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Temporary Traffic Management Credentials Framework
Findings and Recommendations

Prepared for Manukau Institute of Technology
Prepared by Beca Limited

31 October 2023

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Contents

Revision History

Revision Nº	Prepared By	Description	Date
1	Mia Te Tana Alyssa Greaney	Draft Literature Review	5 July 2023
2	Mia Te Tana Alyssa Greaney Kaitlyn Stringer Charlotte Lee	Draft Final Report	25 September 2023
3	Charlotte Lee	Final Report	31 October 2023

Document Acceptance

Action	Name	Signed	Date
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1 Introduction and Scope

The Temporary Traffic Management (TTM) Credentials Framework Governance Group is looking to develop an **improved TTM Credentials Framework**. More specifically, the vision for this project is to gather comprehensive, evidence-based insights from international and national frameworks, models, and literature on TTM and other vocational training systems, to inform the development of a Framework that more adequately addresses **the unique needs of the industry and its diverse workforce, particularly Māori, Pasifika, and women**.

To inform this work, a comprehensive research project has been undertaken, comprised of the following elements:

1. **A review of literature**, focusing on relevant studies, articles, and documents.

2. **Engagement** with representatives from the TTM industry/ training providers and other vocational training system providers, as well as focus groups with TTM workers.

3. **This final report**, which brings together the findings of the literature review and engagement and provides a series of recommendations for the TTM Credentials Framework Governance Group.
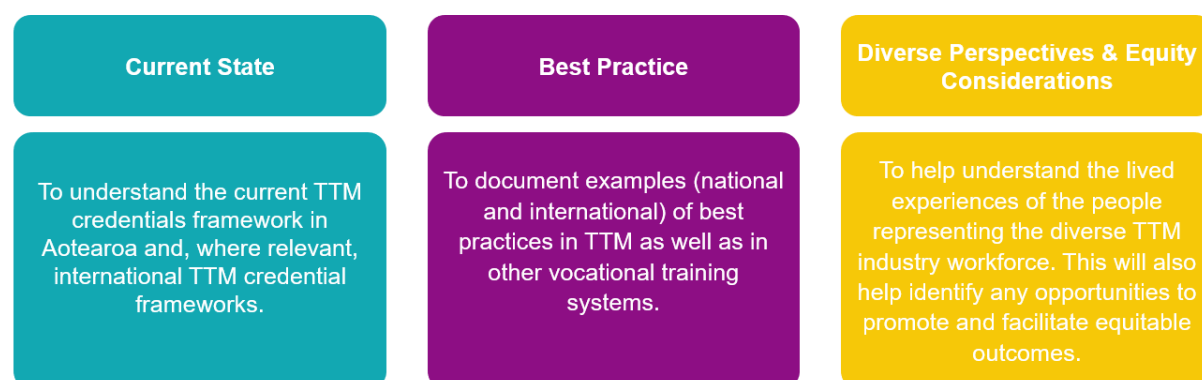
2   Approach and Methodology

2.1   Literature Review

A review of relevant literature was undertaken, to understand best practice in TTM and other vocational training systems, and how the project priority groups of Māori, Pasifika and women can be considered in the development of an improved TTM Credentials Framework.

The literature review comprises three key parts:

Current State	Best Practice	Diverse Perspectives & Equity Considerations
To understand the current TTM credentials framework in Aotearoa and, where relevant, international TTM credential frameworks.	To document examples (national and international) of best practices in TTM as well as in other vocational training systems.	To help understand the lived experiences of the people representing the diverse TTM industry workforce. This will also help identify any opportunities to promote and facilitate equitable outcomes.

The TTM Credentials Framework Governance Group was also interested to understand how the industry could support school leavers in to TTM, and this was explored as a sub-theme in the literature review. Based on these key topics, confirmed by the Governance Group, and as outlined above, we established a list of search terms and identified potential data sources. This step was completed to make sure that our methodology is robust, and our data comes from a broad range of credible sources, particularly focusing on analysis that is already in the public domain, good quality studies and published academic literature.

We searched these data sources for relevant key material. We are cognisant that this research is to be directly applicable to the New Zealand context, and New Zealand examples were searched for in the first instance. We then looked to include international examples where they demonstrated different or best practice approaches to TTM or other vocational training and education or provided examples that can be applied in Aotearoa.

Professional judgement was used to determine the quality of the evidence base; that is, the number of studies to support a proposition and whether there are any gaps in analysis. A key aspect of our search was to determine what research has already been undertaken in relation to this topic. A large proportion of material found was grey literature, including industry and government websites, articles, reports and working papers.

