YouthInsight
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2024 STEM Influencer Report – Teachers & Career Advisors

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

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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.

Wave – When a survey is repeated multiple times, each occurrence is called a wave. The waves of this research are as follows:

- 2020 – wave 1
- 2022 – wave 2
- 2024 – wave 3

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, the report 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.

1. **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.

- **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.

2. **STEM subjects at primary school:** mathematics, science, technologies
3. **STEM subjects at secondary school:**
    a. **General STEM subjects:** mathematics, biology, chemistry, earth and environmental science, physics, geography, design and technologies and digital technologies
    b. **Year 9-10 elective STEM subjects:** geography elective, agricultural technology, design and technology, food technology, graphics technology, industrial technology, information and software technology
    c. **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
4. **STEM subjects at higher education:** agriculture, computing and information technology, engineering and technology, environmental studies, mathematics, biology, chemistry, physics, earth and environmental sciences.
5. **STEM qualifications:** computing or information technology (IT), data analyst, engineering, mathematics, science
6. **STEM jobs / careers:**
    a. **Qualifying jobs / careers:** computing or information technology (IT), data analysis, engineer, mathematician, scientist
    b. **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)

Executive summary

Building on from the Youth in STEM research, the Department of Industry, Science and Resources (DISR) 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. This report contains the results from the third wave of research with Teachers and Career Advisors.

Separate online surveys were conducted among parents and educators (including teachers and career advisors) from August to October 2024 and reached a representative sample of 1,500 parents and 801 educators across the country. Respondents were sourced via an online panel and through a direct partnership with Education Services Australia. Respondents were sourced from a range of online panels and through direct partnerships with Education Services Australia (ESA) This report outlines the detailed findings from the *Teachers & Career Advisors 2024* research and compares with the two previous waves.

It's important to observe the composition of survey respondents. In terms of gender, respondents were 76% women, 22% men and 1% non-binary or unspecified, which is a higher proportion of men teachers compared to previous waves. To account for this, the data has been weighted to reflect the education sector as per previous waves, made up of 84% women, 14% men and 1% non-binary or unspecified.

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, only 5% of the sample were career advisors, although many classroom teachers also advise students on careers. There was considerable role crossover, with two in five teachers reporting to have other roles in addition to classroom teaching. The survey also included 8% of educators from the tertiary sector.

While the study is vastly detailed, this report focuses on a set of key metrics used to evaluate educators' awareness and understanding of STEM, perceived importance of STEM, feelings of qualification and confidence in teaching STEM and connecting STEM content with real-world applications, along with other metrics such as gender biases.

In addition, a new question added for wave 3 in order to understand the perceived impact of Artificial Intelligence (AI) on future careers and whether or not educators have spoken with, or plan to speak to, their students about the impact of AI on jobs.

A summary of the findings for each of the key metrics, along with a summary table, can be found below.

Summary of findings

The results presented in this section summarise key insights and differences between research waves 1, 2 and 3.

Table 1: Key metrics across waves 1, 2 and 3.

Key metric	Wave 1	Wave 2	Wave 3
Prior STEM qualifications / education	35%	40%	34%
Awareness of STEM acronym	87%	88%	86%
Confidence in teaching STEM (as an integrative set of skills)	61%	62%	59%
Confidence in connecting STEM content with real-world applications	72%	75%	69%
Perceived importance of STEM for future employment	89%	89%	86%
Feeling qualified to teach STEM (as an integrative set of skills)	58%	59%	57%

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. Among the secondary teachers surveyed, 50% teach STEM: 23% teach only STEM subjects, 28% teach STEM subjects and non-STEM subjects. Only 42% do not teach STEM at all. With seven in ten (69%) 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 slightly more likely to be men (28% vs 22% of women). From the student perspective, this means they may be more likely to see men STEM teachers, which can potentially influence their gender associations with STEM careers. However, women are just as likely to teach STEM alongside other subjects as men, with 28% of women reporting this compared to 27% of men. The gender difference is not as pronounced as previous waves.

STEM qualifications and further education

Among all respondents, a third (34%) of survey respondents had obtained a STEM qualification before entering the education sector, down slightly (not significantly) since wave 2 (40%) but in line with wave 1 (35%). Exploring these results in further detail, men were more likely than women to have obtained a STEM qualification prior to teaching (44% of men vs 33% of women). Prior STEM qualifications were also more commonly found in secondary school teachers (42%) compared to primary school teachers (26%). When comparing secondary teachers who are currently teaching STEM to those who do not teach STEM, those teaching STEM are more likely to have STEM qualifications than those who do not teach STEM (63% vs 21%). This is consistent with the previous waves.

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 almost nine in ten (86%) correctly identifying all subjects. A further 12% were able to correctly identify three out of the four subjects, with engineering being the subject that was incorrect most often. Only two percent got the acronym completely wrong or were unsure.

Tertiary educators recorded the highest score of correct responses (94%), followed by Secondary STEM teachers (91%), primary teachers (85%) and lastly secondary non-STEM teachers (81%). Career Advisors were more likely than any other type of educator to correctly define STEM (97%).

While not significant, those in government schools (87%) were slightly more likely to give a correct definition compared to Catholic (81%) and independent (81%) schools. Since tracking began the data has shown lowest awareness of STEM among Catholic school teachers.

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 working in education topped the list (12%) alongside scientist (also 12%). One in ten (10%) said STEM education could lead to an engineer job, while the same proportion said IT jobs.

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. Seven in ten teachers (69%) feel somewhat or very confident connecting STEM content with real-world applications, slightly lower than the previous wave (75%). 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 (33% vs 8%).

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 (82% vs 67%). Last wave this could be explained by a higher proportion of men undertaking STEM-related further education or training, however this is not so much the case in wave 3.

Feelings of qualification and confidence in teaching STEM

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

Looking at the data at a more detailed level, men feel more qualified to teach engineering than women (44% vs 29%) but do not feel more qualified to teach integrated STEM or any other STEM subject. This is a change from last year where men felt more qualified to teach all STEM subjects as well as STEM as an integrative set of skills.

Overall, teachers did not report having high levels of confidence in teaching STEM-related subjects. Confidence was highest in mathematics (70%), followed by technology (63%), the integration of STEM as a set of skills (59%) and science (58%). Confidence in teaching engineering was significantly

lower compared to all other subject areas, with only 31% saying they feel confident. This is consistent with the previous waves.

Three in five male teachers (62%) were highly confident with at least one STEM subject, compared to 37% of women. This potentially reflects the slightly 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.

Relevance of STEM to teaching practice

Most educators surveyed identified the teaching of STEM skills as being relevant to their role, consistent wave on wave. STEM as an integrative set of skills, technology and mathematics skills were all selected as relevant to the role of 77% 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 (67%) and significantly lower for engineering skills, which was only relevant to 55% 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.

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. In an open-ended question, the most common skills mentioned by respondents were collaboration, co-operation and teamwork (9%), creativity and lateral thinking (9%), problem solving (8%) and critical thinking (5%).

When asked to select from a list, all respondents (100%) could identify at least one of the core STEM skills (science, technology, engineering and mathematics), while between 84% and 94% correctly identified other life skills such as problem solving and critical thinking, which closely aligned to their open-ended responses.

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 93% agreed that STEM skills are applied in everyday life.

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. Teachers that are men were more likely to believe it is important to have skills in engineering than women teachers (29% vs 19%), however, this was the only significant difference between genders.

Teachers were also asked what they thought the barriers are to schools placing a greater emphasis on STEM. The top reason was that there are not enough qualified teachers (66%), followed by a lack of STEM resources (63%). Other common reasons included budget constraints (58%), the school focusing on other areas or timetabling issues (both 43%).

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. These perceptions have remained consistent since the previous waves.

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 52% for technology up to 63% 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

The survey explored the topic of career advice given to students. In wave 3 we spoke with 276 respondents who were classed as mentors, who provided advice at least monthly, and 43 career advisors.

Most secondary school teachers claim to provide some level of career advice to students throughout the school year. When providing STEM advice to students, advisors place the greatest emphasis on the alternate pathways to STEM outside of university, local STEM employers, the scholarships and financial support specially for women studying STEM at university, the abundance of job opportunities and the opportunities and pathways specially for women in STEM.

Among those who provide career advice to students, 43% rated their ability to provide students with STEM pathways as high or very high, down (not significantly) from 53% in wave 2. A further 40% rated their ability as medium. Only 15% rate their ability as low or very low. Mentors who are women were more likely to rate their ability as very high compared to men (16% vs 7%).

A critical insight uncovered around career advice was the inconsistency in STEM career suggestions given to boys and girls. The survey found that advisors do not provide the same STEM career suggestions to girls as they do to boys. The top recommended roles for boys are engineering, scientist and IT roles. The top recommended roles for girls are engineering, scientist and health or medical related roles. Advisors are significantly more likely to recommend engineering to boys (67% vs 49%), and more likely to recommend scientist and health-related roles to girls (32% vs 21% and 31% vs 10% respectively).

Continuing this trend, career advisors' estimation of the proportion of girls and boys who are likely to enter STEM careers also differ, with teachers and career advisors estimating 33% of boys will enter a STEM career, compared to 23% of girls.

The barriers for students entering into a STEM career are also strongly gendered, with girls being more likely than boys to raise not feeling confident in mathematics, science, engineering, and science. They were also more likely to raise that there are not enough women in the field or there are a lack of role models. Finally, girls were also more likely to raise that there are no alternate pathways to get into STEM other than university.

When asked what educators believe would help improve the girls' attitudes towards STEM, the most common suggestion, in line with the previous wave, was to have more women role models visible,

followed by more hands-on, engaging and relevant STEM activities, and teachers playing a role in confidence building and addressing negative stereotypes about STEM workers.

Thoughts and conversations about AI

Two new questions added for wave 3 sought to understand the influence of the recent advances in artificial intelligence (AI). First, we asked whether or not they believe that generative AI tools will have a significant impact on work and careers in the future. Nine in ten (91%) said yes, reflecting a majority feeling that AI is going to have an impact on jobs.

The survey also asked whether teachers had spoken to their students about AI or the impact on their future careers. Almost half (45%) had already spoken to their students about this, while a further quarter (26%) planned to speak to them about this, adding to a total of 7 in 10 (71%). Only 22% of educators did not plan to speak to their students about AI, with a final 7% being unsure.

There were some differences by demographic group, with women educators being less likely to have spoken to their students about this (42% compared to 66% of men). Secondary teachers, those with STEM qualifications, tertiary educators and those from higher socioeconomic areas were the most likely to say they had spoken about this or they planned to in the future.

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 2024* research, complements the insights uncovered through the *Youth in STEM* research, providing much-needed context around young people's perceptions of STEM.

Moving forward, DISR will continue tracking key measures around STEM from both young people and their key influencers. The next round of research will be conducted in 2025 and will be the fifth wave of the *Youth in STEM* research.

Project background

Background

Building on from the Youth in STEM Research, which was first commissioned for the STEM Equity Monitor in 2018, the Department of Industry, Science and Resources (DISR) 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* research showing that girls' perceptions of, and engagement with, STEM are strongly influenced by parents, teachers and career advisors, DISR 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:

- 2018: People aged 12-25
- 2019: People aged 12-25

- 2020: Parents
- 2020: Teachers & Career Advisors
- 2021: People aged 12-25
- 2022: Parents
- 2022: Teachers & Career Advisors
- 2023: People aged 12-25
- 2024: Parents (separate report)
- 2024: Teachers & Career Advisors (current report)

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 third wave of the Teachers & Career Advisors report. Key differences between the insights from this report and the Teachers & Career Advisors 2022 (wave 2) report 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.
- This wave, we have also included questions on the perceived impact of generative artificial intelligence (AI) on work and careers, and whether or not this is something educators speak to students about.

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 801. The sample was sourced via a combination of online panel providers and partnerships among organisations with robust educator databases. Respondents were sourced from an online panel (Octopus Group) and through a direct partnership with Education Services Australia.

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 2: Total unweighted sample and weighted population.

EDUCATOR PROFILE	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
Total	**801**	**100%**	**801**	**100%**
Gender				
Man	179	22%	115	14%
Woman	610	76%	674	84%
Other / non-binary / prefer not to specify	12	1%	12	1%
Main role				
Classroom teacher	501	63%	510	64%
Career advisor	43	5%	39	5%
Other	195	24%	191	24%
VET or higher education educators	62	8%	62	8%
Time in role				
Under 4 years	124	15%	118	15%
4 – 7 years	166	21%	164	21%
8 – 11 years	183	23%	195	24%
12 – 19 years	175	22%	175	22%
20 or more years	153	19%	148	18%
Employment type				
Relief	27	3%	26	3%
Casual	55	7%	55	7%
Part-time	200	25%	220	28%
Full-time	513	64%	494	62%
Other	6	1%	5	1%
Aboriginal and / or Torres Strait Islander status				
Yes	12	1%	13	2%
No	783	98%	783	98%
Prefer not to say	6	1%	5	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	518	70%	479	65%
Catholic	93	13%	143	19%
Independent	122	17%	107	15%
Other	6	1%	10	1%
School level*				
Primary	337	42%	354	44%
Secondary	228	28%	214	27%
Combined (P-12)	105	13%	101	13%
Special school	27	3%	26	3%
Other	42	5%	45	6%
Tertiary / higher education	62	8%	61	8%
Single sex or co-ed				
Co-ed	694	94%	699	94%
Single sex (girls)	19	3%	19	3%
Single sex (boys)	26	4%	22	3%

*Within the survey sample, 92% work within a primary or secondary school while 8% work in the VET / tertiary sector.

LOCATION AND SOCIOECONOMIC STATUS	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
State				
NSW	246	31%	257	32%
VIC	207	26%	207	26%
QLD	145	18%	159	20%
WA	95	12%	57	7%
SA	55	7%	80	10%
ACT	21	3%	17	2%
TAS	18	2%	8	1%
NT	11	1%	14	2%
Location of school				

LOCATION AND SOCIOECONOMIC STATUS	UNWEIGHTED SAMPLE	UNWEIGHTED SAMPLE %	WEIGHTED POPULATION	WEIGHTED POPULATION %
Capital city / major metropolitan area	495	62%	465	58%
Regional or remote / rural	306	38%	336	42%
Socioeconomic status of teachers' school (SES)				
Lower SES (Decile 1 - 5)	313	40%	393	50%
Higher SES (Decile 6 - 10)	476	60%	397	50%

Educator profile & specialisation

Educator role

Around two thirds of the survey sample (64%) are employed as classroom teachers in their main role, while 29% work in other roles such as teacher support / aides (15%), career advisors (5%), school coordinators (6%) and assistant / deputy principals and principals (3%). The survey also included 8% of educators who worked in the tertiary sector (university and / or TAFE / VET).

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, a third (33%) reported to also have a secondary role as either a school coordinator, teacher support / aide, career advisor or an unspecified educator role.

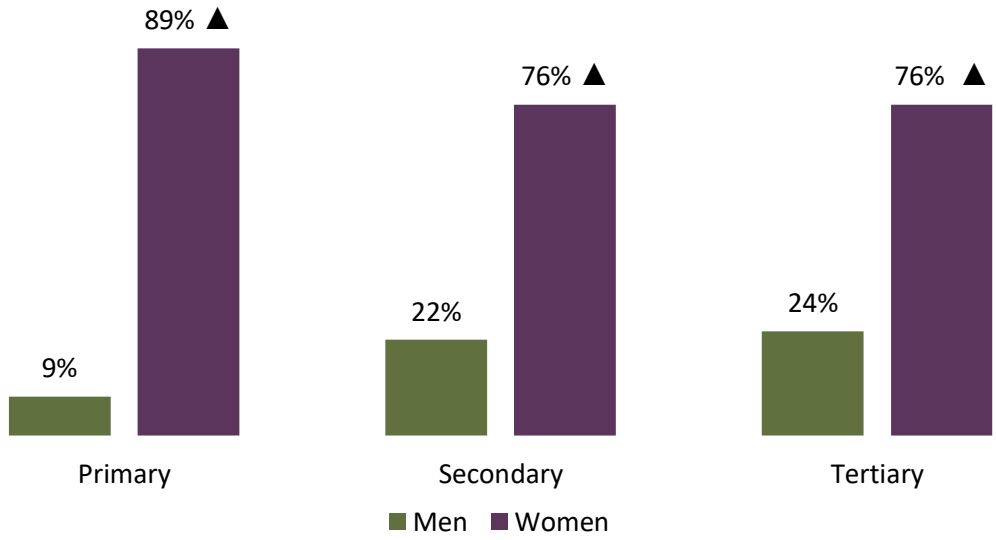
Educator gender

Among all educators surveyed, 84% were women and 14% were men (weighted). This gender imbalance is reflective of Australia's school education sector, with women making up 72% of FTE teachers in 2023, according to the 2023 National Report on Schooling data portal, produced by the Australian Curriculum, Assessment and Reporting Authority (ACARA)[1]. The ACARA data shows the gender difference is more pronounced at the primary level (82.1% female) than at secondary level (61.4% female).

In line with the National Report on Schooling data portal, the survey data also shows that the proportion of men among teachers differs along with the schooling year levels, with men making up 9% of primary school teachers, 22% of secondary school teachers and 24% of tertiary educators.

Figure 1: Gender balance among teachers within education levels.

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

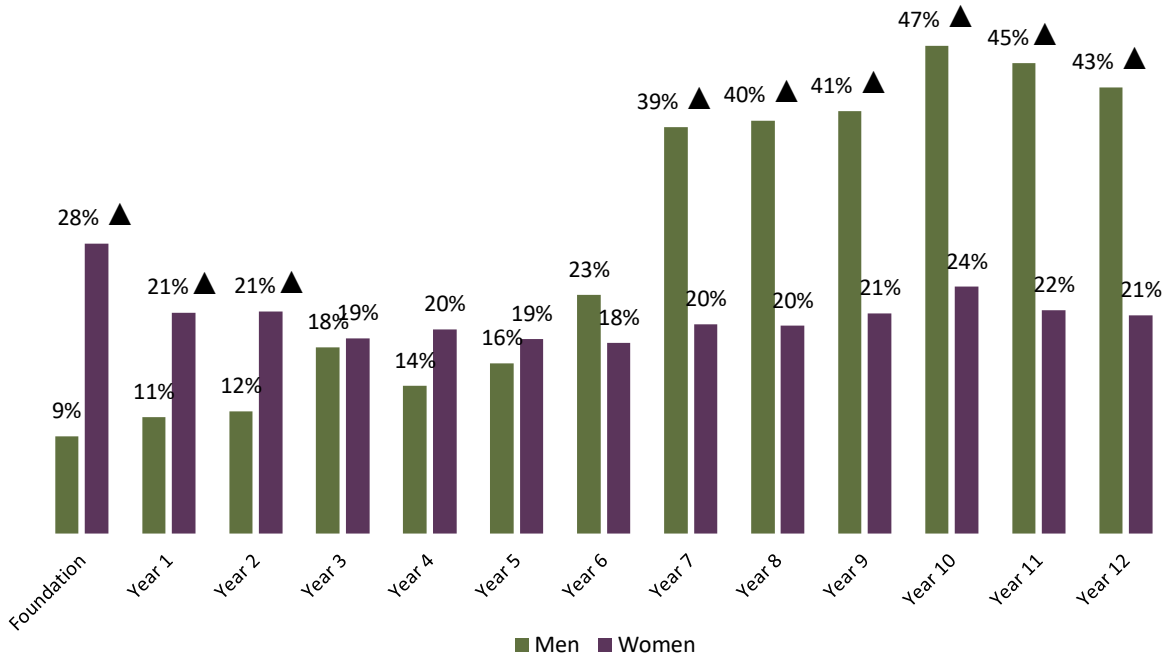


Base: unweighted men – 179, women – 610 (not shown due to low base size: non-binary teachers – 12).

[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 2: Teacher gender distribution by year level taught.

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



Base: unweighted, those in a teaching role, men – 148, women – 533 (not shown due to low base size: non-binary teachers – 11).

Unlike last wave, men that teach secondary school subjects were not significantly more likely than women to teach STEM subjects (55% vs 49%).

General Mathematics was the subject most taught by both men and women at Secondary level (21% of men, 26% of women), although a high proportion of men and women in this wave's survey reported teaching an 'other' subject not listed (38% and 31% respectively).

Mainstream vs specialist education settings

Of the educators surveyed, 89% work within a mainstream education setting, and 11% 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, 79% provide disability / special needs support services, 54% provide English as Secondary Language (ESL) programs and 54% support students from First Nations communities.

Eighteen percent of educators are at schools / institutions where the Aboriginal and / or Torres Strait Islander student population is 20% or more, consistent with previous waves.

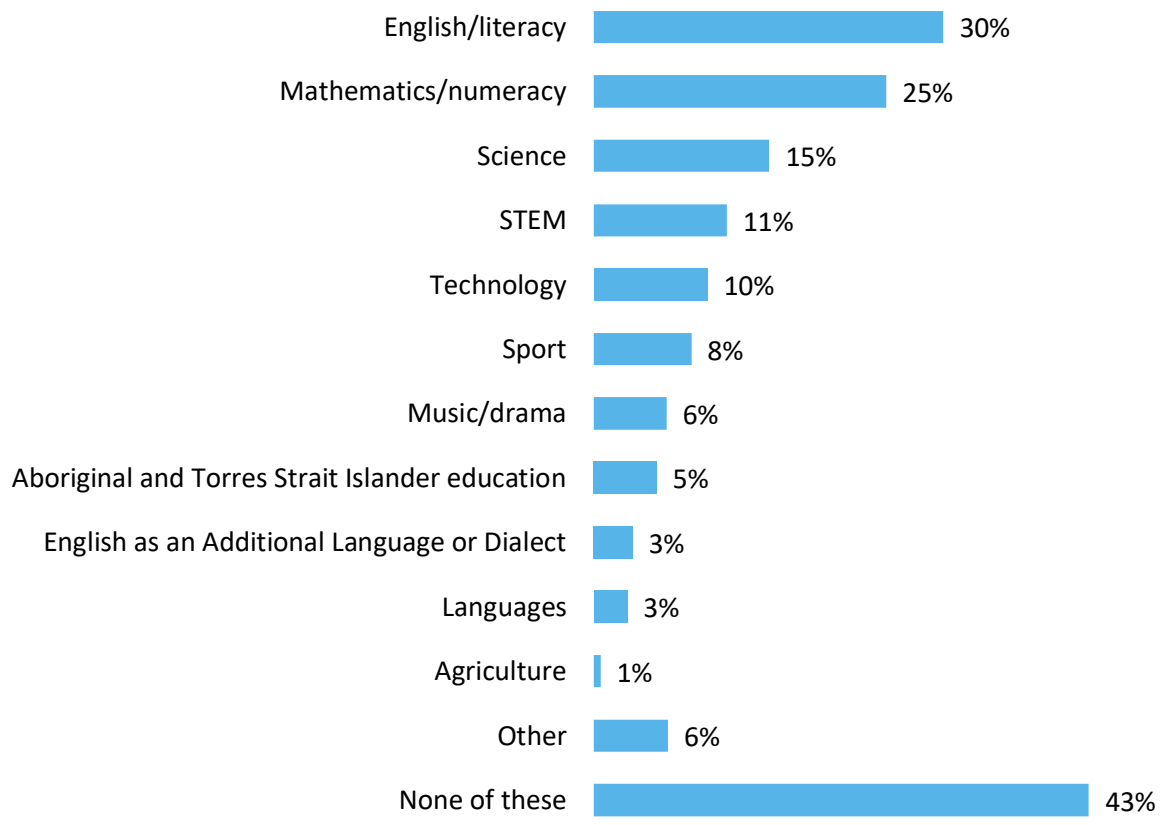
Primary teachers

When asked about their specialisations, three in five primary school teachers (57%) reported to have a specialisation in at least one subject area, in line with wave 2.

Focusing specifically on STEM subjects, 33% of primary teachers have a STEM specialisation, in line with wave 2. Mathematics ranked as most common (25%), followed by science (15%). Eleven percent reported to be STEM specialists this wave, up from 5% in wave 2.

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)



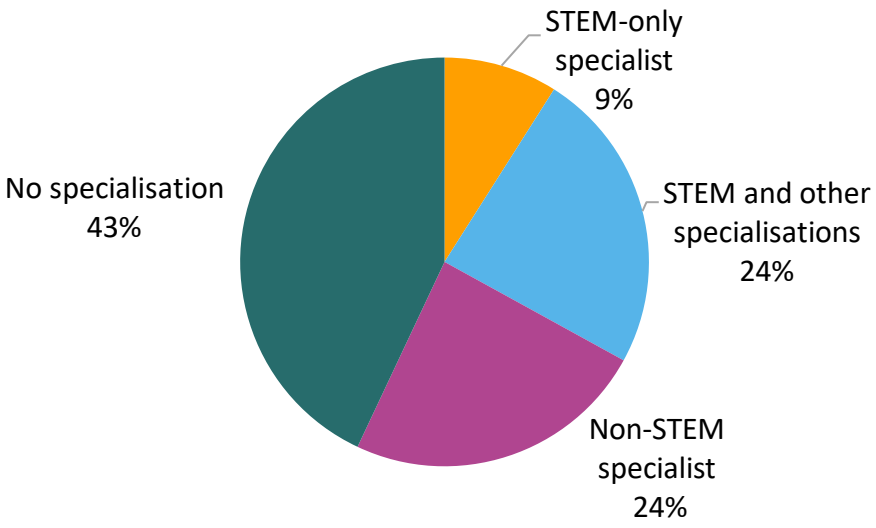
Base: unweighted primary school teachers – 371.

Although not statistically significant, teachers who are men were more likely to report being a STEM specialist (20% vs 11% of teachers who are women). However, men were significantly more likely to report a specialism in a specific STEM subject compared to women (57% vs 31%).

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, 73% of those also have a specialisation in a non-STEM subject area. This is slightly lower than in wave 2 (77%).

