Queensland MINERALS & ENERGY ACADEMY

INSIGHTS & OPPORTUNITIES FOR ASPIRING RESOURCES SECTOR APPRENTICES & TRAINEES

QMEA RESOURCES SECTOR APPRENTICE/TRAINEE EMPLOYABILITY SKILLS FOR SCHOOL LEAVERS

SURVEY RESULTS, NOVEMBER 2016

PREAMBLE

Queensland Minerals and Energy Academy (QMEA) is a partnership between the resources sector represented by Queensland Resources Council and the Queensland Government through its Gateway to Industry Schools Program.

It offers a range of experiences to broaden student and teacher knowledge of the sector and provide a talent pipeline for professional and vocational students into minerals and energy careers and other supporting science, technology, engineering, maths (STEM) industries.

QMEA teachers and students have frequently expressed a need to further understand the requirements of industry for students seeking a vocational pathway into the resources sector and its supporting industries as an apprentice or trainee. On the back of its multiple partnerships with industry QMEA sought to draw on the wealth of industry experience and knowledge to provide insights on current and future opportunities for vocational students and preferred requirements for school leavers seeking apprenticeships and traineeships.

METHODOLOGY

To achieve this the *QMEA resources sector apprentice/trainee employability skills for school leavers' 2016 survey* was developed using Survey Monkey to ascertain the current and future prospects for students entering the industry and gauge the value of employability skills necessary for school leavers wishing to enter the resources sector and its supporting industries. The survey was sent to companies who represented a cross-section of industry (coal, metalliferous, oil and gas, service and supply chain) with a focus on personnel employed in the recruitment and training of apprentices and trainees.

All responses received were anonymous.

NEXT STEPS

The results from this survey have been aggregated and will be shared with principals, teachers and students throughout the 36 schools that make up the QMEA network and other educational stakeholders e.g. Queensland Department Education and Training. It is anticipated this feedback will be used as a tool to assist in curriculum review, development and implementation, provide a valuable reference for vocational guidance and provide input into discussions with government around the preparedness of school leavers seeking entry level pathways into the sector.

INTRODUCTION

The *QMEA resources sector apprentice/trainee employability skills for school leavers' 2016 survey* identified the desired employment characteristics from the viewpoint of the Queensland resources sector in the employment of apprentices and trainees. The strengths and weaknesses in the current apprentices and trainees was captured and comments collated on suggestions to improve the successful transitioning of students from school into the workplace.

Responses were received from 17 organisations which represented a strong cross section of the resources sector and its suppliers. Nearly 50% of respondents came from either the coal/metalliferous sectors with strong representation from the energy and services sectors followed by the supply chain. (See Chart 1) The majority of respondents were in the area of apprentice management with 100% of organisations indicating they currently employ apprentices or trainees.

KEY FINDINGS

The key findings of the *QMEA resources sector apprentice/trainee employability skills for school leavers' 2016 survey* indicated that:

1. **Industry representatives from across the spectrum of the resources sector have identified significant concerns in the current literacy and numeracy levels of apprentice and trainee school leavers. There was an overwhelming consensus that despite rapid changes in technology the priority skills for this cohort were a solid background in maths and English** *(Chart 1, Tables 3 & 4)*

'Our biggest concern is the level of basic maths and English.'

'We need an increase in written English skills. With the increase in technology the writing ability of students is decreasing'.

2. **Softer skills such as communication, problem solving, motivation, work ethic and attitude were personal attributes overwhelmingly preferred by industry** *(Chart 10, Table 4)*

3. **The results indicated some entry level certificate qualifications have been identified as somewhat useful for apprenticeships. However comments indicated a solid pass in year 12 is preferable to certificates as industry prefers to train apprentices and trainees in their own 'real' work environments** *(Table 2)*

'We don't require any Cert qualifications - high school is enough'

'Attitude and behaviours are the most important. We are able to train for skill.'