Following the collation of relevant literature, evidence from the review was analysed and then organised by theme. This was set out in a framework that includes the subject and main arguments of the literature, as outlined in Section 3 (Literature Review) and Appendix A of this Report.

2.2   Engagement

Following completion of the literature review, we undertook **six interviews** with TTM training providers, vocational training providers and vocational training specialists, and a TTM worker, and held **three focus groups** with TTM workers. Participants were primarily identified through ConCOVE or the TTM Credentials Framework Governance Group, and further participants were found via snowball sampling; whereby existing participants helped to identify and connect with additional participants.

The interviews were all held online (via Teams) and were an hour in duration. Interviewees were asked a range of questions, broadly relating to:

- Learning and development barriers and challenges for Māori, Pasifika, and women

- How organisations and educational institutions can create inclusive and culturally sensitive environments to support learning and development

- The role of wrap around support services

- Different ways of learning (or learning styles), particularly of Māori, Pasifika, and women

- The role of technology

- Supporting school leavers into the TTM industry

The focus groups were held online (x2) and in-person (x2) and were an hour in duration. To encourage participation, a $50 voucher was provided to all focus group attendees. We specifically targeted participants from our priority groups (Māori, Pasifika, and women), resulting in focus groups that predominantly consisted of individuals from these demographics. Participants were asked a range of questions, broadly relating to their TTM training experience, and their experiences of working in the TTM industry. Including:

- Positive and negative experiences of the training

- Things they would change if they were designing the training

- The mix of people in the training course

- If any additional support was provided

- Ways the training could be more culturally appropriate

- Positive and negative experiences of working in the industry

- What the industry could do to encourage more people into a TTM career

The interviews and focus groups were semi-structured; whilst we had a predetermined list of themes and questions to ask at each interview, these were not strictly adhered to. Instead, they were used to facilitate and prompt discussion on the topics of most interest and relevance to the interviewee. Notes were taken and these were circulated to the interviewees shortly following the interview. This gave the interviewees the opportunity to clarify any points and/or add further detail.

2.3 Data analysis

Thematic analysis was used to derive meaningful insights from the data obtained through stakeholder interviews and focus groups. This qualitative analytical approach allowed for an exploration of participant perspectives and the identification of recurring themes and patterns within the data.

Notes from the stakeholder interviews and focus groups were carefully reviewed, and initial codes were generated by identifying significant phrases, concepts, and ideas. These codes were then organised into subthemes, which were further refined and grouped into overarching themes. This process ensured a systematic and in-depth exploration of both individual views from the interviews, and the collective views and experiences expressed during the focus group sessions.

2.4 Limitations

The main limitation of this research is that views given may not be fully representative, given that this was a sampling exercise, rather than a survey of the population as a whole. This is typical for research projects of this size and duration. We did, however, engage with sufficient numbers to develop key thematic findings.

A secondary limitation was the difficulty we experienced in recruiting people for the focus groups and interviews. It was initially challenging to get people to sign up, and some people did not show up to the interviews or focus groups after indicating their interest in participating. Whilst we were able to gather some valuable information and perspectives, and reached our engagement targets, there were some groups that we did not manage to reach. Most notably, we intended to interview people specifically around learning/development opportunities and barriers for Māori, and for disabled people, but were not able to do so.

3   Literature Review

3.1   Introduction

As described in the approach and methodology, the literature review is comprised of three parts: **current state, best practice,** and **diverse perspectives and equity considerations,** with a sub-theme looking at how the industry could support school leavers in to TTM.

The following sections set out a summary of the literature and material found for each of these topics. More comprehensive tables, providing a detailed description of the literature and its relevance to this research, are attached as Appendix A.

3.2   Current State

The following topics make up the current state literature review:

- The current system and credentials framework of TTM training in New Zealand [the Status Quo], including information about the learning blocks, performance and knowledge expectations required to progress into TTM leadership roles (e.g., a universal site traffic management specialist).

- Context relating to the current reform under the proposed New Zealand Guide to Temporary Traffic Management (NZGTTM).

- A brief description of how TTM (or equivalent) training is taught and managed in other countries around the world (USA, Australia, Canada, UK).

- Context relating to formal apprenticeships in New Zealand, including which industries commonly offer apprenticeships and the rules and benefits of completing one.

- A brief overview of the training and qualifications framework offered through Surf Life Saving New Zealand, Toi Ohomai Institute of Technology and Etco Ltd. This provides a useful comparison of TTM training with other vocational careers (surf lifesaving, forestry, and electricity respectively).