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)



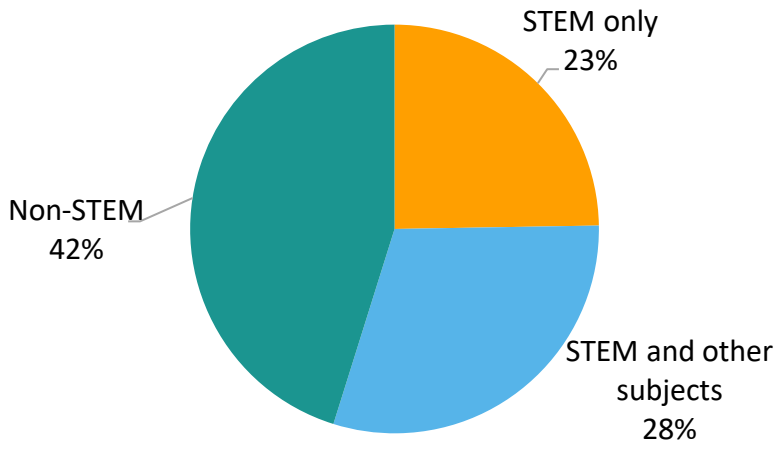
Base: unweighted primary school teachers – 371. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Secondary teachers

Reflecting the multiple roles that teachers have, it was evident from the data that a significant overlap exists between secondary teachers who specialise in STEM and those who do not. Among the secondary teachers surveyed, 50% teach STEM: 23% teach only STEM subjects, 28% teach STEM subjects and non-STEM subjects. Only 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: unweighted secondary teachers – 313. 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. There are teachers who do not currently teach STEM, who have STEM qualifications (20%). Inversely, there are teachers currently teaching STEM who do not have STEM qualifications or training (37%).

Based on teachers' entire careers, the survey found that 50% of secondary teachers currently teach at least one STEM class, 19% have taught at least one STEM class in the past and 31% have never taught STEM.

With seven in ten (69%) 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 slightly more likely to be men (28% vs 22% of women). From the student perspective, this means they may be more likely to see men STEM teachers, which can potentially influence their gender associations with STEM careers.

However, women are just as likely to teach STEM alongside other subjects as men, with 28% of women reporting this compared to 27% of men.

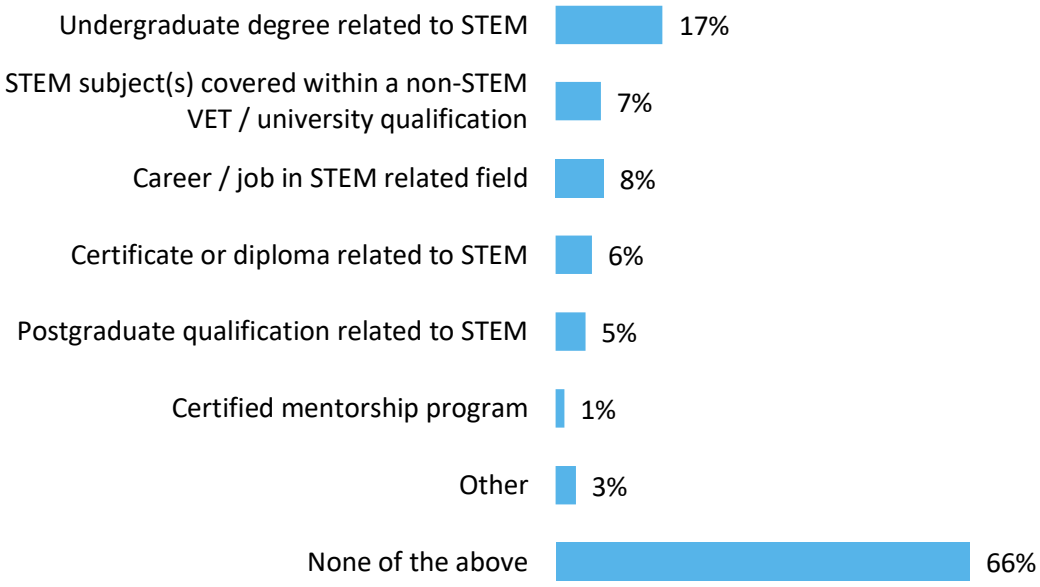
Prior STEM qualifications

A third (34%) of survey respondents had obtained a STEM qualification before entering the education sector, down slightly (not significantly) since wave 2 (40%) but in line with wave 1 (35%).

The most common qualification was an undergraduate degree (17%). Eight percent previously had a job in a STEM related field and 7% had covered a STEM subject within a non-STEM VET or university qualification.

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	Wave 1	Wave 2	Wave 3
Net: Had prior STEM qualification(s)	35%	40%	34%
Did not have a STEM qualification	65%	60%	66%

Base: unweighted total wave 1 – 844, wave 2 – 730, wave 3 – 801.

Exploring these results in further detail, men were more likely than women to have obtained a STEM qualification prior to teaching (44% of men vs 33% of women). Prior STEM qualifications were also more commonly found in secondary school teachers (42%) compared to primary school teachers (26%). When comparing secondary teachers who are currently teaching STEM to those who do not teach STEM, those teaching STEM are more likely to have STEM qualifications than those who do not teach STEM (63% vs 21%). This is consistent with the previous waves.

Consistent with wave 2, those teaching at Catholic schools were most likely to have STEM qualifications (37%, 34% for independent and 31% for government schools).

These prior STEM qualifications and experiences 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, 11% have prior career experience in a STEM-related field. This represents a downward progression since wave 1 (23%) and wave 2 (17%).

Further STEM education

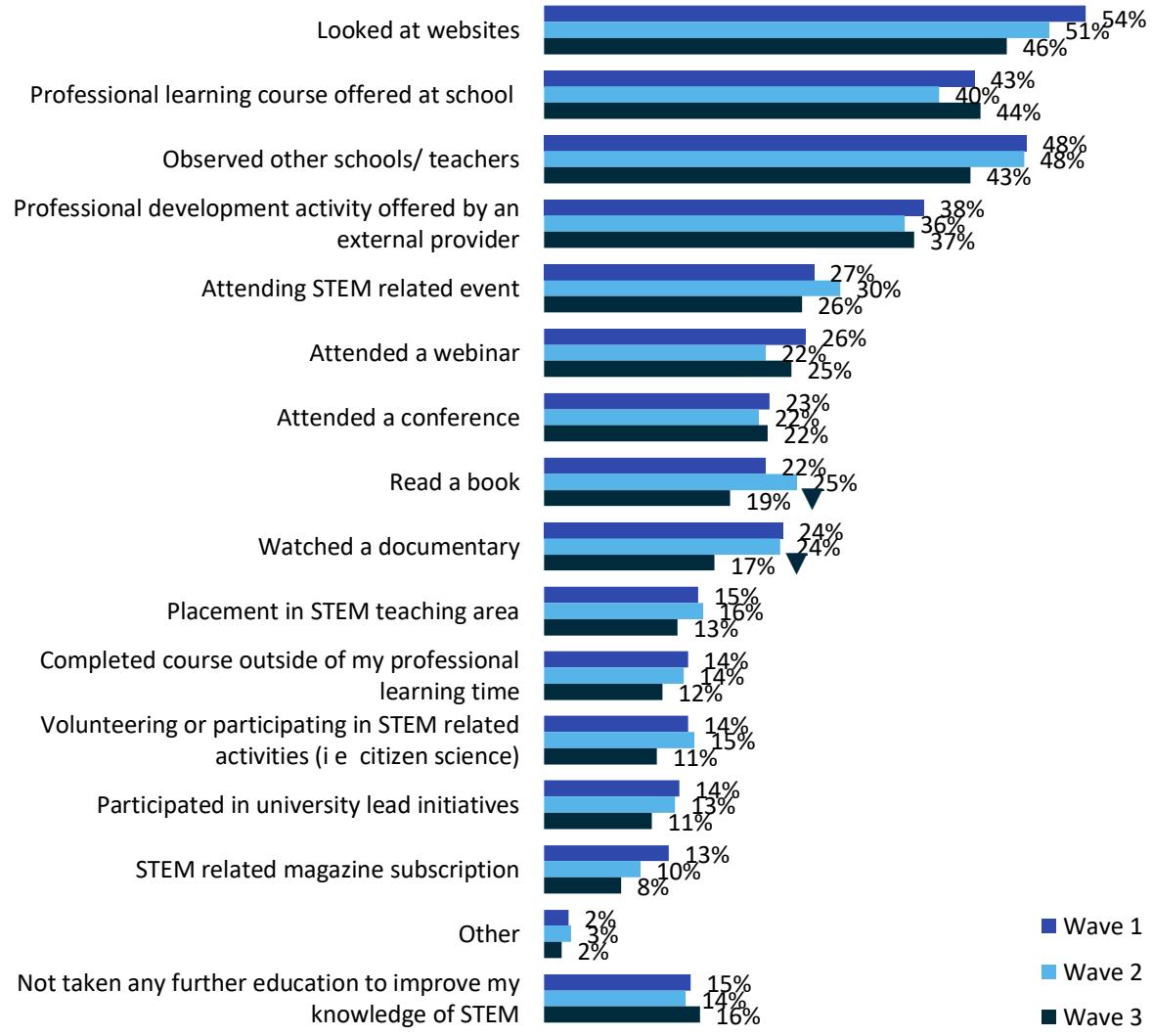
Among educators where STEM is relevant to their teaching, 84% have undertaken some level of further education to improve their knowledge of STEM. This includes a wide range of activities, from formal courses through to less formalised professional development such as reading books, magazines, websites or watching documentaries. There has been no change in overall undertaking since the previous wave (86%).

Regarding formalised training, 62% of teachers have undertaken further STEM education in a formalised setting (completed a 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). This is in line with the previous wave (61%).

This wave, teachers were less likely to have read a book (19% down from 25%) or watched a documentary (17% down from 24%) to improve their knowledge of STEM. While not significant, indicatively there are more teachers this wave who have taken a professional learning course, taken part in an external professional development activity or attended a webinar.

Figure 7: 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	Wave 1	Wave 2	Wave 3
Net: Undertaken further STEM education	85%	86%	84%
Undertaken formalised training in STEM	62%	61%	62%
Have not undertaken further STEM education	15%	14%	16%

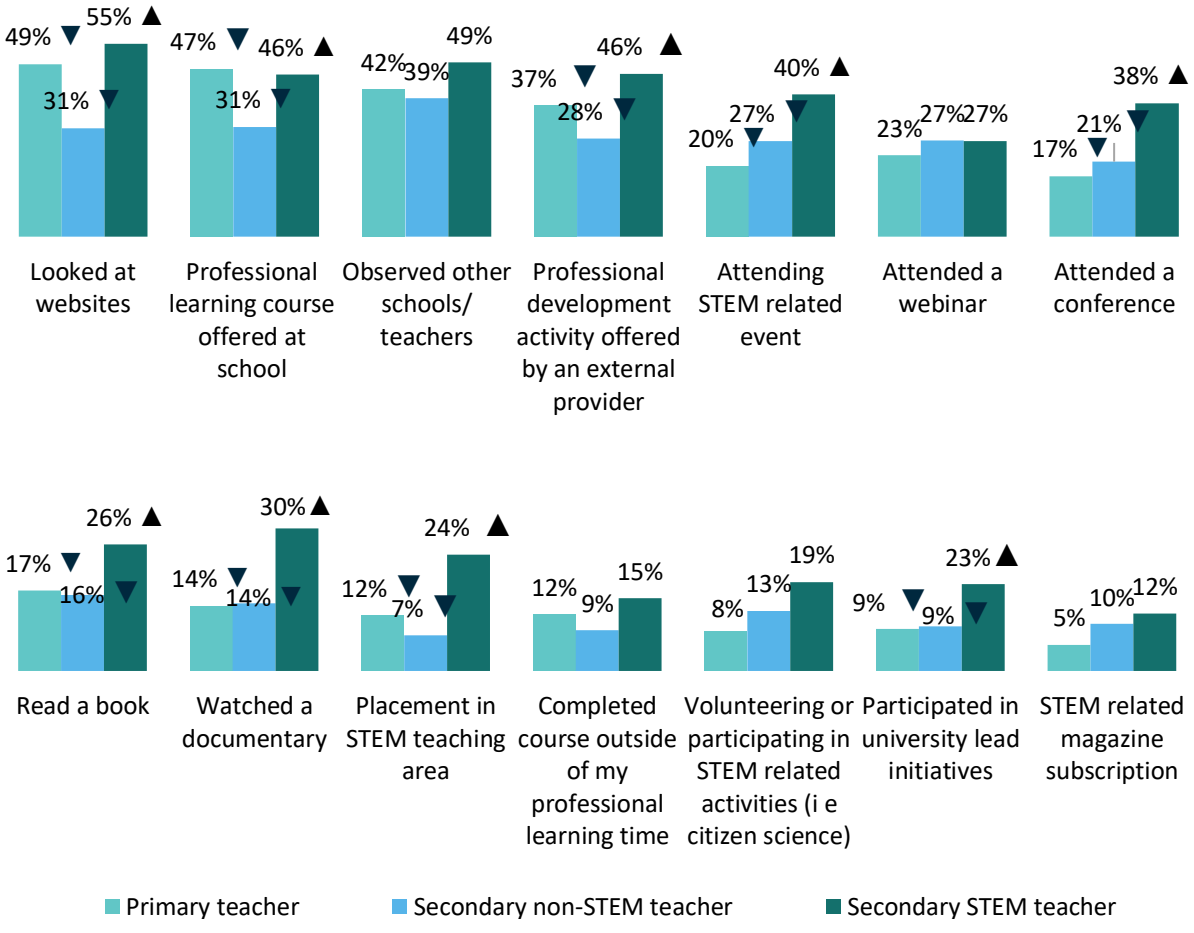
Base: unweighted Those who said that STEM skills are relevant to their role – wave 1 – 692, wave 2 – 629, wave 3 - 684. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Some differences in gender were observed in the undertaking of further STEM education, with 31% of teachers who are men reporting attending a conference compared to 21% of women teachers, and 27% of men watching a documentary compared to 15% of women. However, there were fewer gender differences than observed in previous waves.

As shown in Figure 8 below, 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 89% having undertaken at least some form of further STEM education and 71% having undertaken formal STEM training.

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	Primary teachers	Secondary non-STEM teachers	Secondary STEM teachers
Net: Undertaken further STEM education	86%	76%	▲89%
Undertaken formalised training in STEM	64%	46%	▲72%
Have not undertaken further STEM education	14%	▲24%	11%

Base: unweighted primary teachers – 371, secondary non-STEM teachers – 152, secondary STEM teachers – 161.

The survey also revealed some other distinct differences between teacher cohorts. Teachers in mainstream schools were more likely than those in specialised schools to have attended any type of further education (86% vs 72%). Those with previous STEM qualifications were more likely than those without to have attended any further education (92% vs 81%) including formalised training (72% vs 57%).

We also saw that those with longer teaching tenures were more likely to have taken part in formalised training (68% of those with 12+ years of experience, compared to 58% of those with shorter tenures). This was driven by those with longer tenures being more likely to attend most types of training / education.

Positively, those teaching in higher socioeconomic areas were just as likely to have taken part in formalised training as those in lower socioeconomic areas, compared to last wave where the survey found higher rates of training among those in higher SES areas.

Educator attitudes towards STEM

Awareness and understanding

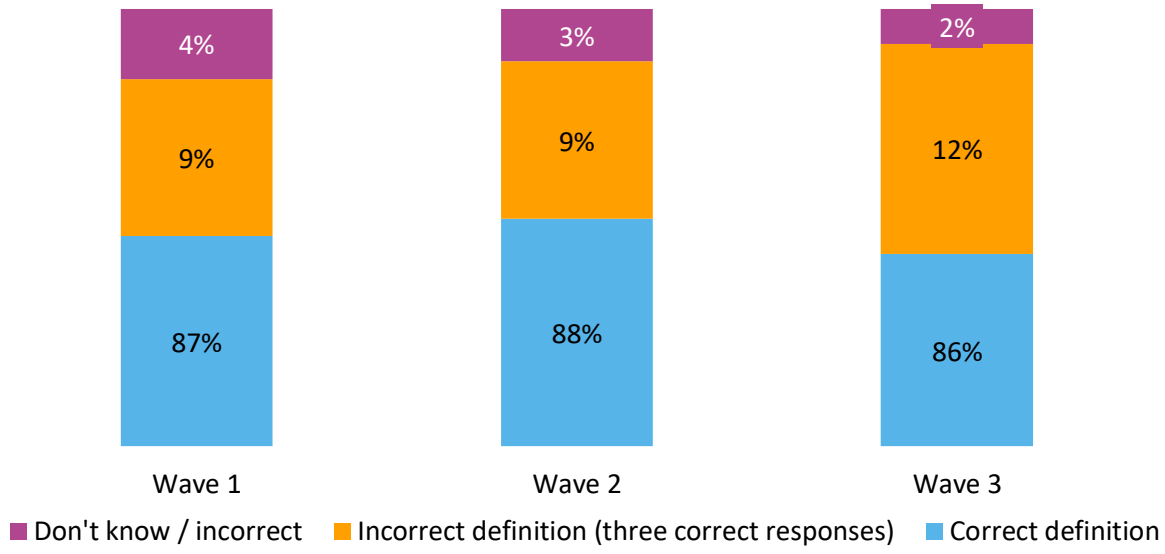
To get an indication of their understanding of STEM, educators were asked to write what they believe STEM stands for. Almost nine in ten (86%) correctly answered with science, technology, engineering and mathematics (although not necessarily in that order). We have not recorded any changes in awareness since tracking began.

A further 12% were only able to correctly identify three out of the four subjects, with engineering proving to be the subject that most got confused with (7%).

Only 2% 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.

Figure 9: Understanding of the term 'STEM' (coded).

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



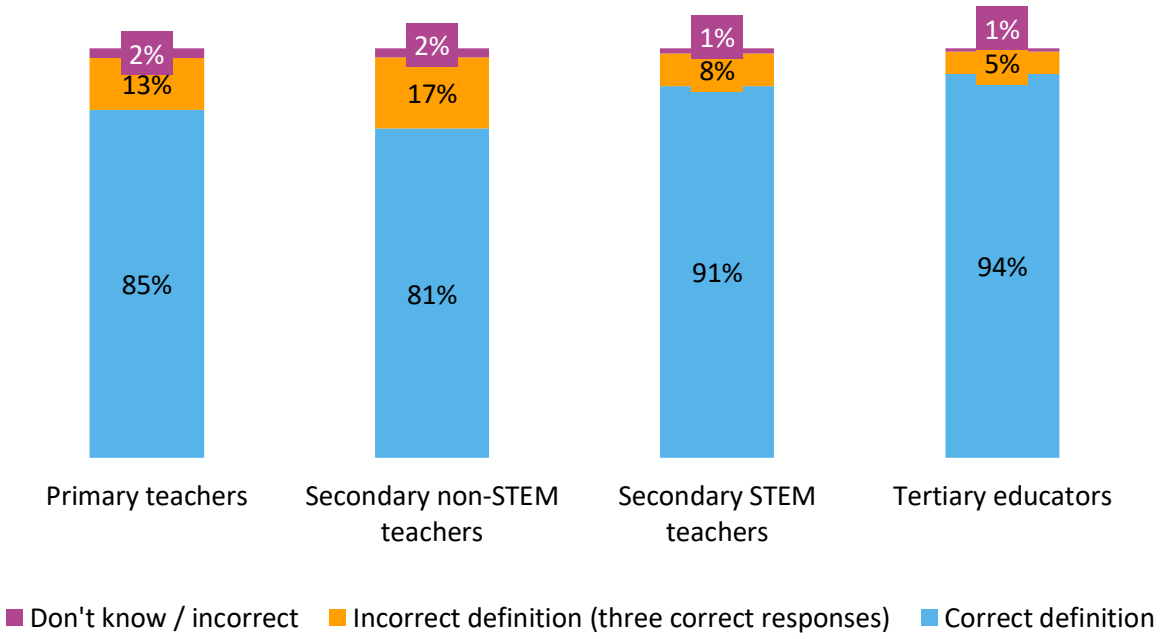
Base: unweighted total educators – wave 1 – 844, wave 2 – 730, wave 3 - 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Tertiary educators recorded the highest score of correct responses (94%), followed by Secondary STEM teachers (91%), primary teachers (85%) and lastly secondary non-STEM teachers (81%). Career Advisors were more likely than any other type of educator to correctly define STEM (97%).

While not significant, those in government schools (87%) were slightly more likely to give a correct definition compared to Catholic (81%) and independent (81%) schools. Since tracking began the data has shown lowest awareness among Catholic school teachers.

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

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



Base: unweighted wave 2 primary teachers – 371, secondary non-STEM teachers – 152, secondary STEM teachers – 161, tertiary educators – 62. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Perceived importance of STEM skills for future work

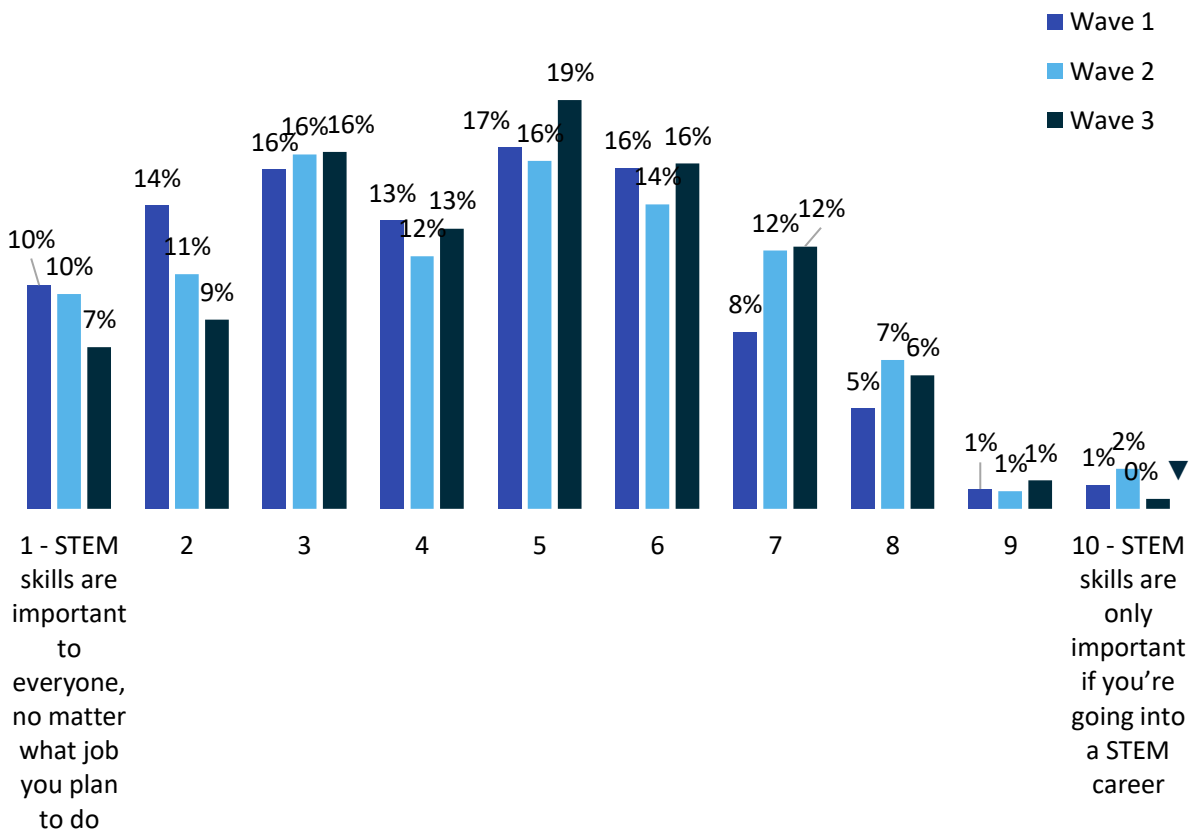
Educators were asked to place themselves on a 10-point scale with two opposing statements about STEM skills: STEM skills are important to everyone, no matter what job you plan to do, and STEM skills are only important if you're going into a STEM career. The scale purposefully did not have a midpoint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

Two thirds (64%) selected a position on the left side of the scale, agreeing that STEM skills are important to all, in line with wave 2. The strength of this agreement was varied with a relatively even spread of positions. One third (36%) took the opposing view, that STEM skills are only important if you are going into a STEM career, also in line with last wave.

Teachers who are men were more likely to score from 1-4 (STEM skills being important to everyone) compared to teachers who are women (54% vs 44%). Other groups of teachers who skew left on the scale are secondary teachers, teachers with a longer tenure and career advisors.

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: unweighted total – wave 1 – 844, wave 2 – 713, wave 3 - 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

The average score out of ten for all respondents was 4.6 (where 1 = totally agree with the left statement and 10 = totally agree with the right statement), in line with 4.5 observed last wave. 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.

The average score has increased (perceived importance has decreased) slightly for teachers with prior STEM qualifications and teachers at independent schools.

Table 3: Average scores of perceived importance of STEM skills for future work by teacher type.

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

Teacher type	Average Wave 1	Average Wave 2	Average Wave 3
All teachers	4.3	4.5	4.6
Secondary STEM teachers	3.6	4.2	4.3
Teachers with STEM qualification	3.9	4.1	4.5
Teachers at independent schools	4.4	4.3	4.7

Base: unweighted total – wave 1 – 844, wave 2 – 713, wave 3 - 801.