4. **Dual trades in fitting/welding, electrical/instrumentation are set to become more in demand with organisations still offering apprenticeships predominantly in electro-technology, mechanical and diesel fitting with traineeships in administration and warehousing.** *(Charts 4 and 5)*

5. **The QMEA Science Maths and Related Technologies (QSMART) subject was considered by industry as an option for students seeking a vocational pathway with 94 per cent of respondents indicating that they thought it may address some of the shortfalls in maths literacy.** *(Chart 8)*

6. **Industry has indicated there are some signs of optimism regarding future employment of apprentices and trainees on the back of an industry recovery despite the economic downturn in the resources sector having a significant effect on the level of employment of apprentices and trainees.** *(Chart 6)*

OTHER FINDINGS

- **Industry overwhelmingly prefers to employ apprentices and trainees from their local areas** and school leavers are the preferred group from which this cohort is sourced rather than the adult workforce or within the business *(Chart 2)*

- In the recruitment of apprentices the more **traditional methods of advertising through the newspapers and word of mouth are employed by 70% of the respondents.** Group training organisations and direct contact with schools also come into play. Less popular was the use of online services and recruitment agencies *(Chart 3)*

- Industry rated a range of experiences such as being **local to the area, work experience and part time work as the most desired attributes** in the transition to employment with school leadership roles, sporting achievements, community volunteering and membership of teams considered somewhat useful *(Chart 9)*

- All respondents indicated there would **still be a need for traditional apprenticeships and traineeships with increased automation in industry** although some comments were made around potentially reduced apprentice numbers *(Chart 11)*

- **Other preferred subjects for apprentices were engineering technology, industrial design technology** with maths B being a requirement for an electrical apprenticeship *(Chart 7 and Table 1)*

- **Increased opportunities for exposure of students to automation, attracting females into the sector, increasing skill level of teachers in industry related subjects** and more industry and school engagement were mentioned in other considerations

- Respondents noted the **strengths of current apprentices** and trainees lay in their **ability to bring a fresh set of eyes to businesses, adapt to new technology and having the willingness to learn and develop**

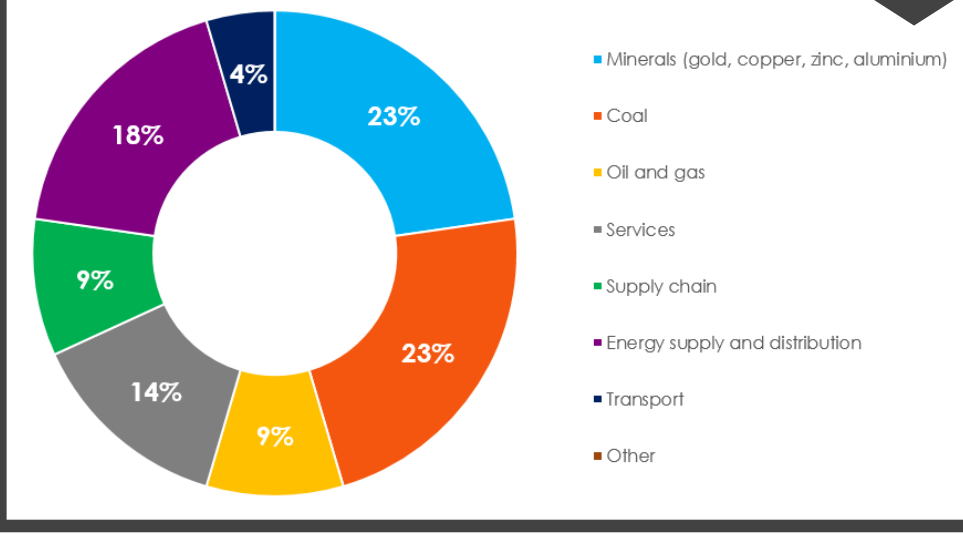
- Additional comments on **concerns** related to industry **reducing its apprenticeship numbers** to the point where it could facilitate another skills shortage and impacts on Certificate III based on Certificate II results and User Choice funding.

Demographics

All respondents that completed the survey currently host or employ apprentices and trainees. **Their areas of work included apprentice management (47%) human resources (11.8%) and the maintenance, career development, community relations and training areas (35%).**

Their organisations and current apprentices and/or trainees are representative of the sectors identified in Chart 1.