In New Zealand, TTM training involves a combination of theoretical and practical assessments to gain qualifications under the Waka Kotahi 'warrant' system. Once TTM workers are qualified, they can undertake further training to progress into more specialised or leadership roles (e.g., universal site traffic management specialist). TTM competency and training is currently undergoing a reform with the proposal of the NZGTTM. The NZGTTTM aims to improve the safety of workers and the road users by having a greater focus on risk-assessment and the planning stages of TTM.

Regardless of country, TTM training commonly involves a mixture of theoretical and practical assessments. Several entry-level or beginner courses contained solely theoretical assessments and were commonly taught online or gave an option for people to take the course in a classroom-type environment. Refresher training tended to be between every 2 to 5 years. There is variation in training content; that is, training to work in different road environments or with different TTM practices/ approaches.

Compared to other countries in this review, TTM courses in the USA contain primarily theoretical assessments. Topics include how to apply and install TTM, relevant standards and guidelines (e.g., markings, roadside design guide and components of the site) and how to read management plans. Alongside classroom assessment, American students are required to have a certain number of hours work experience (dependent on course type) to pass the course. In contrast, New Zealand, Australia, Canada, and the UK do not have any work experience requirements.

We note that one of the international examples [Association Quebecoise des Transports (2023)] uses masculine pronouns (e.g., he, his) to describe a person undertaking the training process. We recognise that the website may have been translated from French (gendered nouns); however, it creates a hidden preference for men and perpetuates a gendered stereotype for the role. Native English-speaking women may feel unwelcome and/or unsuited to the job or industry.

We looked at the training and credentials frameworks for other vocational industries in Aotearoa. Specifically, surf lifesaving, forestry, and electricity. Like TTM, these industries provide a combination of theoretical and practical training. However key differences to note are that these industries require students to obtain at least NCEA Level 1 or equivalent. Surf lifesaving, however, does recognise prior academic work or working achievements as part of its qualification framework (e.g., through C.V., reference checks etc).

We also explored the current framework and policy direction for apprenticeships in Aotearoa New Zealand. The Careers NZ website provides a register of all apprenticeships and providers in Aotearoa, as well as information about apprenticeships and the benefits of completing one. The New Zealand Government implemented a $519.8 million Apprentice Support Programme in 2020 to ensure job security or existing apprentices during the COVID-19 pandemic, and ensure that new apprentices could continue to be employed throughout the COVID-19 recovery. The Programme includes job-focused initiatives to support apprentices and their employers, including regional apprenticeship support, Mana in Mahi, which supports at-risk people through an industry training pathway, and a group training scheme, which provides funding for employers that are not able to afford apprentices. This speaks to the current Government's focus on maintaining sector capacity, avoiding future skill shortages, and supporting economic development. The literature notes that some of the benefits of undertaking an apprenticeship include earning at least the training minimum wage, and gaining technical, practical skills. Some organisations, including Etco Ltd, also offer additional learning support and advice.

3.3 Best Practice

This section covers various best practice TTM, vocational education and training services and institutions from New Zealand and around the world. Various topics are covered such as:

- How vocational education and training should be situated and integrated within industry.

- Best practice of the training itself, such as content, support services aligned with the training, trainers, and the way training is undertaken.

- Outcomes associated with best practice and quality training.

- Supporting high-school leavers to transition to vocational careers.

A key theme throughout the best practice literature is a focus on the integration between practical and theoretical knowledge. The literature notes that practical application of learnings has been shown to enable people to remember 90% of what they are taught, compared to 50% of theory. This means it is important for practice and theory to be integrated within training to achieve the best learning outcomes for students.

The literature also discusses the importance of clear integration between the training and job outcomes/industry partners. This means students are learning skills that are important for relevant jobs and, therefore, can be easier to get a job once the training is completed. It is also important for students to have enough support to complete the training course and for their job search after the training. This support could include career advisors, strong family support and/or support services specific for students at risk of not completing the course. This was particularly identified as important for those with mental illnesses re-entering working life but could also be extended to other groups, or more generally as 'business as usual' process.

Several sources discuss the role of the trainer and optimal trainer attributes; making sure trainers are well qualified and well connected to the industry, that they reflect the diversity in the workforce and that they can create a good learning environment, including modifying their practice to meet individual learner needs. Well qualified typically means training through formal university-level qualifications, a vocational qualification and/or industry-based experience. This will help ensure the information being taught is up to date, credible and grounded in experience. Providing training for teachers/trainers to understand how to teach diverse learners (culturally diverse students, and students with diverse learning needs) and go beyond the traditional teaching methods to be more relational, inclusive, and less formal and student-centred is also discussed in the literature.