Life skills associated with STEM education

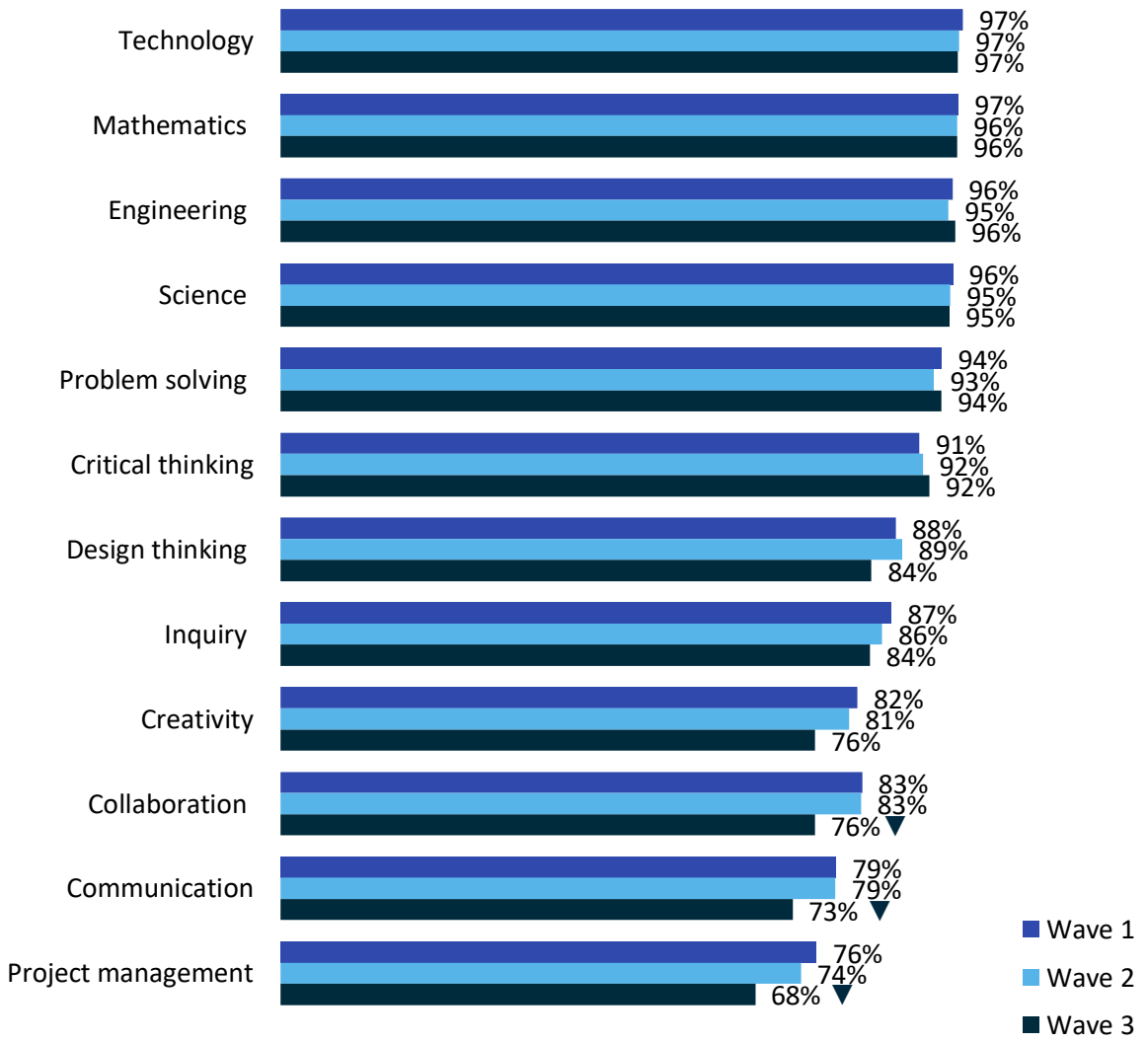
When asked in an open-ended question, what broader life skills does STEM education provide students, the most common skills mentioned by respondents were collaboration, co-operation and teamwork (9%), creativity and lateral thinking (9%), problem solving (8%) and critical thinking (5%).

Respondents were then provided with a list of skills and asked to identify which ones they believe are STEM skills. All respondents (100%) could identify at least one of the core STEM skills (science, technology, engineering and mathematics), while between 84% and 94% 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 (73%), project management (68%) and hand-eye coordination (53%). Despite these skills ranking lowest compared to all others, these results suggest there is a wide interpretation of the skills derived from STEM education.

Figure 12: Skills that educators associate with STEM.

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



Base: unweighted total – wave 1 – 844, wave 2 – 728, wave 3 – 801.

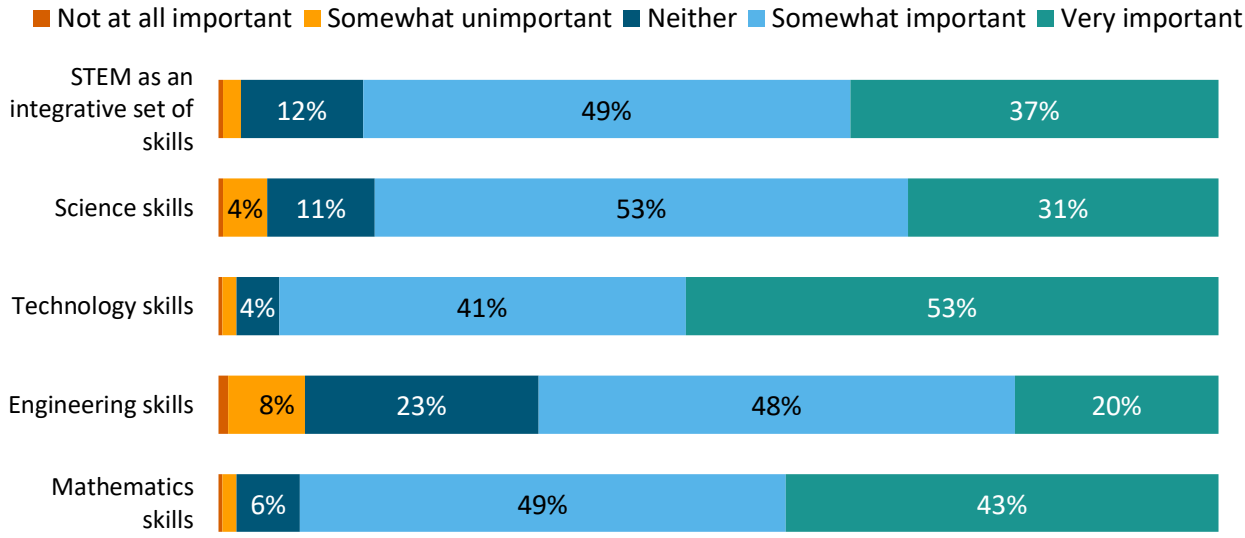
STEM careers and opportunities

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 over half (53%) saying these skills are very important, followed by mathematics skills (43% said these skills are very important). In contrast, only 20% of educators said that engineering skills are very important.

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	85%	84%	94%	68%	92%
Net: somewhat / very unimportant	2%	5%	2%	9%	2%

STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: somewhat / very important – W1	89%	89%	95%	75%	93%
Net: somewhat / very important – W2	89%	85%	94%	73%	93%
Net: somewhat / very important – W3	85%	84%	94%	68%	92%

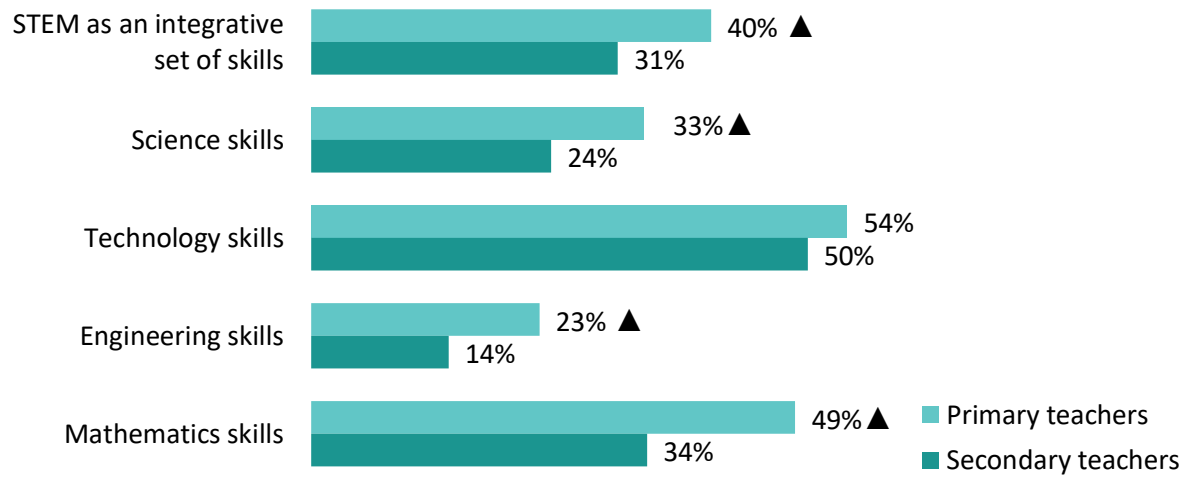
Base: unweighted total – wave 1 – 844, wave 2 – 728, wave 3 - 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Teachers that are men were more likely to believe it is important to have skills in engineering than women teachers (29% vs 19%), however, this was the only significant difference between genders.

There were some differences by school type. The survey found that primary teachers place significantly greater importance on all type of STEM skills except technology compared to secondary teachers, as seen in the chart below.

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?

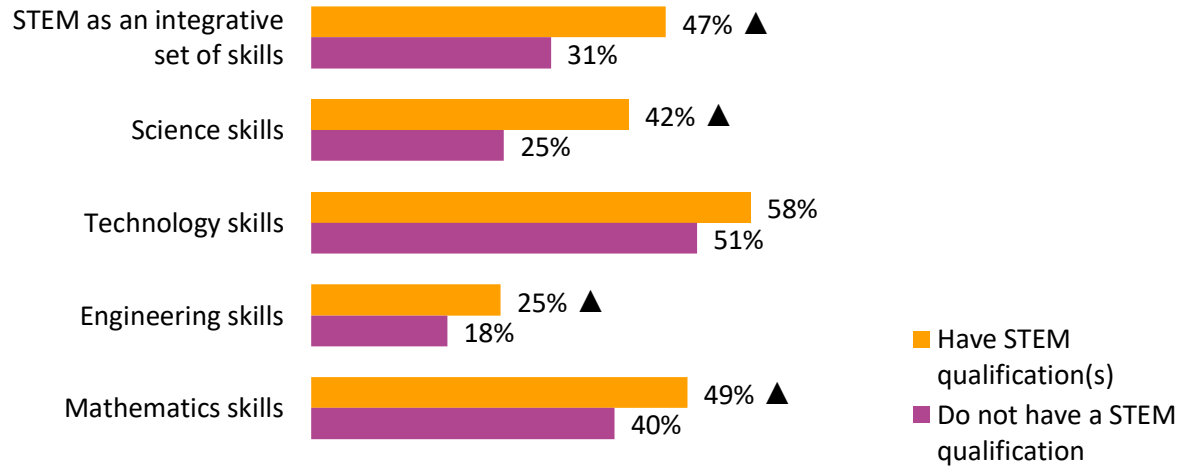


Base: unweighted primary school teachers – 371; secondary school teachers – 313.

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 (47% say integrative STEM skills are very important, compared to 31% of those without STEM qualifications). The only skill which was seen as equally important was technology (58% for those with STEM qualifications vs 51% 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: unweighted those with prior STEM qualification(s) – 282, those without – 519.

Those who teach STEM were more likely to perceive all STEM skills, including STEM as an integrative set of skills, as very important, than those who do not teach STEM.

Educators who disagreed that STEM skills are important to acquire a good job in the future (n=89) were asked why they held this opinion. In wave 3, the key themes were;

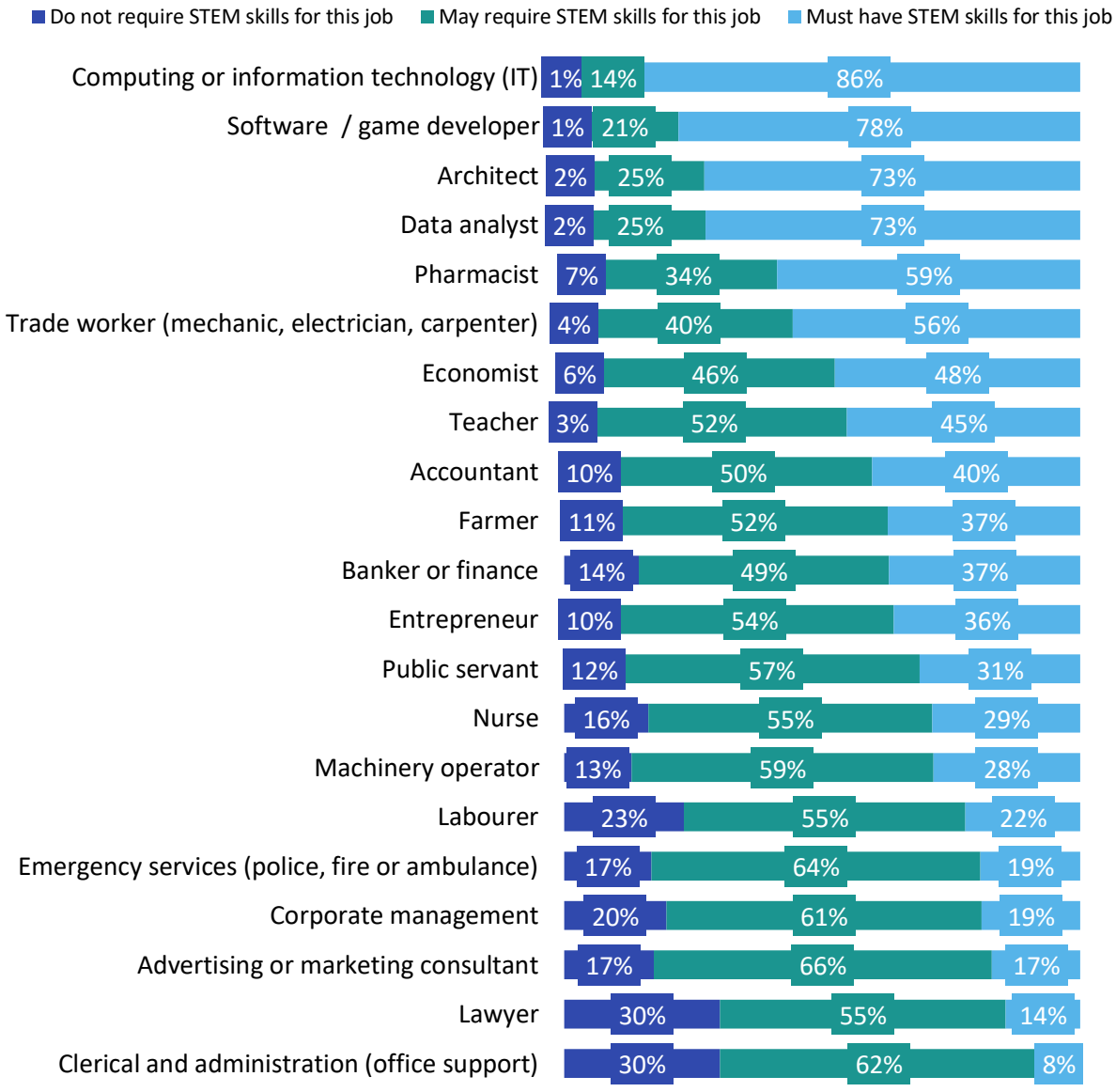
- **STEM skills are not needed for all jobs:** Some educators highlighted that not all jobs or career paths require STEM skills, emphasising that there are various fulfilling roles outside STEM fields, such as trades, arts, humanities, social sciences, and more. The necessity of STEM skills often depends on the type of career that the student wishes to pursue.
- **Basic and essential skills vs. STEM:** Several responses suggest that foundational skills such as literacy, communication, and basic mathematics may take precedence over advanced STEM skills for certain students, particularly in specific educational contexts e.g. at primary level or schools that support students with disabilities or special needs.
- **Emphasis on "soft" skills:** Several remarks stressed that more typically 'soft' skills, such as critical thinking, communication, and adaptability, are increasingly relevant in the job market and may sometimes be more critical than traditional STEM competencies (e.g. science skills).

To further understand educators' association of STEM skills and 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 six out of ten (62%) 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: unweighted total – 801. Sample was split in half to reduce survey fatigue (a maximum of 413 saw each answer option). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

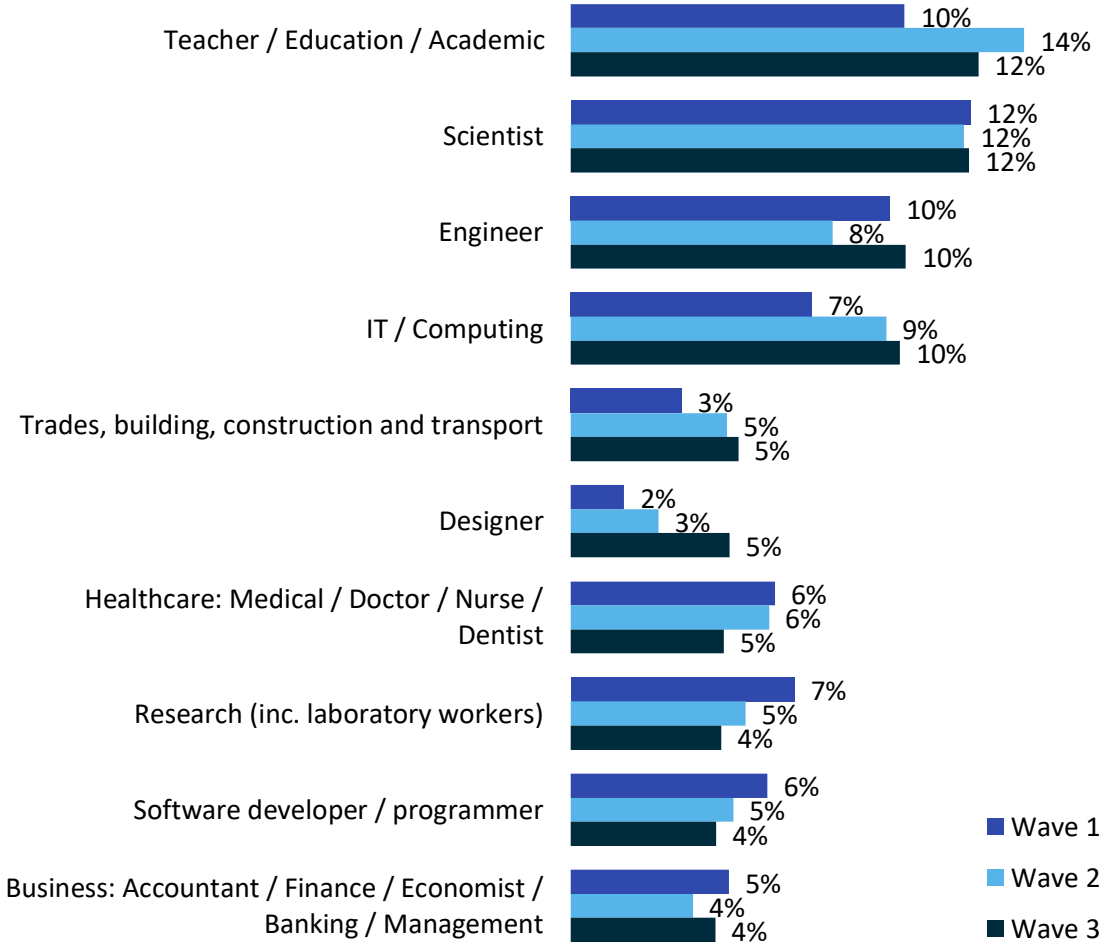
Jobs associated with STEM qualifications

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 working in education topped the list (12%) alongside scientist (also 12%).

One in ten (10%) said STEM education could lead to an engineer job, while the same proportion said IT jobs.

Figure 17: Jobs associated with STEM qualifications (coded, top 10).

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: unweighted total – wave 1 – 844, wave 2 – 730, wave 3 – 801.

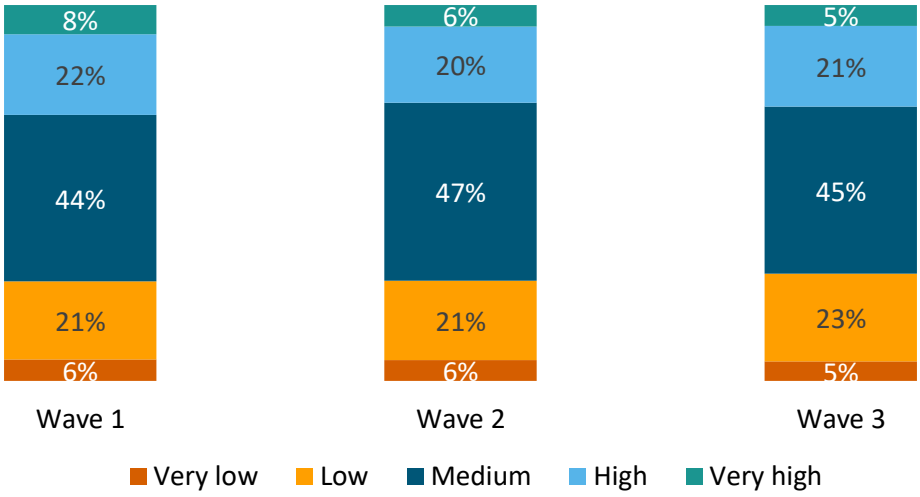
Other roles educators associated with STEM among smaller proportions of educators (but mentioned by at least 1%) were: mathematician, data scientist or analyst, architect, technician or technologist, robotics, aero/astro roles, government roles, chemist, pharmacist or pharmaceuticals, and environmental, sustainability or climate roles.

As part of the survey, educators were asked to self-assess their ability to explain what different STEM careers involve. Only one quarter (27%) would rate their ability as high or very high, in line with wave 2.

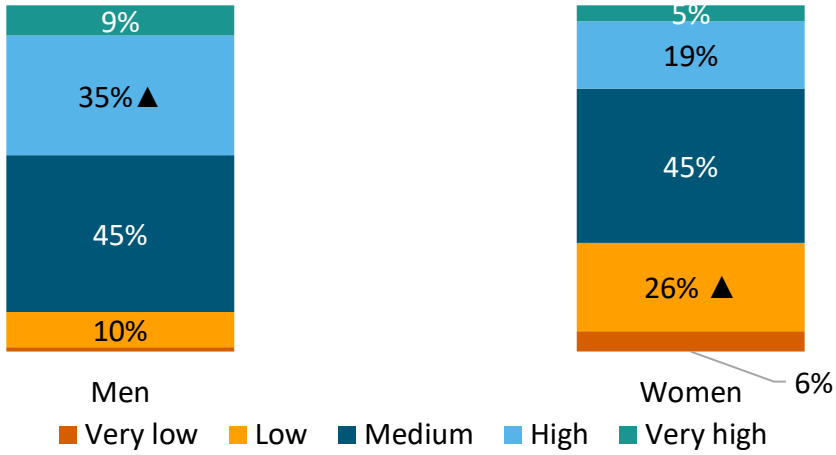
Higher self-assessments were driven more by men (43%) compared to women (24%), although this may be related to a higher proportion of men who have STEM qualifications compared to women.

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?



	Wave 1	Wave 2	Wave 3
High – Very high	29%	26%	27%
Low – Very low	26%	27%	28%



	Men	Women
High – Very high	▲43%	24%
Low – Very low	11%	▲31%

Base: unweighted total – wave 1 – 844, wave 2 - 713, wave 3 – 801, men – 179, women – 610. 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 %
School level	
Primary	21%
Secondary	▲31%
Tertiary	▲46%
Prior STEM qualifications	
Has prior STEM qualifications	▲46%
Does not have prior STEM qualifications	17%
Tenure	
0-11 years	22%
12 or more years	▲34%

The STEM teaching experience

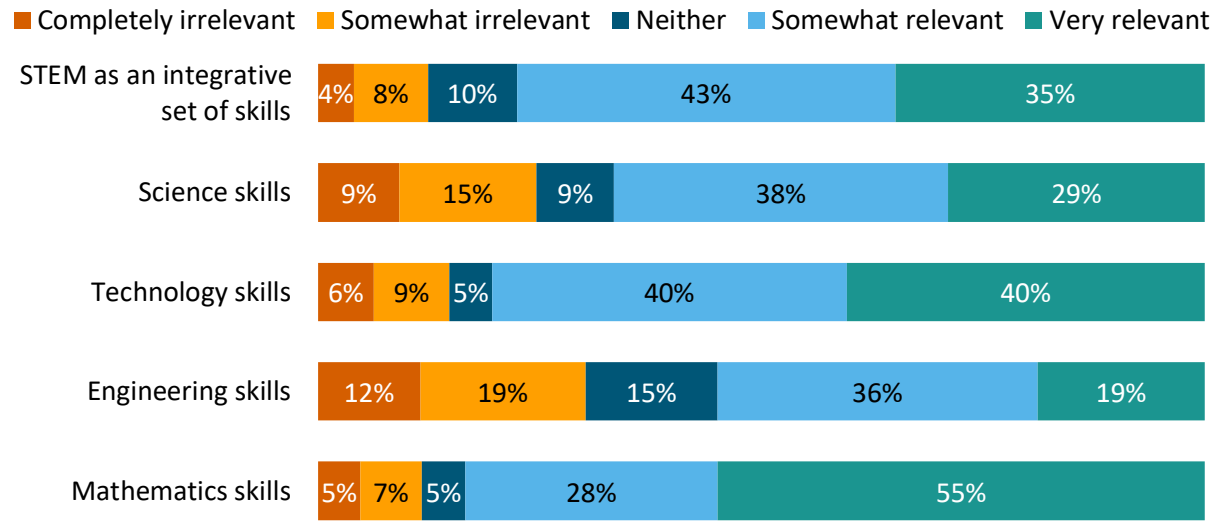
Relevance of STEM to teaching practice

Most educators surveyed identified the teaching of STEM skills as being relevant to their role, consistent wave on wave. STEM as an integrative set of skills, technology and mathematics skills were all selected as relevant to the role of 78% 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 (67%) and significantly lower for engineering skills, which was only relevant to 55% 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	77%	67%	80%	55%	83%
Net: somewhat / completely irrelevant	12%	25%	15%	30%	12%

STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: somewhat / very relevant – W1	81%	74%	83%	60%	84%
Net: somewhat / very relevant – W2	79%	70%	80%	56%	83%
Net: somewhat / very relevant – W3	77%	67%	80%	55%	83%

Base: unweighted total – wave 1 – 844, wave 2 – 730, wave 3 – 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

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.

