Victorian Skills Authority

International Specialised Skills Institute

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Design Education and VET – Preparing Graduates for Future Industries | Paul Boys, 2023

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Report by Paul Boys

Typeset by Danielle Cull

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The International Specialised Skills Institute

1/189 Faraday St,
Carlton VIC 3053

info@issinstitute.org.au
+61 03 9347 4583

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Acknowledgments

The Awarding Body – International Specialised Skills (ISS) Institute

The ISS Institute plays a pivotal role in creating value and opportunity, encouraging new thinking and early adoption of ideas and practice by investing in individuals.

The overarching aim of the ISS Institute is to support the development of a 'Better Skilled Australia'. The Institute does this via the provision of Fellowships that allow Australians to undertake international skills development and applied research that will positively impact Australian industry and the broader community.

The ISS Institute was founded 29 years ago by a small group of innovators, including Sir James Gobbo AC, CVO, QC, and former Governor of Victoria, who had a vision of building a community of industry specialists who would lead the up-skilling of the Australian workforce. The Fellowship program builds shared learning, leadership and innovation across the broad range of industry sectors worked with. Fellows are supported to disseminate learning and ideas, facilitate change and advocate for best practices by sharing their Fellowship learnings with peers, colleagues, government, industry and community. Since its establishment, ISS Institute has supported over 450 Fellows to undertake skill and knowledge enhancement across a wide range of sectors which has led to positive change, the adoption of best practice approaches and new ways of working in Australia.

The Fellowship programs are led by our partners and designed to achieve the needs and goals desired by the partners. ISS Institute works closely to develop a Fellowship program that meets key industry priorities, thus ensuring that the investment will have a lasting impact.

For further information on ISS Institute Fellows, refer to www.issinstitute.org.au

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The Victorian Skills Authority works in partnership with the International Specialised Skills Institute by funding the VET International Practitioner Fellowships. The Fellowship program focuses on developing opportunities within the VET sector to assist in building an Education State in Victoria that produces excellence and reduces the impact of disadvantage. In addition, the program is funded to support the priorities of Skills First, including developing capacity and capability, innovative training practices and increasing teacher quality within the VET sector as well as building industry capability and developing Victoria's current and future workforce.

Acknowledgements

- The Executive team at TAFE Gippsland for their belief in me, their patience with the COVID delays and the support to allocate time to complete the fellowship
- Tom Cappelletti from Sacramento City College who organised 3 days of visits and connections which were rich and diverse, providing me with a wealth of information and inspiration to work for change to improve student experiences and outcomes
- Luca Vassalli from Empower Semi-conductors – his openness and willingness to share how they work to solve complex industry problems and the need to work collaboratively to achieve this, will make me a better practitioner and collaborator into the future.
- Derek Payton from Root Access for helping me to connect in with the wider Fresno maker community to see how smaller, regional towns are working to solve problems at a local level.
- My family for their belief and support to allow me the time to commit to the fellowship and the write-up of the final report. Without my family, I would not be able to achieve what I have to date.
- Tech School Directors Network for their council and connection to contacts in the USA
- Craig Robertson – CEO – Victorian Skills Authority for his support for my ISSI fellowship application and his advice around the topic of interest

1. Executive Summary of Fellowship

Design Education, Problem Solving and Collaboration are critical themes which underpin an environment that supports innovation and growth in industry and education. As the VET sector prepares graduates for 21st century jobs (Conversation, 2020), we need to look to new approaches to support graduates to be well-placed to be adaptive, resilient and responsive in a fast-paced industry environment, which operates on a global scale. The opportunity to visit California and share in their best practice will bring forward a wealth of new approaches that will help to guide and shape the next generation of industry leaders who will build the foundation for industry in Victoria over the coming decades.

Both State and Federal governments within Australia have commissioned numerous reports over the past decades, which have been aimed at strengthening, reforming and preparing the VET sector to be responsive to the needs of industry and an ever-changing workforce (Macklin, 2020) (Joyce, 2019) (NASWD, 2020). Each review has been charged with a unique set of parameters, based on the needs of the lead agency, but the inherently shared value between each review is the recognition of the importance of VET and its role in supporting innovation in the future world of work. Although there have been multiple reports produced, the recommendations within these reports have had limited measurable impact on graduate/teacher impact as the reforms have been primarily focused on funding, regulation and coordination of the sector (Seet & Jones, 2019). In light of there being multiple examples of strategies to reform the sector, Prime Minister Scott Morrison, commissioned an independent review of Australia's VET sector in 2019, to examine ways to deliver skilled workers for a stronger economy. The Joyce Review was explicit in its recognition that VET has a critical role in supporting innovation in industry as well as the need for high-quality teachers to be the drivers of innovation in practice and application (Joyce, 2019). The review also recognises that innovative learning models are needed to create flexible and adaptable graduates, Joyce reported that:

> *work-based learning models will be more important in the future as technology-driven changes to the 'way we do things' need to be more quickly transmitted across industries and around workplaces. Our fast moving world will need flexible and applied ways of learning so people can lay strong foundations for their careers and then build skills and knowledge to participate in new and changing industries (Joyce, 2019, p. 1)*

Sectoral analysts and researchers have been actively seeking structural reforms within the VET sector which are backed-up by new teaching practices and design models to give students the higher order learning skills, including creativity, critical thinking, communication and collaboration that are needed to succeed in the future world of work (Lucas, Spencer, & Claxton, 2012). To continue the transition from industrial to digitised economies, the VET sector, as a whole,

must reform its priorities and structures to provide students with a foundation that is focused on developing higher order learning skills as advocated by the youth-based think tank, the Foundation for Young Australians (FYA) (2017). As a sector, VET needs to be more responsive to meet the future challenges of new and emerging industries and technologies which are underpinned by a 'life-long learning' system.(Moodie, 2015). These potential reforms will strengthen the sectors' ability to respond to digital disruptions in education and industry by supporting new and emerging industries in a more flexible and responsive manner.

Design education has been traditionally referenced when discussing the notion of objects, products or services in respect of the arts (Lyon, 2011). Literature has been shifting to broaden the concept to include the process that leads to the creation of objects including the connection to the educative process which supports the learning and doing associated with an emerging theory. Swann (2010) writes that there are six essential characteristics of design, which he describes as being 'multi-faceted', including:

> *These are the multi-faceted characteristics of design; design as a link for creativity to innovation; design as a source of competitive distinction; design as an approach to planning and problem-solving; design as a means of creating order out of chaos; and design as an approach to system thinking (Swann, 2010, p. iv)*

This description introduces the notion that design as an element of education can be instilled and developed to assist with some of the industry skills which are central to future work and career skills namely, problem solving, creativity, innovation and system thinking which are also referenced in several reports from the Foundation for Young Australians (FYA, 2017). Design education can be experienced in both a formal and informal environment, with the practical and 'hands-on' application of the design process, demonstrating a clear connection to the traditional apprenticeship system which was based on the master sharing their experience and skills with an apprentice so they can acquire and hone their skills (Lyon, 2011). The modern VET system was founded on the traditions which underpinned the apprenticeship system which evolved in eighteenth century England and was adopted in Australia post-colonisation (Whitelock, 1974). The connection to design education, although not formally written as a construct, was evident in the Australian VET system since its inception but modern literature is bringing the concept to the fore as a 'new' approach to supporting the modern training sector.