We also investigated best practice support systems and services for students with diverse needs and experiences. In addition to system-wide settings (e.g., financial support), providing holistic support services for students that involve time management, and other issues that contribute to the process of learning and not just the learning itself, helps to improve learning outcomes. Particularly, role modelling and mentoring were commonly cited. Pairing students with a role model (example of success) or support person that they can relate to can support both personal and professional growth that aids in students learning and sense of belonging. By displaying the possibilities that students from diverse social and cultural backgrounds (e.g. Maori, Pasifika, people with disabilities) can achieve, role models and mentors can also help to break down barriers and self-stereotypes. The act of having a mentor also aligns with Māori values of whanaungatanga and the family-oriented living/lifestyles of Pasifika students. Early needs assessments and monitoring student engagement in training courses were also recommended in the literature to help identify early when students might need additional support.

For students with learning difficulties, stepwise processing techniques, including memorising, drilling, and focussing on ensuring that students understand the fundamentals of a new topic before moving on, can help these students to achieve educational success. The literature also discusses the importance of helping students with learning difficulties identify the way (or ways) they like to learn, and develop effective study strategies and methods that suits their needs. Tailored learning workshops with students is recommended to give students the tools they need to succeed. There is also a growing body of research that argues it is unhelpful to assign learners to groups or categories of 'learning styles'; suggesting instead that learners are very unlikely to have a single learning style. Other factors are potentially of more importance, such as focusing on the provision of timely and specific feedback to all learners.

3.4   Diverse Perspectives

This section includes literature that focuses on diverse and minority perspectives within the construction industry. This includes indigenous perspectives such as Māori, Pasifika and Aboriginal peoples, people with disabilities, women, and people in the LGBTQIA+ community. The construction industry is very male-dominated and, therefore, highlighting the experiences of diverse people can help create a diverse framework and training for TTM in New Zealand. This section covers topics from experiences within the industry, including first-hand lived experience, and procurement policies and strategies to attract diverse people into the industry.

Currently, training systems tend not to be inclusive of indigenous worldviews. Indigenous worldviews often place cultural value on connection with family, community, and the land, and have different ways of knowing, being and doing compared to western ways. These differences impact indigenous peoples' way of learning and of working in the construction industry. For example, the nomadic nature of working on different sites creates a tension between indigenous values of kinship with the land. In training, the lack of connection with relatable mentors can make it harder for indigenous peoples to feel comfortable to ask questions and, therefore, learn and succeed. Whānau is also very important to Māori and Pasifika students, but families are not always welcomed or encouraged to participate in student's education.

The literature discusses the importance of ensuring that a learning environment has a reciprocal nature where the teacher is motivated to learn more about and integrate diverse students' social and cultural identity within the classroom. For example, providing resources in the students preferred language and using culturally relevant materials and concepts to engage learners with the curriculum. The literature notes that aboriginal and indigenous students would rather be presented with a big picture idea that is relevant to their day to day lives, and that they have a greater affinity for visual and story-based learning. Collaborative learning techniques that involve problem solving as a group is important. Being visible and involved in indigenous communities can also exhibit that teachers are interested in learning about students' cultures. Ensuring learning environments are welcoming and encouraging of students' whānau is highlighted, as this can aid in students learning and help teachers to learn about the different worlds the student is a part of.

Unconscious biases formed by teachers/trainer about the learning abilities of culturally diverse students is an issue that can negatively impact learning outcomes for such students. Equipping teachers to identify their own biases, and the way they may reinforce/contribute to institutional racism is important. Tools such the Tapasā tool, developed by the Ministry of Education to increase the cultural competency of teachers of Pacific learners, can aid teachers/trainers with this, and demonstrate how they can contribute to breaking down racism in education.

TTM workers can be employed as temporary workers. Temporary jobs (temp jobs) are identified in the literature as often not as a choice, but because of 'structural racism' and a 'forced choice due to no other options'. Social procurement policies have the potential to stop temp jobs and ensure job security for ethnic minorities and people with disabilities because it incentivises and influences large organisations to change the way they operate to ensure the inclusion of social value on their projects, which often includes the employment of indigenous workers or indigenous-led companies. Social procurement can also provide opportunities for capacity building and training for workers to get higher paying jobs. This could extend to TTM. Although there are various potentially positive outcomes with social procurement, it is important to note that indigenous worldviews and perspectives are not always expressed in procurement policy and therefore, create negative outcomes for marginalised communities.