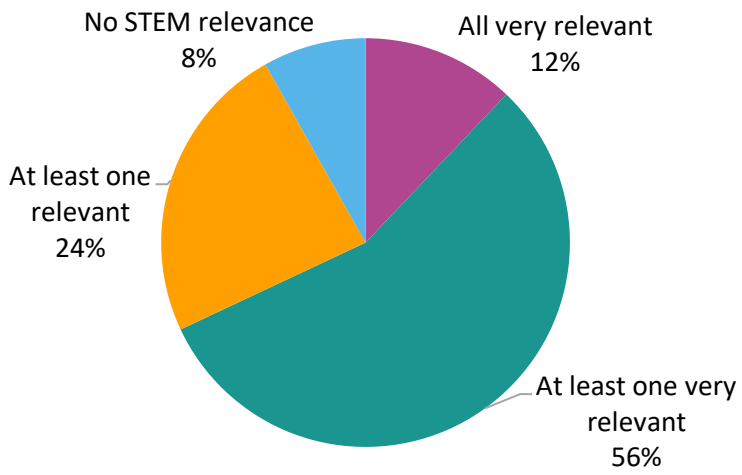
These groupings created the following segments:

- 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 one in ten educators are in a teaching role that is fully STEM integrated (12%), half find at least one STEM subject highly relevant to their teaching (56%), while a quarter have some connection to STEM in their teaching (24%) and only 8% see no relevance with STEM in their main role. These results are consistent with the previous wave.

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

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

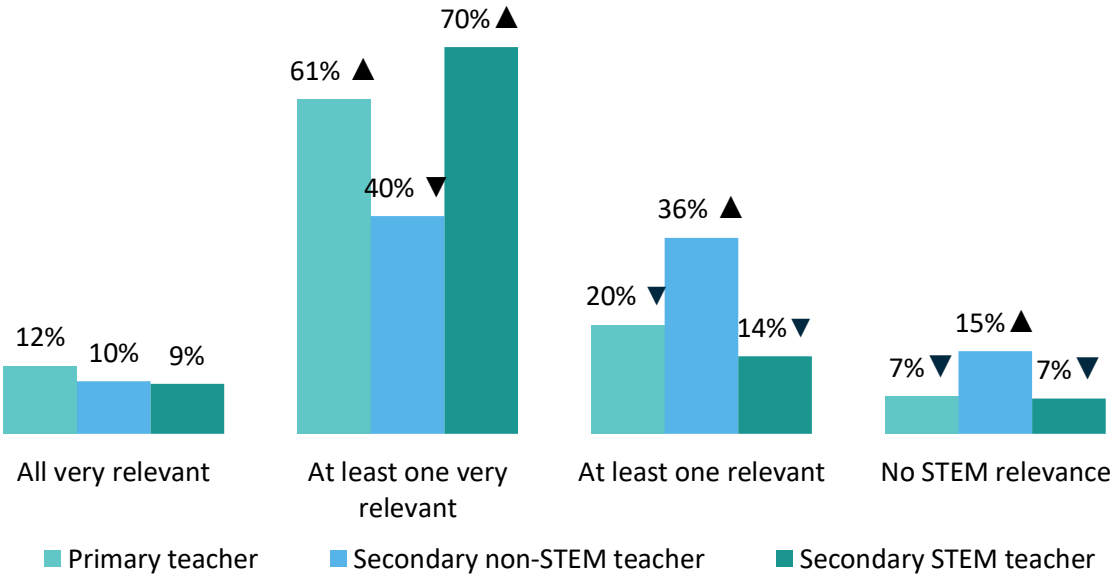


Base: unweighted total – wave 1 – 844, wave 2 – 730, wave 3 - 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Exploring these segments further, it can be seen 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: unweighted primary school teachers – 371, secondary non-STEM teachers – 152, secondary STEM teachers – 161.

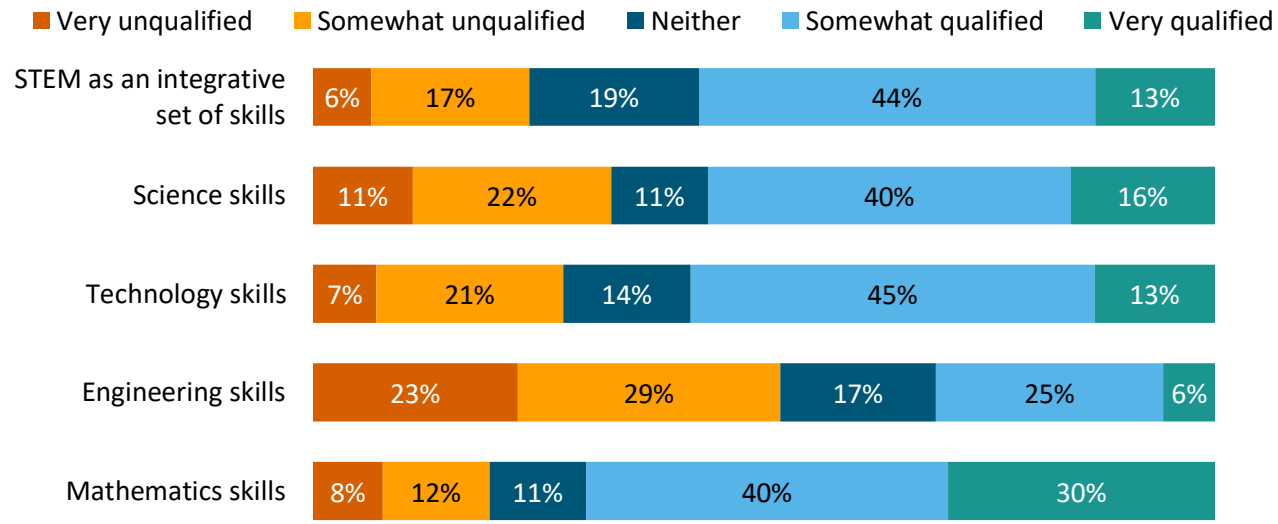
Feelings of qualification to teach STEM

When asked which STEM subjects they feel qualified to teach, mathematics was the clear winner with 70% feeling qualified to teach it.

Next was technology (58%), closely followed by STEM as an integrative set of skills (57%) and science (56%). Feelings of qualification to teach engineering skills was significantly lower, with only three in ten who feel they are qualified to teach this (31%).

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	57%	56%	58%	31%	70%
Net: somewhat / very unqualified	24%	33%	28%	52%	20%

STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: somewhat / very qualified – Wave 1	58%	56%	60%	30%	67%
Net: somewhat / very qualified – Wave 2	60%	60%	62%	31%	73%
Net: somewhat / very qualified – Wave 3	57%	56%	58%	31%	70%

Base: unweighted those who are primary teachers, or who currently teach or previously taught STEM, or if STEM is relevant to their main role – wave 1 – 812, wave 2 – 709, wave 3 - 774. 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 feel more qualified to teach engineering than women (44% vs 29%) but do not feel more qualified to teach integrated STEM or any other STEM subject. This is a change from last year where men felt more qualified to teach all STEM subjects as well as 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.

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 non-STEM teachers	Secondary STEM teachers
STEM as an integrative set of skills	62%	31%	▲67%
Science	62%	28%	▲66%
Technology	63%	40%	▲62%
Engineering	33%	11%	▲38%
Mathematics	83%	33%	▲71%

Base: unweighted primary school teachers – 371, secondary non-STEM teachers – 134, secondary STEM teachers – 161.
Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Within secondary schools, most teachers feel qualified to teach the STEM skills that align to the subjects they currently teach. For example, 80% of biology teachers feel they are qualified to teach science, 84% 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?

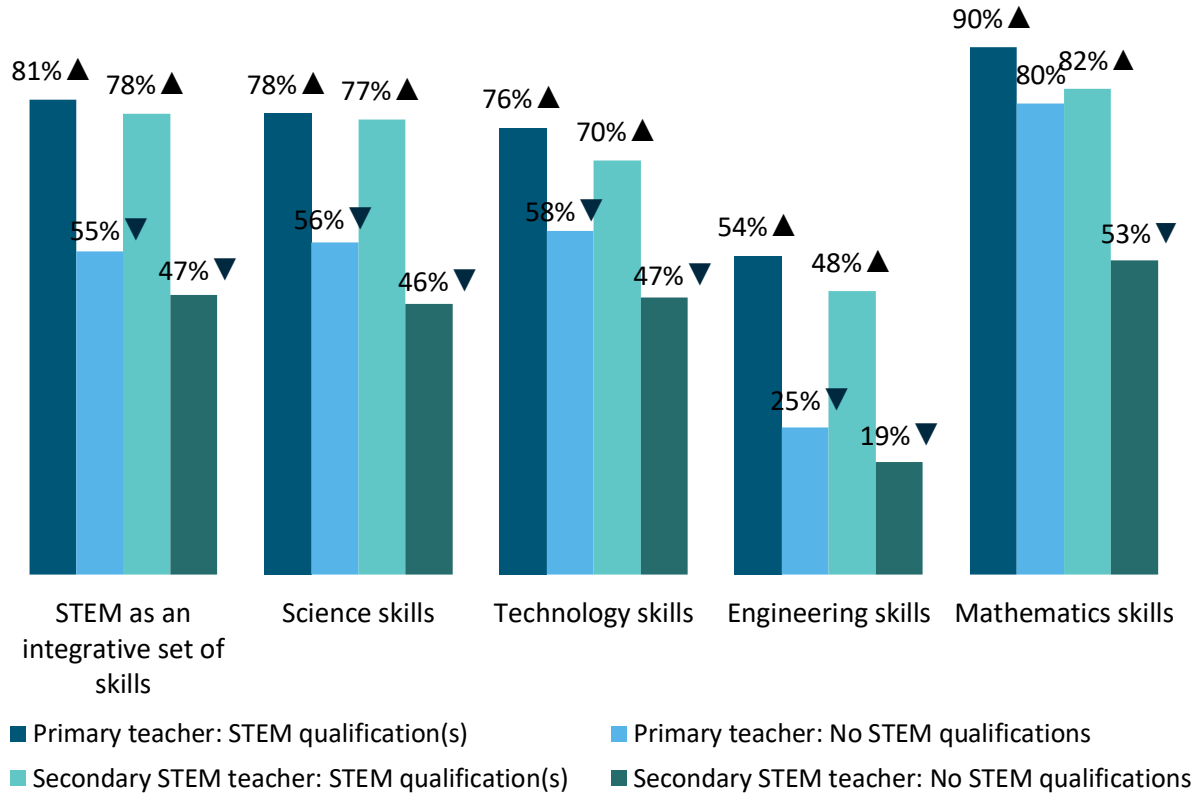
STEM subject	Subject taught									
	General Mathematics	Mathematics Methods	Specialist Mathematics	Biology	Chemistry	Env. Science	Physics	Geography	Design & Tech	Digital Technology
STEM as an integrative set of skills	63%	61%	63%	71%	83%	69%	88%	45%	64%	68%
Science	61%	69%	67%	80%	86%	81%	97%	42%	59%	70%
Technology	52%	66%	58%	56%	62%	57%	63%	47%	78%	84%
Engineering	39%	65%	46%	36%	39%	43%	39%	21%	45%	54%
Mathematics	82%	91%	90%	76%	82%	72%	86%	50%	49%	75%
Base	*65*	*26**	*13**	*43*	*36*	*30*	*22**	*39*	*36*	*18**

*Note: small base size.

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?



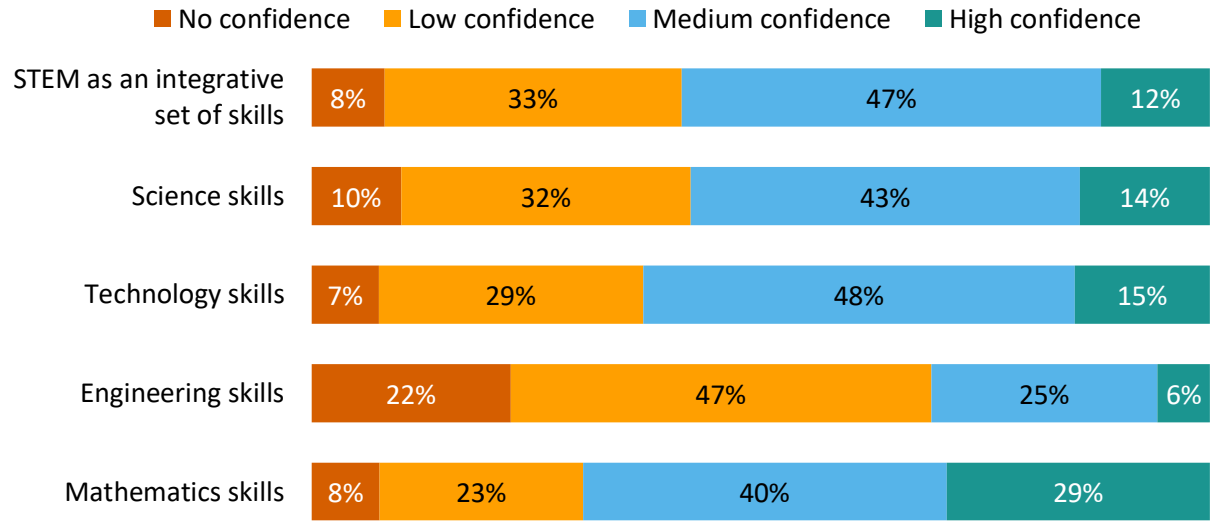
Base: unweighted Primary teachers with prior STEM qualifications - 93; Primary teachers with no prior STEM qualifications - 278; Secondary STEM teachers with prior STEM qualifications - 102; Secondary STEM teachers with no prior STEM qualifications - 59.

Confidence in teaching STEM

Overall, teachers did not report having high levels of confidence in teaching STEM-related subjects. Confidence was highest in mathematics (70%), followed by technology (63%), the integration of STEM as a set of skills (59%) and science (58%). Confidence in teaching engineering was significantly lower compared to all other subject areas, with only 31% saying they feel confident. This is consistent with the previous waves.

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	59%	58%	63%	31%	70%
Net: low / no confidence	41%	42%	37%	69%	30%

STEM subjects	STEM as an integrative set of skills	Science skills	Technology skills	Engineering skills	Mathematics skills
Net: medium / high confidence – W1	61%	61%	64%	32%	69%
Net: medium / high confidence – W2	62%	61%	63%	29%	72%
Net: medium / high confidence – W3	59%	58%	63%	31%	70%

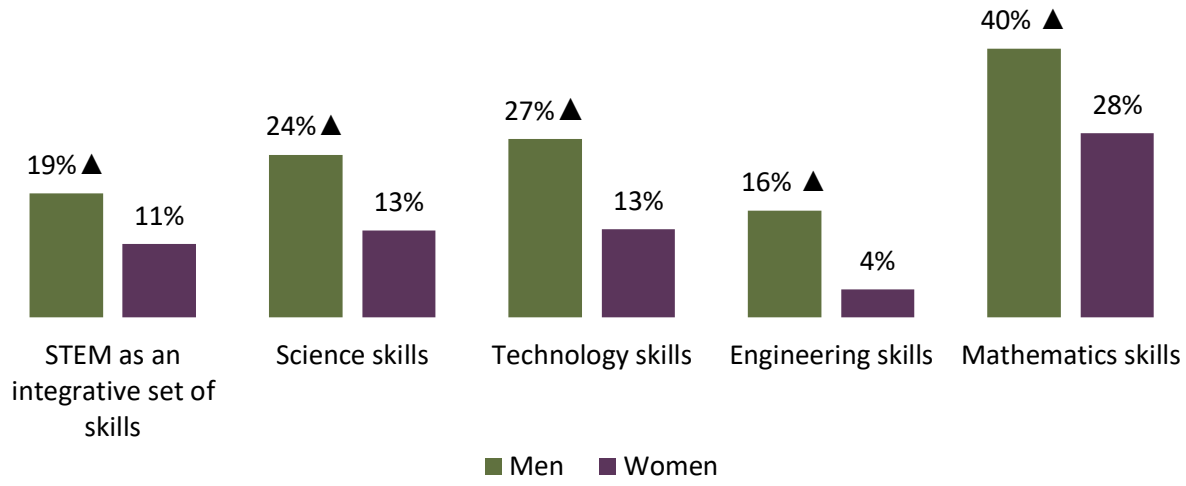
Base: unweighted Base: unweighted those who currently teach or previously taught STEM subjects, those who say STEM is relevant to their role, or primary teachers, wave 1 – 812, wave 2 – 708, wave 3 - 774. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole 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 male teachers (62%) were highly confident with at least one STEM subject, compared to 37% of women. This potentially reflects the slightly 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?

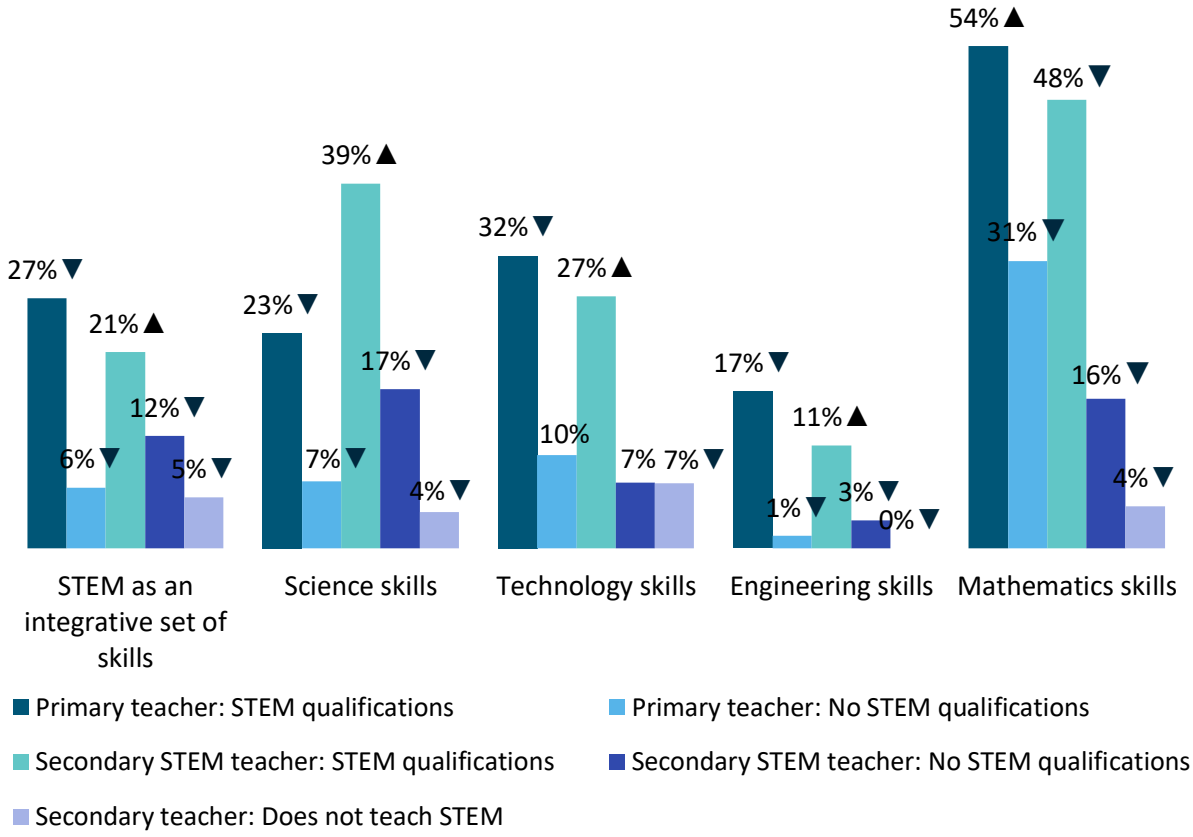


Base: unweighted those who currently teach or previously taught STEM subjects, those who say STEM is relevant to their role, or primary teachers, men – 175, women – 588.

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: unweighted Primary teachers with prior STEM qualifications - 93; Primary teachers with no prior STEM qualifications - 278; Secondary STEM teachers with prior STEM qualifications - 102; Secondary STEM teachers with no prior STEM qualifications – 59, Secondary teachers who do not teach STEM – 134.

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?

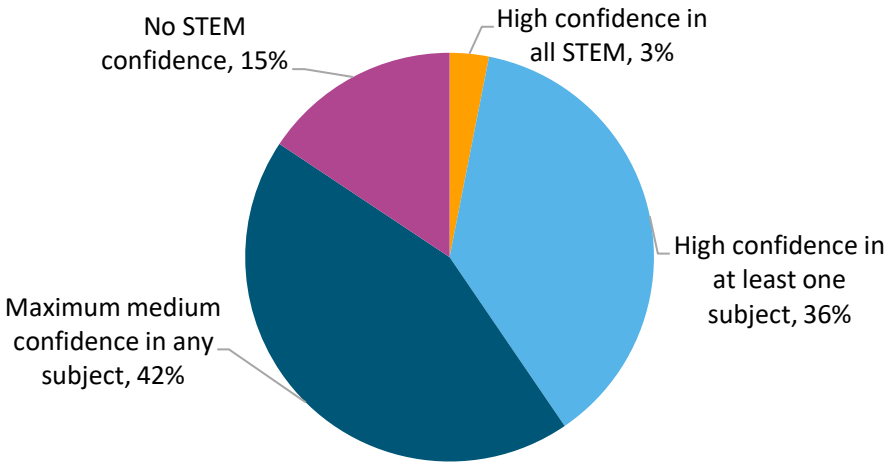
STEM subject	Subject taught									
	General Mathematics	Mathematics Methods	Specialist Mathematics	Biology	Chemistry	Env. Science	Physics	Geography	Design & Tech	Digital Technology
STEM as an integrative set of skills	13%	32%	30%	33%	26%	19%	31%	6%	17%	29%
Science	20%	49%	55%	63%	51%	46%	82%	3%	21%	36%
Technology	16%	30%	20%	10%	9%	7%	9%	3%	44%	41%
Engineering	10%	26%	19%	8%	6%	4%	7%	1%	16%	14%
Mathematics	56%	77%	78%	30%	33%	14%	49%	15%	21%	23%
Base	*65*	*26**	*13**	*43*	*36*	*30*	*22**	*39*	*36*	*18**

Base: unweighted 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 (36%), those whose highest level of confidence in any subject was medium (42%) and finally those without confidence in any area (15%). The results show us that very few educators are confident across the entire STEM curriculum. This is consistent with what was found in previous waves.

Figure 27: Confidence in teaching STEM (segments).

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



Base: unweighted Base: unweighted those who currently teach or previously taught STEM subjects, those who say STEM is relevant to their role, or primary teachers, wave 3 - 774. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

Men were significantly more likely to feel confident with at least one STEM subject than women (56% vs 34%).

Other statistically significant differences between these segments are found below:

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

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

Audience	WEIGHTED %
Secondary level - teaches STEM	
Teaches at least one STEM subject	▲55%
Does not teach STEM	15%
Prior STEM qualifications	
Has prior STEM qualifications	▲57%
Does not have prior STEM qualifications	26%

Unlike in wave 2, Primary school STEM teachers have higher confidence: six in ten are highly confident in at least one area (40%), compared to 35% of secondary school teachers (not a significant difference). This may represent the higher proportion of non-STEM secondary teachers who took part in the wave 3 survey compared to previous waves (54% compared to 60% in wave 2 and 58% in wave 1).

The majority of primary teachers have only medium confidence in any STEM subject (46%) and 11% have no STEM confidence. Similarly, the majority of secondary teachers have only medium confidence in any STEM subject (38%) while one in five (20%) say they have no STEM confidence.

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.

As per the previous waves, 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. 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, as well as feeling unsure about how to best integrate STEM into the curriculum in line with the school's pedagogy.

Some comments also reflected a desire to build confidence, but a lack of time or opportunity within a busy curriculum to do so, and a feeling that things are 'constantly evolving', requiring even more effort from teachers to keep up with change.

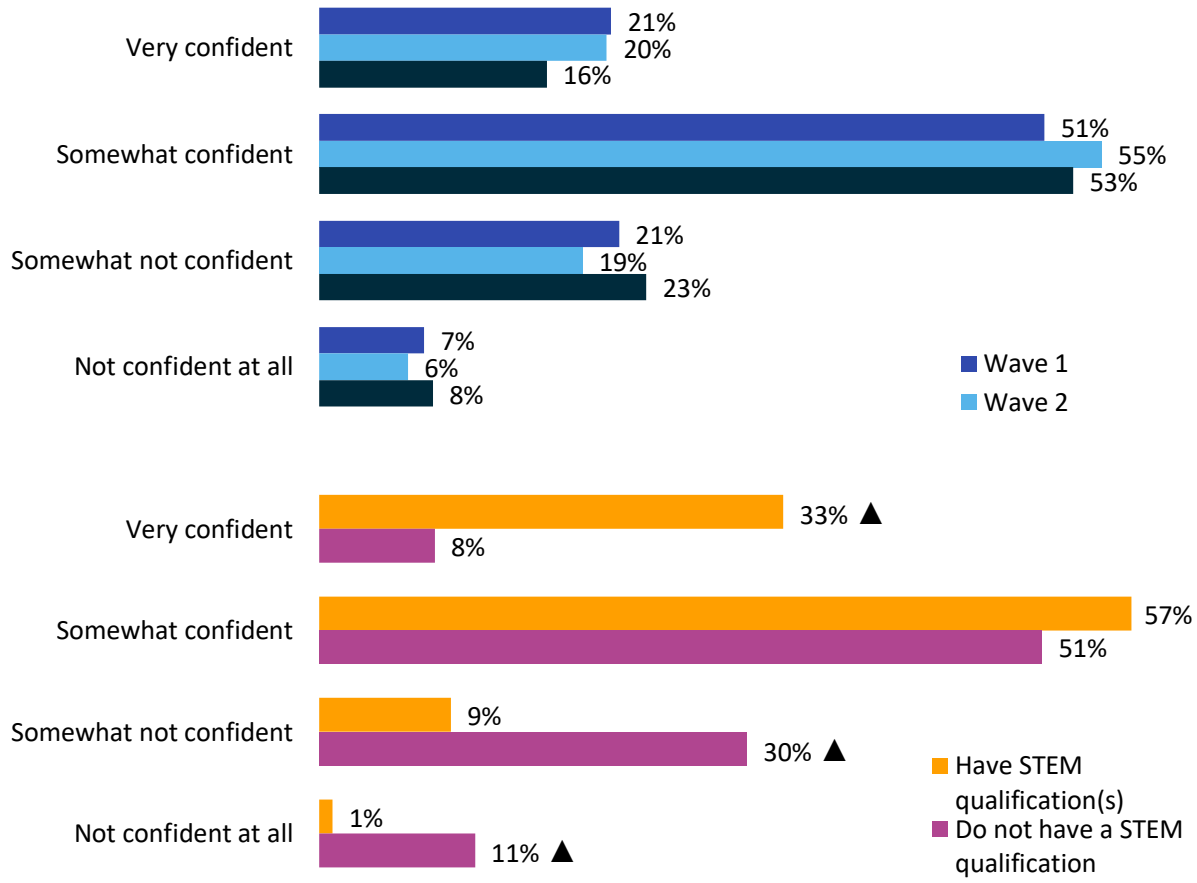
Confidence in connecting STEM content with real-world applications

Seven in ten teachers (69%) feel somewhat or very confident connecting STEM content with real-world applications, slightly lower than the previous wave (75%).