Design education is a practical learning methodology which is founded as a human-centred approach supporting the users to collaborate and expose themselves to external stimuli to shape a 'non-traditional' approach to industry-based problems (Almendra & Ferreira, 2020). When referencing design education to the traditional trades and emerging industry environments, the

VET sector is at a critical juncture which authors including Macklin (2020) and Joyce (2019) have discussed the need to look to innovative models of program design and facilitation to provide graduates with the skills needed for future careers. Design education is shown by (Norman, 2000) to be a valuable contributing practice to support the skills and knowledge required to develop critical thinking, problem solving, cooperative team-working and motivation for students in the P-12 classroom. The principles of design education, with a focus on collaboration and interaction between students, teachers and industry is worthy of further research to see how these skills can be applied in the VET sector.

The release of the Review into Vocational and applied learning in senior secondary schooling (Firth Review, 2019) and the subsequent reforms to the Victorian Certificate of Education (VCE) to include the Vocational major (VM) into the qualifications has seen the profile of VET raised to parity with the traditional VCE pathway. The challenge for Victoria is to recognise how innovation, technology and collaboration will influence the new VM component of the senior secondary outcome. Combined with new and emerging technologies influencing industry practice, the Victorian system is at a critical juncture whereby the implementation of these priorities is important to the future-proofing of VET in Victoria. The gaps are not so much about what is missing but the fellowship experiences highlights the need to be future-focused and responsive in a timely manner to changes in industry so that the VET sector can keep pace with the changes experienced in industry.

The Foundation for Young Australians (FYA) has researched job advertisements between 2012 and 2015 to determine the key skills and attributes that industry requires of graduates in their first years of work, post education (FYA, 2016) . The FYA found that employers were seeking graduates who had defined skills in creative and critical thinking, effective communication, collaboration and digital literacy (referred to as twenty-first century skills), when compared to skills that were sought in the previous five year period (FYA, 2017). The changing nature of work and the challenges around predicting the future are inter-related issues discussed by Wheelahan and Moodie (2011) who note the need to recognise that future education must include green skills and discussion around sustainable and ethical practices in industry. Employers and researchers are forecasting significant changes in the ways that people work and the skills that they will need to be successful in the future world of work and as such, VET educators need to be equipped with new skills to meet these needs (NASWD, 2020). This is described by Joyce (2019) who argues that “high-quality teachers are essential for a high-quality training system that is respected by students and employers” (Joyce, 2019, p. 49). The range and diversity of the VET sector, which currently has 59 endorsed training packages, covering a number of industry areas and contain more than 1,430 qualifications, 1,390 skill sets and 16,000 units of competency, highlights the complexity of the sector and the breadth of skills that are taught (ASQA, 2021). The size and complexity of the VET

sector also recognises that twenty-first century skills, are applicable across all training packages as they underpin the key learnings that a competency-based training (CBT) system is founded upon. The increased influence of applied learning in the overall VCE is a new factor to further influence the direction of senior secondary education.

Having worked in the VET sector for more than twenty years, where the Fellow has held numerous roles including teacher, program coordinator, administrator and director, the Fellow has seen significant change within the sector over this time. One of the major challenges that the sector faces is how to prepare graduates for the future world of work, considering the rapid pace of change that industry is currently experiencing (FYA, 2017). As new and emerging technologies begin to transform the way in which business operate, VET graduates need to be more adaptable and responsive to these changes and the responsibility to support these new ways of thinking sit with colleges and facilitators.

The Fellow chose to visit the Bay Area of San Francisco, Silicon Valley, Sacramento and Fresno (California) presenting the Fellow with a unique opportunity to see how industry, community colleges and community makerspaces were able to collaborate and share practice to give vocational students the best opportunity to learn about the ecosystem which supports innovation in their region. The Bay Area of San Francisco has been the leader in design education and innovation for more than 40 years and the location was a logical place to explore my research topic and share the learnings in Victoria.

Organisation	Key Contact	Job Title	Email	Website
Empower Semi-Conductors: 2700 Zanker Road, San Jose, CA.	Luca Vassalli	Senior Manager – Customer Applications Engineering	Luca.vassalli@empowersemi.com	www.empowersemi.com/
Root Access – Community Makerspace: 1476 N. Van Ness Ave, Fresno, CA.	Derek Payton	Executive Director	derek@rootaccess.space	www.rootaccess.org
Quiqlabs: 700 Van Ness Ave. Suite 015 Fresno, Ca 93721	Damon Thomas	CMO UX/UI Architect, Adjunct Instructor & Mentor	damon@quiqlabs.com	www.quiqlabs.com
Sacramento City College: Building 1, 3835 Freeport Blvd, Sacramento	Tom Cappelletti	Faculty Project Director	capalet@scc.losrios.edu	www.scc.losrios.edu/makerspace
Inventopia: 630 Pena Drive, Suite 100, Davis, CA	Ousema Zayati	Facility Director		www.inventopia.org/
Square One Makerspace: Woodland Public Library, 250 1st St, Woodland, CA	Trina Camping	Librarian		www.woodlandpubliclibrary.com/191/Square-One
MADE by HackerLab: 3519 Broadway, Sacramento, CA	Gina Lujan	Director		https://mailchi.mp/092af57f1b38/made-powered-by-hacker-lab
Cosumnes River College: 8401 Center Parkway, Sacramento, CA	Eddie Maximo	Director		https://crc.losrios.edu/
Folsom Lake College Innovation Centre: 10 College Parkway, Folsom, CA	Zack Dowell	Professor		www.flcmakerspace.org/

Sacramento City College

The Sacramento City College (SCC) Makerspace serves as a hub for innovation and collaboration, attracting those that wish to apply their skills in design, science, technology, arts & crafts, engineering, mathematics, medicine, physics, and more. The Makerspace is free and open to all currently enrolled students, faculty, and staff at SCC.

Students are encouraged to stop by, take a tour, and learn more. The facility features workshops, trainings, events, and internship opportunities throughout the year to build the skills of students to be innovative and collaborative in support of future careers in local industries. The Makerspace is founded on the values of equity, social justice, and inclusion to all in the true spirit of an empowering global maker movement and “maker culture.”

The Makerspace serves as a hub for innovation and collaboration. The Makerspace has two main spaces that provide equipment and staff support for students.

Figure 1. Professor Tom Cappelletti, Pam Posz and Paul Boys

Figure 2. Maker studio – flexible collaborative space

Figure 3. Blending power tools with new technologies

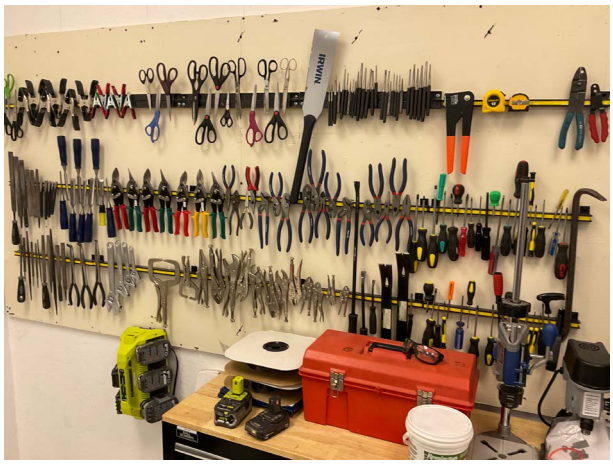


Figure 4. Traditional tools connecting with new industry practices – prototyping and testing

Shop Class – Sacramento

Community Shop Class is a place to learn and create, teach and build. With a focus on community development, the facility is designed to expand access to trades work and to celebrate those who create and build things that help the community. The purpose is to be a good neighbour in every way possible.

