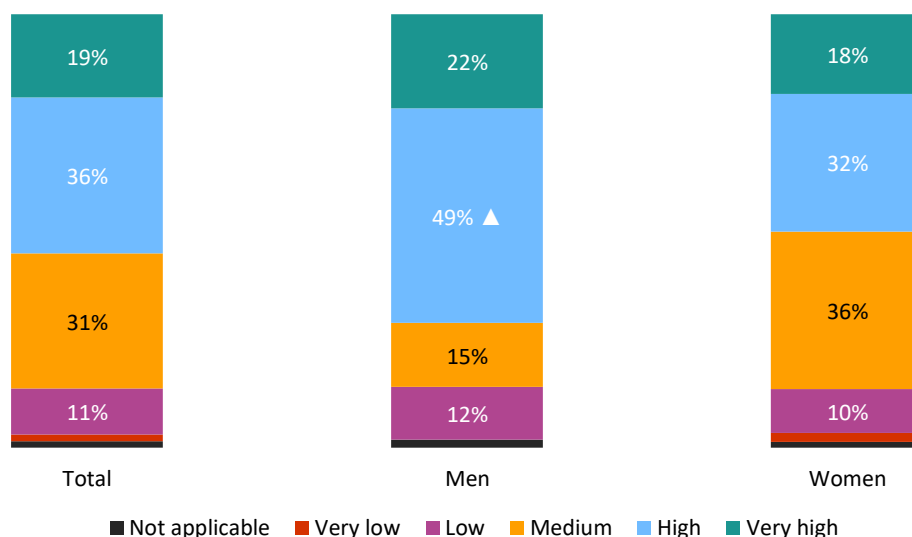
Advisors' ability to discuss STEM careers

Among those who provide career advice to students, 55% rate their ability to provide students with STEM pathways as high or very high, with a further 31% rating their ability as medium. Only 12% rate their ability as low or very low. Men were more likely to rate their abilities as high compared to women (49% vs 32%).

When all educators were asked to rate their own abilities in explaining STEM careers to students, the survey found that those specifically tasked to advise students on careers, rate their abilities much higher than the educators in general.

Figure 46: Self-rated ability to recommend STEM pathways to students showing an interest.

Q. How would you rate your ability to recommend STEM pathways to students showing an interest in this area?



Self-rated ability to recommend STEM pathways	Total	Men	Women
Net: high / very high	55%	71%	50%
Net: low / very low	12%	12%	12%

Base: career advisors and teachers who regularly provide career advice; total – 220, men – 49, women - 169. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

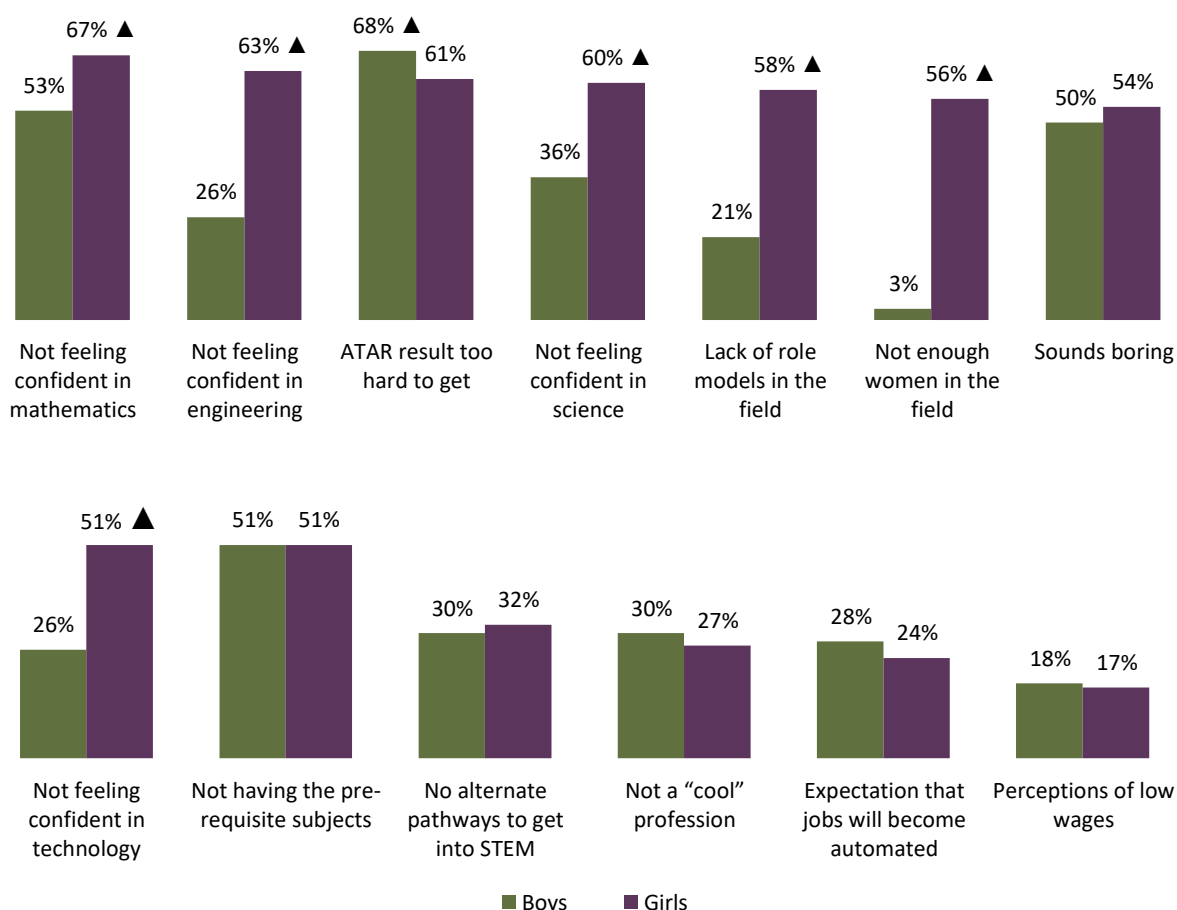
Advisors' perceptions of barriers to STEM careers

When discussing STEM careers with students, the top barriers raised by students were not feeling confident in mathematics, ATAR results being too hard to get and not feeling confident in engineering.

There are clear differences between boys and girls in the perceived barriers to a STEM career. Girls are significantly more likely than boys to cite the following barriers to entering a STEM career: not enough women in the field (53% more likely), not feeling confident in engineering (38% more likely), lack of role models in the field (37% more likely), not feeling confident in technology (25% more likely), and not feeling confident in science (24% more likely).

Figure 47: Barriers to STEM careers raised by students.

Q. When having career conversations with students about a STEM career, what are some of the barriers students raise?



Base: career advisors and teachers (advisors) who regularly provide career advice; advisors of boys – 200, advisors of girls – 212. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.