As seen in the chart below, 16% of teachers feel very confident doing this. However, this is strongly driven by teachers with prior qualifications, who are four times as likely to feel very confident compared to those who do not have prior STEM qualifications (33% vs 8%).

Figure 28: 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?



Base: unweighted wave 1 – 844, wave 2 – 715, wave 3 - 801, those with STEM qualifications – 282, those without – 519. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

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 (82% vs 67%). However, women feel even less confident than men than in previous waves (74% in wave 2).

A similar pattern can be observed among primary and secondary school teachers, with a higher proportion of secondary teachers (74%) feeling confident with making STEM connections compared to primary teachers (65%).

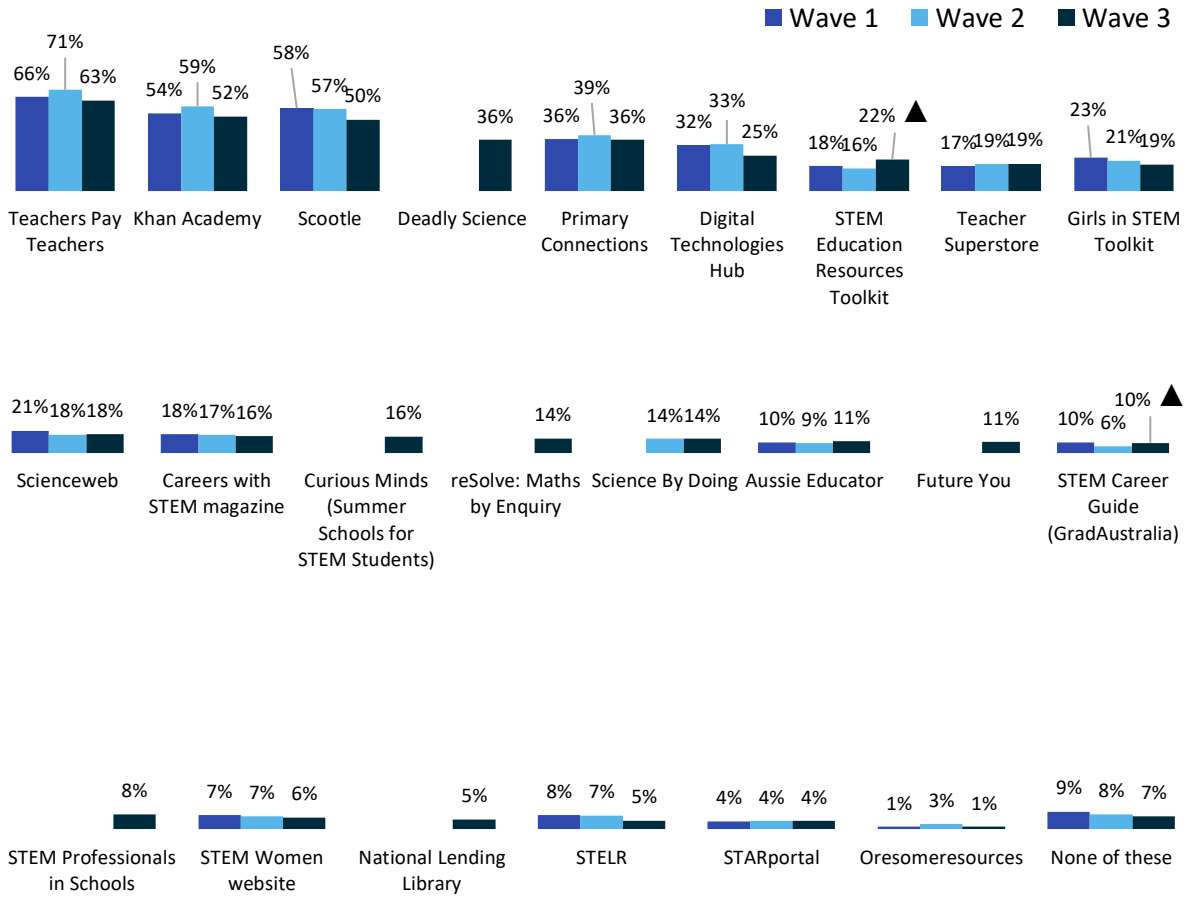
STEM teaching resources

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, Khan Academy and Scootle 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.

Figure 29: Awareness of STEM teaching resources.

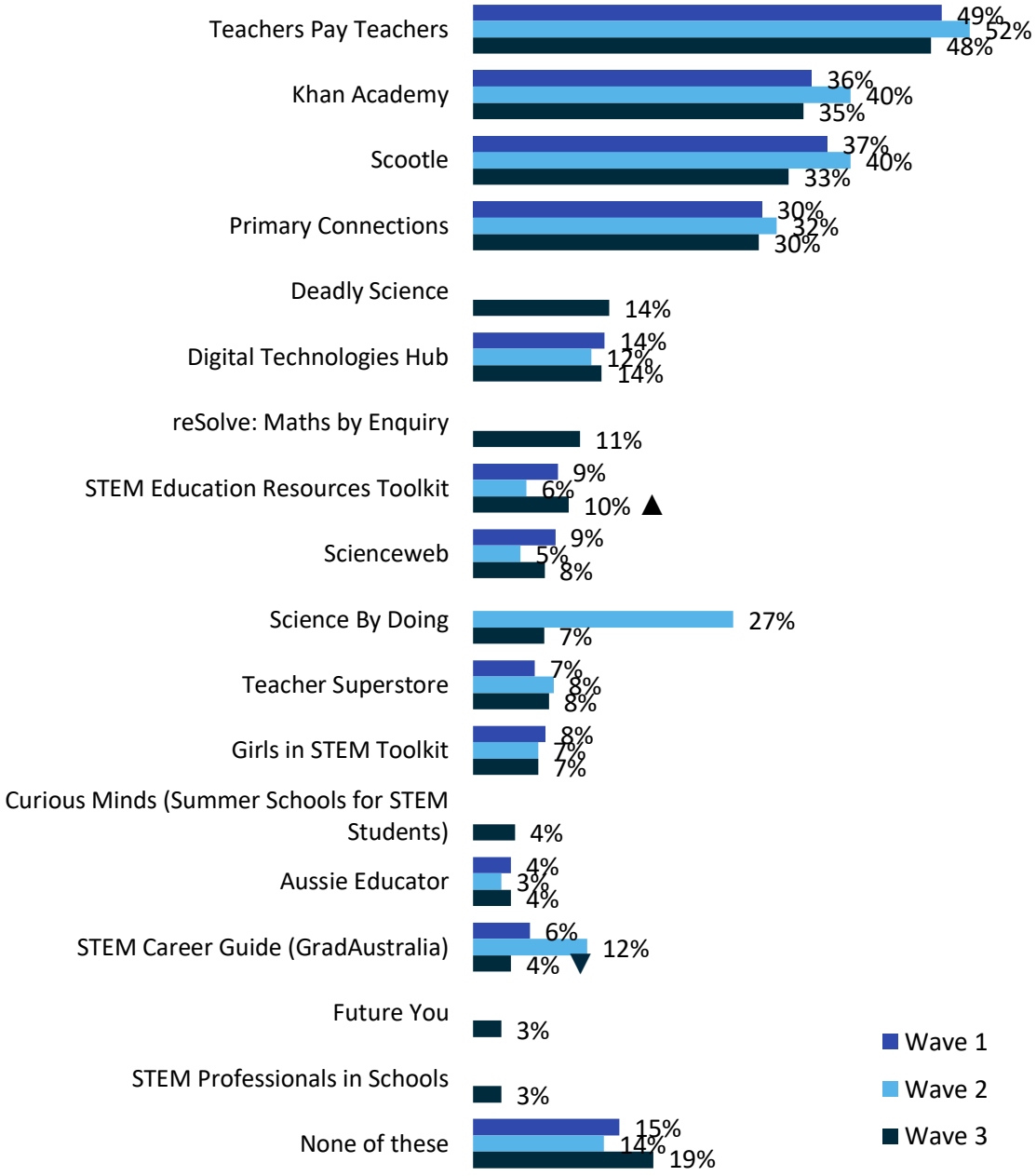
Q. Below is a list of STEM resources. Please select which of the following you've heard of before.



Base: unweighted total – wave 1 – 844, wave 2 – 714, wave 3 – 801. Note: Deadly Science, Curious Minds, ReSolve, Future You, STEM Professionals in Schools and National Lending Library are all new codes for wave 3.

Figure 30: Usage of STEM teaching resources.

Q. And which of the following STEM resources have you used before?

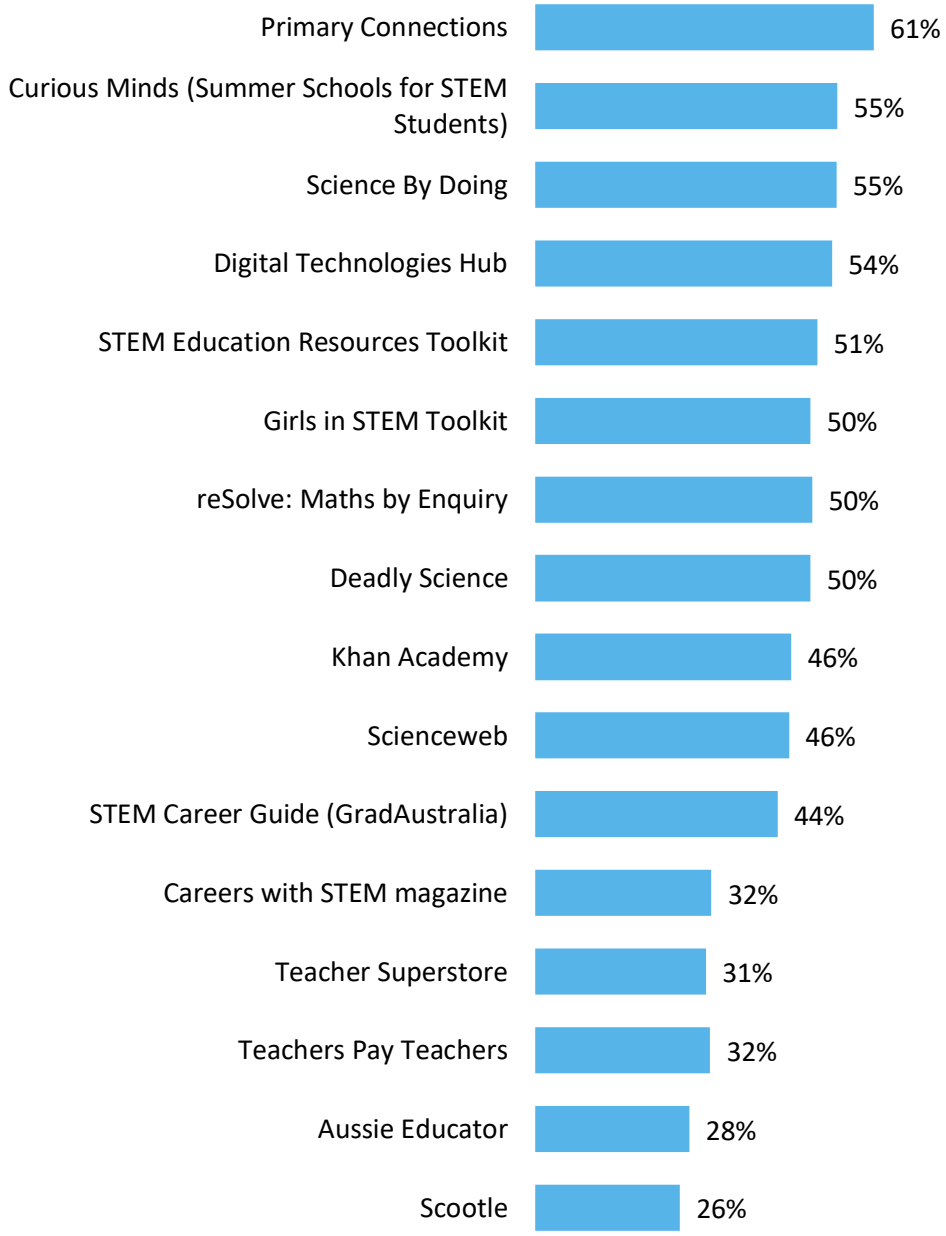


Base: unweighted those aware of resource, varies by resource, from 20 to 213. Resources with a base size of less than 20 have been removed from the chart. Note: Deadly Science, Curious Minds, ReSolve, Future You and STEM Professionals in Schools are all new codes for wave 3.

The most useful resources (ranked by 'very useful') were Primary Connections (61%), Curious Minds (55%), Science By Doing (55%) and Digital Technologies Hub (54%). While Teachers Pay Teachers and Scootle were resources used most frequently, the proportion perceiving these resources as very useful was low in comparison to other resources.

Figure 31: Usefulness of STEM teaching resources.

Q. How useful did you find the STEM resources that you have used? (% very useful)



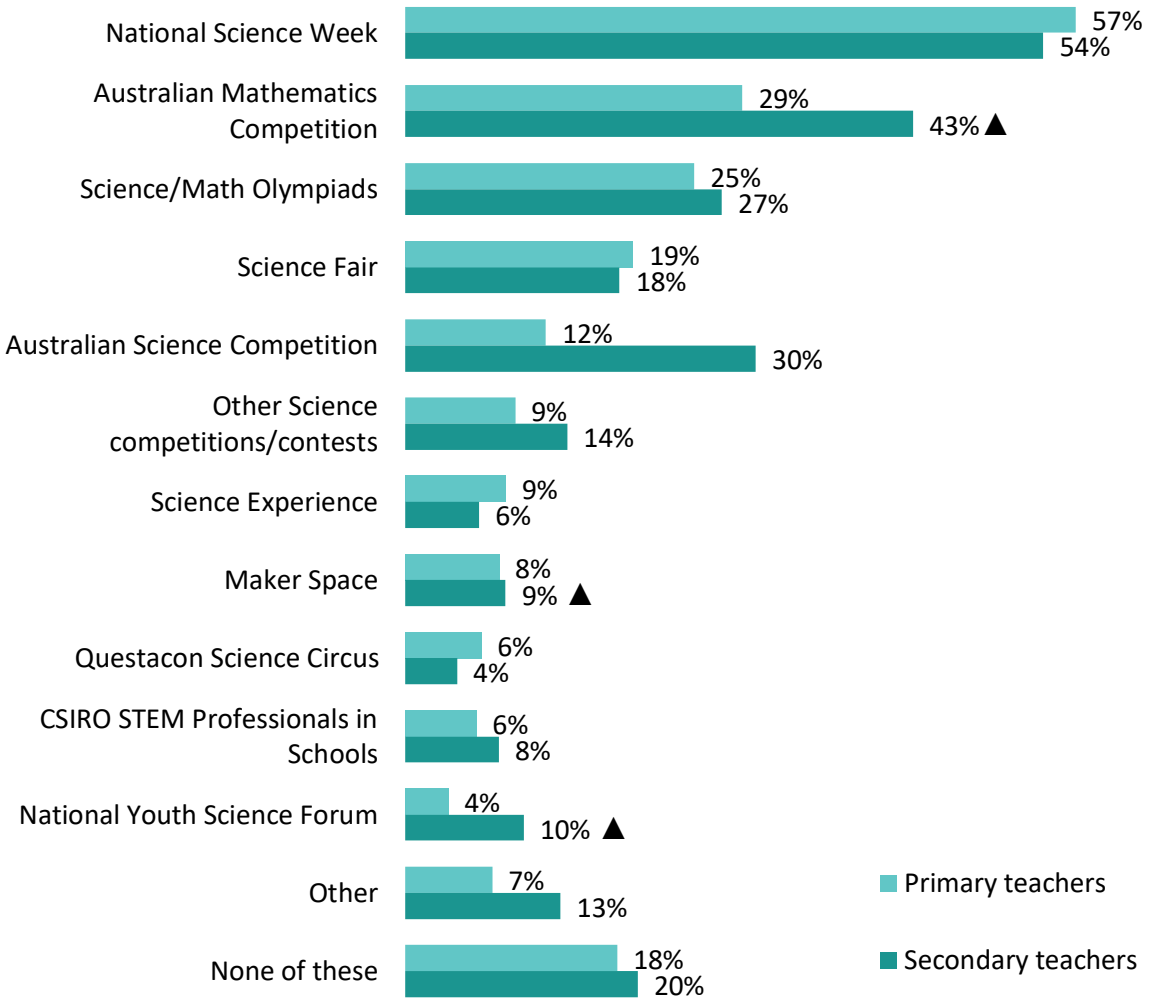
Base: unweighted those aware of resource, varies by resource, from 20 to 213. Resources with a base size of less than 20 have been removed from the chart. Note: Deadly Science, Curious Minds, ReSolve, Future You and STEM Professionals in Schools are all new codes for wave 3.

The survey also investigated which STEM related activities and events schools participate in. There were no significant changes since wave 2.

The survey found that some STEM focused events are more popular among secondary schools (driven by secondary STEM teachers), such as the Australian Science Competition and National Youth Science Forum.

Figure 32: School / institution participation in STEM events.

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



Base: unweighted primary teachers – 371, secondary teachers – 313.

Gender bias

Gender bias in the media

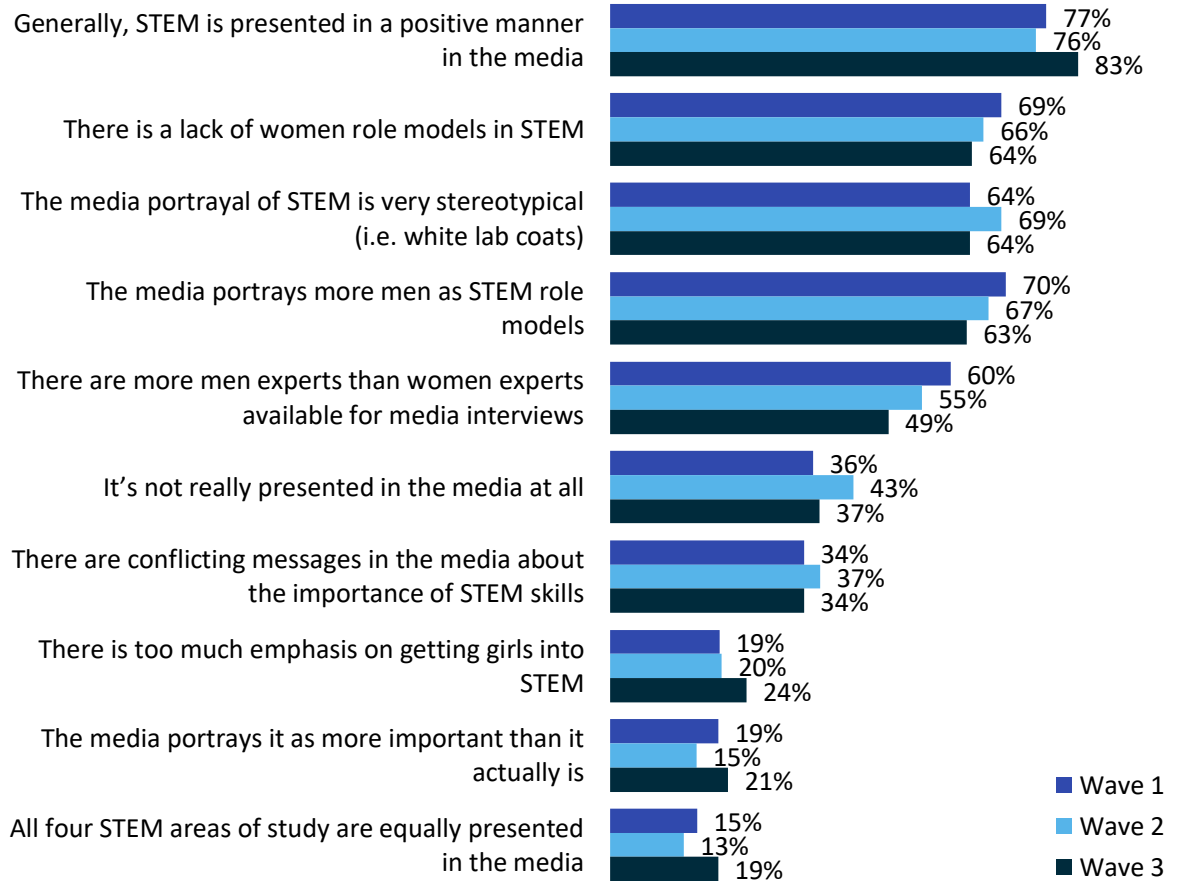
Respondents were asked how strongly they agree or disagree with a range of statements relating to how STEM is currently presented to young people in the media. The survey found that although educators generally agree that STEM is presented in a positive manner (83%), six in ten (63%) agree that the media portrays more men as STEM role models. Possible explanations for this are that the majority of educators agree (64%) there is a lack of women role models in STEM or that 49% agree that there are more men experts available for media interviews. These perceptions have remained generally consistent over time (no significant differences).

With most educators acknowledging this gender bias in the media, it is understandable that only a quarter (24%) agree that there is too much emphasis on getting girls into STEM, although this has increased slightly this wave.

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 only 19% agree that all four STEM areas of study are equally presented in the media.

Figure 33: Agreement with statements about STEM portrayals in the media (net: slightly / strongly agree).

Q. Below is a list of statements of how STEM is currently presented to young people in the media. Please indicate how much you agree or disagree with these statements.



Base: unweighted wave 1 – 844, wave 2 – 730, wave 3 - 801. Sample was split in half to reduce survey fatigue (a maximum of 390 saw each answer option).

There were very few demographic differences in attitudes towards media presentation of STEM this wave, similar to the previous wave. Primary teachers were more likely than secondary teachers to agree that STEM is not really covered in the media at all (44% vs 25%).

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 (10%) disagreed that these skills will provide job security in the future and two in ten (18%) disagreed that that there are many STEM graduate roles available.

Two new statements were added in wave 3 to understand perceptions of STEM careers' flexibility and work-life balance. Almost 9 in 10 (85%) agreed that STEM careers offer flexibility, while three quarters (73%) agreed that STEM careers offer good work-life balance. Both of these values have consistently been highlighted as important for younger generations, so it is positive to see that educators feel STEM careers can offer them these things.

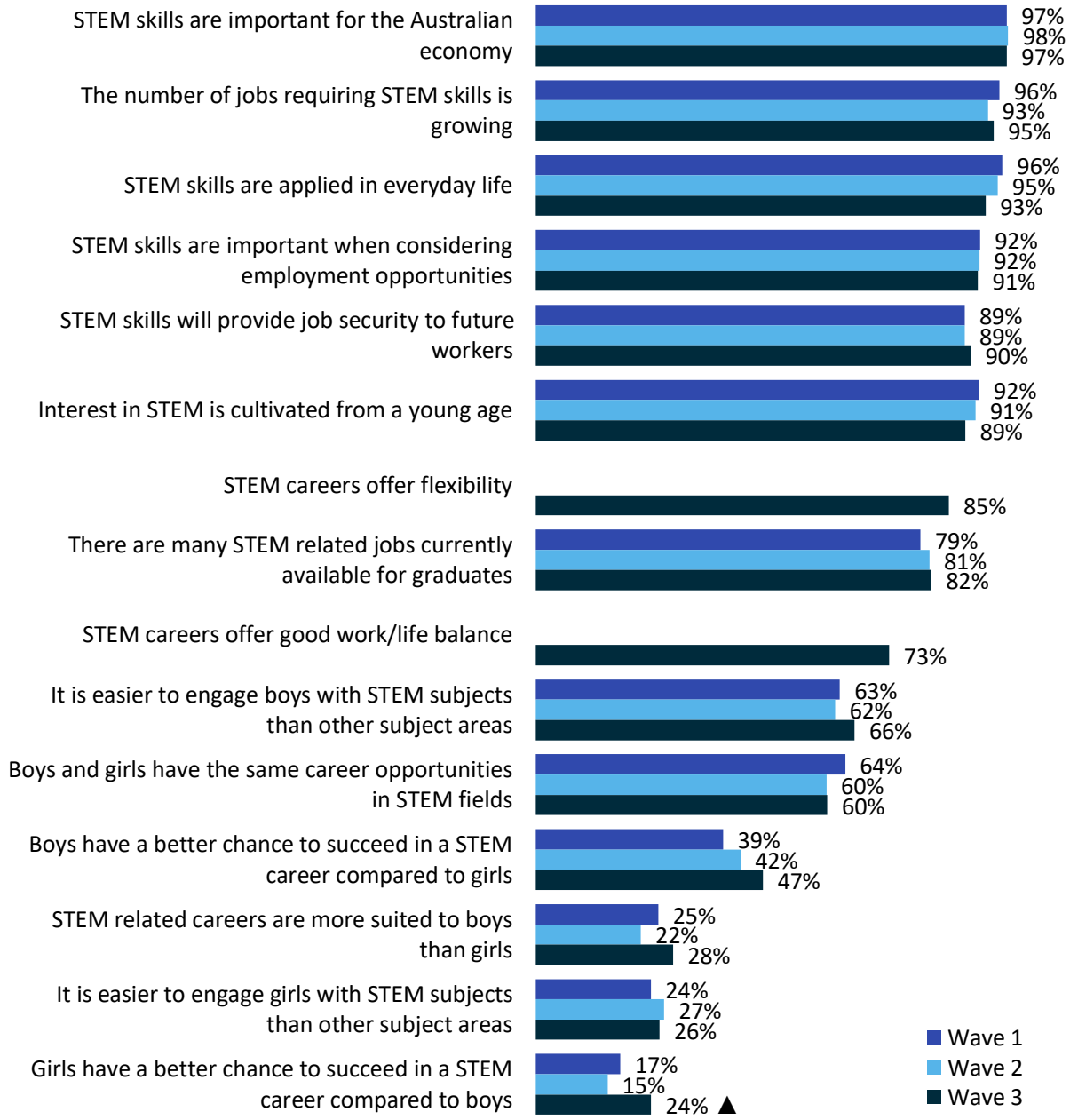
When it came to understanding the role that gender plays in STEM careers, three in five educators (60%) agreed that boys and girls have the same career opportunities in STEM fields, with men being more likely to agree with this statement (75% compared to 58% of women). However, a higher proportion of educators (66%) acknowledged that it is easier to engage boys with STEM than other subjects compared to only 26% who believe the same for girls.