The shop is filled with tools which are available for loan to local community members. Shop Class also offers summer and after school programs designed to give Oak Park students/residents a place to learn the basics of carpentry, plumbing and electrical work while also learning about sustainability, safety and conservation. Our life focused curriculum will be reinforced with positive coaching, accountability and sensitivity. Our efforts will be seen in our neighbourhood as we will use the skills we learn to help Oak Park residents, non-profits and micro businesses.

Figure 5. Shop Class – Shared community learning space

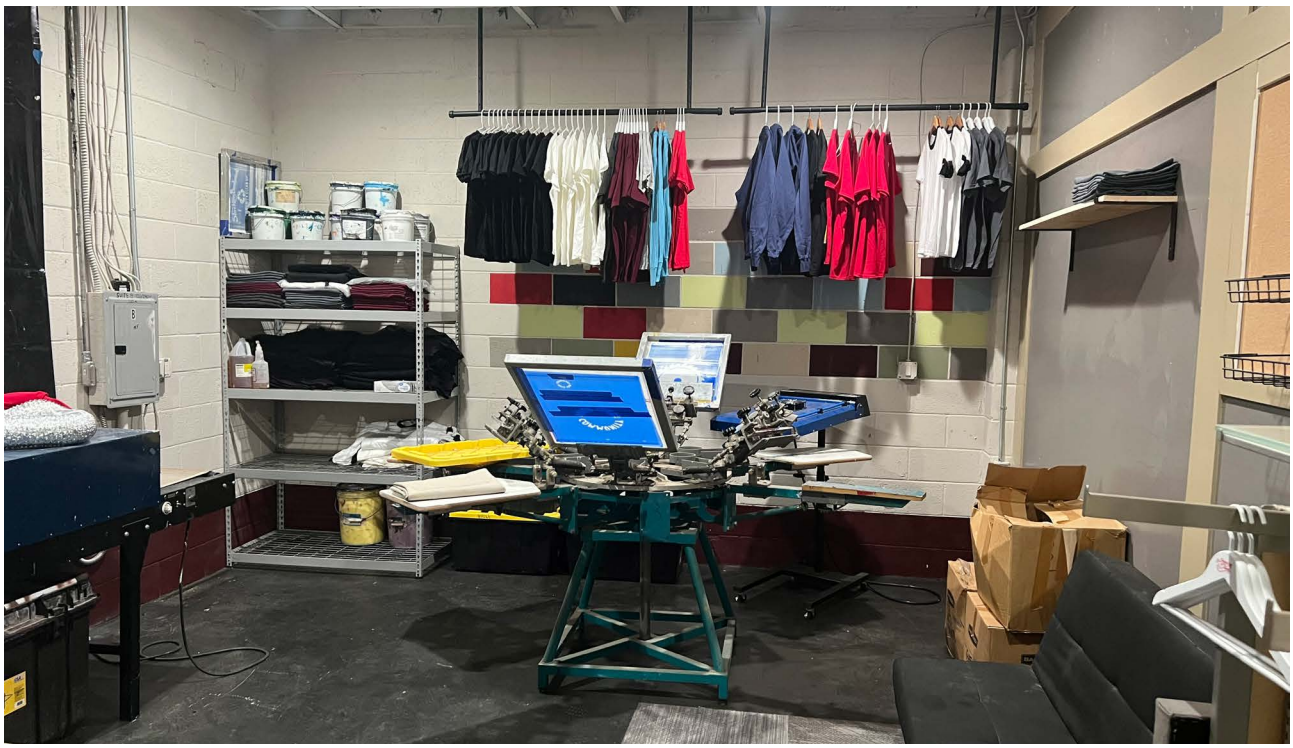


Figure 6. Shop Class – design and textiles

Root Access – Fresno

Root Access was founded in June 2017 with the goal of filling the gaps in Fresno's technology scene by building a community space for coders, electronics hobbyists, and other technology makers to learn, explore, and share. Established by a group of friends, the organisation aims to connect community and young people to "making" in a safe and supported environment to grow the culture of innovation in Fresno

Root Access officially opened in August 2017 inside a 2,700ft² space in the Tower District of Fresno. As a membership-based organisation, they rely on local people, with a diverse set of technology and "making" skills to build connections and skills for young people.

Figure 7. Mini Maker Space – 3D design

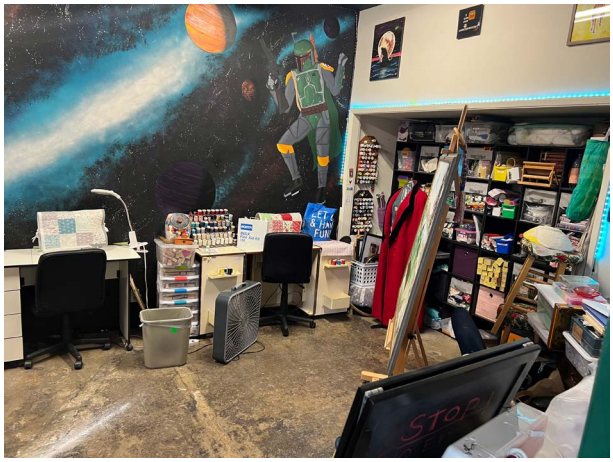


Figure 8. Textiles and Design

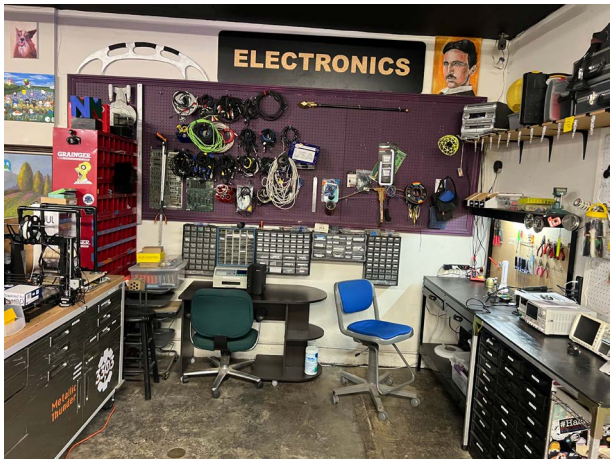


Figure 9. Electronics and Circuits

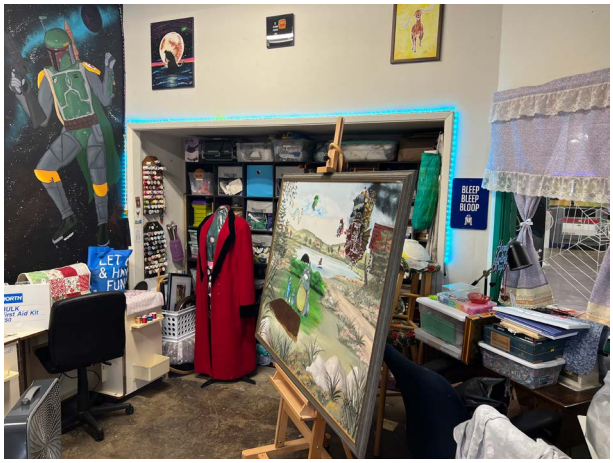


Figure 10. Dressmaking and Fabrics

Empower Semi-Conductors – San Jose

Empower Semiconductor was founded to solve fundamental problems in power delivery for data-intensive applications.

