MASTER ELECTRICIANS AUSTRALIA

Lead.Connect.

Pathways to Diversity in STEM.

How VET in Schools pathways and improving the status of VET and STEM can increase diversity and relieve skills shortages in STEM trades.

Chris Lehmann & Georgia Holmes
5 September 2023

Introduction

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 (Master Electricians Australia) advocates that integrated and streamlined Vocational Education and Training (VET) into secondary school curriculum with an equal weighting of VET outcomes to ATAR (Australian Tertiary Admission Ranking) rankings, is the best solution to fostering diversity in the STEM-trades workplace. The benefits include better equipped personnel entering the workforce, enhanced aptitude and competency screening, heighted attraction and retention and greater diversity in the workplace through early exposure in a supportive environment. MEA sees this as the pivotal role in actioning societal, structural and systemic change.

MEA's commentary in this document is aimed primarily at apprenticeships in the STEM (Science, Technology, Engineering and Mathematics) trades (electrical, engineering, building, etc) but the approach is just as valid for other VET and STEM pathways.

LEADERSHIP AND GOVERNANCE

Leadership and governance can be the underpinning pillar for systemic change if utilised effectively. Anti-discrimination policies and support initiatives have long been around, yet trades continue to experience diversity issues. Government would best promote diversity through focusing on embedding exposure to VET STEM careers in the school curriculum rather than post-hoc national approaches and more government oversight. Efforts should be directed towards the Nation's youth for the best results in diversity.

Recommendation 1a: Australian Government should set up an ongoing central office and independent council to maintain accountability, oversight and momentum of diversity in STEM initiatives.

MEA does not support this recommendation.

It will be advocated throughout this submission that MEA believes integrating VET courses into the school curriculum and lifting the profile of VET careers to be on par with ATAR pathways, is the key tool for facilitating growth in STEM diversity. It follows that measured actions and accountability should be extended to the relevant existing ministries, such as The Ministry of Education and Youth Australia as opposed to other government departments focusing on STEM initiatives. The current statistical reporting mechanisms such as the ABS (Australian Bureau of Statistics) and NCVER (National Centre for Vocational Education Research) can monitor any changes to the makeup of VET workforce.

Recommendation 2a: Building on recommendations of this review, the Australian Government should create a national strategic approach to diversity in STEM initiatives.

MEA gives qualified support to this recommendation by encouraging a primary focus of any strategic approach towards VET in schools and increasing the status of VET careers to being on-par with ATAR/academic pathways.

Current STEM initiatives are mostly limited to those already in in the workforce, and therefore does not effectively target the goal of increasing the size of the labour pool and its diversity. The most effective way to influence societal norms with regards to diversity in STEM is at the secondary education level, fostering diverse backgrounds and skills beyond a focus on academia. Diversity would be enhanced by

exposing students to the STEM sector and VET careers from a younger age providing access and informed choice, and growing the potential cohort overall, in the supportive school environment.

MEA also believes there is merit in directing funding towards Group Training Organisations (GTOs), and fostering partnerships between schools and GTOs, in recognition of the superior track record that GTOs have for higher completions when compared to indentures of apprentices in private employment, especially SMEs (Small to Medium Enterprise).

Recommendation 2b: Government funding bodies and STEM-employing organisations should commit to the long-term success of diversity in STEM programs and initiatives.
Refer to response in recommendation 2a.

Recommendation 3a: Government grant funding, investment and procurement for STEM-related programs should align with best practice guidelines for inclusion and diversity.
MEA supports this recommendation in principle.

Funding should be invested to ensure access is available to all, for example ensuring quality internet connection for remote and rural groups to enable online training. However, Government funding and initiatives should largely target VET schooling curriculum and programs.

MEA also believes that investments should be funnelled into GTOs as they have successful apprentice completion rates.