CHART 1: RESPONDENTS BY SECTOR



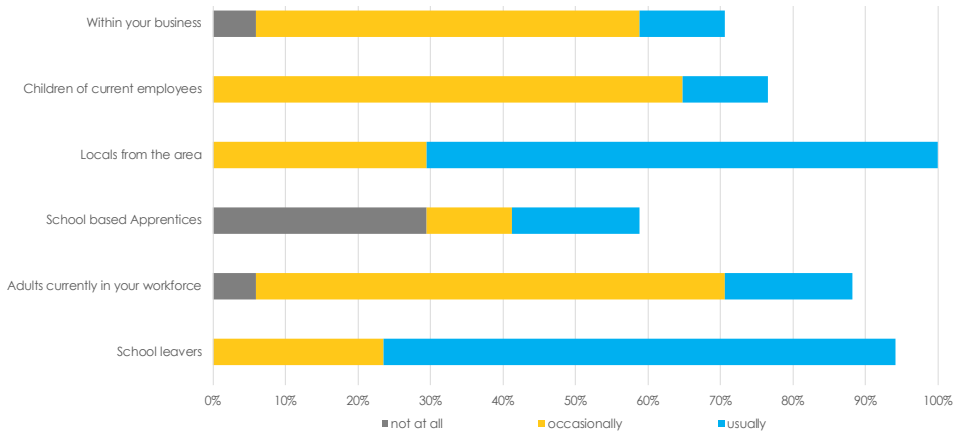
Recruitment

Where are your apprentices and trainees generally sourced from?

The respondents were asked to comment on where their organisation generally sourced its apprentices or trainees.

The results indicated that **locals and school leavers are the preferred group.**

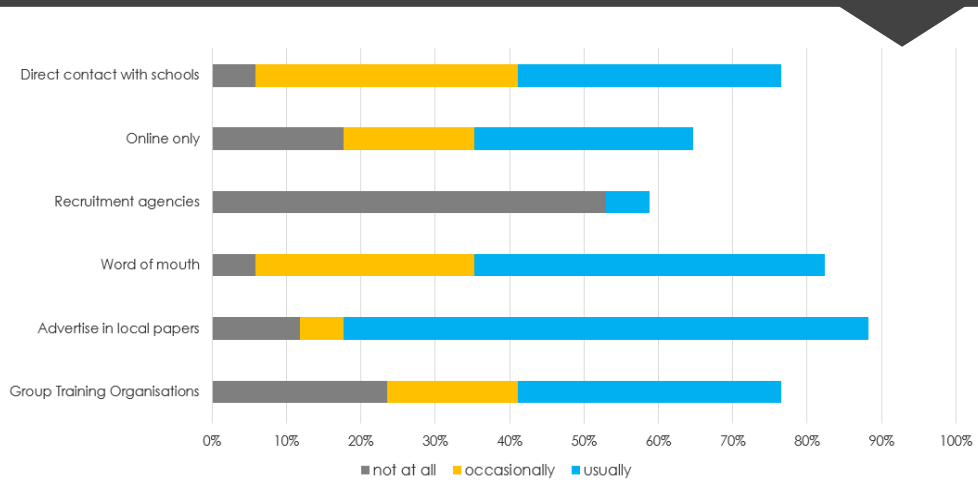
CHART 2: WHERE ARE YOUR APPRENTICES/TRAINEES GENERALLY SOURCED FROM?



What services or techniques does your organisation currently utilise as part of your recruitment process?

The respondents were asked to indicate what methods were used as part of the recruitment process. Responses indicated that **70% of respondents prefer to advertise in local papers and rely on word of mouth** to let the communities know of upcoming apprentice or trainee opportunities.

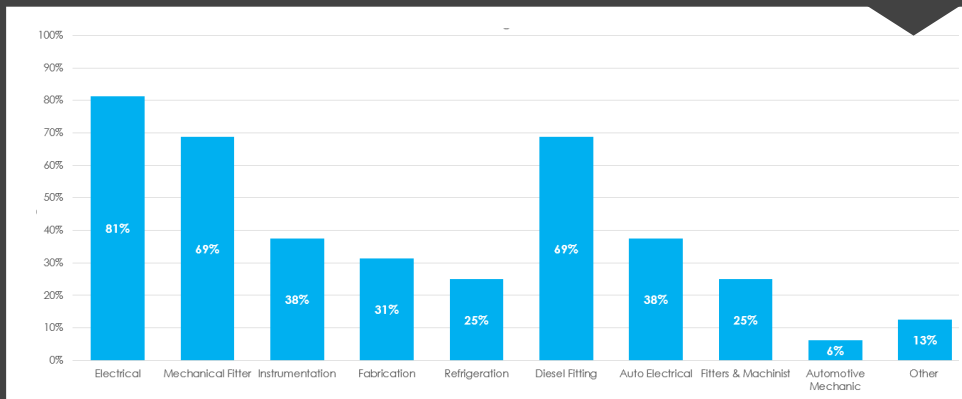
CHART 3: WHAT SERVICES OR TECHNIQUES DOES YOUR ORGANISATION CURRENTLY UTILISE AS PART OF YOUR RECRUITMENT PROCESS?