Traditional power solutions require dozens of discrete components with big footprints, complex designs and deliver power inefficiently with poor response times and inaccuracies.

Empower's patented IVR technology integrates dozens of components into a single IC increasing efficiency, shrinking footprints by 10x and delivering power with unprecedented simplicity, speed & accuracy and with zero discrete components.

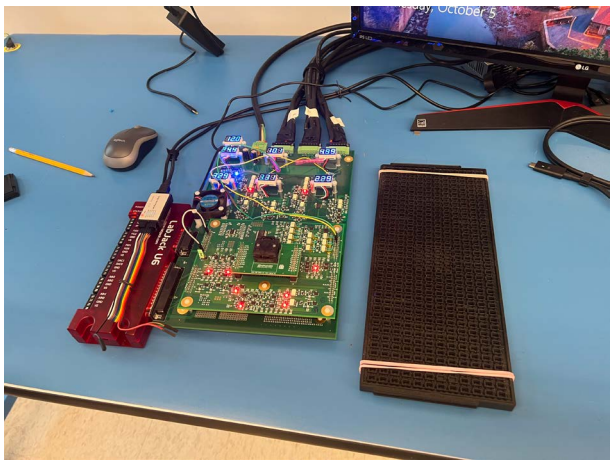


Figure 11. Using technology to test and trial prototypes

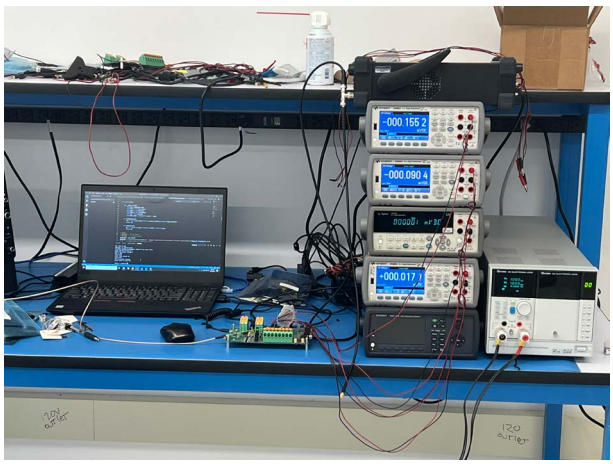


Figure 12. Making semi-conductors smaller and more powerful requires collaboration

Printable Circuit Board Conference – San Jose

The conference brought together industry partners from Silicon Valley to share in the future development of technologies to reduce the size of semi-conductors whilst increasing their capacity to process more information. The take-away from the conference was the importance of collaboration to share in skill-sets and learnings for improved outcomes which are driven by industry and governments.

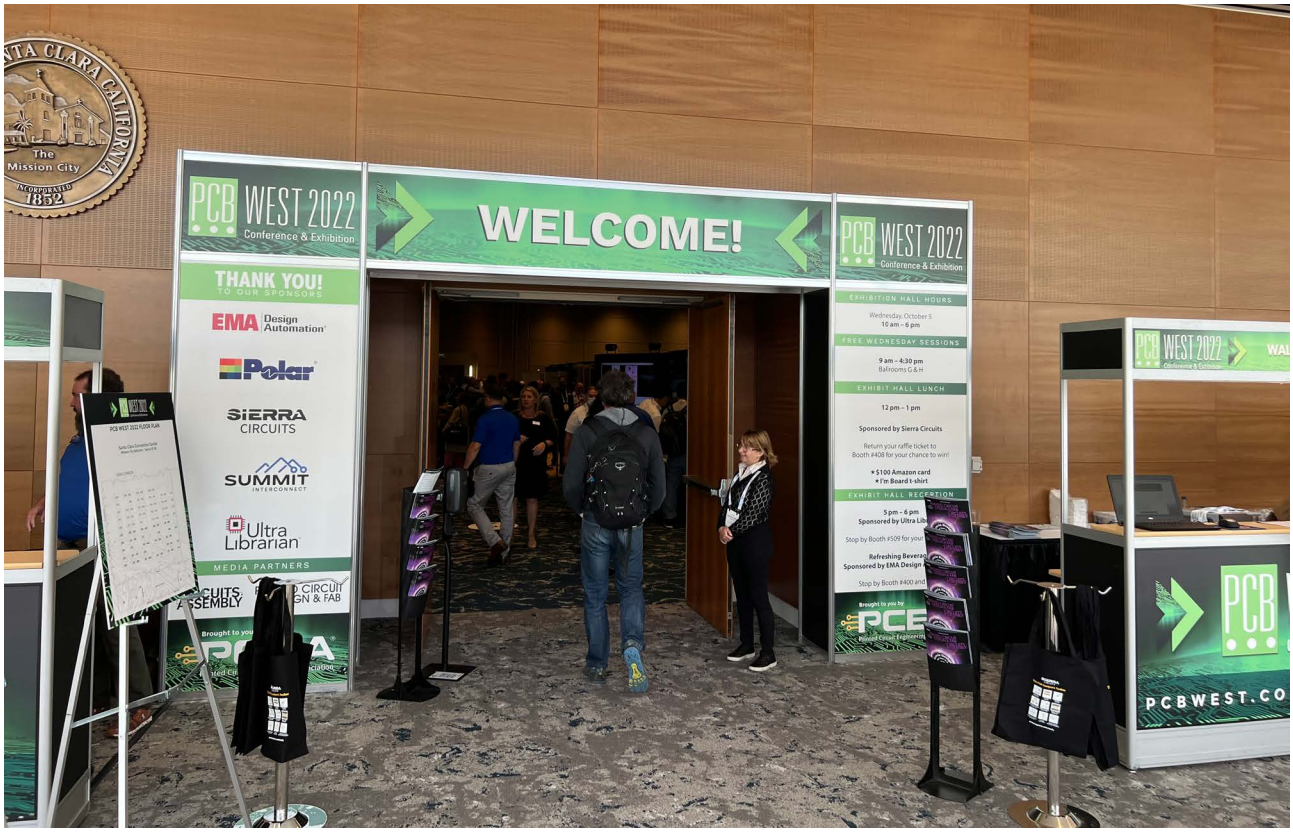


Figure 13. PCB 2022 Conference (above)

Figure 14. AR/VR Presentation

Woodland Public Library – Maker Space 745.5 Square One

Woodland Public Library is located in the City of Woodland, located 32 kilometres from the state capital of Sacramento. Square One is a Maker Space which is available to local residents to drop in and access a range of technologies and equipment to help build new ideas and collaborations in their community. The facility is a shared space to benefit the community of Woodland.