For women, TTM is seen as a great entry point into the construction industry; one that has a practical focus, rather than on the academic pathway. The literature outlines some of the positive outcomes that have come from having women working within TTM, such as higher productivity, traffic calming (calming road rage drivers with strong communication skills), facilitating stronger group cooperation, solving labour shortages, and strengthening consumer trust.

The literature also outlined that young women are often deterred from entering the construction industry due to fear of intimidation, sexual and verbal harassment. Some of the lived experience examples in the literature from women in the industry noted that sexuality became a focus of interest when they entered the workplace. There is a need for the industry to recognise this; while there may be increasing general awareness among employers of the need to eliminate sexual harassment, experiences indicate that homophobic harassment is less well recognised as an issue. Until the industry begins openly to address the sexual diversity of its workforce, there is a danger that strategies for tackling homophobic harassment will remain underdeveloped. Considering and designing for diverse needs and perspectives will benefit all users.

3.5   Supporting school leavers transition to vocational careers

Leaving secondary school is a significant transition as it is the first major choice an individual makes about their unique pathway in life. This section focuses on literature relating to supporting school leavers to transition to vocational careers, including the roles that industry, businesses, schools, and parents can play in empowering school leavers to pursue vocational training and employment. Supporting students into TTM was not specifically mentioned in the literature.

The literature discusses the importance of equipping school leavers with vocational careers information and support. School leavers tend to have little awareness and knowledge of the contents and outcomes of vocational courses. Thus, causing confusion and apprehension to engage in vocational training. Access to appropriate and adequate resources helps individuals to make informed career decisions and transition to further learning or employment.

Similarly, the literature highlights the important role that parents play in children's career decisions. Conversations that parents have with their children about careers are vital for young people's self-investigation, value-forming, career exploration and decision making, therefore it is crucial that parents have access to adequate resources to help their children make informed career decisions. This is particularly the case for parents with lower levels of education, as there is a strong correlation between parents' level of education and the discussion of post-school options and education levels for children.

Careers NZ also recommends that employers build relationships with local schools to increase awareness and attract future talent. Recommended methods to build awareness and relationships with students include:

- Presenting about potential careers or industry.
- Sponsorship of school events (e.g., sport competitions, kapa haka groups).
- Creation of resources and tools to teach students about the industry (e.g., posters, online resources).
- Participation in mock job applications and interviews with learners
- Competitions for young people to solve business problems or sell products
- Workplace visits and work shadowing
- Work experience through Gateway or cadetships
- Attendance at industry events or career expos.

Finally, a New Zealand study identified the barriers to high school students pursuing their preferred careers. Common barriers included study costs, connections (familiarity with people in the field or trainers), capacity (time and space), COVID-19 (mental and physical health) and systemic biases. This highlights the need to understand and address potential barriers to students embarking on vocational careers. Cost is a major barrier to almost half of all school leavers, 76% of Pacific students, 72% of disabled learners, 55% of Māori learners, and 52% of female students.

3.6   Literature review summary

This literature review has sought to understand best practice in TTM and other vocational training systems, and how priority groups such as Māori, Pasifika and women can be considered in the development of an improved TTM Credentials Framework.

The **best practice** vocational education and training examples identified in the literature give various strategies and tools to create quality training.

- For training content, it is important that students are learning skills that are aligned with industry expectations and are provided with skills and tools that are relevant and practical. It is recommended to have a mix of practical and theoretical knowledge and assessments as it is important for holistic learning.

- Training delivery is very important to influence students' motivation for and success in completing the course. Well-qualified trainers who create a welcoming and warm learning environment is important. As is providing training for teachers/trainers to understand how to teach diverse students and go beyond the traditional teaching methods to be more relational and inclusive.

- Providing holistic support for the diverse needs and experiences of the students is important to encourage the completion of the training as well as producing successful outcomes in terms of job employment. Particularly, role modelling and mentoring were commonly cited as effective support

services for diverse students. Clear integration with industry will also help to ensure positive outcomes.

Diversity perspectives and experiences are important to consider so that training frameworks can be tailored to meet diverse needs to provide successful outcomes for minority groups. Considering and designing for diverse needs and perspectives will benefit all users.

- There is an opportunity for TTM training to be more inclusive of indigenous worldviews and diverse backgrounds. Specifically, providing resources in the students preferred language, and using culturally relevant materials and concepts to engage learners with the curriculum. This requires trainers to have a certain level of cultural competency.