Apprenticeships

Of the apprenticeships currently offered the most prevalent are **electrical, diesel fitting and mechanical fitting.** Although comments were made that dual trades were gaining popularity like fitter/welders, and electrical/ instrumentation.

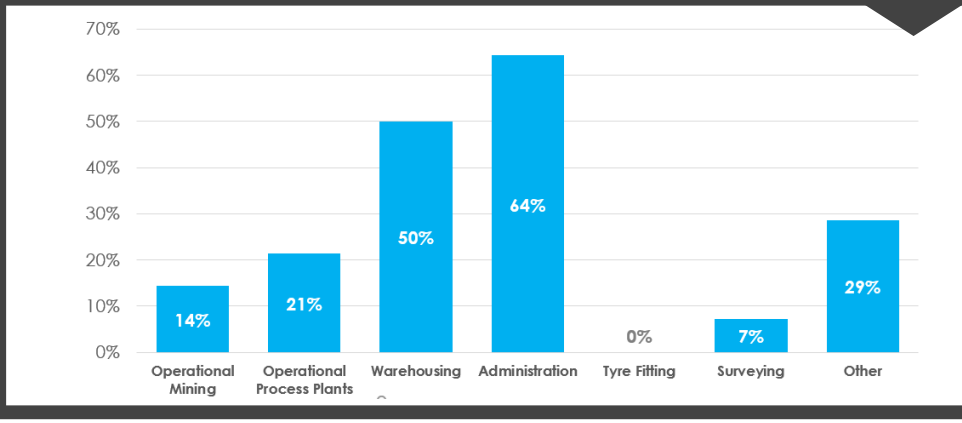
CHART 4: WHAT TYPES OF APPRENTICESHIPS DOES YOUR ORGANISATION CURRENTLY OFFER?



Traineeships

Of the traineeships currently offered **administration and warehousing** were the most popular. It can be surmised the downturn in the sector has diminished the numbers of operational trainees which traditionally would have represented a higher percentage.

CHART 5: WHAT TYPES OF TRAINEESHIPS DOES YOUR ORGANISATION CURRENTLY OFFER?



'We intend to offer apprenticeship opportunities in addition to the current traineeship positions.'

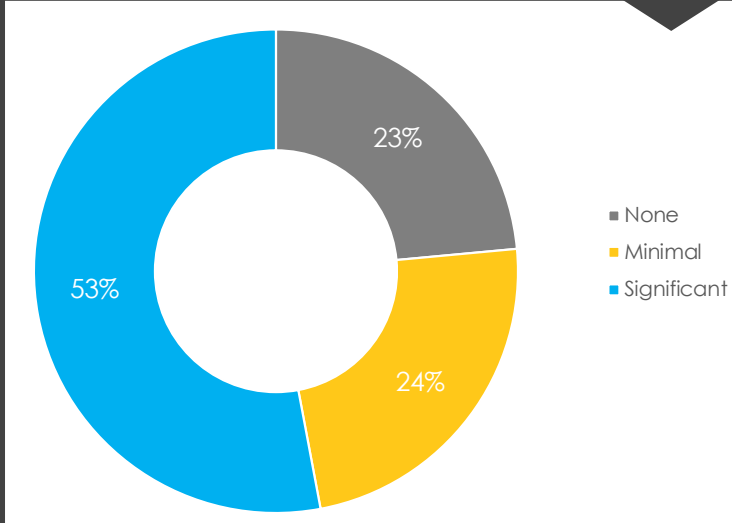
Recruitment prospects

When asked about the level of impact the downturn in the resources and energy sector has had on the recruitment of apprentices and trainees **53% of respondents said the downturn has had a significant effect.**

Respondents were also asked to provide a comment on estimated changes (if any) the organisation may be considering in the employment level for apprentices and trainees that may occur in the next three years.