Figure 15. Woodland Public Library – Maker Space

Figure 16. Paul Boys and Trina Camping – Maker-Space Director

Figure 17. Textiles and craft resources for community usage

Figure 18. Shared learning spaces with a wide range of available resources

Quiqlabs – Fresno

Quiqlabs is a diverse operation which supports businesses with web and graphic design, as well as developing the next generation of young IT professionals through their learnsteam.org arm. Working with schools across the Fresno Unified School district, they work to expose students across all ages to new technologies and design principles to help build the next generation of innovators in the Fresno Valley region.

Figure 19. Paul Boys and Damon Thomas – Co-Founder QuiqLabs

Figure 20. Bitwise – shared space which houses Quiqlabs in Fresno

Figure 21. Resources and technologies to support STEAM in schools

Inventopia

Starting any company is hard but bringing a new technology to market is even harder. Inventopia focuses on providing resources for “tough tech” companies - those that require up-front R&D, prototyping and testing. The paradox for tough tech entrepreneurs is that doing this kind of development work is expensive; yet it is hard to raise capital if you haven’t already done that work. Inventopia exists to break this paradox. We provide low-cost access to cutting edge laboratory and prototyping technologies so that you can spend less time and money on raising money, and more time on doing the work.

Figure 22. Inventopia – member of the UC Davis Venture Catalyst Distributed Research Incubation and Venture Engine (DRIVE)

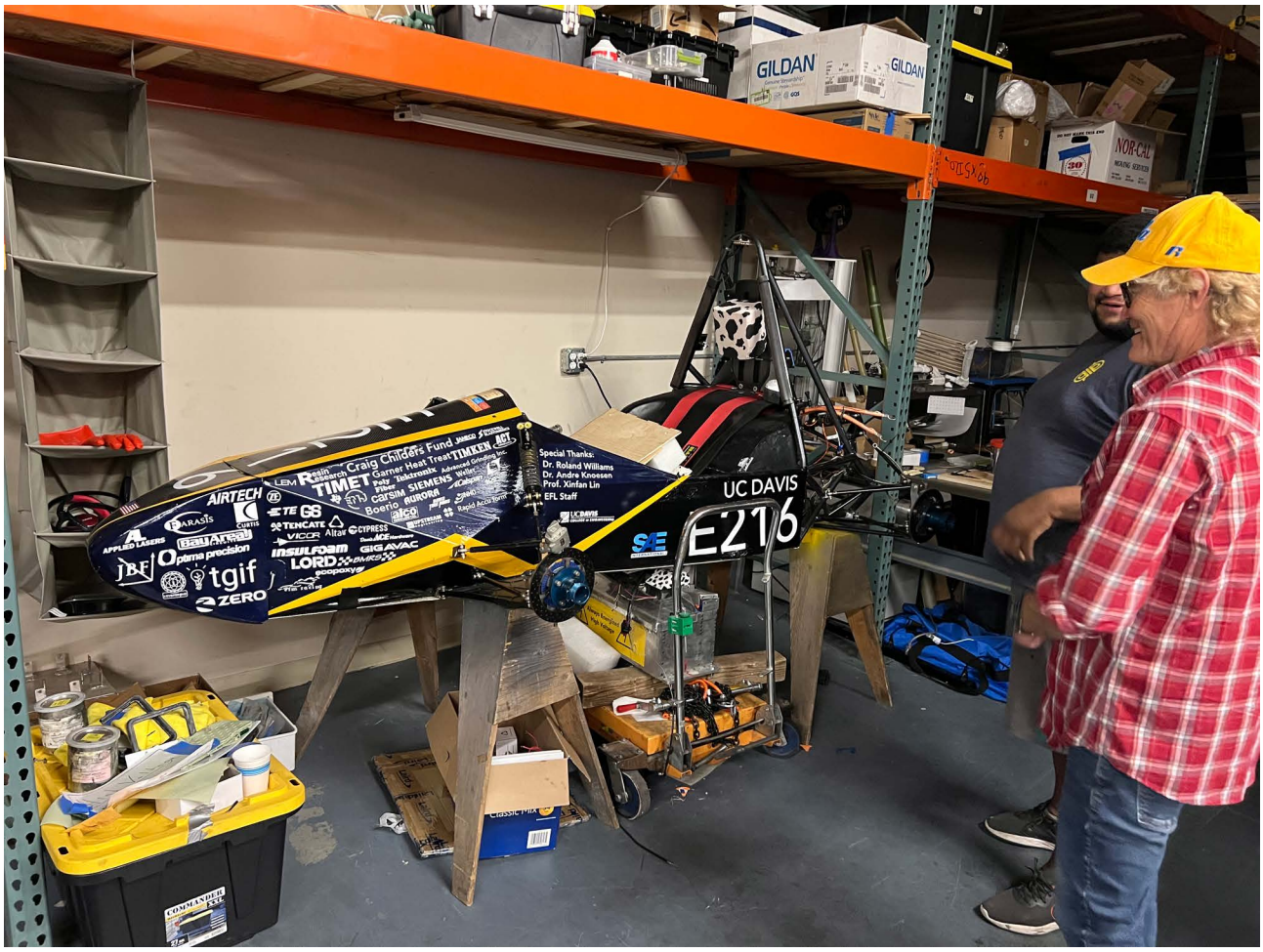


Figure 23. Electric vehicle project - prototype

Figure 24. CNC milling machine

Figure 25. CNC machine for rapid prototyping

MADE by Hackerlab

Hacker Lab is an innovative company not for profit company that has been a catalyst for Sacramento's tech ecosystem for over a decade. An institution recognized for trailblazing and leadership in the local and national tech ecosystem. Hacker Lab continuously offers robust programming that changes lives. Noted and honoured in countless articles and a recipient of many prestigious awards.

Starting as a grassroots movement in a tiny office in Curtis Park above a bar and hosting Meetups, Hacker Lab quickly grew into a leader in building the local start-up and maker community and eventually became recognized as one of the nations leading maker spaces. We partner with orgs like Maker Mag, California Community Colleges, and local Governments. Hacker Lab has also contracted with corporate giants such as HP, Intel, Kaiser, SMUD, AT&T, Toyota, and Northrop Grumman, to name a few.

Hacker Lab mostly prides itself on building community and creating a place to be. For many years it has been home to thousands of creators, changemakers, and makers who have pursued their passions and dreams.