- Compared to trade apprenticeships, TTM has quite a short training period, but mentoring could lead to better career progression and long-term retention. Māori and Pasifika specific mentors for each COE/region may ensure they succeed long-term into their career.

- The literature identified that the number of women in the construction industry is increasing. TTM is identified – including by female workers - as a strong well-paid entry position for women to enter the construction industry. However, the literature also identifies that women often have negative experiences within the construction industry, particularly around intimidation, sexual and verbal harassment. There is a need for the industry to recognise this, and inclusive policies and environments are important.

- Social procurement has the potential to stop temp jobs and ensure job security for ethnic minorities and people with disabilities, but it is noted that when creating these policies, it is important to consider indigenous worldviews and perspectives.

- The literature demonstrated that there is a small consistent difference in preferred learning approaches for women and men. Men tend to prefer learning concepts and relating them to the 'big picture' (abstract conceptualisation learning modes), meanwhile women tend to prefer experiential and action-orientated learning (concrete or active learning). However, the slight difference in preferred learning styles suggests that gender may not have as great of an influence compared to culture and experience. There is also a growing body of research that argues it is unhelpful to assign learners to groups or categories of 'learning styles'; suggesting instead that learners are very unlikely to have a single learning style. Other factors are potentially of more importance, such as focusing on the provision of timely and specific feedback to all learners.

In terms of **supporting school leavers to transition to vocational careers,** the literature discusses the importance of equipping school leavers with vocational careers information and support, and the important role that parents play in children's career decisions. It is crucial that parents have access to adequate resources to help their children make informed career decisions, particularly for parents with lower levels of education themselves.

4 Findings and Discussion

The following section presents the synthesized findings of this research, drawing upon insights gathered through the literature review, stakeholder interviews, and focus group discussions. These findings can be broadly categorised into the following themes:

- Ways of learning
- Learning and development barriers and opportunities
- Technology and innovation
- Encouraging people into the TTM industry

4.1 Ways of learning

In our stakeholder interviews and our focus group discussions, we sought insights on any difference in ways of learning (or learning styles) of different groups, focusing particularly on our priority groups of Māori, Pasifika, and women.

Of those interviewed, most agreed that Māori and Pasifika learners benefit from and thrive in a **tuakana-teina** environment. This is a concept from te ao Māori and refers to the relationship between an older (tuakana) person and a younger (teina) person. In teaching and learning contexts, this can include peer to peer, younger to older, older to younger, or able/expert to less able/expert. One interviewee noted that it does not matter what level each person is at, Māori and Pasifika people are more likely to benefit from this relationship, and from a group learning environment more generally, as this closely aligns with their culture and indigenous worldview. Another interviewee also stated the importance of having training staff and facilitators that are Māori and Pasifika.

Interviewees and focus group participants talked about the benefits of team and group working, particularly around the ability to work together and share from each other (**ako**). Focus group participants noted that sharing

> *"Having facilitators and other staff who are whakapapa Māori and Pasifika make a big difference to our Māori and Pasifika learners"*
> *Stakeholder interviewee*

knowledge from each other and not just being told how to do something by the trainer was important; this was the kind of learning environment the feel more comfortable in. Taking time to build relationships and trust was also noted as an important part of any learning; the importance of **whanaungatanga** should not be underestimated. However, one focus group participant identified that cultural principles are important, but that they need to be authentic: "*I'd rather it not be done if it's not authentic*". One interviewee also noted that Māori and Pasifika commonly learn through storytelling and sharing of concepts, which is often not provided for in our educational system.

Interviewees noticed a few differences in the way that women and men learn, although most agreed that these were not always apparent. Some of the differences identified were that women are often better at reading instructions and were more likely to provide more comprehensive written answers and have more confidence in a learning environment. One interviewee noted that in her experience, women preferred to work together in small groups, and would often communicate outside the classroom (e.g., on Facebook Messenger) to talk about work assignments. Several interviewees and some of the focus group participants also noted that women tend to feel more confident learning the operational aspects of the job (e.g., operating machinery) in virtual environments, rather than on the job. Comparatively, interviewees noted that male workers tended to have more confidence in the work environment (versus the learning environment) and applying for positions that they may not be fully suited to.

The literature demonstrated that there is a small consistent gender difference; female learners preferred active learning ('doing'), while male learners preferred abstract ideas and concepts ('listening and discussion'). However, the slight difference in preferred approaches suggests that gender may not have as great of an influence on learning styles compared to culture and experience. Furthermore, it is important to recognise that there is no discussion on preferred ways of learning of non-binary and other gender identities within this report.