Responses were mixed with some indicating there would be **minimal intake or no extra intake in the coming twelve months**. However there were some signs of optimism on the back of a recovery by industry with some indications that apprentice/trainee numbers had bottomed out with some slight increases predicted.

CHART 6: WHAT LEVEL OF IMPACT HAS THE DOWNTURN IN THE RESOURCES SECTOR HAD FOR THE EMPLOYMENT OF APPRENTICES AND TRAINEES IN YOUR ORGANISATION?

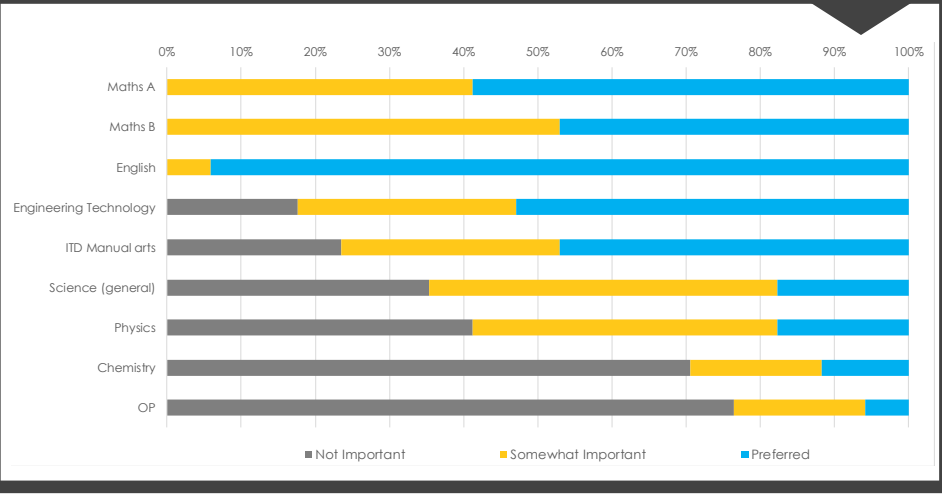


Value of school subjects

Respondents were also asked about the relevance of school subjects undertaken in year 11 and year 12 during the apprentice selection process. Most resource companies indicated they do not employ year 11 students but thought that **English was the most important year 11 subject for students to focus on**.

For year 12 subjects the **preferred subjects for apprentice recruitment was maths A and English. Maths B was also highly regarded** particularly for electrical apprenticeships.

CHART 7: WHEN RECRUITING FOR APPRENTICES HOW WOULD YOUR ORGANISATION ASSESS THE IMPORTANCE OF PASSES OR BETTER IN THE FOLLOWING SUBJECTS?



Engineering technology and industrial technology and design were noted as preferred subjects for all apprenticeships.

Respondents were also asked about subjects for traineeships, given that the most prevalent traineeships were warehousing and administration, the respondents indicated that **year 12 subjects were the most preferred and again maths and English**. Indications were for operational traineeships that marginally it was preferred to have year 12 but both year 11 and year 10 was acceptable but again maths and English are the preferred subjects.

The survey further drilled down into individual vocational pathways and the preferred maths subject. The vocations were grouped as:

- Electrical, Refrigeration and Instrumentation
- Automotive, Diesel Fitting, Auto Electrical
- Fabrication
- Fitting
- Trainees.

	Electrical (inc Refrigeration and Instrumentation)	Automotive (inc diesel fitting, mechanics, auto electrical)	Fabrication	Fitting	Trainees
Year 11 Maths A	18%	41%	24%	35%	12%
Year 11	24%	24%	18%	18%	6%
Year 11	12%	6%	6%	6%	0%
Year 12	29%	65%	41%	53%	29%
Year 12	65%	53%	29%	35%	29%
Year 12	24%	18%	12%	12%	12%
Year 12	6%	29%	12%	18%	18%

TABLE 1

The indication is that for:

- Electrical, refrigeration and instrumentation apprentices the preference is maths B
- Automotive, diesel fitting and auto electrical apprentices the preference is maths A
- Fabrication and fitting apprentices the preference is marginally maths A
- Trainees, maths A and B are equally preferred.

