



Lead.**Connect.**

Innovation Territory NextGen youth in STEM

Investing in our future today.

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21 December 2023



Master Electricians Australia (MEA) is the trade association representing electrical contractors recognised by industry, government and the community as the electrical industry's leading business partner, knowledge source and advocate. Our website is www.masterelectricians.com.au

MEA are strong advocates for Vocational Educational Training (VET) to be integrated and streamlined into the secondary school curriculum with an equal weighting to Australian Tertiary Admission Rank (ATAR). It is our strong belief this is the most impactful solution to addressing the Northern Territory's (NT) skills shortage issue in addition to improving teenage engagement with Science, Technology, Engineering and Math (STEM) across all diversities (i.e. gender, ethnicity, residential location, disabilities, etc.). The benefits include better equipped personnel entering the workforce, enhanced aptitude and competency screening, heightened attraction and retention and engagement by teenagers. MEA sees this as the pivotal role in actioning societal, structural and systemic change.

Vocational Education Training in secondary schools (VETSS) can foster safe and supportive learning environments. It is likely to encourage a greater number of students to engage with their secondary school learning as the curriculum is designed to extend beyond the traditional academic/commercial pathway of ATAR schooling, and motivate students who would otherwise be disengaged, to work towards their desired STEM career.

Discussion Paper Questions

The NextGen Youth in STEM Symposium

Q1. Do you have an idea or suggestion about how we can engage more Territory teenagers into STEM futures?

Throughout many submissions, MEA has strongly advocated that integrating VETSS with an equal weighting to ATAR is one of the key solutions to both gender diversity and skills shortages in STEM trades. The current schooling system moulds students to fit an academic structure, leaving behind those who are unwilling or unable to conform. Providing exposure and targeted training provides students enhanced opportunities for future success in VET by providing a supportive and encouraging environment, better incentivising those who might otherwise be disengaged, to become proactive towards their future career. They are removed from the academic/commercial teaching structure of ATAR schooling and made to feel more included by teachings targeted towards their VET skill set.

MEA regularly make visits to trade/VET based schools which are designed to educate and inform year 11-12 students towards STEM trades and other such practical careers. We noticed a stronger engagement from students in these subjects, who are working towards a desired career, than they would have otherwise been whilst pigeonholed in an ATAR curriculum subject with no desire to pursue what they are learning. There are not many of these schools around and are exclusive towards VET courses. We recommend implementing streamlined and integrated VET curriculum courses into all secondary to ensure access to alternative career options is available to all students regardless of residential location, gender, diversity and personal circumstance.

Q2. How can we engage better with you about engaging more Territory teenagers into STEM futures?

As a trade association representing electrical contractors across Australia, we feel very firmly about VETSS. We are aware of the impact the skills shortage crisis is having on our members and the wider industry and foresee the problem being exacerbated without concerted efforts to address it. Through MEA staff visits to VET based schools, engagement with members and

regular responses to State and Federal VET consultations, MEA strongly advocates for the benefits of VETSS.

Given our vast engagement on the matter, we are well positioned to further enter discussion with the NT Government (NTG) on advancing VETSS and the benefits it provides. We strongly believe VETSS can create a generational change towards systemic and societal attitudes regarding STEM. We offer ourselves a strong collaborative partner for the NGT to improve youth STEM engagement thanks to our strong network within the industry to gather knowledge of what is needed to develop our next generation of STEM tradespeople.

Purpose of this Discussion Paper

Q3. Are you interested in further discussion (similar to NextGen Youth in STEM Symposium in April 2023) to develop policy and program options? Do you have a suggestion for a better way to do this?

Yes. Please refer to Q2.

Background on STEM youth engagement in the Territory

Q4. How can we support deeper interconnectedness between STEM ecosystem members?

MEA believe, first and foremost, the NTG needs to integrate VETSS with an equal weighting to ATAR subjects and outcomes, making it accessible across all secondary schools. By establishing this foundation, more students will be exposed to STEM trades enhancing the value that STEM ecosystem members provide.

We note the importance GTOs and RTOs, such as TAFE, have in cultivating STEM careers. By integrating the VETSS syllabus to align with TAFE offerings, students can expect to have a easier transition into post-secondary school training which will likely enhance their sense of personal worth and improve their “agency and self-determination”¹.