Sub-Conclusion
The Australian Government should give greater focus to enhancing access to VET pathways in secondary schools to provide the best return on investment for tax-payer money in STEM/VET initiatives that lead to employment outcomes, and boost training completions. Increasing the status of VET to be on par with ATAR pathways in the school curriculum exposes all secondary students to VET and STEM opportunities, maximising access to diverse backgrounds during the formative school years. Providing success metrics for secondary schools for VET and employment outcomes, rather than just relying on ATAR position would incentivise school systems.

CULTURE, COMMUNITY APPTITUDES & VALUE

While MEA agrees a cultural shift to encourage greater participation from underrepresented groups is needed, we do not support the Department of Industry and Science's recommendations listed under this theme. MEA advocates that taxpayer money used for STEM trade diversity is to be invested into secondary school curriculum where the greatest exposure and societal change will occur.

Recommendation 4a: Australian Government should develop and run a formal, long-term and measurable national communication and advertising campaign relating to STEM.
MEA supports this this recommendation and believes that the National Careers Institute's tag line of "There are many ways to succeed" and "Real Skills for Real Careers"[1] is an excellent campaign and should be expanded.

MEA supports a national campaign provided there is no prioritisation of inclusion over merit. The skills shortages in VET and STEM fields are acute and affecting national productivity. Increasing the pool of available candidates for STEM related careers will assist in addressing these shortages, but competence and aptitude should be the foremost consideration for recruitment and promotion. To this end, MEA

believes the greatest proportion of taxpayer money is best invested in VET secondary school promotional and educational programs, where social and educational support is provided from a younger age, and there is inherent access to cohorts of non-traditional candidates such as women, indigenous, and ESL.

Recommendation 4b: The Australian media and entertainment industry should work with relevant academies, STEM peak bodies and not-for-profit organisations to celebrate diversity in STEM. This would involve more accurately representing the diverse people and roles in STEM.
MEA supports this recommendation.

As it is MEA's position that STEM-trade diversity will be most influential during secondary school education, MEA believes the media will best assist in influencing societal change amongst this age group who are particularly suggestible to media influence.

Recommendation 4c: All STEM-related sectors should actively include diverse knowledges and representations of diversity in research, publications, education materials and scientific approaches.
MEA partially supports this recommendation.

Including imagery and stories in promotional material should be inclusive of all backgrounds. However, prioritising diverse cultural scientific knowledge is not conducive for STEM trades. MEA believe that the current scientific system is proven, effective and safe, and the lack of diversity in the workforce is not the result of a single cultural scientific foundation at the expense of traditional knowledge, rather a lack of social and educational support at a younger age.

Sub-Conclusion
A more substantive approach is required than national campaigns. The embedding of VET courses into the standard secondary school curriculum, assisted by media influence, will drive a greater diversity in trades and an increase in the pool of candidates to address shortages in STEM occupations. The lack of diversity issue does not lie within the lack of cultural relevance of current scientific knowledge, rather the lack of access to, and promotion of VET/ STEM pathways from a younger age to a diverse cohort.

LIFE-LONG LEARNING

Diversity grows from exposing and curating skills at a young age. Introducing VET courses into the secondary school curriculum provides an opportunity for all students, regardless of background, to become skilled in STEM trades. This is where we can expect to see cultural change towards STEM diversity.

Recommendation 5a: Implementing the 2022 National Teacher Workforce Action Plan should incorporate a strong focus on teaching on STEM thinking and skills pathways into STEM.
MEA supports this recommendation.

Recommendation 5b: Governments should partner with First Nations people and the education sector to reflect First Nations scientific knowledges in courses….
MEA does not support this recommendation for reasons outlined above. The current globally accepted scientific method of Observation, Research, Hypothesis, Experiment, Analyse, Conclusion, then Communicate for peer review, is effective, proven, and by its nature incorporates "Traditional & First Nations" knowledge.

A lack of access to VET courses at secondary school inhibits exposure to diverse cohorts of students in supportive classroom environments. This is the current issue, not the lack of diverse background in educational teachings. Refer to response on recommendation 4c.

Recommendation 6a: VET, industry and other education providers (like schools and universities) should increase collaboration to promote VET-based STEM offerings. This includes promoting streamlined pathways to STEM careers or university STEM qualifications. These communications should reach parents to address parental perceptions of STEM VET education.
MEA supports this recommendation.