QSMART subject

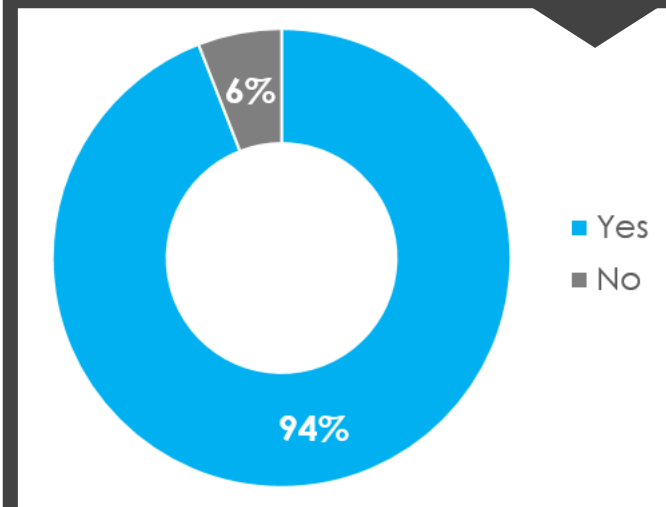
For the past 9 years, QMEA has been involved in the development and trial of the QSMART maths subject.

Respondents were provided with the following brief description of QSMART ***'QSMART is a trade based maths subject equivalent to maths A that has been developed by the minerals and energy industry in collaboration with QMEA. The course delivers the need for a futures-oriented applied mathematics and science course that is hands-on in nature and contextualised by experiences in real workplaces. It provides students with opportunities to learn from a practical and investigative approach to learning.'***

Respondents were asked if QSMART was an alternative for school students who wished to pursue a trade, and if they thought it would be viable maths alternative.

Respondents strongly indicated that **QSMART was seen as a valued maths alternative.**

CHART 8: DOES YOUR ORGANISATION SEE VALUE IN QSMART AS A MATHS OPTION FOR SCHOOLS?



Value of entry level qualifications

The survey asked about the importance of entry level qualifications as useful for apprentices and trainees as part of the application process. The results indicated **Certificate II Engineering or Certificate II Engineering Pathways have been identified as useful for fitting and fabrication** in particular.

However a number of comments indicated a **solid pass in year 12 is preferable to certificates as industry prefers to train apprentices and trainees in their own real work environments.**

What entry level qualifications does your organisation see as useful for apprentices and trainees as part of the application process?

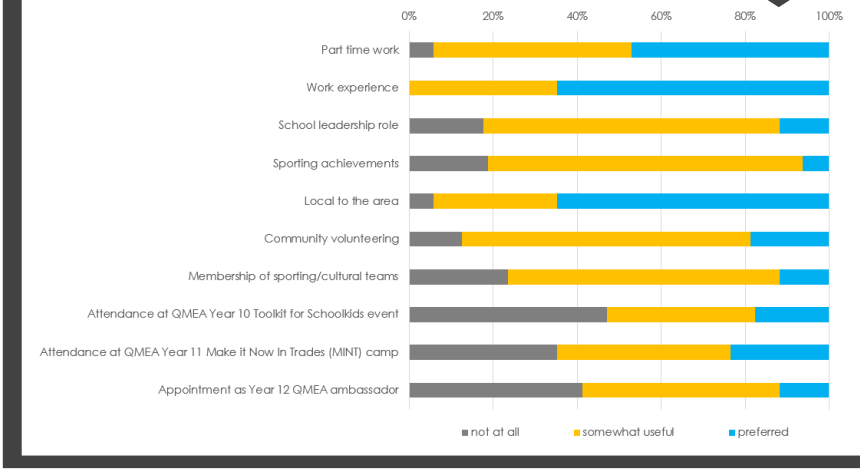
	Traineeship	Electrical	Fitting	Automotive	Fabrication	Response Count
Certificate 2 Engineering	1	1	5	1	3	11
Certificate 2 Engineering Pathways	1	2	4	1	3	11
Certificate 2 Business	2	0	0	0	0	2
Certificate 3 Business	2	0	0	0	0	2
Certificate 2 RIWP Resources Infrastructure	1	1	1	0	0	3
Certificate 2 Industrial Computer Technology	0	0	1	2	0	3
Certificate 2 Surveying and Spatial Information	0	0	1	0	0	1
Certificate 2 Coal Operations	1	0	0	1	0	2

TABLE 2

Value of pre-employment extra curricula experience

The survey asked respondents to rate the usefulness of a range of experiences as part of the apprenticeship/traineeship application process. In summary, industry rated **work experience, being local to the area and part time work as the most desired attributes** with school leadership roles, sporting achievements, community volunteering and membership of teams proving somewhat useful.