By exposing all secondary students to the STEM industry through VETSS, other programs such as the STEM Roadshow, the Children’s University and Charles Darwin University will plausibly have greater impact as we can expect to see a greater participation with VETSS through piqued student interest. The discussion paper reveals that “informal STEM providers and schools [hold] missed views about a shared vision for STEM in the NT”². We are confident that prioritising VETSS will path the way for a cohesive STEM environment that will better strengthen the interconnectedness between members. VETSS will be a likely natural leader in setting the vision’s tone.

Q5. How can we support a more strategic approach to STEM engagement with youth across all stakeholders?

Please refer to our response under Q4.

MEA are confident that through VETSS more students will become exposed to, and engaged in, learning towards STEM trades. This will plausibly increase student engagement with other STEM stakeholders as more youths become interested in STEM related activities. Much like we see students at school engaging in sporting and academic extracurricular activities (for example, cadets, debating, chess, spelling bees), we can expect to see this natural extension of curiosity and interest spread into STEM programs.

Q6. Are you involved in an organisation that supports Territory teenagers to engage in STEM? If yes, provide a brief description of your activities.

¹ Northern Territory Government, ‘Innovation Territory NextGen you in STEM Discussion Paper’, (November 2023), 21.

² (n1), 17.

While we are not directly involved in any NT initiatives for teenage STEM engagement, we are advocates for Australian VETSS which educates students towards their STEM career. Please refer to Q2 for a more detailed description.

Below is a summary list of our engagement activities:

- Visit year 11-12 VET schools to give presentations on:
 - the importance of VET learning during school; and
 - STEM career pathways.
- Regularly submit responses to State and National consultations in addition to participating in round table discussions. You can view our previous VETSS advocacy submissions at <https://www.masterelectricians.com.au/advocacy> .
- Engage with our members, receiving feedback that generational change at secondary school is necessary for improving our skills shortage.
- MEA staff engaging in judging panels for State and Federal Training Awards programs.

Q7. Are you interested in joining a network of other people and organisations with an interest in engaging more Territory teenagers into STEM futures?

Yes.

[The benefits of engaging more teenagers into STEM futures](#)

Q8. Are you aware of further benefits of engaging more Territory teenagers into STEM futures that are not covered in this section? If yes, please provide a brief description of the benefits.

We reiterate ‘agency and self-determination’ and ‘social emotional learning to emotional and social well-being’ are enhanced through improved STEM engagement. MEA strongly believe that streamlined VET courses into the secondary school curriculum will significantly foster systemic and societal attitude changes towards STEM trades through safe and supportive learning environments. It was recently reported that “many young students feel unsafe at school”³ where (as of 2021) “44 percent of [Darwin children were] concerned about their personal safety and 16 per cent worried about crime”⁴. “A total of 10 per cent were concerned about bullying and school behaviours”⁵. Whilst we appreciate that a more engaging education is not going to miraculously resolve State crime rates and safety, we believe VETSS can have a large positive influence on student behaviour, both those bullying and being bullied, through increased participation in school and altering perceptions in the school learning environment to foster a safer environment.

As per appendices A-E, there has been a relatively plateaued number of NT year 11 and 12 students enrolled in school during term 3 since 2013 through to 2023, with a slight improvement in aboriginal enrolments as of 2020. However, attendance rates for these same students during term 3 throughout the last decade are deteriorating. The 2022 School Survey Summary from Darwin High School presented a theme in student responses that they wanted “reduc[ed] ATAR pressure”⁶. Whilst we appreciate this summary from a single school is insufficient to be a sample of the greater NT student population, it does speak the overall idea that the ATAR schooling system is not designed for all students’ skills and needs, and is very targeted towards academic careers.

MEA argue VETSS will likely enhance enrolment and attendance rates in the NT. VETSS will engross more students who would otherwise be disengaged in their secondary school education, better preparing them towards a STEM trade that is aligned with their interest and

³ (n1), 10.

⁴ Charles Darwin University Australia, ‘Survey finds Darwin children more worried about safety than grades’ (5 February 2021), < <https://www.cdu.edu.au/news/survey-finds-darwin-children-more-worried-about-safety-grades>>

⁵ Ibid.

⁶ Darwin High School, ‘2022 School Survey Summary’, (15 December 2022), <https://darwinhigh.nt.edu.au/news/2022-school-survey-summary/>

skill set. Furthermore, by integrating VETSS, these students are given equal opportunity for developing skills towards success in their chosen career field; the same opportunities as those pursuing academic/corporate careers. Positive flow-on-effects could include reduced school bullying, improved personal safety and reduced crime as more students become occupied with school and, in the long-term, a meaningful career cultivated at a young age.