MEA advocates that streamlining VET courses into the secondary school curriculum is key to addressing diversity in 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 all students equal opportunities for future success by providing a supportive and encouraging environment. Introducing VET courses into the curriculum in concert with aptitude screening, will ensure the right skills are matched with the right trade creating greater retention in the workplace. There are well established pathways in VET to attain higher qualifications at Diploma and Advanced Diploma level, satisfying pre-requisites and RPL for Tertiary Degree qualifications.

Recommendation 7a: Industry and Government should increase horizon-scanning exercises to inform STEM workforce development.
MEA supports this recommendation; this should be done in concert with Industry.

Recommendation 8a: Governments and Australian universities should work together towards equity in access, participation and attainment of STEM higher education.
MEA supports this recommendation. The focus should be on equality of opportunity (supported by targeted promotional initiatives) and not unattainable equality of outcome targets.

Recommendation 8b: Each Australian university should address the barriers to access for diverse cohorts for its STEM courses.
MEA supports this recommendation in principle.

There should be well defined pathways to tertiary education with extra opportunities for diverse cohorts. However, care needs to be taken to ensure financing of such changes delivers value for money, which is why MEA believes the best utilisation of public money is the streamlining of VET courses into the secondary school curriculum to provide structural and long-lasting effect.

Recommendation 8c: The Australian Government should consider opportunities to broaden existing successful initiatives that support gender diversity in university STEM education to other underrepresented groups.
MEA partially supports this recommendation.

The expansion or replication of successful models to provide ongoing support should be supported. However, it is necessary to have balance between opportunity and outcome. There is a risk of over-investing in initiatives which heavily target underrepresented groups. This is money that may be more efficiently invested in targeting traditional cohorts that have proven aptitude for occupations.

Sub-Conclusion

It is critical that the Australian secondary school curriculum integrates VET courses to provide exposure and opportunity for all students to excel in their skills beyond academia and address shortages in vital skills. Lack of student exposure to training in VET courses with well-equipped teachers is hindering STEM-trade diversification. There should also be a recognition that there is great scope for expanded career pathways through VET with higher level qualifications, and the opportunity to transition to a tertiary qualification with the underpinning knowledge of an occupational vocation.

WORKPLACE

Targeting diverse recruitment is only effective when there are skilled diverse personnel available. While all workplace policies and recruitment should be inclusive of all underrepresented groups, focusing on this strategy alone does not address the core problem. A limited pool remains available for recruiters without educational support.

Recommendation 9a: STEM-employing organisations and governments should apply policies like anti-bullying and harassment, flexible work and pay transparency to create safe and inclusive environments. They should invest in programs to accelerate progress for underrepresented groups, like career development, fellowships, job customisation or mentoring.

MEA supports this recommendation.

Policies demanding work-place safety is encouraged by MEA. All underrepresented groups should work free from bullying and harassment supported by transparent, accessible and measurable policies to ensure accountability for actioning them.

Support systems for marginalised groups within organisations is positive, however, balance is needed to avoid over-investment of money and time into such programs at the expense of tangible outcomes.

MEA believes the GTO (Group Training Organisations) model, partnered with expanded VET in school programs, is perfectly suited to making inroads into improving diversity in VET and STEM. The proven model of GTOs with embedded mentoring and pre-qualification recruitment practices, leading to 70% completion rates, could be a vital part in driving real improvements in diversity in STEM occupations.

Recommendation 9b: STEM-employing organisations and governments should adopt or strengthen accountability mechanisms for middle and senior leaders to effectively implement policies and programs that accelerate change and inclusion.

MEA partially supports accountability in leadership positions.

Systemic change is largely a top-down effort that requires a willingness to support and encourage diversity into the STEM trades. However, mandatory training risks becoming a meaningless 'box-ticking exercise' avoiding the core issue. There is also a danger that quotas could become too focused on public relations as opposed to merits of skills available thereby compromising not only work quality, but also safety. Ensuring awareness training is embedded into the STEM sector from secondary school, ensures that quotas in commencements become meaningful.