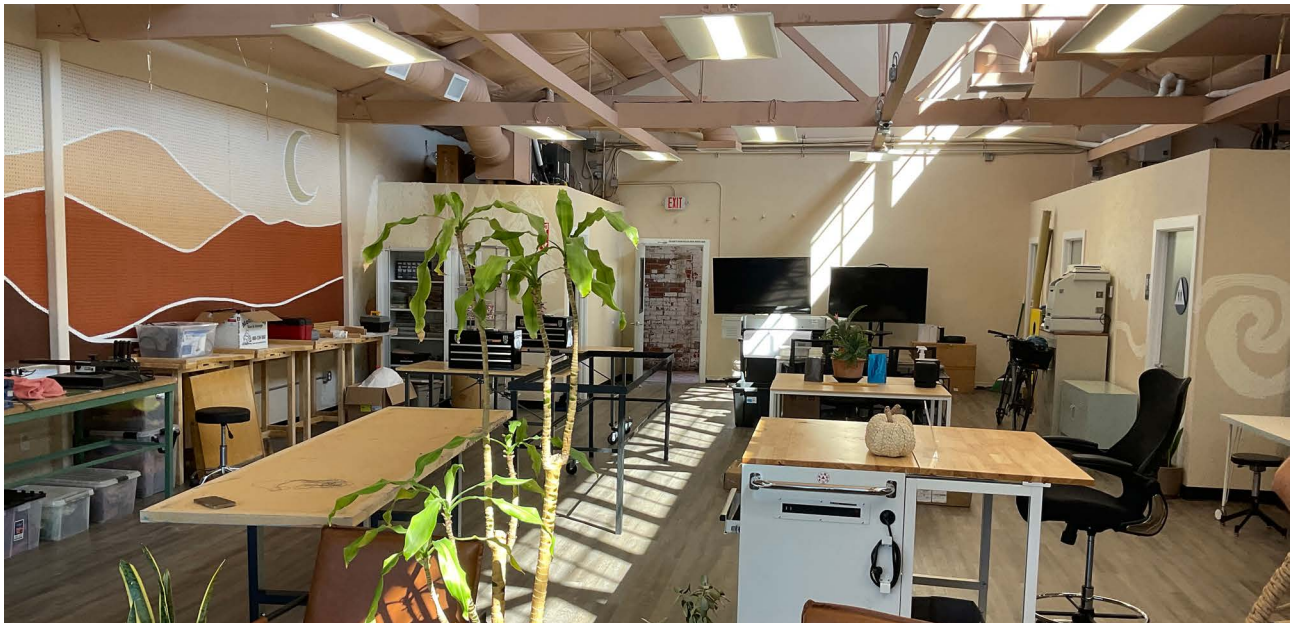


Figure 26. Flexible, creative spaces for shared learning

Consumnes River College – Maker Space - Sacramento

The CRC Makerspace supports students to learn what is now possible when they are on campus. Students can learn about the advanced manufacturing capabilities we now have, and brainstorm with us how you can get yourself or your students engaged in the learning process.

We will be showing how all of the new equipment works and explaining how we intend to get open door hours for folks to have access to come in and use the facility.

The CRC Makerspace equipment includes a full CNC wood cutter, a water jet, a milling machine, multiple lasers, multiple 3D printers, a textile room that includes sewing machines, custom embroidery, and a poster making printer. There is also an electronics station, and a wood working room.

Figure 27. Eddie Maximo (Director), Paul Boys and Colleague

Figure 28. Industry collaborations to support student projects

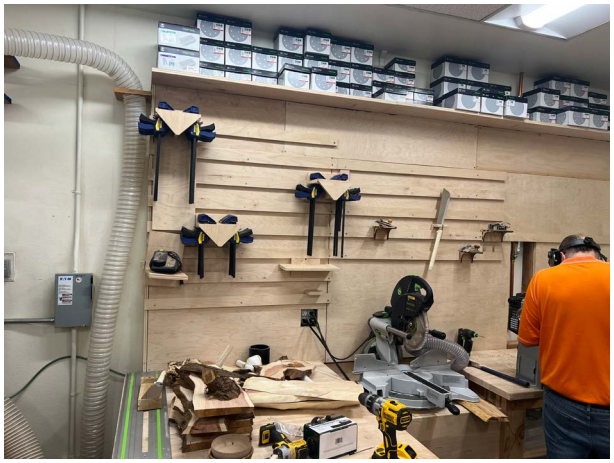


Figure 29. Creative thinking and practical tools

Figure 30. Blending traditional tools with new technologies

Folsom Lake College – Folsom

The Innovation Center Makerspace is a student resource located at the Main Folsom campus in Aspen Hall FL1-130 dedicated to the exploration of knowledge and making. They connect students with short internships designed to introduce students to the real-world field in which they would work. They also hold many free student workshops, are home to the Folsom Lake College eSports team, as well as play host to the Math and Science club.

Figure 31. Innovation Center - student shared space

We believe in being a safe space for all students; from students interested in fibre arts or that like to tinker, to those that want to relax by playing video games in our living room or make music in our studio. The Innovation Centre Makerspace is a great space for students from different cliques to get together to contribute to their community, both in the school setting and in the larger world.

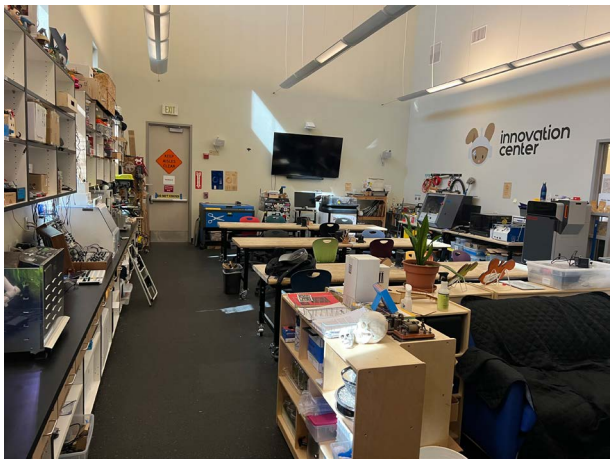


Figure 32. Design Studio

Figure 33. Textiles and design

Figure 34. Music and sound production

The main findings from the fellowship are listed below:

- Problem solving requires collaboration, cooperation and a sense of purpose – no one organisation can provide the answers to existing and emerging challenges. Business in Silicon Valley collaborate and share knowledge to overcome complex issues which require multiple points of view to resolve
- Working in silos stifles creativity and innovation and we must work to share, test, trial and innovate as a collective.
- Design Education is a unique methodology which empowers participants to direct their learning, explore new ideas, test and fail in a supported environment with innovation as the driver of practice. We must embrace and build a culture which supports the freedom to fail.
- Digital technologies are a critical component to all industries, and we need to assess how we can apply and include these skills in all training packages with a scaffolding of learning across qualification levels
- Industry needs to have more representation in the classroom, with a direct connection to bringing real-world problems into curriculum design, through problem-based design challenges
- Innovation cannot operate as a stand-alone unit; it must be a central theme in all of the curriculum and programs that we create.

The need to develop a future-focused curriculum with specific reference to design technologies, is a key driver for the VET sector in Victoria so they keep up to date with industry practice and collaborative design. The opportunity to develop a program based on the research exists, with the right support and interest from key stakeholders in the sector. The Fellow will work within existing VET networks to seek avenues for the research findings to help shape future policy in the sector.