Q9. Are you aware of other projects or programs that boost Territory teenagers to achieve stronger futures through STEM? If yes, please provide a brief description of the project and a contact and/or online resource about the project.

As mentioned throughout the discussion paper, MEA have made visits to multiple year 11-12 VET based schools in Queensland (such as the Australian Trade College framework). Unfortunately, there are not many of these schools, however they provide an excellent example of an innovative new schooling curriculum which inspires and motivates students to learn that would be otherwise disengaged from ATAR subjects. Furthermore, MEA believe VETSS will also provide better opportunity in exposing STEM to students living rurally and remotely as it would be available within their current schooling framework.

Q10. Are there any aspects of these discussion topics not covered above or other topics that should be included in this discussion?

MEA's position is for Government to prioritise the investment of public funding into a streamlined and integrated VETSS curriculum, with an equal weight to ATAR, to help address diversity in STEM careers, improve completions, and decrease skills shortages. Investing in aptitude and competency at the school level will put many Australians on the first rung of the ladder of success in a rewarding career, as students have their skills better matched towards the trades that best suit them. This will likely foster systemic and societal attitude changes towards STEM trades; we believe it necessary to embed generational change in perception towards STEM to assist in resolving the skills shortage crisis.

Q11. How can we design develop and deliver further such innovative responses in Territory to solve the global challenge of engaging more teenagers into STEM?

Please refer to Qs 1-10.

Q12. In your opinion, what are the key challenges or obstacles that teenagers in our territory face when it comes to learning STEM and digital skills?

Lack of exposure and limited resources is one of the biggest challenges inhibiting teenagers from engaging with STEM. The current schooling system streamlines students into the ATAR structure, in many cases leaving behind those who are unwilling or unable to conform. Without being presented opportunities in an environment that encourages, normalises, and exposes students to STEM, we cannot expect to see significant improvement with teenager engagement.

Lack of early training through secondary school puts students at a disadvantage when entering the STEM workforce. Too often we are seeing students poorly equipped with basic maths (trigonometry and algebra) skill sets which are essential to performing well in STEM trades and is contributing towards poor retention rates in the workplace. In the last two decades, Australia has seen a significant increase in trade apprentice commencement rates (appendix F) but unfortunately, cancellation rates have followed the same pattern (appendix G). By exposing students to STEM at a young age, a larger cohort of students are exposed to VET/STEM than might otherwise be under the currently secondary school framework.

Q13. As a stakeholder, what resources, expertise, or support can you offer to help address these challenges?

As an industry representative, MEA is positioned to collaborate with the NTG as the electrical industry's voice. We can assist in designing core frameworks for soft skills applicable to all trades and more specified skills for the electrical/electro industry.

Q14. Are there any specific local, national or international programs, initiatives, or partnerships that you believe could be beneficial in promoting STEM and digital skills learning for teenagers in our territory?

VETSS would promote itself. Students not wanting to engage in ATAR subjects will likely apply for VET subjects. Schools would need to advocate the new curriculum to not just students, but also parents, to raise awareness of its opportunities.

Q15. How can your organisation or industry collaborate with educational institutions, community organisations or government agencies to enhance STEM and digital skills education for teachers?

To alleviate teaching capacity pressure and insufficient skill/competency of current teachers specifically regarding VET courses, we recommend utilising older generations of STEM tradespeople. Many STEM tradespeople enjoy giving back to their industry and often look to jobs which are less physically demanding as they get older but still utilise the skills and knowledge they have accumulated throughout their lifetime.

As already discussed, VETSS is not streamlined and therefore not currently an incentivising and attractive career option for tradespeople. Furthermore, we note that while many of the ageing trade population would enjoy the opportunity of teaching VET related courses, there is the expectation they obtain extra qualifications to teach. This within itself will prohibit access to this core group of potential teachers as they will have no desire to complete a extra training such as the Training and Assessment Course (TAE) without financial support. As we are promoting an additional curriculum to the secondary school framework, we also need to customise its teaching qualifications. Those with the relevant and necessary qualifications with a certain number of years' experience, should be allowed to lecture in aspects of skills, or be supported to attain the TAE qualification to provide the basic fundamentals of teaching in a school class.