There is also the reality that most STEM occupation employers are SMEs, meaning that legislating and enforcing compliance becomes more complex. Cultural and societal change driven through public promotion and earlier intervention embedded in school systems will ultimately drive organic improvement.

Recommendations 10a: All STEM-employing organisations should develop a recruitment and promotion system for STEM positions that attracts, retains and promotes employees from underrepresented, including intersectional, cohorts.

Refer to MEA's response in 9b.

STEM-employing organisations should be recognising and rewarding promotion of workplace diversity where it is positively impacting the business. Imposing these obligations on businesses, especially SMEs, is costly. Clients do not pay tradespeople based on payroll diversity, but rather to complete a task in a safe and compliant manner. Furthermore, promotion and recruitment based primarily on workplace diversity weakens the necessary merit criteria.

Recommendation 10b: The Australian Government should do a detailed analysis of how overseas STEM qualifications are recognised in Australia.

MEA supports this recommendation with a caveat.

MEA has been vocal in other submissions about Automatic Mutual Recognition (AMR) between Australian States and Territories. Before international recognition can be considered to work effectively in Australia, there needs to inter-state AMR across all trades and occupations. Once a nationally harmonised licence/certification is set up; then the Australian Government should then move to identify international certifications equivalent to Australia's and supports standardised bridging courses where necessary.

Recommendation 11a: Australia should follow the lead of other countries, such as the Netherlands and the UK, to change the recognition, reward and research system we use to assess the performance of STEM researchers.

MEA has no opinion on recommendation 11a.

Sub-Conclusion

While leadership procedures and policies should support workplace diversity, there is a risk of these becoming costly 'box-ticking' exercises if heavily mandated without the foundational support of creating a pipeline of skilled & diverse tradespeople. The key focus needs to be on upskilling the workforce for all underrepresented groups, starting at secondary school. This should be prioritised above mandating diversity hiring procedures, which would be difficult, if not impossible to enforce in the largely SME employer dominated market.

WOMEN IN STEM

MEA supports initiatives that enhance opportunities for women and other diverse groups in STEM, however, caution needs be given towards ensuring that value for money is provided. MEA believes the best use of public money is investment of integrating VET courses into the secondary school curriculum and providing greater support for GTOs. This will elevate the status of VET/STEM providing the best opportunity for cultural and systemic change, thereby inherently enlarging the diverse pool of backgrounds entering trades. Support groups such as WiSA and GiST should continue to be supported, but in concert with a VET secondary school curriculum.

Conclusion

MEA is supportive of the government goal to increase both diversity in STEM occupations, and to address skills shortages in STEM trades. MEA's position is for Government to prioritise the investment of precious public funding in a streamlined and integrated VET secondary school curriculum, with an equal weight to ATAR, to help address diversity in STEM careers.

This would ensure all students are exposed to VET/ STEM pathways at a younger age regardless of background. All students, beyond academia, would have the opportunity to excel in a supportive educational environment best suited to individuals' skills. This creates opportunity for aptitude and competency screening thereby enhancing attraction and retention in the workplace, especially when partnered with the proven GTO employment model.

MEA believes that focusing on training a younger and more diverse generation at the later stages of secondary schooling is the most effective use of Government spending on STEM initiatives and addresses both diversity in STEM and skills shortages. Campaigns targeting post-secondary school to change entrenched behaviours and beliefs in Industry and society, whilst worthy, should be in support of the strategy, not the main thrust of it. To support this assertion, the current average age of commencing STEM trade is 24 years old, meaning that for an increasing number of citizens, there is a 6–7-year gap between finishing secondary school, and starting a well-paid career in a STEM occupation in areas of vital need for the Australian economy.

MEA believes that first investing in aptitude and competency at school levels initiates Australians on the ladder of success to a rewarding career. All other initiatives and campaigns will inherently be limited in effectiveness and become a less effective use of precious taxpayer money.