The literature is careful not to generalise the preferred ways of learning of Māori, Pasifika, or female students, and it is also noted that some literature outlines that learners may not have a preferred learning style. Further, an emerging body of research has 'debunked the myth' that learners should be separated into groups based on learning styles, and outlines that educators should not make any predetermined decisions on how students may like to learn, as it can detract from positive educational outcomes. However, the literature does emphasise the importance of helping students (particularly those with learning difficulties) to develop effective study strategies and methods that suits their needs, and of providing timely and specific feedback to all learners.

4.2 Learning and development barriers

We focused on learning and development barriers for people going through TTM training, or vocational training more generally, with a particular focus on our priority groups (Māori, Pasifika, and women).

Numeracy and literacy levels (real or perceived) were identified by several interviewees as a significant barrier for learners, and it was agreed that this is most acutely experienced by Māori and Pasifika. This was also repeatedly discussed in the literature. It was noted that many of the people who enter TTM, or other construction pathways did not do well at school, or left school early, and entering a training course can be very daunting. The focus group participants supported this, also noting that they found the mainstream schooling system difficult, and it resulted in them having very low levels of numeracy and literacy. These participants also noted that their lack of numeracy and literacy skills make them feel nervous about signing up for any additional training through their work; they often have a fear of failure, especially when they have worked hard for the company and want to do well.

In terms of **culture**, a few interviewees identified that Pasifika workers are most likely to not question a decision that has been made by a superior, even if they know it is incorrect or unsafe, which can then create an issue for learning and for safety outcomes. Cultural difference also tends to come in when asking questions. Interviewees noted that Māori and Pasifika students are often scared to ask questions in person but might feel safer and more comfortable doing so in online learning environments.

Although online learning may then be considered an opportunity for better learning outcomes, **digital inequities** were also raised as a barrier. Online learning is increasingly used in vocational training, but several interviewees noted that not everyone is experienced in using digital devices. This might be due to the cost, as computers and technology are too expensive for many families, or age, as digital education is relatively new. Interviewees noted that there should be digital confidence building (training) before any online learning can be expected. If online learning is introduced without doing so, you run the risk of turning people off from learning.

The **mental load** was identified by several interviewees, and refers to the invisible, non-tangible tasks involved in running a household. This was mentioned particularly for women and how, in a learning context, it can have impacts on their ability to concentrate and on the time they have available outside of the classroom. Expectations of completing work at home can be overwhelming and difficult to complete alongside family commitments. This was also noted

"The intersectionality of culture and gender can create additional struggles"

Stakeholder interviewee

for Māori and Pasifika individuals who often have a high level of responsibility within their family environment; family is the number one priority. Pasifika and Māori women may then feel this mental load most keenly.

Common barriers to learning and development identified in the literature included **self-doubt** (lower career aspirations), **financial burdens, educational disadvantages** and **limited time dedicated to self-development** due to multiple responsibilities (e.g., home, part-time work, community work). TTM and other vocational pathways can create a good entry-level position for disadvantaged individuals, as they often provide additional supports (wrap around services) including tutoring and financial aid.

4.3   Learning and development opportunities

We also sought to understand the learning and development opportunities for people going through TTM training, or vocational training more generally, with a particular focus on our priority groups (Māori, Pasifika, and women). These can be broadly themed as opportunities around **ways of learning** and **learning content**.

In terms of **ways of learning**, section 4.1 noted that Māori and Pasifika commonly learn through storytelling and sharing of concepts, which is often not provided for in our educational system. Incorporating more aspects of this, for example through more group working and learning from each other, could support better learning outcomes for everybody.

In addition, and related to the points raised in the previous sections, one interviewee noted that training and learning can be daunting, and it is important to make people feel safe and positive about their learning journey. Before any training takes place, trainers and learners need to connect and build relationships and trust (whanaungatanga). Another interviewee also noted that trainers should see learners as individuals; a key factor in positive learning outcomes is having a teacher/ trainer that can recognise individual needs and requirements, and work with the learner to achieve. In practice, this might be as simple as having individual conversations about levels of numeracy and literacy, from the outset. The literature also discussed this, most notably around helping students with learning difficulties develop effective study strategies and methods that suits their needs. This also extends to understanding the past training and life experiences of the learners. For example, one interviewee commented that people come to the learning table with different life experiences, which can either help or hinder their training experience. Understanding and valuing those experiences could be important for supporting better learning outcomes. The literature review also identified that surf lifesaving does in part recognise prior academic work or working achievements as part of its qualification framework (e.g., through C.V., reference checks etc).