Q16. Do you have any suggestions for improving the accessibility and availability of STEM and digital skills learning opportunities in remote areas of our territory?

Under question 9, we identified that VETSS has the opportunity of exposing all students to STEM, removing barriers for students living in remote and rural areas. Government funding needs to ensure all schools are equipped with training facilities and teaching staff capable of providing qualified education in VET courses. This has a large potential to encourage a large cohort of students to work towards a STEM career. By streamlining VETSS along with ATAR, it provides students living remotely and rurally an equal opportunity with those living more in more urban areas to work towards STEM during their schooling.

Q17. Are there any innovate approaches or technologies that you believe could be utilised to enhance STEM and digital and digital skills learning experiences for teenagers?

Beyond the scope of MEA's expertise.

Q18. How can we ensure that the learning experiences provided are relevant, engaging, and aligned with the current and future needs of industries and the job market?

Through continued collaboration with industry representatives, employers and experts.

Q19. Are there any funding opportunities or investment strategies that you would recommend to support the development and implementation of STEM and digital skills education programs?

MEA's position is for Government to prioritise the investment of public funding into a streamlined and integrated VETSS curriculum, with an equal weight to ATAR, to help address diversity in STEM careers, improve completions, and decrease skills shortages. Investing in aptitude and competency at the school level will put many Australians on the first rung of the ladder of success in a rewarding career. Also to support retiring or transitioning tradespeople to complete the TAE qualification to facilitate an increase in trained lecturers and assessors.

Q20. Do you have any additional suggestions, ideas, or comments on how we can collectively contribute to the advancement of STEM and digital skills learning for teenagers in our territory?

Please refer to Qs 1-19.



Conclusion

MEA strongly advocate for NTG to prioritise its funding into VETSS to provide a sustainable and meaningful solution to the skills shortage crisis and lack of teenage engagement with STEM. By streamlining and integrating VET into the secondary school curriculum, with an equal weighting to ATAR, we can expect to see systemic and societal change to the perception of STEM trade careers and the diversity within its skilled pool of labour. An Integrated VETSS will expose all students, regardless of diversity and personal circumstance, to STEM trade opportunities. It will allow those who do not wish to pursue ATAR subjects the same opportunities as those developing an academic/office career to begin pursuing the trade jobs at an early school age. It is time to change the narrative and begin emphasising the benefits and inclusiveness of STEM trades. Without cultivating this change at a young impressionable age, we cannot expect to see the skills shortage issues resolved.

We predict that VETSS will improve NT year 11-12 student attendance rates which can plausibly create a safer learning environment for those 10% currently feeling unsafe at school. As those students who typically disrupt class or bully others are exposed to VETSS, there is a greater chance they become more disciplined through engagement with something meaningful. Currently, the ATAR curriculum is designed for academic/corporate career-paths, essentially excluding a large cohort of students from having impactful secondary school education.

We look forward to NT's plans to improve NT teenager engagement with STEM, giving them hope for a rewarding future career. MEA are available to partake in any further discussions regarding skills and employment in the NT.

Appendix A – NT Secondary School Enrolment and Attendance Statistics

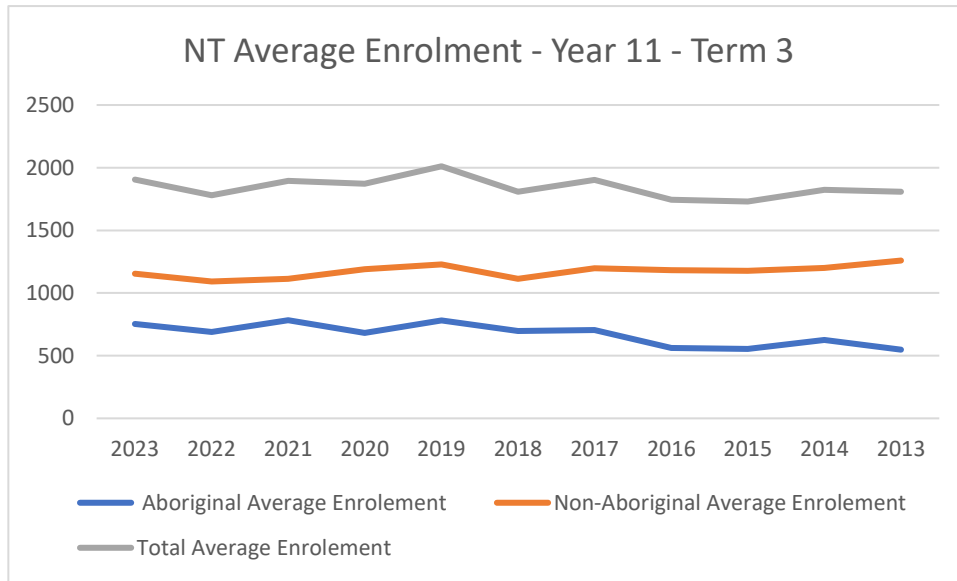
MEA has created the below tables and graphs from data obtained from the NT Government Department of Education's website.⁷