CHART 9: HOW DOES YOUR ORGANISATION RATE THE USEFULNESS OF THE FOLLOWING EXPERIENCES AS PART OF THE APPRENTICESHIP/ TRAINEESHIP APPLICATION PROCESS?

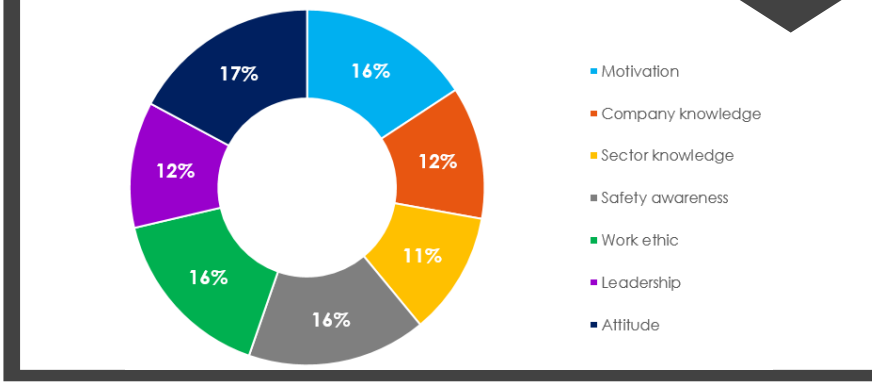


'Not everyone will be an ambassador, but I like QMEA students as they have given up one week of holidays to participate'

Value of pre-employment personal attributes

The survey asked respondents what personal attributes in apprentices and trainees would be most useful in their organisation. Responses indicated **motivation, positive attitude, work ethic and safety awareness were the most useful.**

CHART 10: HOW DOES YOUR ORGANISATION RATE THE USEFULNESS OF HIGH LEVELS OF THE FOLLOWING ATTRIBUTES AS PART OF THE APPRENTICESHIP/TRAINEESHIP APPLICATION PROCESS?



Value of pre-employment school based skills

The survey asked how the organisation generally rated the usefulness of the following pre-employment skills for apprentices and trainees.

The results indicated **English, communication and problem solving were rated the most highly as preferred pre-employment skills** followed by knowledge of machinery and computers.

How does your organisation generally rate the usefulness of the following pre-employment skills for apprentices and trainees?

	not at all	somewhat	preferred	Percentage
Knowledge of computer equipment, computer hardware	0%	65%	35%	100%
Knowledge of machines and tools e.g. uses, repair and	6%	53%	41%	100%
Knowledge of arithmetic, algebra, geometry and their	6%	71%	24%	100%
Knowledge of English language including correct spelling,	0%	29%	71%	100%
Knowledge of coding or programming	76%	24%	0%	100%
Communication	6%	24%	71%	100%
Problem solving	12%	18%	71%	100%

TABLE 3

Value of technology skills

With industry becoming more technologically advanced respondents were asked to rate the value of skills in preparing school leavers for work environments that are becoming increasingly automated.

Respondents again rated **maths and English, problem solving and general industrial technology and design skills as being the most useful.**

As industry is becoming more technologically advanced how does your organisation rate the value of the following skills in preparing school leavers for work environments that are becoming increasingly automated?

	not at all	somewhat useful	preferred	Percentage
Computer programming	41%	59%	0%	100%
Gaming	94%	6%	0%	100%
Graphics	29%	59%	12%	100%
Web design	65%	35%	0%	100%
Robotics/coding	59%	35%	6%	100%
Social media	59%	35%	6%	100%
Maths and English	0%	24%	76%	100%
General manual arts (Industrial Technology and Design) skills	12%	47%	41%	100%
3D printing	65%	24%	12%	100%
Keyboard skills	6%	71%	24%	100%
Data analysis and application	24%	65%	12%	100%
Problem solving	6%	35%	59%	100%
Drone piloting	82%	18%	0%	100%
Drone maintenance	76%	24%	0%	100%