The majority of educators disagreed that either gender has a better chance to succeed in a STEM career (53% disagree for boys and 76% for girls). Furthermore, three quarters of all educators surveyed (72%) disagree that STEM related careers are more suited to boys than girls.

The only statement that saw a change since last wave was that girls have a better chance to succeed in a STEM career compared to boys, where agreement increased from 15% to 24% this wave.

Figure 34: Agreement with statements about STEM skills and future careers (net: slightly/strongly agree).

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: unweighted total wave 1 – 844, wave 2 – 730, wave 3 - 801. Sample was split in half to reduce survey fatigue (a maximum of 376 saw each answer option). Note: two new codes were added in wave 3.

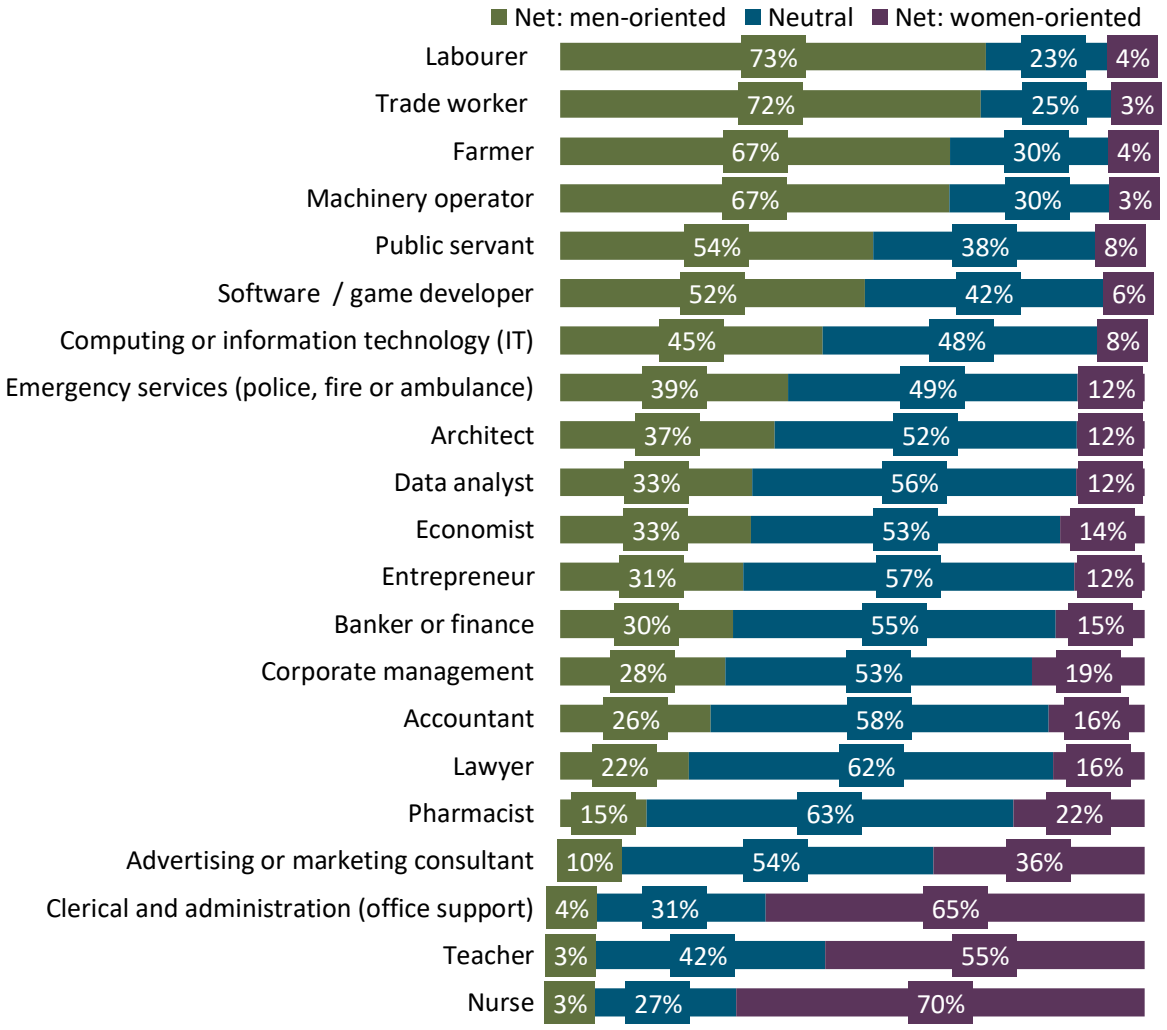
To further investigate gender bias related to STEM careers respondents were asked the degree to which they felt each of a range of occupations were oriented towards men or women. The sliding scale they were presented with displayed “very male” on the left (score of -10), “neutral” in the centre (score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

As we found in the previous wave, 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 (consistent with the previous wave). The top three roles most skewed towards women were nurse, teacher and office support, while labourer, trade worker, farmer and machinery operator topped the list for being most skewed towards men.

Figure 35: Educators’ gender associations with occupations.

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



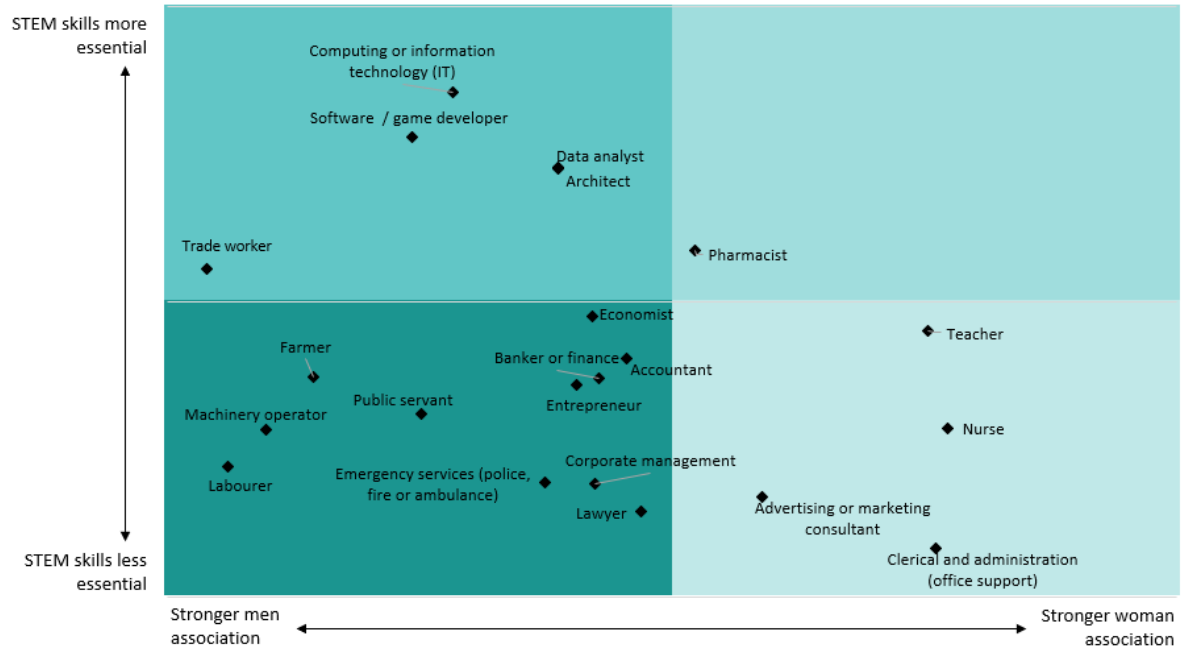
Base: unweighted wave 3 total - 801. Sample was split in half to reduce survey fatigue (a maximum of 412 saw each answer option). Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

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 was the only occupation where STEM skills are seen as more essential and skewed towards women. Last wave, 'teacher' fit into this category, but this wave the survey takers thought STEM skills were less essential for this role. These findings are similar to the associations among educators in the Teachers & Career Advisors research.

Figure 36: 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?



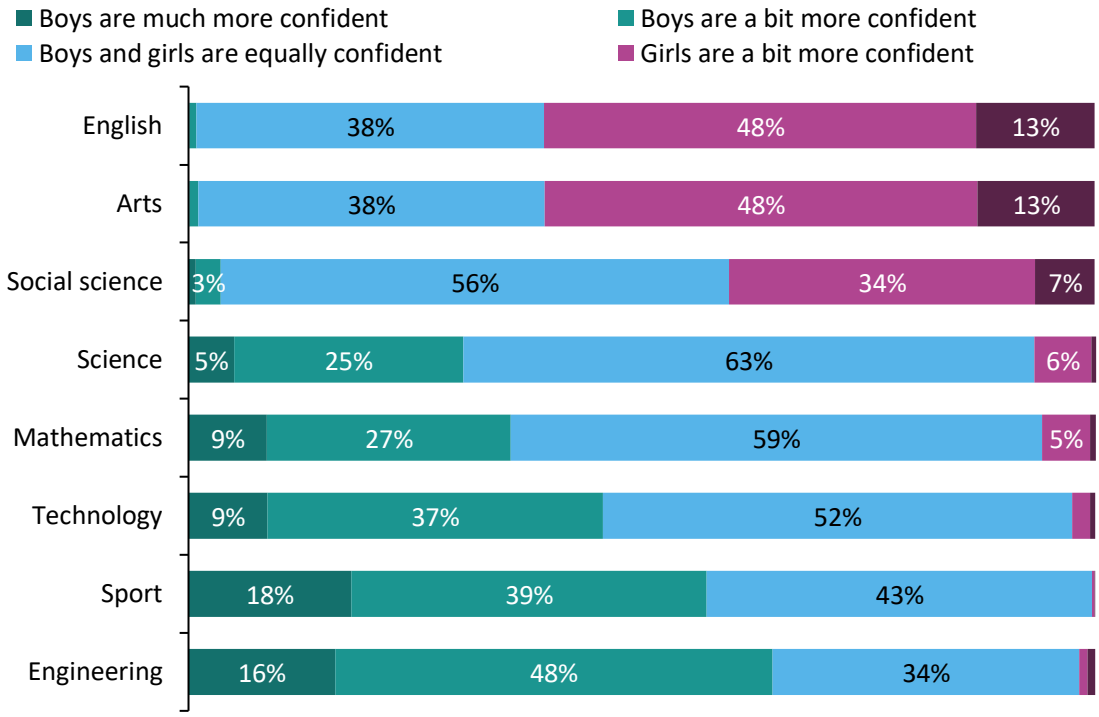
Base: unweighted total wave 3 – 801.

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. This is consistent with the previous wave. 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 (63%) and mathematics (58%).

Figure 37: Perceived 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%	61%
Social science	4%	40%
Mathematics	30%	6%
Science	35%	7%
Engineering	64%	3%
Technology	46%	2%
Sport	57%	0%
NET: STEM	75%	13%
NET: Non-STEM	59%	77%

Base: unweighted total wave 3 - 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

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 (as per last wave) was to have more women role models visible, followed by greater focus on positioning STEM in a more relevant manner that aligns with their interests.

Role models and visibility (55 mentions)

"Strong female role models."
"Access to female role models via websites, videos etc."
"More representation and role models, more incursions with female scientists, more real-world connection."

Hands-on, engaging, and relevant STEM activities (45 mentions)

"Making it engaging and relevant to them- surveying interests and creating activities with stem reference- e.g. make lipstick."
"More hands on to encourage participation.
"More engaging lesson from passionate teachers."

Confidence building and addressing stereotypes (36 mentions)

"Encourage problem-solving and critical thinking skills in my subject areas, giving them more confidence to try STEM subjects."
"Encouraging collaboration through group projects and female-led STEM clubs helps create a supportive environment. Building confidence through positive reinforcement, promoting a growth mindset, and showing a wide range of career opportunities in STEM can empower girls to see themselves as capable of success in these fields."
"Challenging gender stereotypes through positive reinforcement and mentorship would significantly enhance their interest and confidence in these fields"

Showcasing careers pathways / opportunities (33 mentions)

"More female role models/successful females in science career pathways discussed."
"Have people come out to the school with all the resources to take classes through activities. Show more of a range of pathways in STEM."
"Having more of an understanding of what opportunities stem presents. E.g. job opportunities, future technology development. Real world applications."

Mentorship and guidance (28 mentions)

"Women in STEM mentoring female students."
"I think exposing girls to STEM at a younger age so their are aware its an option for them. I think its important for girls to have mentors who support and foster their interest in STEM related industries."
"To improve female students' attitudes toward STEM, it's crucial to provide positive role models and mentors who can inspire them and show what's possible."

More encouragement and enthusiasm from teachers (27 mentions)

"Encourage from early years that they are capable."
"I think it comes down to the teacher and the way that it is taught/introduced and the

opportunities presented. I love teaching STEM so because I am enthusiastic about it, the students are enthusiastic about it."
"It's not about the subject, it's the fact that it is school. There is a lack of enthusiasm towards any sort of education, regardless whether it is stem or not."

Early exposure and access (25 mentions)

"I think exposing girls to STEM at a younger age so their are aware its an option for them. I think its important for girls to have mentors who support and foster their interest in STEM related industries."
"Providing them with more opportunities within the school to be exposed to it (not just offering opportunities out of class time at university workshops)."
"Starting from an early age."

Professional development and resources for teachers (18 mentions)

"Lesson plans and unit programs easily available Subscription's to companies and professional development at a low cost."
"More specialist teachers with better training to deliver this more successfully."
"More resources that could be tailored to things that girls enjoy."

Career advice

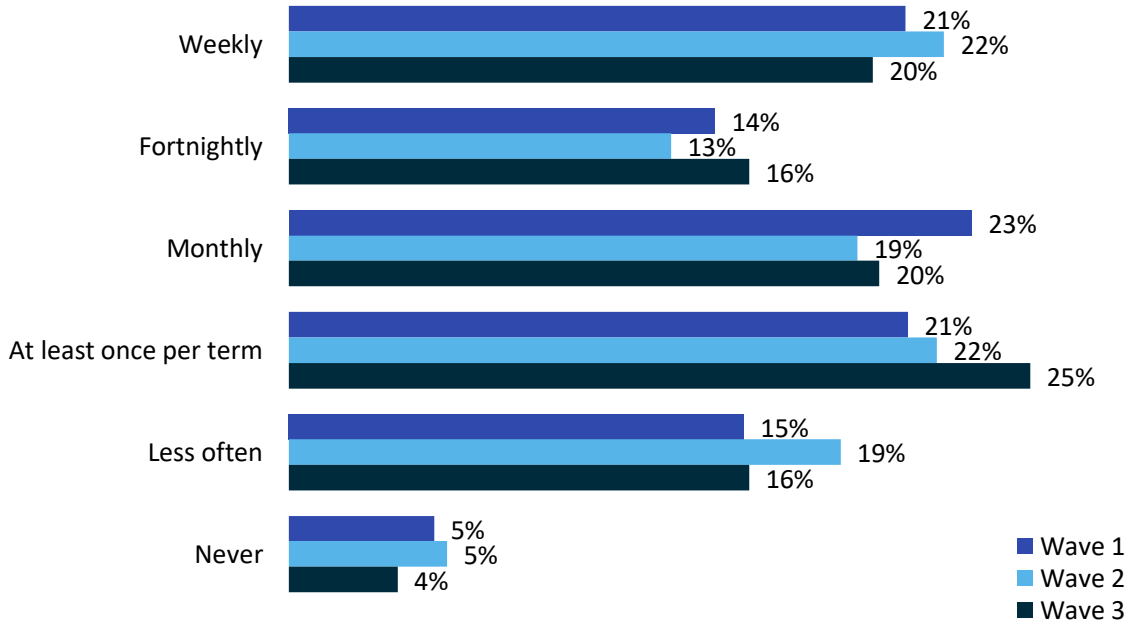
The final section of the survey explored the topic of career advice given to students. While some questions were directed at all respondents, most were answered only by career advisors and teachers who regularly provided career advice to their students (i.e. those who provide advice at least monthly).

Providing career advice

Almost all (96%) secondary teachers said that they provide career advice to students throughout the school year. Over half (56%) provide career advice at least monthly, with 35% 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: unweighted secondary school teachers – wave 1 – 282, wave 2 – 248, wave 3 – 276.

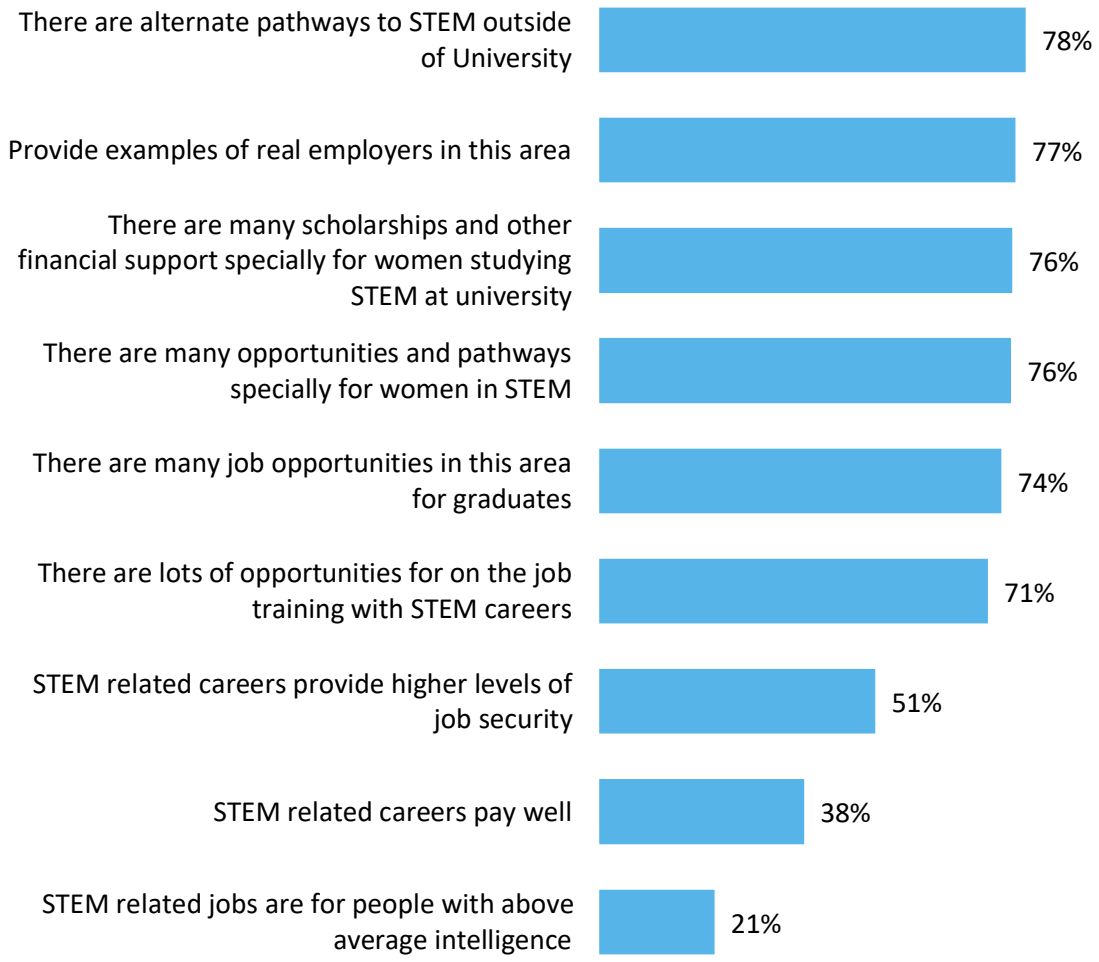
When providing STEM advice to students, advisors place the greatest emphasis on the alternate pathways to STEM outside of university (78%), examples of STEM employers (77%), the scholarships and financial support specially for women studying STEM at university (76%), the abundance of job opportunities (76%) and the opportunities and pathways specially for women in STEM (74%).

Advisors place less emphasis on talking about STEM-related careers provide higher levels of job security (51%). This is despite the majority of educators believing that STEM careers can provide security, and data from our Youth in STEM survey suggesting that this is important to them. This indicates that career advisors could be doing more to emphasise the security of careers in STEM. They also place less emphasis on STEM careers paying well, despite financial security also being important to many young people.

The majority of advisors don't talk about STEM-related jobs being for people with above average intelligence (21%).

Figure 39: Conversations about STEM careers (net: somewhat/strongly emphasise).

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



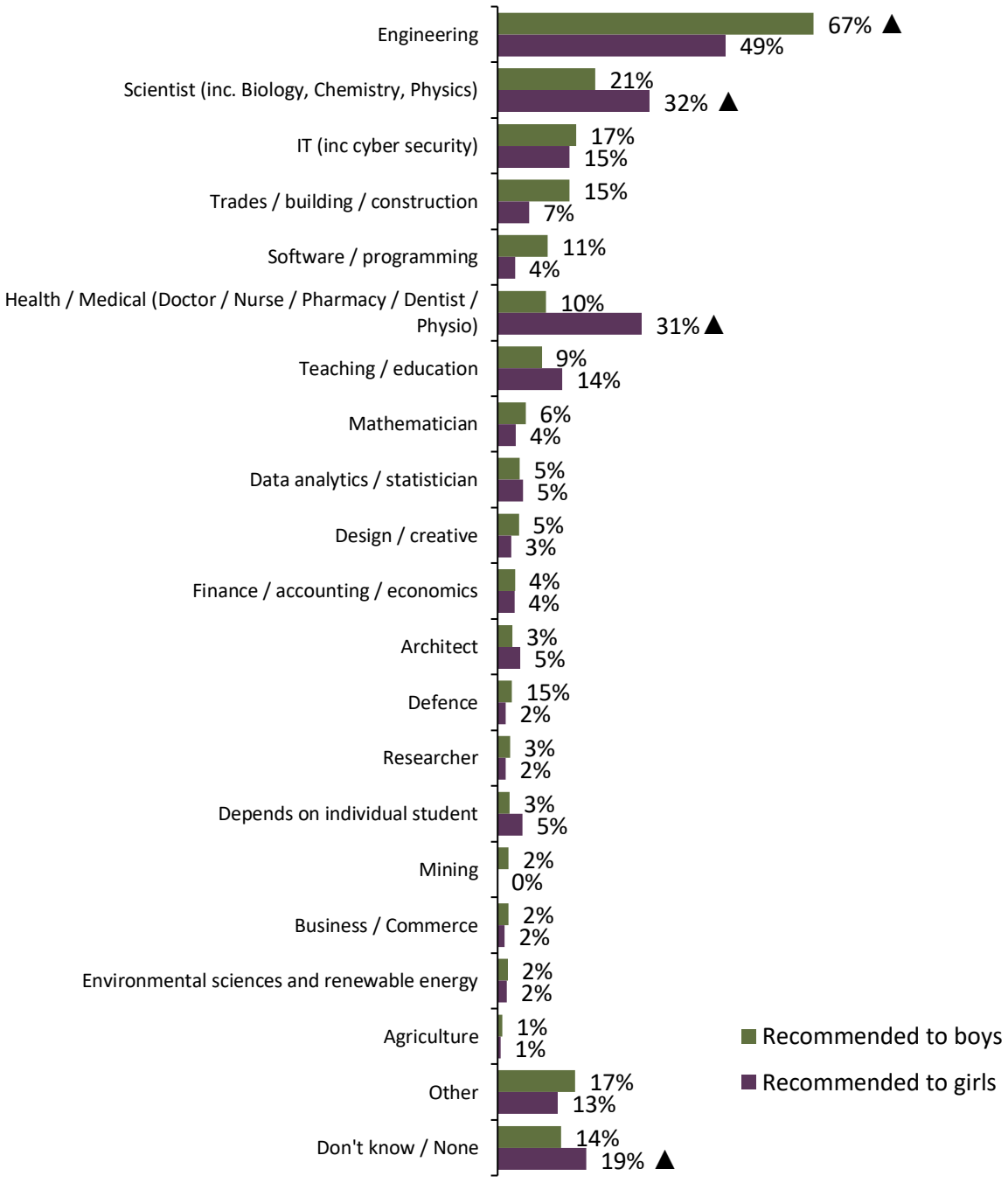
Base: unweighted wave 3 - career advisors – 43.

The survey found that advisors do not provide the same STEM career suggestions to girls as they do to boys. The top recommended roles for boys are engineering, scientist and IT roles. The top recommended roles for girls are engineering, scientist and health or medical related roles.

Advisors are more likely to recommend engineering to boys (67% vs 49%), and more likely to recommend scientist and health-related roles to girls (32% vs 21% and 31% vs 10% respectively).

Figure 40: STEM careers recommended to students.

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



Base: unweighted wave 2 - career advisors and teachers who regularly provide career advice to girls – 193, to boys – 192.

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.