Findings

- Innovation, critical thinking, collaboration, problem solving, and shared practice are the foundations for success in future industries. Industry will always be the primary driver of the key skills which are included in training packages but as industry evolves to include more technological advances, VET needs to be more responsive to support the development of these skills.
- Through the implementation of the Vocational Major (VM) component into the Victorian Certificate of Education (VCE), applied learning will have a more prominent role in the senior secondary school completion. There is an opportunity to explore how the learnings from the fellowship can support a more integrated approach to the inclusion of applied learning in the qualifications.
- Industry, education, schools and community need to work together to co-design curriculum and experiences which reflect the lived experience of industry practitioners. The need to collaborate and share learnings will only help to make the VET experience a richer one for graduates.
- Maker Spaces are a critical element in driving success, collaboration, problem solving and innovation in education as they allow for students to explore new ideas and share learnings in a supported environment. As a shared approach, VET policy makers can be the drivers to begin the transformation of the sector to support graduates for future careers.
- True innovation requires all partners to be invested in the goal of a shared outcome. This is clearly demonstrated in the USA experience with all education providers working to embed these skills in all curricula across their institutes.

The Bay Area of San Francisco and Northern California is renowned as the innovation home for technology and design thinking in the USA and the region has influenced the establishment of hundreds of innovation zones around the world (The Economist, 2022). The Fellow was able to work with key stakeholders and industry partners to see how collaboration, specialist skills and a shared vision for innovation are influencing the future skills and practice of tertiary education providers.

The Victorian Experience	The Northern Californian Experience
Industry collaboration has been a key driver of VET curriculum with continuous improvement integral to its success	Collaboration between industry, community, libraries and colleges is the key driver to innovation in the region
Pathways to higher education are clearly defined in most VET programs	Community colleges have clearly identified pathways into further education with defined articulations
Training packages are slow to respond to new technologies in curriculum design	New and emerging technologies are incorporated into curriculum design in a timely manner
Most training is government subsidised	There is a genuine philanthropic support for disadvantaged learners
Maker-spaces are not included as learning components in the Victorian VET system	Colleges are set-up and funded to support design education through shared maker-spaces to promote innovation amongst students
Difficult to assess the success of promoting new ideas in VET providers	Faculties and disciplines are united to share in the promotion of new ideas and thinking
Student shared spaces are limited in the Victorian experience	Textiles, art, design and creativity are seen as ways to connect and share learning with students in a supported environment – promotes advocacy, voice and leadership

Strengths	Weaknesses
• Industry focused learning • Greater influence of industry on curriculum development • Future focused graduates with the skills to adapt to a rapidly changing workplace • Builds collaboration and shared practice with the VET sector • Makes graduates more employable with transferrable skills	• Requires investment to develop a targeted approach to embed these practices • Cultural change can be difficult to implement • Structural change to embrace the implementation of the recommended reforms
Opportunities	**Threats**
• Industry will continue to evolve and change to keep pace with competitors and technologies. VET Educators need to make this a part of their practice to maximise their impact on student learning • As new industries emerge, TAFE will be better equipped to respond to the skill-sets required • Improved collaboration between industry, VET providers and community will lead to shared outcomes being explored • Collaboration as an opportunity to share practice and improve innovation in education	• The failure to respond to industry changes will place VET graduates at risk of not being industry ready • Funding and resources to influence change • Buy-in from policy makers and influencers in the VET sector • Apathy to respond to future workplace skill needs

The implementation of the “Vocational Major” (VM) into the Victorian Certificate of Education (VCE) has seen a series of recommendations from the Firth Review (2022) which aim to expose students to applied learning opportunities as per the quote below:

Recommendation 32

To ensure all students are exposed to applied learning and to a range of vocational pathways prior to senior secondary:

- the VCAA should develop additional guidance for providers that identifies opportunities for applied learning in the Victorian Curriculum F–10
- the VCAA should provide advice on how experiential learning can be linked to the Victorian Curriculum F–10
- the Department should promote student participation in vocational tasters that are linked to the

Victorian Curriculum F–10 by using Tech Schools to host tasters, promoting partnerships with TAFEs and increasing the use of Trade Training Centres

There is a potential opportunity to pilot some of these proposals following consultation and co-design with a designated working group to explore these possibilities in more detail.

Considerations and Next Steps

- Connections to policy officers who can assist with accessing networks and stakeholders who can help to position the research.
- Other challenges include resources to support the pilot of the identified initiatives, an appetite to take risks and test new ideas as well as the development of a shared purpose statement to drive the findings
- Buy-in from stakeholders to test and trial the findings
- The next steps are to disseminate and share the findings within my existing networks and leverage connections to see how the findings from the Californian experience can influence VET practice in Victoria. This could involve a series of workshops, mind-mapping exercises to take the ideas further with a unique lens on Victoria's sector.
- https://cemets.ethz.ch/ I would relish the opportunity to participate in the Summer institute program, as a Victorian TAFE team to work collaboratively as a sector to implement design education and innovation into the Victorian VET curriculum
- Share the findings within the Tech School Networks and wider VET networks to inform future practice reviews and program design
- Seek opportunities to connect community libraries, VET providers, industry and schools to shared learning spaces which promote inquiry, collaboration, networking and friendships to boost the health and wellbeing of young people.
- Work with the Department of Education, Latrobe City Council, Victorian Skills Authority and other bodies to investigate the viability of expanding the use of maker-spaces in regional areas as a trial with a formal review and evaluation included as part of the design.
- Investment in a trial program which links design education, maker-spaces, libraries to traditional VET studies to sustain the connection of education across the F-10 and VCE learning experience.
- The implementation of the Vocational Major into the VCE provides a unique opportunity for further research to be undertaken to assess the viability of connected community/TAFE spaces as shared resources for future learning environments
- Connect a group of like-minded professionals to network and convene a think-tank to explore how new and emerging industry practice can influence education in a timely and responsive manner.

Impacts of Fellowship

Personally

The opportunity to travel and share experiences with like-minded colleagues has been a rewarding experience which I will cherish for the remainder of my career. I will advocate with fervour to remain connected to these colleagues to continue the sharing of resources and experiences for the betterment of students in the USA and Australia. Practitioners in California showed me how collaboration and a positive mind-set with clear goals which are student-centric help to keep you on-track and centered. The fellowship will have a lasting impact through expanded networks, new skills to solve and re-frame problems and an open-mind to the benefits of diversity and difference when seeking skill-sets to address complex problems.

Professionally

It has expanded my networks, helped me to re-frame the importance of collaborative practice and given me clarity as to the importance of program design being future focused, inclusive, forward thinking and user-focused. I feel that I am a better communicator, listener and practitioner as the fellowship experience has helped me to re-focus my priorities to better support my team and colleagues where possible to improve their practice in a non-judgemental and “freedom-to-fail” mindset. Teaching impact has been a clear beneficiary from the fellowship as I am able to impart the experience within my own work team with a specific focus on helping our graduate teachers to be more aware of being holistic when approaching student learning.

Organisationally

The completion of the fellowship report will serve as the catalyst for further engagement with the TAFE Gippsland Executive and Board to investigate how the findings could be used to influence future funding and policy settings in Victoria. There are significant opportunities available across the Gippsland region and with connections across the secondary schools, university and community space, there is an appetite to look differently at how we prepare the next generation of graduates to gain skills for the future-world-of-work. This can be achieved through targeted professional learning workshops, modelling best-practice across the institute and actively working to influence practitioners at events, conferences etc. The Californian example demonstrated how different organisations, with similar objectives, need to rely and collaborate on each other’s learnings to influence each organisations operations.