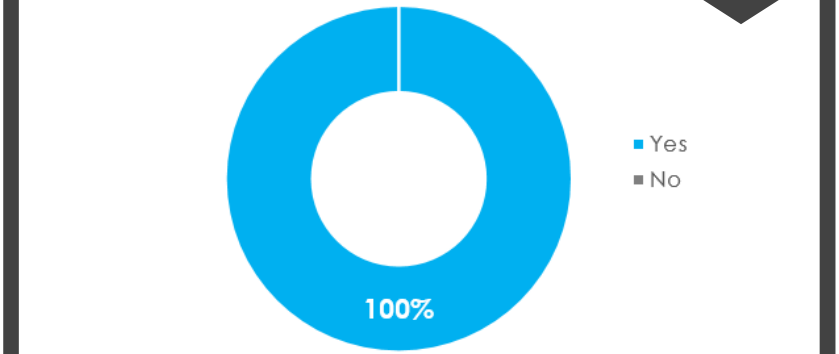
TABLE 4

'Drones at very early stages of use, may in 5 years have a different answer'

When asked with the introduction of automation in industry if there would still be a need for the traditional apprenticeships and traineeships, the response was 100% in the affirmative.

Although the respondents indicated **there will be a future need for apprentices as industry increases its level of automation** some comments indicated the respondents thought total apprentice numbers could be reduced.

CHART 11: WITH THE INTRODUCTION OF AUTOMATION IN INDUSTRY WILL THERE STILL BE A NEED FOR THE TRADITIONAL APPRENTICESHIPS AND TRAINEESHIPS?



FUTURE OUTLOOK

The survey asked respondents to identify the most significant changes needed in school based studies to meet current industry needs for apprentices and trainees.

The respondents indicated overwhelmingly improved maths and English skills, alongside motivation, work ethic and attitude, increased opportunities for exposure to automation and industry diversity and improved industry and school engagement leading to increased skill level of teachers and more apprenticeships and traineeships.

'There is a big need for better motivation and attitude'

'Automation is going to be the key to success'

As part of the future outlook respondents were asked about their greatest concerns with the skills of current school leavers seeking to be apprentices or trainees.

Responses indicated the overriding concern was around the students being able to have the skills necessary to transition into a apprenticeship. Maths and English were identified as the major concerns with soft skills such as respect, attitude, work ethic and behaviour equally concerning to the respondents.

'A connection between industry and education needs to be developed for right outcomes'

'What they have learnt in certain classes is not applicable for when they go to work or TAFE'

The survey asked respondents to identify what were the strengths of current apprentices and trainees. Responses identified the value of experience in prevocational studies and having strong soft skills in communication.

'Willingness to get involved, pre-vocational studies, and the ability to adapt to changes with technology is valued'

FINAL COMMENTS

The survey asked if respondents had any other final comments they wished to make that may have not been captured in the survey.

Responses related to concerns regarding low number of apprentices corresponding to a future skill shortage and Certificate II results and subsequent implications for Certificate III apprentices within the context of User Choice funding.

'As technology increases in our industry future tradespersons will need to be multi skilled. They will still need to have good hand skills, but their ability to fault find and diagnose problems quickly will be highly regarded.

A good level of maths and English will ensure they can read and understand procedures, and follow a sound diagnostic process.'

QMEA acknowledges the contributions of industry to this report which will inform teachers in school and aspiring apprentices and trainees as to the employability skills required by the resources sector and supporting industries.

FOR MORE INFORMATION

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Companies invited to participate	
1	Anglo American
2	APLNG/ConocoPhillips
3	Aurizon
4	BMA
5	Boyne Smelter
6	Cement Australia
7	EAG
8	EDI Downer
9	GAGAL
10	Gladstone Port Corporation
11	Glencore Mt Isa
12	Glencore Townsville
13	Goldings
14	Hastings Deering
15	Jellinbah
16	Komatsu
17	McKoskers Contracting
18	MIGAS
19	Monodelphus
20	MRAEL
21	NRG
22	Positive Resourcing
23	QGC
24	Rio Tinto
25	Santos GLNG
26	Sibelco
27	Skills 360
28	Stanwell
29	Thiess

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