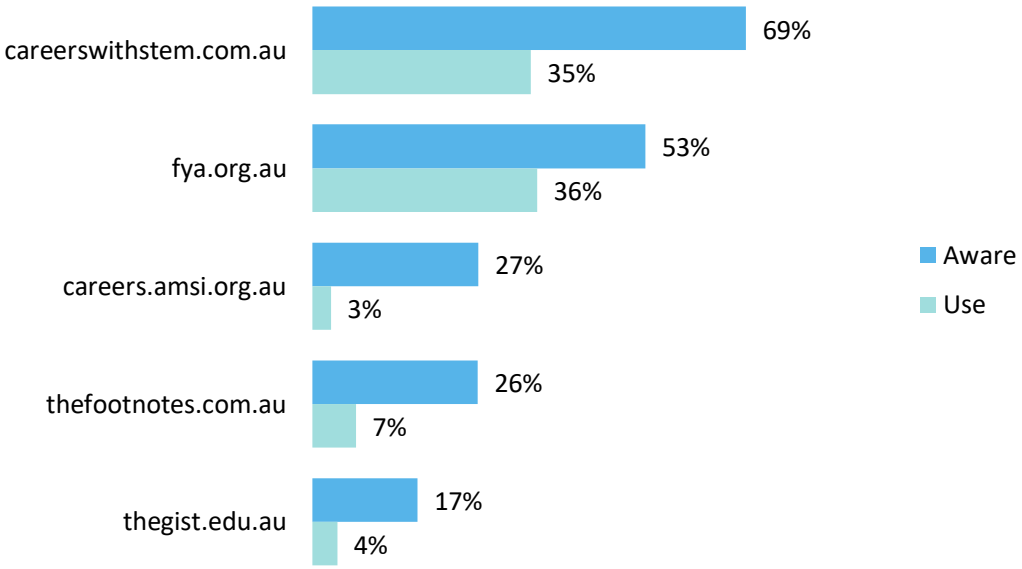
The survey found that advisors were most aware of careerswithstem.com.au (69%) and fya.org.au (53%). A quarter of career advisors were aware of thefootnotes.com.au (26%) and careers.amsi.org.au (27%). Finally, 17% were aware of thegist.edu.au.

Regarding frequency of use of career-related websites, usage is not directly related to awareness; usage is highest for fya.org.au (36%), followed by careerswithstem.com.au (35%). Seven percent or fewer had used the other websites in question.

Due to a low base size there are no significant differences across waves.

Figure 41: Awareness and use of STEM careers websites.

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



Base: unweighted wave 3 - career advisors – 43. Note: Low base sizes for use.

Expectations of students' future intentions

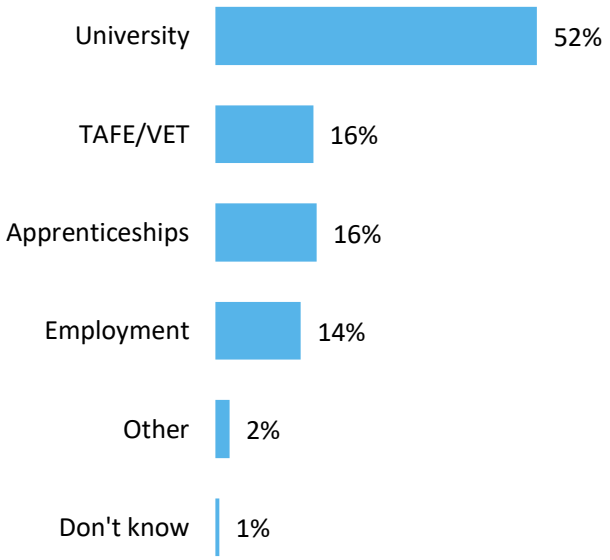
Educators expect that 52% of their senior students (years 10 to 12) will continue to university upon completion of secondary school. This declined significantly in wave 2 (42%) but has now increased to wave 1 levels.

A further 30% are expected to go straight into the workforce (16% through apprenticeships and 14% through employment), up from 26% in wave 2.

Finally, 16% are expected to extend their studies through TAFE or other vocational education.

Figure 41: Proportion of students considering different options after high 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? (MC)



Base: unweighted total wave 1 – 844, wave 2 – 730, wave 3 - 801.

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 21% completing an apprenticeship and 16% going straight into employment. For independent schools, the average expectation for university as a next step was 76%, with 10% taking up an apprenticeship and 3% going straight into employment.

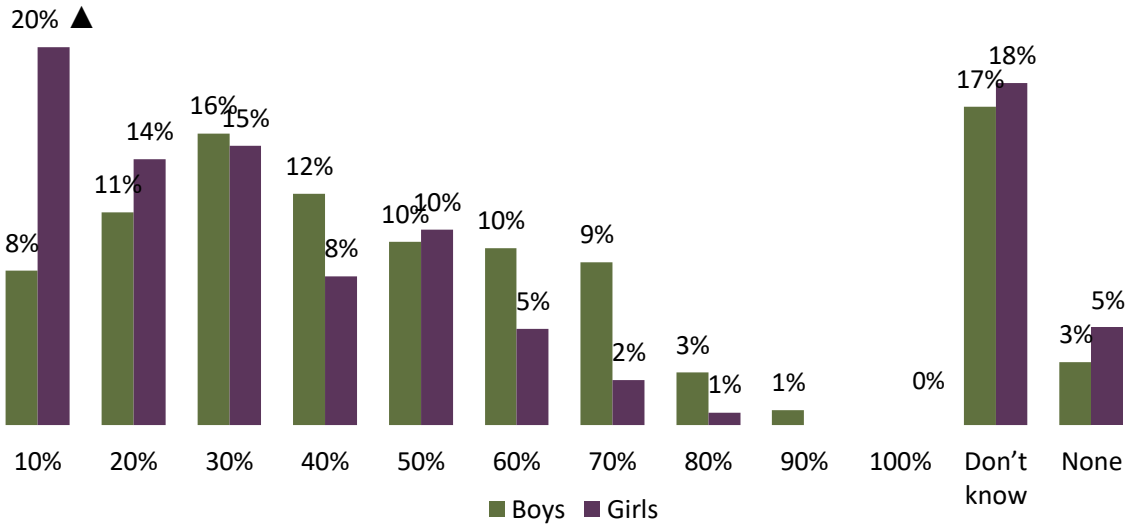
Teachers at co-ed schools expected a lower proportion to go to university (46%) compared to those at single sex schools (74%). While sample sizes are low, expectations for university were higher at all-girls schools (83%) compared to all-boys schools (56%).

It was also found that teachers from higher socioeconomic areas expect a larger proportion of their students to go to university (60%) compared to teachers from lower socioeconomic areas (34%). While not significant, teachers from lower socioeconomic areas expected a higher proportion of students to transition into TAFE/VET, apprenticeships or into employment.

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 and career advisors estimated that 33% of boys are considering a STEM career, compared to an average estimation of 23% for girls, lower than the 29% reported in wave 2.

Figure 43: Proportion of students who are considering a STEM career, by gender.

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



	Average proportion of students who are considering a STEM career		
Gender	**Wave 1**	**Wave 2**	**Wave 3**
Boys	34%	33%	33%
Girls	24%	29%	▼23%

Base: unweighted career advisors and teachers who regularly provide career advice; wave 1 - advisors of boys – 207, advisors of girls – 216, wave 2 – advisors of boys – 148, advisors of girls – 142, wave 3 - advisors of boys – 190, advisors of girls – 185.

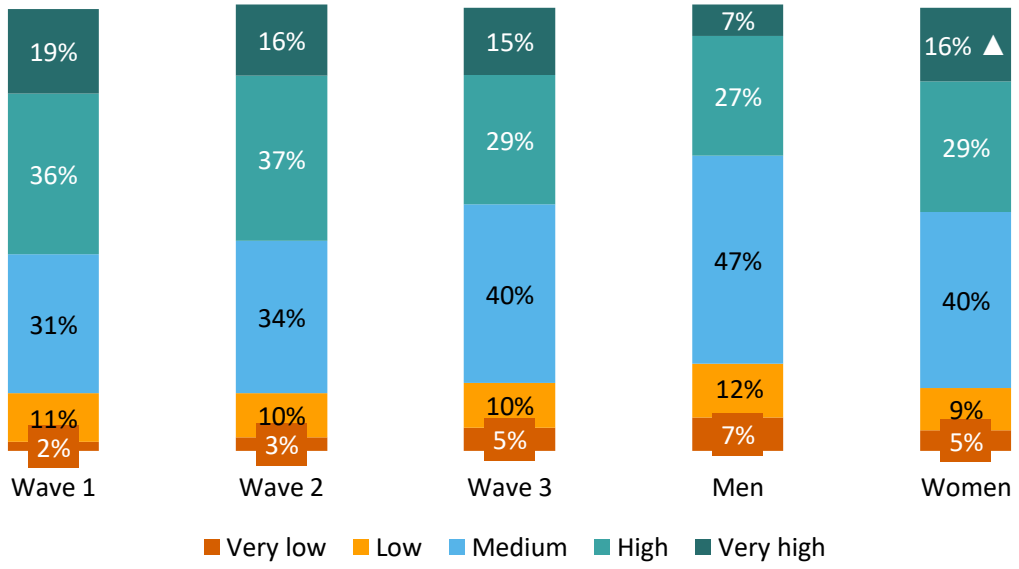
Advisors' ability to discuss STEM careers

Among those who provide career advice to students, 43% rated their ability to provide students with STEM pathways as high or very high, down (not significantly) from 53% in wave 2. A further 40% rated their ability as medium. Only 15% rate their ability as low or very low.

Mentors who are women were more likely to rate their ability as very high compared to men (16% vs 7%).

Figure 44: 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	Wave 1 Total	Wave 2 Total	Wave 3 Total	Men	Women
Net: high / very high	55%	53%	43%	34%	46%
Net: low / very low	12%	12%	15%	20%	14%

Base: unweighted mentors – wave 1 – 220, wave 2 – 151, wave 3 – 197, men – 72, women - 121. 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

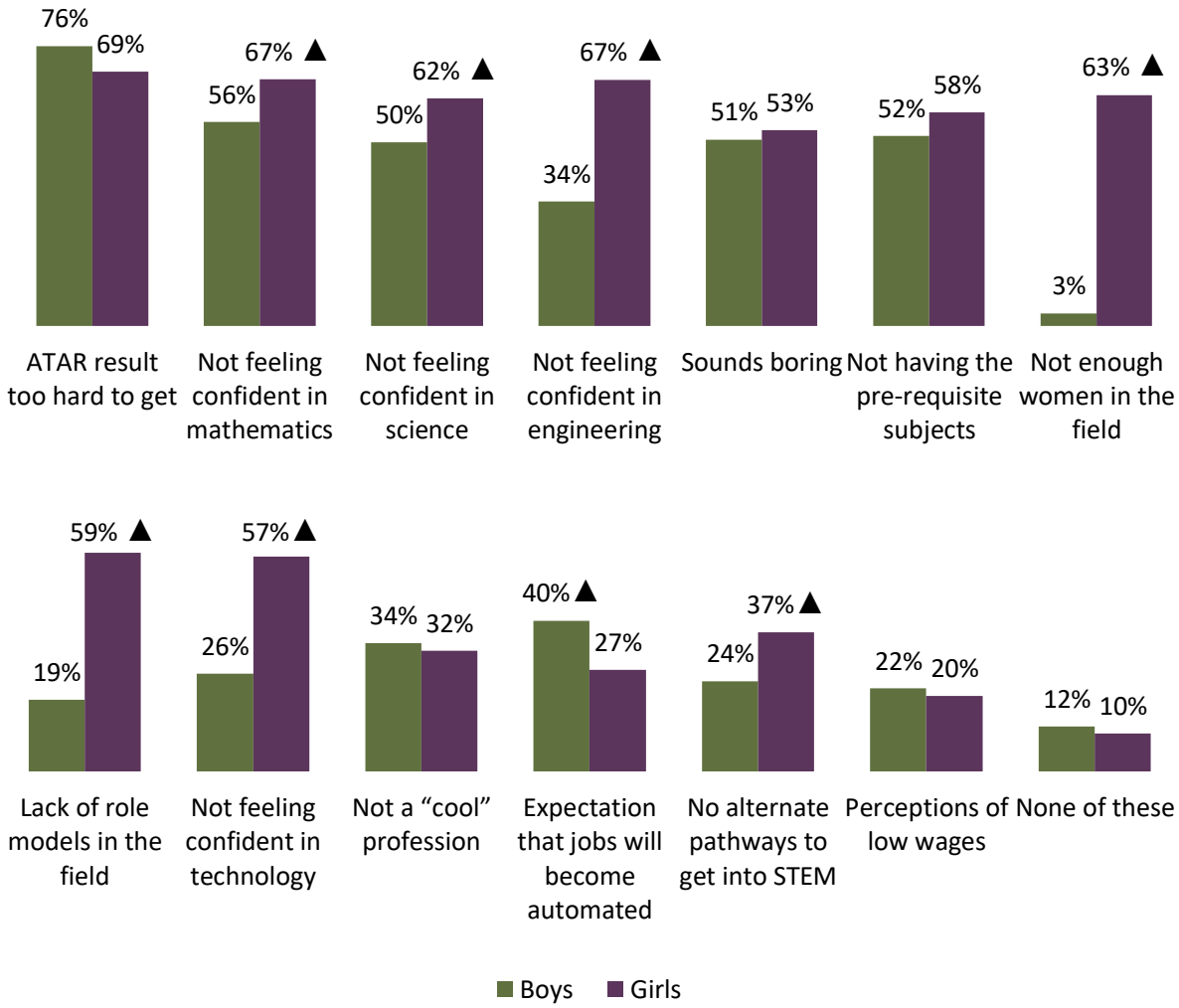
When discussing STEM careers with students, the top barrier raised by students were that ATAR results were too hard to get, raised equally by boys and girls. Other top barriers were not feeling confident in mathematics, science or engineering.

There are clear differences between boys and girls in the perceived barriers to a STEM career, as shown below. Girls were more likely than boys to raise not feeling confident in mathematics, science, engineering, and science. They were also more likely to raise that there are not enough women in the field or there are a lack of role models. Finally, girls were also more likely to raise that there are no alternate pathways to get into STEM other than university.

Boys were less likely to raise barriers overall, but were more likely to say they expected that STEM jobs will become automated in the future.

Figure 45: Barriers to STEM careers raised by students, sorted by total.

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



Base: unweighted career advisors and teachers who regularly provide career advice; wave 3 - advisors of boys – 190, advisors of girls – 185.

Barriers to schools placing greater emphasis on STEM

Teachers were asked what they thought the barriers are to schools placing a greater emphasis on STEM. This wave, the top reason was that there are not enough qualified teachers (66%), while last wave the top reason was a lack of STEM resources, but the proportion giving this reason has declined this wave (from 75% to 63%).

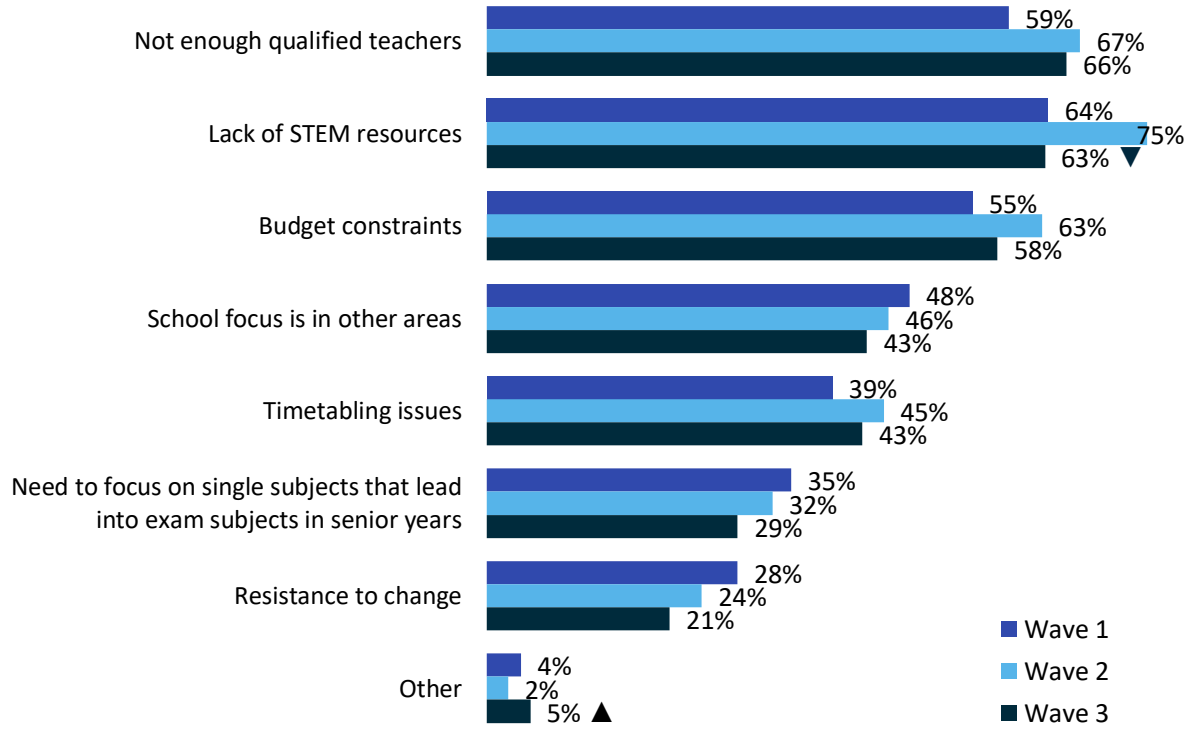
Other common reasons included budget constraints (58%), the school focusing on other areas or timetabling issues (both 43%). Less common answers related to the school's desire to focus on subjects that lead into senior exams, and being resistant to change.

Five percent of educators selected 'other', with other barriers specified:

- Rooming / space constraints
- Lack of physical or hands-on resources
- Curriculum / time constraints
- Other programs competing for attention
- Student related challenges e.g. low engagement or interest or special needs.

Figure 46: Barriers to schools placing an emphasis on STEM.

Q. What do you think are the barriers to schools placing an emphasis on the teaching of STEM? (MC).



Base: unweighted educators in schools, wave 1 – 838, wave 2 – 666, wave 3 – 739.

There were some demographic differences in perceived barriers, with women teachers being more likely to mention a lack of STEM resources than men (65% vs 53%), and primary teachers being more likely than secondary teachers to mention a lack of resources (70% vs 55%) or the school focusing on other areas (52% vs 34%). Secondary teachers were more likely to mention a lack of qualified teachers (71% vs 62%) and a need to focus on single subjects that lead into exam subjects in senior years (40% vs 20%).

Thoughts and conversations about AI

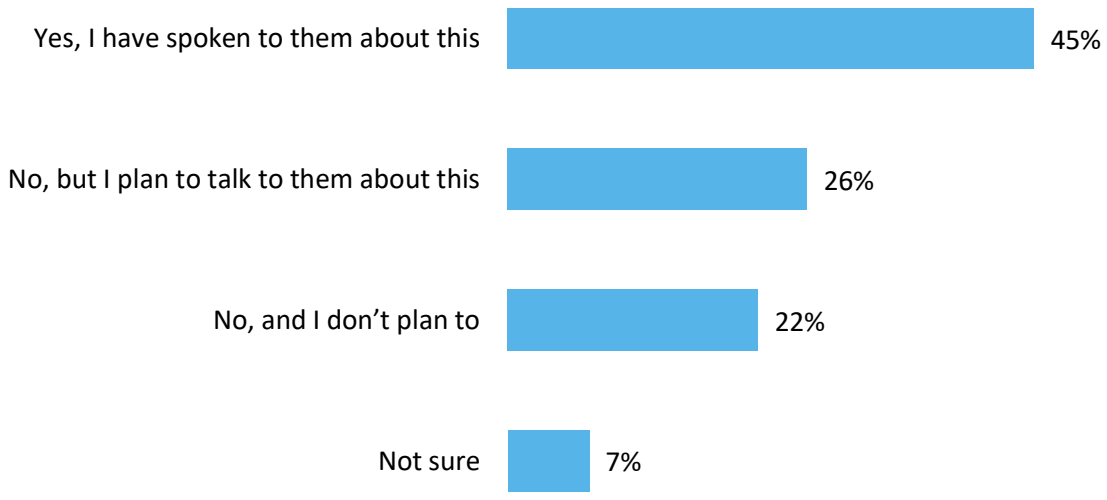
Two new questions added for wave 3 sought to understand the influence of the recent advances in artificial intelligence (AI).

First, we asked whether or not they believe that generative AI tools will have a significant impact on work and careers in the future. Nine in ten (91%) said yes, reflecting a majority feeling that AI is going to have an impact on jobs, consistent with the feelings among parents. Seven percent were unsure and a final 2% said no, they did not think there would be an impact.

The survey also asked whether educators had spoken to their students about AI or the impact on their future careers. As seen in the chart below, almost half (45%) had already spoken to their students about this, while a further quarter (26%) planned to speak to them about this, adding to a total of 7 in 10 (71%). Only 22% of educators did not plan to speak to their students about AI, with a final 7% being unsure.

Figure 47: Conversations had with students about AI or its impact on careers.

Q. Have you ever talked to your students about AI or the impact on their future careers?



Base: unweighted total wave 3 - 801. Weighted percentages may not add up to 100% due to rounding of decimal places to the nearest whole number.

There were some differences by demographic group, with women educators being less likely to have spoken to their students about this (42% compared to 66% of men). Women were more likely to say they have not spoken to them about this and they don't plan to (23% vs 11% of men).

Secondary teachers, those with STEM qualifications, tertiary educators and those from higher socioeconomic areas were the most likely to say they had spoken about this or they planned to in the future.

Overall, the data shows that teachers are aware of the impact of AI on future careers and the majority plan to speak to their students about this in the future.

Appendix: Questionnaire

Note on accessibility: The following questionnaire is presented in the format we use online and includes programming instructions in square brackets. It also contains tables listing questionnaire items. Tables don't have header rows or alt text, and some have blank cells. Questionnaire items appear in the left column with response options in the right column/s. If you have difficulty navigating the information in this questionnaire, please contact YouthInsight at support@youthinsight.com.au

[PROGRAMMING INSTRUCTIONS PROVIDED IN RED]

[SC = Single choice question | MC = Multi choice question | OE = Open ended response required]

SECTION 1: SCREENER & VERIFICATION

Thank you for your participation in this important research. Prior to our interview, we would like you to please complete a survey about STEM education.

Your feedback to this survey, while confidential, will be used as part of our interview and we may discuss some of your answers with you to help us better understand your responses. Please tick the box below to authorise the interviewer to view your survey responses.

[ ] I consent to the research team viewing my individual survey responses

1. Captcha Question

2. Which of the following best describes the industry where you work in?
[ASK ALL.SC.]

Administration & Office Support	1
Advertising, Arts & Media	2
Banking & Financial Services	3
Community Services & Development	4
Design & Architecture	5
Education	6
Engineering	7
Government & Defence	8
Healthcare & Medical	9
Hospitality & Tourism	10
Human Resources & Recruitment	11
Information & Communication Technology	12
Legal	13
Manufacturing, Transport & Logistics	14
Marketing & Communications	15
Mining, Resources & Energy	16
Real Estate & Property	17
Retail & Consumer Products	18
Trades and services	19
Other	20
Unemployed	21

[SCREEN OUT IF CODE 6 NOT SELECTED.]

3. You mentioned you work in education, which of the following best describes your **main role**?
*We are aware that many teachers wear multiple hats! For this question please just nominate your **main** role.*
[ASK IF CODE 6 AT Q2.SC.]

		Soft Quota
TAFE/VET teacher/educator	1	N=50
University professor/lecturer/tutor	2	
Classroom teacher	3	N=650
Teacher support / teacher aid	4	
Career advisor	5	
Learning Support Coordinator	6	
Curriculum Coordinator	7	
Year level Coordinator	8	
Principal	9	
Assistant/Deputy principal	10	
Administration staff	11	Screen out
Other	99	Screen out

4. Which of the following are related to the education sector in Australia?
Select all that apply
[ASK ALL. MC. SCREEN OUT IF CODES 3 OR 4 SELECTED]

ACARA	1	
AITSL	2	
IB	3	
BHP	4	Screen out
ACCC	5	Screen out
ATAR	5	

SECTION 2: INTRODUCTION

Thank you. This is a research project commissioned by the federal government, to better understand teacher, school leaders and career advisors' opinions and experiences around STEM education in Australia. All data is confidential.

SECTION 3: ABOUT YOUR SCHOOL OR INSTITUTION

The first set of questions are about the school or institution where you are employed. If you work at more than one school or institution, please respond for the one you work at most regularly.

5a. Where is the school located?
ASK ALL.SC.

		Quotas
Sydney – City / Suburbs	1	32%
NSW – Regional	2	
Melbourne – City / Suburbs	3	26%
VIC – Regional	4	
Brisbane – City / Suburbs	5	20%
QLD – Regional	6	
Perth – City / Suburbs	7	11%
WA – Regional	8	
Adelaide – City Suburbs	9	7%

SA – Regional	10	
ACT	11	2%
Hobart – City/Suburbs	12	2%
TAS - Regional	13	
Darwin – City/Suburbs	14	1%
NT – Regional	15	

5b. Please enter the school's postcode

ASK ALL.OE. POSTCODES WILL DETERMINE SES AREAS AND METRO/REGIONAL/REMOTE AREAS.

5. Where is your school/institution located?

[ASK ALL. SC.]

Capital city / metropolitan area	1
Regional area	2
Rural / remote area	3

6. What sector does your school operate in?

[ASK PRIMARY AND SECONDARY EDUCATORS (Q3=3-10). SC.]