Broader VET Sector

The findings from the report are to be presented at the VET Development Centre via their “Thought Leadership Series” in March 2023. This will expand the awareness of the findings and provide thought and influence to shape future directions in the sector. Through these connections and

existing relationships with the Victorian Skills Commission (VSC), the Australian Vocational Education and Training Research Association (AVETRA) and school networks, there are significant opportunities to share the findings and work on advisory groups to help shape the next iterations of applied learning in schools and TAFE. The original application that I made prior to being awarded the fellowship, had support from government and industry bodies and these networks will help to broaden the influence and impact of the findings. Best practice in California showed me that working together as a sector will deliver better outcomes for graduates and a more supportive environment for teachers and administrators.

Sector Engagement (Dissemination)

Date	Organisation / Stakeholders	Event / Activity	Format	Project	Key Contact	Future Actions
February 2023	Baw Baw Latrobe LLEN	Board Meeting	Presentation	Board meetings	Lisa Price	Increased connections in Gippsland
April 2023	TAFE Gippsland	Executive Team	Presentation	2023 Planning	Laura McPherson	Ongoing support
16th March 2023	VET Development Centre	Thought Leadership Series	Presentation/ Workshop	Monthly series	Danielle Gellard	Expanded networks and practices
April 2023	AVETRA – Research Today	Publication	Written paper	Bi-yearly publication	Andrew Williamson	Prepare paper for review
2024	World Federation of Colleges and Polytechnics	Global conference	Conference Presentation	World Congress	Organising committee	Draft and submit proposal for conference
2024	Journal of Vocational Education and Training	Journal publication	Written paper	Quarterly publication	Peer review committee	Draft and submit paper for review

The rapid pace of change which is being experienced in industry is directly impacting on the skills needed by VET graduates to help them be job-ready and future focused when beginning their working journey. The pace of change places a unique set of challenges on the VET sector to embed new and innovative ways of thinking in respect of program design and qualification structures to meet the needs of industry. Design Education which includes a focus on teamwork, problem solving, innovation, entrepreneurism, collaboration and digital skills supports a new way of approaching education which provides a holistic set of transferrable skills, applicable in any future industry. The Fellows experience in California demonstrated that industry, community colleges, and schools need to work together to embed these skills as the foundation for success across all levels of education. The findings from the fellowship aim to prompt policy makers and practitioners to re-think how we are preparing graduates for the future world of work and to seek opportunities to explore and trial new practice methodologies to have graduates skilled to meet these challenges. The future is a constant in all of our work and the need to embrace the opportunities which will present themselves in a systematic and coordinated manner will help to determine how successful we are as a sector in response to these challenges.

References

Almendra, R., & Ferreira, J. (2020). Research and Education in Design: People and Processes and Products and Philosophy : Proceedings of the 1st International Conference on Research and Education in Design (REDES 2019), November 14-15, 2019, Lisbon, Portugal. Milton, UNITED KINGDOM: Taylor & Francis Group.

ASQA. (2021). Users guide to the standards for VET accredited courses. Retrieved from https://www.asqa.gov.au/standards-vac

The Conversation (2020) If you're preparing students for 21st century jobs, you're behind the times – accessed online 12/12/22 @ https://theconversation.com/if-youre-preparing-students-for-21st-century-jobs-youre-behind-the-times-131567

The Economist (2022) Can Silicon Valley still dominate global innovation? 16th April, 2022 – accessed online18th December 2022 @ https://www.economist.com/business/can-silicon-valley-still-dominate-global-innovation/21808708

Joyce, S. (2019). Strengthening Skills. Accessed online 11/12/22 @ Retrieved from Commonwealth of Australia: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.pmc.gov.au/sites/default/files/resource/download/strengthening-skills-independent-review-australia-vets_1.pdf

Lee, Carissa (2020) If you're preparing students for 21st century jobs, you're behind the times - accessed online 2/2/2023 @ https://theconversation.com/if-youre-preparing-students-for-21st-century-jobs-youre-behind-the-times-131567

Lucas, B. Spencer, E and Claxton, G (2012) How to teach vocational education: A theory of vocational pedagogy – Centre for Real-world Learning, University of Winchester

Lyon, P. (2011). Design Education : Learning, Teaching and Researching Through Design. London, UNITED KINGDOM: Taylor & Francis Group.

Macklin, J. (2020). Future Skills for Victoria, driving collaboration and innovation in post-secondary education and training. Retrieved from Victorian Government: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.education.vic.gov.au/Documents/about/department/macklinreview-finalreport.pdf

Moodie, G. (2015, 15/1/2015). Vocational training is too complex, too job-specific, too underfunded, Online. The Conversation. Retrieved from https://theconversation.com/vocational-training-is-too-complex-too-job-specific-too-underfunded-36204

NASWD. (2020). National Agreement for Skills and Workforce Development Review - Productivity Commission Study Report. Canberra: Commonwealth of Australia

Norman, J. (2000). Design as a framework for innovative thinking and learning: how can design thinking reform education? Paper presented at the Design Education, Loughborough University. https://repository.lboro.ac.uk/articles/conference_contribution/Design_as_a_framework_for_innovative_thinking_and_learning_how_can_design_thinking_reform_education_/9343250

Seet, P.-S., & Jones, J. (2019, 30th May 2019). The government keeps talking about revamping VET: but is it actually doing it?, Online. The Conversation, p. 1. Retrieved from https://theconversation.com/the-government-keeps-talking-about-revamping-vet-but-is-it-actually-doing-it-117743

Swann, G. (2010). The economic rationale for a national design policy. Occassional paper. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32096/10-1112-bis-occasional-paper-02.pdf

Wheelahan, L and Curtin, E (2010) The quality of teaching in VET: Overview – LH Martin Institute – accessed online 2/12/19 @ https://www.voced.edu.au/content/ngv%3A45772

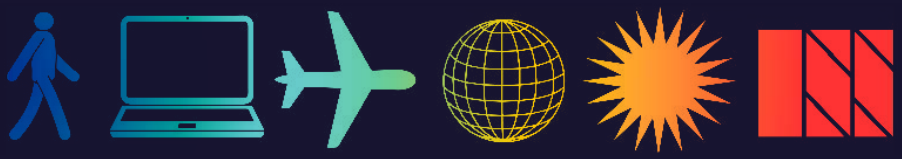
Foundation for Young Australians (2017) The new work smarts – Thriving in the new work order, accessed online 7/6/2022 @ https://www.fya.org.au/app/uploads/2021/09/FYA_TheNewWorkSmarts_July2017.pdf

Joyce, S (2019) Strengthening Skills: Expert review of Australia's Vocational Education and Training System, Commonwealth of Australia, Department of Premier and Cabinet

Victorian Skills Plan (2022) accessed online 12/8/2022 @ https://content.vic.gov.au/sites/default/files/2022-09/Victorian-Skills-Plan-for-2022-into-2023.pdf

Wheelahan, L., & Moodie, G. (2011). Rethinking skills in vocational education and training: From competencies to capabilities Accessed online @ https://www.voced.edu.au/content/ngv%3A48914

Whitelock, D. (1974). The Great Tradition: A History of Adult Education in Australia. Brisbane, Queensland: University of Queensland Press.



The International Specialised Skills Institute
1/189 Faraday Street, Carlton VIC 3053
Ph: 03 9347 4583
www.issinstitute.org.au