Term 3	Aboriginal		Non-Aboriginal		Total		
	Average Enrolment	Attendance Rate	Average Enrolment	Attendance Rate	Average Enrolment	Attendance Rate	
2023	Year 11	753	54.5%	1153	79.7%	1906	72.6%
	Year 12	440	60.3%	886	76.5%	1326	72.1%
2022	Year 11	689	50.6%	1092	78.1%	1255	70.7%
	Year 12	409	56.8%	846	77.1%	1255	72.7%
2021	Year 11	783	55.1%	1113	82.1%	1896	73.9%
	Year 12	428	61.3%	1010	79.2%	1438	75.6%
2020	Year 11	681	53.4%	1191	83.5%	1873	75.3%
	Year 12	502	61.2%	1007	81.2%	1509	76.5%
2019	Year 11	782	55.1%	1228	82.8%	2011	74.8%
	Year 12	400	62.0%	904	80.6%	1304	76.3%
2018	Year 11	697	56.8%	1113	81.0%	1809	73.8%
	Year 12	364	60.8%	953	79.5%	1317	75.7%
2017	Year 11	704	54.1%	1198	82.9%	1902	75.1%
	Year 12	369	61.5%	795	81.4%	1343	77.3%
2016	Year 11	561	63.6%	1183	83.9%	1744	79.0%
	Year 12	345	67.0%	945	83.6%	1291	80.2%
2015	Year 11	554	65.2%	1176	87.1%	1730	81.8%
	Year 12	330	67.3%	894	87.0%	1225	82.9%
2014	Year 11	625	63.5%	1199	86.4%	1824	80.5%
	Year 12	305	68.1%	991	88.6%	1296	85.0%
2013	Year 11	548	61.9%	1259	86.7%	1807	80.7%
	Year 12	353	63.2%	879	87.3%	1232	81.6%

⁷ Northern Territory Government Department of Education, 'Enrolment and attendance data', <<https://education.nt.gov.au/statistics-research-and-strategies/enrolment-and-attendance>>

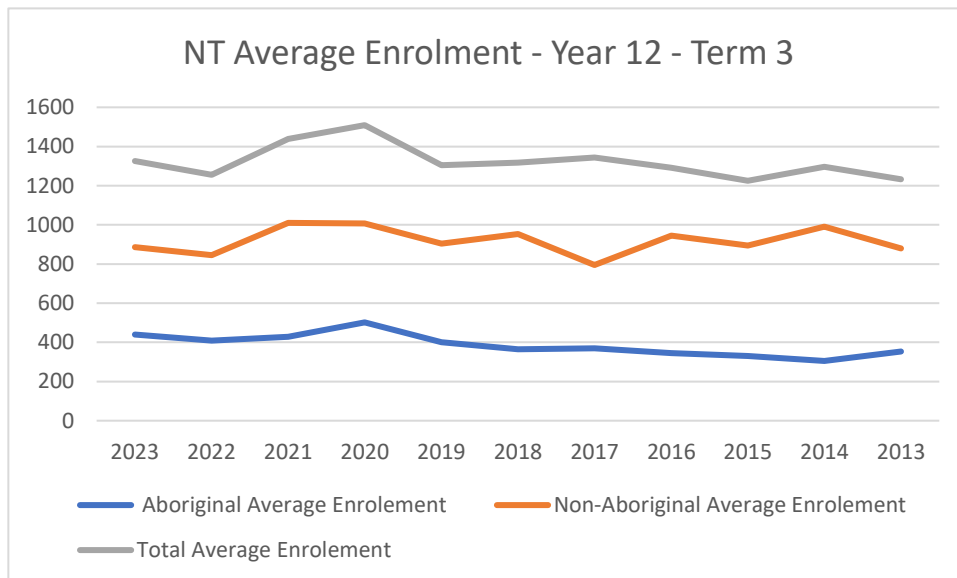
Appendix B – NT Year 11 Average Enrolment (Term 3)