		Quotas
Government	1	66%
Catholic	2	17%
Independent	3	10%
Other (specify)	98	

7. Is your school?

[ASK PRIMARY AND SECONDARY EDUCATORS. (Q3=3-10). SC]

		Quotas
Primary	1	61%
Secondary	2	14%
Combined (P-12)	3	13%
Special school	4	5%
Other (specify)	98	

8. Is your school co-ed or single sex school

[ASK PRIMARY AND SECONDARY EDUCATORS (Q3=3-10). SC]

Co-ed	1
Single sex (girls)	2
Single sex (boys)	3

9. How many students are there at your school?

[ASK PRIMARY AND SECONDARY EDUCATORS (Q3=3-10). SC]

Under 100	1
100-249	2
250-499	3
500-749	4
750 - 999	5
1,000 – 1,499	6
1,500 or more	7

10. Would you describe the education setting at your school as?
[ASK PRIMARY AND SECONDARY EDUCATORS (Q3=3-10). SC]

Mainstream	1
Specialised – School of special needs	2
Specialised – Aboriginal and Torres Strait Islander Focus	3
Specialised – Creative and performing arts	4
Specialised – Selective entry / High academic performance	5
Specialised – Sport	6
Specialised – Science and technology	7
Specialised – Agriculture	8
Other (specify)	98

11. Now, thinking about the student population at your school or institution, does your school or institution have specific support programs or assistance for any of the following
[ASK IF CODE 1 SELECTED ABOVE. MC.]

Students with disability/special needs	1
Students from First Nations communities	2
Students with English as secondary language	3
None of these	4

12. What is the proportion of Aboriginal and/or Torres Strait Islander students within your school?
[ASK PRIMARY AND SECONDARY EDUCATORS. (Q3=3-10). SC]

Under 5%	1
5 – 10%	2
11-25%	3
26-50%	4
Over 50%	5
Don't know	99

SECTION 4: ABOUT YOU…

And now, just a few questions about you, your background and experience…

13. Which of the following do you identify as?
[ASK ALL. SC.]

Man	1
Woman	2
Non-binary	3
Prefer not to specify	4
Other (specify)	98

14. Are you of Aboriginal and/or Torres Strait Islander origin?
[ASK ALL. SC.]

Yes	1
No	2
Prefer not to specify	3

15. How long have you been working as an education professional (regardless of school or institution)?
[ASK ALL.SC.]

Less than 1 year	1
1 – 3 years	2
4 – 7 years	3
8 – 11 years	4
11 – 15 years	5
15 – 19 years	6
20 or more years	7

16. You mentioned that your main role as an educator is [INSERT ANSWER FROM Q3]. On what basis are you currently employed in your **main** role…?
[ASK ALL. SC]

Full-time	1
Part-time	2
Relief	3
Casual	4
Other (specify)	98

17. And what **other roles** do you also fulfil at your school or institution?
[ASK ALL TEACHERS. (Q3=3-10). EXCLUDE ROLE SELECTED EARLIER. MC]

Classroom teacher	1
Learning Support Coordinator	2
Teacher support / teacher aid	3
Career advisor	4
Curriculum Coordinator	5
Year level Coordinator	6
Principal	7
Assistant/Deputy principal	8
Other (specify)	98

18. Which year level(s) do you currently teach in your school?
[ASK ALL TEACHERS (Q3=3,4 OR Q18:1,3). MC]

Foundation	1
Year 1	2
Year 2	3
Year 3	4
Year 4	5
Year 5	6
Year 6	7
Year 7	8
Year 8	9
Year 9	10
Year 10	11
Year 11	12
Year 12	13
Other (specify)	98

[HIDDEN QUESTION:
PUNCH PRIMARY VS SECONDARY TEACHER BASED ON Q19 AND POSTCODE (DEALS WITH STATE DIFFERENCES IN YEAR LEVELS) FOR USE IN FILTERING IN LATER QUESTIONS.]

19. 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.
[ASK SECONDARY SCHOOL TEACHERS ONLY. MC]

English as an Additional Language or Dialect	1
Essential English	2
Literature	3
General Mathematics	4 - STEM
Mathematical Methods	5- STEM
Specialist Mathematics	6- STEM
Biology	7- STEM
Chemistry	8- STEM
Earth and Environmental Science	9- STEM
Physics	10- STEM
F-6/7 HASS	11
7-10 Civics and Citizenship	12
7-10 Economics and Business	13
7-10 Geography	14 - STEM
7-10 History	15
Dance	16
Drama	17
Media arts	18
Music	19
Visual arts	20
Design and Technologies	21- STEM
Digital Technologies	22 - STEM
Personal, Social and Community Health	23
Movement and Physical Activity	24
Other (specify)	98

20. Which of these subjects have you taught in the past?
Subjects listed from the Australian Curriculum. Please select the subjects that most closely describe the subjects you teach.
[ASK SECONDARY SCHOOL TEACHERS ONLY (Q19=8-13).
EXCLUDE SUBJECTS SELECTED AT Q20. MC]

English as an Additional Language or Dialect	1
Essential English	2
Literature	3
General Mathematics	4 - STEM
Mathematical Methods	5- STEM
Specialist Mathematics	6- STEM
Biology	7- STEM
Chemistry	8- STEM
Earth and Environmental Science	9- STEM
Physics	10- STEM
F-6/7 HASS	11

7-10 Civics and Citizenship	12
7-10 Economics and Business	13
7-10 Geography	14 - STEM
7-10 History	15
Dance	16
Drama	17
Media arts	18
Music	19
Visual arts	20
Design and Technologies	21- STEM
Digital Technologies	22 - STEM
Personal, Social and Community Health	23
Movement and Physical Activity	24
Other (specify)	98

21. In your role(s) as a primary school teacher, do you specialise in any of the below subject areas?
[ASK PRIMARY SCHOOL TEACHERS ONLY. MC]

Aboriginal and Torres Strait Islander education	1
Agriculture	2
English as an Additional Language or Dialect	3
English/literacy	4
Languages	5
Mathematics/numeracy	6 - STEM
Sport	7
Science	8 - STEM
Technology	9 - STEM
Music/drama	10
STEM	11 -STEM
Other (specify)	98
None of these	99

SECTION 5: UNDERSTANDING AND PERCEPTIONS ABOUT STEM & QUALIFICATIONS

Now in this next section we would like to ask you some questions about your general views around STEM. Please remember that there are no right or wrong answers and all your answers are confidential.

22. Please write below what you believe the term 'STEM' stands for.
[ASK ALL. OE]

23. In your opinion, what broader life skills does STEM education provide students?
[ASK ALL. OE. DISPLAY AS 5 INDIVIDUAL TEXT BOXES]

24. What type of jobs do you think people would be able to get if they have a STEM related degree or certificate?
[ASK ALL. OE. DISPLAY AS 5 INDIVIDUAL TEXT BOXES]

[Explanation to show on page after the above 3 questions are answered]
STEM *stands for* ***science, technology, engineering*** *and* ***mathematics.***

In this survey, science means things like biology, chemistry, physics, and earth and environmental sciences. It doesn't include medicine, nursing, psychology or health sciences. Technology means things like 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.

25. In your main role, how relevant is the teaching of STEM skills?
[ASK ALL. SC PER ROW]

	Completely irrelevant	Somewhat irrelevant	Neither relevant nor irrelevant	Somewhat relevant	Very relevant
Science skills	1	2	3	4	5
Technology skills	1	2	3	4	5
Engineering skills	1	2	3	4	5
Mathematics skills	1	2	3	4	5
STEM as an integrative set of skills	1	2	3	4	5

26. How qualified do you feel to teach STEM subjects?
[ASK IF CURRENTLY TEACH, TAUGHT STEM, STEM RELEVANT TO MAIN ROLE OR PRIMARY TEACHER. SC PER ROW]

	Very unqualified	Somewhat unqualified	Neither	Somewhat qualified	Very qualified
Science skills	1	2	3	4	5
Technology skills	1	2	3	4	5
Engineering skills	1	2	3	4	5
Mathematics skills	1	2	3	4	5
STEM as an integrative set of skills	1	2	3	4	5

27. Which of the following qualifications or experiences related to STEM did you have **prior to** working in the education sector?
[ASK ALL. MC]

Undergraduate degree related to STEM	1
Post-graduate qualification related to STEM	2
Certificate or diploma related to STEM	3
STEM subject(s) covered within a non-STEM VET / university qualification	4
Certified mentorship program	5
Career / job in STEM related field	6
Other (please specify)	98
None	99

28. Which of the following further education have you undertaken to improve your knowledge of STEM since you started working the education sector?
[ASK TEACHERS. MC. RANDOMISE ORDER.]

Read a book	1
Watched a documentary	2
Completed course outside of my professional learning time	3
STEM related magazine subscription	4

Professional learning course offered at school (e.g. professional development days)	5
Professional development activity offered by an external provider (e.g. workshops, seminars, conferences, courses)	6
Attended a conference	7
Attended a webinar	8
Looked at websites	9
Participated in university lead initiatives	10
Observed other schools/ teachers	11
Volunteering or participating in STEM related activities (i.e. citizen science)	12
Attending STEM related event	13
Placement in STEM teaching area	14
Other (specify)	98
Not taken any further education to improve my knowledge of STEM	99

29. How **confident do you feel** in teaching STEM related subjects?
[ASK ALL. SC PER ROW]

	No confidence	Low confidence	Medium confidence	High confidence
Science	1	2	3	4
Technology	1	2	3	4
Engineering	1	2	3	4
Mathematics	1	2	3	4
STEM as an integrative set of skills	1	2	3	4

30. Why do you not feel confident about teaching [insert entry if codes 1 or 2 selected]?
[ASK THOSE WHO SAID 'NOT CONFIDENT AT ALL' OR 'NOT REALLY CONFIDENT'. OE. INSERT ONE QUESTION PER NEGATIVE RESPONSE ABOVE (CODES 1 & 2).]

31. In your opinion, **how important** is it for your students to have STEM skills in order to acquire **a good job in the future**?
[ASK ALL. SC PER ROW]

	Very unimportant	Somewhat unimportant	Neither	Somewhat important	Very important
Science skills	1	2	3	4	5
Technology skills	1	2	3	4	5
Engineering skills	1	2	3	4	5
Mathematics skills	1	2	3	4	5
STEM as an integrative set of skills	1	2	3	4	5

32. Why do you believe it's not important for students to acquire [insert entry if codes 1 or 2 selected]?
[ASK THOSE WHO SELECT "VERY UNIMPORTANT" OR "SOMEWHAT UNIMPORTANT". OE. INSERT ONE QUESTION PER NEGATIVE RESPONSE ABOVE (CODES 1 & 2).]

33. Which of the below are STEM skills?
[ASK ALL. MC PER ROW. RANDOMISE ORDER.]

	STEM skills
Mathematics skills (STEM Skill)	1

Science skills (STEM Skill)	2
Technology skills (STEM Skill)	3
Engineering skills (STEM Skill)	4
Problem solving skills (STEM Skill)	5
Creativity skills (STEM Skill)	6
Inquiry skills (STEM Skill)	7
Design thinking skills (STEM Skill)	8
Critical thinking skills (STEM Skill)	9
Collaboration skills (STEM Skill)	10
Communications skills	11
Project Management Skills	12
Hand-eye Coordination skills	13
Unsure	99

34. 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 the following statements.
[ASK ALL. SC PER ROW. RANDOMISE ROW ORDER.]

	Strongly disagree	Slightly disagree	**Neither**	Slightly Agree	Strongly agree
Generally, STEM is presented in a positive manner in the media	1	2	3	4	5
The media portrays it as more important than it actually is	1	2	3	4	5
All four STEM areas of study are equally presented in the media	1	2	3	4	5
There are conflicting messages in the media about the importance of STEM skills	1	2	3	4	5
It's not really presented in the media at all	1	2	3	4	5
The media portrays more men as STEM role models	1	2	3	4	5
There are more men experts than women experts available for media interviews	1	2	3	4	5
There is a lack of women role models in STEM	1	2	3	4	5
There is too much emphasis on getting girls into STEM	1	2	3	4	5
The media portrayal of STEM is very stereotypical (i.e. white lab coats)	1	2	3	4	5

35. Below is a list of statements about STEM skills and how they translate into future jobs/ careers. How much do agree with each of these statements?
[ASK ALL. SC PER ROW. RANDOMISE ROW ORDER.]

	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
STEM skills will provide job security to future workers	1	2	3	4
There are many STEM related jobs currently available for graduates	1	2	3	4
The number of jobs requiring STEM skills is growing	1	2	3	4
STEM related careers are more suited to boys than girls	1	2	3	4
STEM skills are important for the Australian economy	1	2	3	4
It is easier to engage boys with STEM subjects than other subject areas	1	2	3	4
It is easier to engage girls with STEM subjects than other subject areas	1	2	3	4
Boys and girls have the same career opportunities in STEM fields	1	2	3	4
Interest in STEM is cultivated from a young age	1	2	3	4
STEM skills are applied in everyday life	1	2	3	4
STEM skills are important when considering employment opportunities	1	2	3	4
Boys have a better chance to succeed in a STEM career compared to girls	1	2	3	4
Girls have a better chance to succeed in a STEM career compared to boys	1	2	3	4
STEM skills will provide job security to future workers	1	2	3	4
STEM careers offer good work/life balance	1	2	3	4
STEM careers offer flexibility	1	2	3	4

36a. [QUESTION REMOVED IN 2024]

36b. [QUESTION REMOVED IN 2024]

36c. [QUESTION REMOVED IN 2024]

36. How essential do you think STEM skills are to the following careers?
[ASK ALL. SC PER ROW. RANDOMISE ORDER. SPLIT SAMPLE TO ONLY SHOW 10 CAREERS.]

	Must have STEM skills for this job	May require some STEM skills for this job	Do not require STEM skills for this job
Accountant	1	2	3
Architect	1	2	3
Clerical and administration (office support)	1	2	3
Corporate management	1	2	3
Economist	1	2	3
Farmer	1	2	3
Labourer	1	2	3

Machinery operator	1	2	3
Pharmacist	1	2	3
Teacher	1	2	3
Advertising or marketing consultant	1	2	3
Banker or finance	1	2	3
Computing or information technology (IT)	1	2	3
Data analyst	1	2	3
Emergency services (police, fire or ambulance)	1	2	3
Entrepreneur	1	2	3
Lawyer	1	2	3
Nurse	1	2	3
Public servant (includes Defence Force - Army, Airforce, Navy)	1	2	3
Trade worker (mechanic, electrician, carpenter)	1	2	3
Software / game developer	1	2	3

37. Who do you believe is more confident in the following subjects?
[ASK ALL. SC PER ITEM. RANDOMISE ORDER]

	Boys are much more confident	Boys are a bit more confident	Boys and girls are equally confident	Girls are a bit more confident	Girls are much more confident
Mathematics	1	2	3	4	5
Science	1	2	3	4	5
Technology	1	2	3	4	5
Engineering	1	2	3	4	5
Arts	1	2	3	4	5
Social science	1	2	3	4	5
English	1	2	3	4	5
Sport	1	2	3	4	5

38. Of these jobs, which ones do you think are more for men, more for women or for both?
[ASK ALL. SC PER ITEM. SPLIT SAMPLE TO ONLY SHOW 10 CAREERS.]

	Strongly men	Moderately men	Slightly men	Neither men nor women	Slightly women	Moderately women	Strongly women
Accountant	-1	-2	-3	0	1	2	3
Architect	-1	-2	-3	0	1	2	3
Clerical and administration (office support)	-1	-2	-3	0	1	2	3
Corporate management	-1	-2	-3	0	1	2	3
Economist	-1	-2	-3	0	1	2	3

Farmer	-1	-2	-3	0	1	2	3
Labourer (construction, grounds maintenance, factory worker)	-1	-2	-3	0	1	2	3
Machinery operator	-1	-2	-3	0	1	2	3
Pharmacist	-1	-2	-3	0	1	2	3
Teacher	-1	-2	-3	0	1	2	3
Advertising or marketing consultant	-1	-2	-3	0	1	2	3
Banker or finance	-1	-2	-3	0	1	2	3
Computing or information technology (IT)	-1	-2	-3	0	1	2	3
Data analyst	-1	-2	-3	0	1	2	3
Emergency services (police, fire or ambulance)	-1	-2	-3	0	1	2	3
Entrepreneur	-1	-2	-3	0	1	2	3
Lawyer	-1	-2	-3	0	1	2	3
Nurse	-1	-2	-3	0	1	2	3
Public servant (includes Defense Force - Army, Airforce, Navy)	-1	-2	-3	0	1	2	3
Trade worker (mechanic, electrician, carpenter)	-1	-2	-3	0	1	2	3
Software / game developer	-1	-2	-3	0	1	2	3

39A. Here is some more information about AI. Artificial intelligence, or “AI,” is the ability for a computer to think and learn. With AI, computers can perform tasks that are typically done by people, including processing language, problem-solving, and learning. Artificial intelligence is a tool, much like other types of new technologies.

Generative AI is a type of artificial intelligence system capable of generating text, images, or other media in response to prompts, for example ChatGPT.

Do you believe that Generative AI tools will have a significant impact on work and careers in the future?

ASK ALL. SC

Yes	1
No	2
Unsure	3

39B. Have you ever talked to your students about AI or the impact on their future careers?

ASK ALL. SC

Yes, I have spoken to them about this	1
No, but I plan to talk to them about this	2
No, and I don't plan to	3
Not sure	4

39. [REMOVED IN 2024]

40. How much emphasis does your school or institution put into the teaching of STEM?
[ASK THOSE IN SCHOOLS. SC]

No emphasis at all	1
Some emphasis, but not much	2
Quite a bit of emphasis	3
A lot of emphasis	4

41. What do you think are the barriers to schools placing an emphasis on the teaching of STEM?
[ASK THOSE IN SCHOOLS. SC]

Not enough qualified teachers	1
School focus is in other areas	2
Budget constraints	3
Its slowly moving in that direction, but not there yet	4
Timetabling issues	5
Need to focus on single subjects that lead into exam subjects in senior years	6
Lack of STEM resources	7
Resistance to change	8
Other (specify)	98

SECTION 6: STUDENT ATTITUDE AND ENGAGEMENT - GENDER DIFFERENCES

[ONLY TO BE ASKED TO TEACHERS THAT TEACH STEM SUBJECTS OR TEACHING STEM IS RELEVANT FOR MAIN ROLE]

In the next few questions, we would like to ask you a few questions about the general performance of your boys/men and girls/women students in STEM subjects. We understand that there will be a wide range of differences among your students, but for these questions we'd like you to think of the average performance of your students.

42. What proportion of your students would you place in the categories below based on their attitudes towards STEM education?
[CONSTANT SUM. MUST ADD TO 100%.]

	Boys/Men	Girls/Women
Love it	1	1
Like it	2	2
Indifferent	3	3
Dislike it	4	4
Hate it	5	5

43. What would help you to improve the attitudes of your female students towards STEM?
_____
_____
_____

SECTION 7: ABORIGINAL AND/OR TORRES STRAIT ISLANDER DEEP DIVE

44. [QUESTION REMOVED IN 2024]
45. [QUESTION REMOVED IN 2024]
46. [QUESTION REMOVED IN 2024]

SECTION 6: APPROACH TO TEACHING STEM

In this next section we would like to ask you some questions **about your interactions with students around STEM and your perceptions regarding their engagement with STEM.**

47. How frequently do you have conversations about STEM with your students separate to the delivery of STEM curriculum?

This could be general discussions about future employment skills, soft skills such as problem solving and critical thinking, STEM stories in the media (e.g. vaccines, face masks), real world applications of science or specifically about discipline specific skills (Science, Technology, Engineering and Mathematics).
[ASK ALL. SC]

Everyday	1
A few times a week	2
At least once a week	3
A few times a month	4
At least once a month	5
A few times a semester	6
At least once a semester	7
A few times a year	8
At least once a year	9
Less often than once a year	10

48. How confident are you to connect STEM content with relevant, real-world applications and career examples?
[ASK ALL. SC]

Very confident	1
Somewhat confident	2
Somewhat not confident	3

Not confident at all	4

SECTION 7: STEM RESOURCES

In the next set of questions we'd like to ask you about STEM specific teaching resources.

49. Below is a list of STEM resources. Please select which of the following you've heard of before.
[ASK ALL. MC]

STEM Education Resources Toolkit	1
Scootle	2
Teachers pay teachers	3
Khan Academy	4
Scienceweb	5
Aussie Educator	6
Oresomeresources	7
STELR	8
Teacher Superstore	9
Digital Technologies Hub	10
Girls in STEM Toolkit	11
Careers with STEM magazine	12
STARportal	13
STEM Women website	14
STEM Career Guide (GradAustralia)	15
Primary Connections	16
Science By Doing	17
Future You	18
National Lending Library	19
Curious Minds (Summer Schools for STEM Students)	20
STEM Professionals in Schools	21
reSolve: Maths by Enquiry	22
Deadly Science	23
None of these	99

50. And which of the following have you used before?
[ASK THOSE WHO SELECTED AN OPTION AT PREVIOUS QUESTION. MC.
PIPE RESOURCES SELECTED ABOVE.]

None of these	99

51. How useful did you find the STEM resources that you have used?
[ASK ALL. SC PER ROW]

	Not useful	Somewhat useful	Very useful
[PIPE RESOURCES SELECTED AT PREVIOUS QUESTION]	1	2	3

52. Which of the following activities/events does your school/institution participate in?

CSIRO STEM Professionals in Schools	1
National Science Week	2
Science/Math Olympiads	3
Australian Mathematics Competition	4
Australian Science Competition	5

National Youth Science Forum	6
Science Fair	7
Maker Space	8
Questacon Science Circus	9
Other Science competitions/contests	10
Science Experience	11
Other:	12
None of these	99

53. How effective do you believe these programs (*[AT Q57]*) are at influencing students to choose elective STEM subjects or advanced STEM subjects in senior levels?
[ASK ALL. SC.]

Very effective	1
Quite effective	2
Somewhat effective	3
Not effective	4
Don't know	5

54. How effective do you believe these programs (AT Q57]) are at increasing student interest in STEM careers?
[ASK ALL. SC.]

Very effective	1
Quite effective	2
Somewhat effective	3
Not effective	4
Don't know	5

SECTION 8: CAREER COUNSELLOR SECTION

55. In your experience as an educator, how often do you provide career advice to your students?
[ASK ALL HIGH SCOOL EDUCATORS EXCEPT FOR CAREER COUNSELLORS]

Weekly	1
Fortnightly	2
Monthly	3
At least once per term	4
Less often	
Never	

[EDUCATORS WHO SELECTED CODES 1-3 ABOVE = MENTORS]

56. 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?
[ASK CAREER COUNSELLORS IN HIGH SCHOOLS ONLY. OE – PERCENTAGE ENTRY]

Year levels	%
Year 7	1
Year 8	2
Year 9	3
Year 10	4
Year 11	5
Year 12	6
N/A	7

57. 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?
[ASK CAREER COUNSELLORS IN HIGH SCHOOLS. OE – PERCENTAGE ENTRY]

Post school options	%
University	1
TAFE/VET	2
Apprenticeships	3
Employment	4
Other (specify)	5
Don't know	6

58. What proportion of students at your school/institution are seriously considering a career in STEM?
[ASK CAREER COUNSELLORS AND MENTORS. SC PER COLUMN. DISPLAY AS DROP DOWN.]

	Boys/Men	Girls/Women
None	1	1
10%	2	2
20%	3	3
30%	4	4
40%	5	5
50%	6	6
60%	7	7
70%	8	8
80%	9	9
90%	10	10
100%	11	11
Don't know	99	99

59. How would you rate your ability to explain what different STEM careers involve? What the people in those careers do?
[ASK ALL. MC.]

Very high	1
High	2
Medium	3
Low	4
Very low	5

60. How would you rate your ability to recommend STEM pathways to students showing an interest in this area?
[ASK CAREER COUNSELLORS AND MENTORS. MC.]

Very high	1
High	2
Medium	3
Low	4
Very low	5
Not applicable	99

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

[ASK ALL. SC. DISPLAY AS SLIDER TYPE QUESTION.]

STEM skills are important to everyone, no matter what job you plan to do	…	STEM skills are only important if you're going into a STEM career
1	2,3,4,5,6,7,8,9	10

62. When having career conversations with students about a STEM career, what are some of the barriers students raise?
[ASK CAREER COUNSELLORS AND MENTORS. MC.]

	Boys/Men	Girls/Women	Not applicable
ATAR result too hard to get	1	1	1
Not enough women in the field	2	2	2
Expectation that jobs will become automated	3	3	3
Sounds boring	4	4	4
No alternate pathways to get into STEM	5	5	5
Not having the pre-requisite subjects	6	6	6
Not feeling confident in Mathematics	7	7	7
Not feeling confident in science	8	8	8
Not feeling confident in technology	9	9	9
Not feeling confident in engineering	10	10	10
Not a "cool" profession	11	11	11
Perceptions of low wages	12	12	12
Lack of role models in the field	13	13	13

63. When speaking to students about STEM related careers, how much do you emphasise the following points?
[ASK CAREER COUNSELLORS. SC PER ROW.]

	Don't even talk about it	I talk about I, but don't emphasise it	Somewhat emphasise	Strongly emphasise
There are many job opportunities in this area for graduates	1	2	3	4
STEM related careers pay well	1	2	3	4
STEM related careers provide higher levels of job security	1	2	3	4
There are lots of opportunities for on the job training with STEM careers	1	2	3	4
STEM related jobs are for people with above average intelligence	1	2	3	4
Provide examples of real employers in this area	1	2	3	4
There are alternate pathways to STEM outside of University	1	2	3	4
There are many opportunities and pathways specially for women in STEM	1	2	3	4

There are many scholarships and other financial support specially for women studying STEM at university	1	2	3	4

64. What is your awareness and use of each the following STEM careers websites?
[ASK CAREER COUNSELLORS. SC PER ROW.]

	Never heard of it	Heard of it don't use it	Use infrequently	Use regularly
https://www.thegist.edu.au/	1	2	3	4
https://thefootnotes.com.au/	1	2	3	4
https://careerswithstem.com.au/	1	2	3	4
https://careers.amsi.org.au/	1	2	3	4
https://fya.org.au/	1	2	3	4

65. What are the top 3 STEM careers you recommend to students and why?
[ASK CAREER COUNSELLORS AND MENTORS. DISPLAY AS TEXT BOX GRID. ONE COLUMN FOR BOYS AND ONE COLUMN FOR GIRLS.]

66. _____
67. _____
68. _____