MEA has created the below graph from data obtained from the NT Government Department of Education’s website.⁸



Appendix C – NT Year 12 Average Enrolment (Term 3)

MEA has created the below graph from data obtained from the NT Government Department of Education’s website.⁹

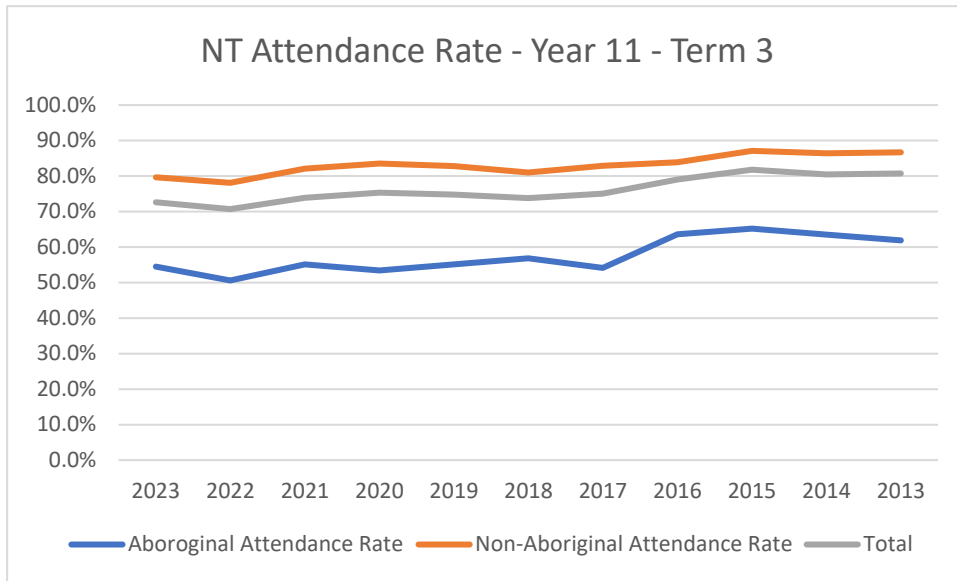


⁸ (n6).

⁹ (n6).

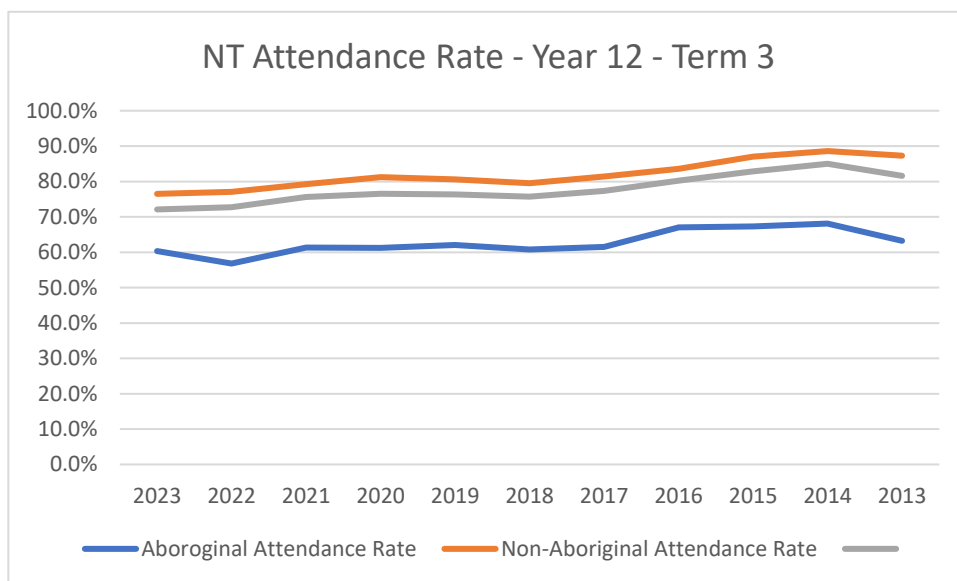
Appendix D – NT Year 11 Average Attendance (Term 3)

MEA has created the below graph from data obtained from the NT Government Department of Education’s website.¹⁰



Appendix E – NT Year 12 Average Attendance (Term 3)

MEA has created the below graph from data obtained from the NT Government Department of Education’s website.¹¹

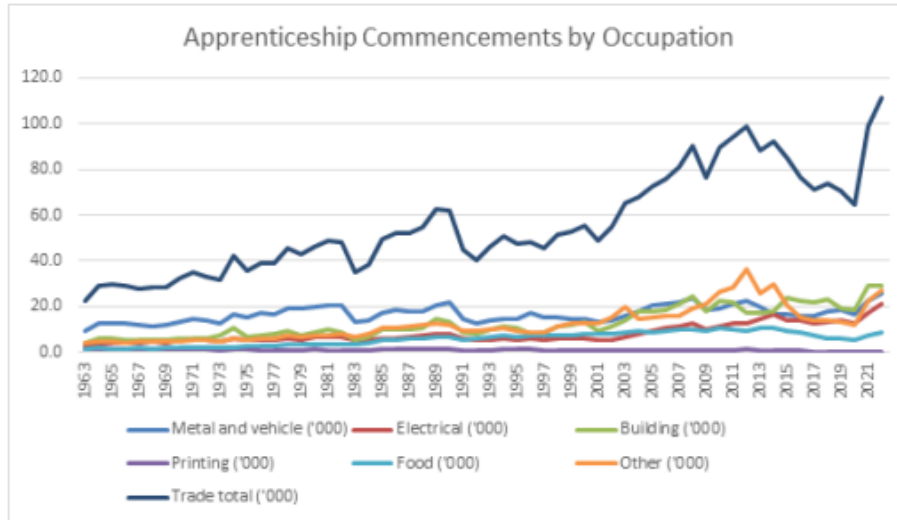


¹⁰ (n6)

¹¹ (n6)

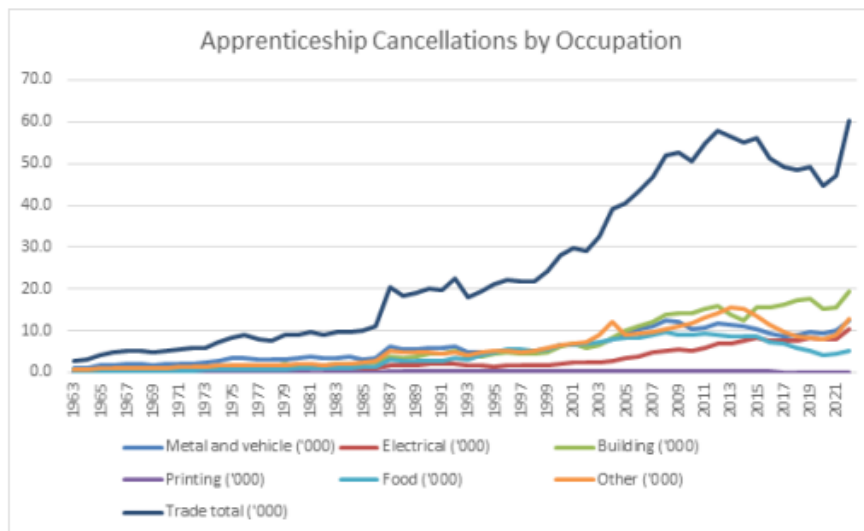
Appendix F – Trend in Australian Trainee Commencements from 1963 – 2022

MEA has created the below graph from data obtained from the National Centre for Vocational Education and Training (NCVER), “the national body responsible for collecting, managing, analysing and communicating research and statistics on the Australian VET sector”¹².



Appendix G – Trend in Australian Trainee Cancellations from 1963 – 2022

MEA has created the below graph from data obtained from the National Centre for Vocational Education and Training (NCVER), “the national body responsible for collecting, managing, analysing and communicating research and statistics on the Australian VET sector”¹³.



¹² NCVER, 'Getting to know NCVER' < [Historical time series of apprenticeships and traineeships in Australia from 1963 to 2022 \(ncver.edu.au\)](https://www.ncver.edu.au/historical-time-series-of-apprenticeships-and-traineeships-in-australia-from-1963-to-2022)>, 2.

¹³ NCVER, 'Getting to know NCVER' < [Historical time series of apprenticeships and traineeships in Australia from 1963 to 2022 \(ncver.edu.au\)](https://www.ncver.edu.au/historical-time-series-of-apprenticeships-and-traineeships-in-australia-from-1963-to-2022)>, 2.