> *"Quite often, what is good for Māori is good for everybody in terms of education"*
>
> *Stakeholder interviewee*

As mentioned in previous sections, group learning is important. This also extends to **wrap around services** provided. Interviewees noted that group meetings allow learners to support and learn from each other. Focus group participants also talked about the important role of having a mentor while you are learning. The literature discusses how pairing students with a relatable mentor, role model (example of success) or support person in their field can support both personal and professional growth. Having a mentor can also help to break down learning barriers such as self-doubt and self-stereotypes.

> *"If you get paired with a good mentor when you're doing the practical work you'll learn far more, more quickly, than you ever will in a classroom"*
>
> *Focus Group participant*

One participant noted that the STMS/team leader and more senior members of the team are quite instrumental in creating a positive and safe learning environment for more junior staff, which suggests that leadership, teaching/mentoring, and people management training is important. Another participant commented that their STMS/team leader taught them everything they needed to know, but considered that training new people - particularly people who have not undergone any training, or do not speak English well- is a burden that can undermine the ability of STMS's ability to do their job and keep everyone safe. One participant highlighted that they enjoyed mentoring members of their team, and would like to be more formally recognised for this role.

In terms of **learning content**, the focus group participants provided several insights from their collective experience, including opportunities that could be realised for a new credentials framework.

A key discussion point was around learning opportunities to **better equip people for the on the job safety realities** of TTM. For example, participants commented that TTM was more dangerous than they had expected, or was suggested by their training, and that more focused training could added to the curriculum. Participants noted that this was around conflict from the public, operational safety and general on-site health and safety, and sexual harassment. In addition to general health and safety training, three suggestions were given:

1. More focus on de-escalation/ conflict management, as all attendees noted that abuse from the public was happening more frequently, and they often felt ill-prepared.

2. More training in harnesses on the setup trucks, to avoid accidents and injuries.

3. Participants agreed that there needs to be more training on sexual harassment. One male participant (a team leader) noted that harassment towards women from male colleagues can occur. This training should be both for women (what to do when it occurs) and for men (what is not appropriate in the workplace, and how to support and keep female colleagues safe etc).

Focus group participants also noted that refresher training courses are not always very good. They agreed that the training was not very effective at checking what people know / do not know, and that employers often sent people to refresher training when it was not needed. It was suggested that an initial assessment by the employer might help to determine whether the refresher training was required and if so, at what level.

Participants from all focus groups agreed that **practical learning** and assessments, rather than theoretical classroom learning, was the most enjoyable part of the training. One participant commented that even in the classroom it could be more practical by using videos or live footage to demonstrate a training aspect. This also corresponds with earlier sections around numeracy and literacy skills and that a lot of TTM trainees are more practical by nature and have better outcomes when 'learning by doing'. Several of the interviewees agreed with this, with one noting that if we can capture learning in a practical way rather than a theorical way, it demonstrates that the task is understood and able to be performed. This differs from theory, which can be learned by rote, but not truly understood in application. This was reinforced in the literature, which noted that that practical application of learnings has been shown to enable people to remember 90% of what they are taught, compared to 50% of theory.

In addition, focus group participants noted that on the job training opportunities were helpful, but not always widely available; it tends to vary widely across organisations. Interviewees and focus group participants mentioned the importance of learning life skills alongside work skills; for example, increased numeracy or literacy, or knowing how to have a telephone conversation. Focus group participants also mentioned that on-site they are required to fill in paperwork on an electronic tablet, and many of them did not know how to use these. Learning these skills also tends to have broader outcomes, as they have the potential to also impact and benefit whānau.

In terms of opportunities for the priority groups (Māori, Pasifika, and women), several interviewees and focus group participants agreed that it was important to have training materials that learners can see themselves in. For example, pictures of Māori, Pasifika, and women working in TTM, and avoiding the use of he/him pronouns. Focus group participants also mentioned a monthly Māori leadership courses that an STMS can attend, and how valuable this opportunity is, noting that it should be supported and delivered across the industry.

4.4 Technology / innovation

We investigated the role of technology or innovation in learning and development, in TTM and in vocational training more generally.

Several interviewees and focus group participants talked about the role of **simulation / virtual reality (VR)** in TTM training. Participants agreed that VR tools can be helpful, and can make the course more interesting and practical, for example, using a driving rig to experience the site from different drivers' perspectives, and checking lane widths. An interviewee also noted that a gamification aspect for the training might appeal to a wider group of people and encourage more into TTM. One interviewee also noted that they had some experience with using VR and thinks it works particularly well in remote areas to deliver training. However, all interviewees agreed that VR is very expensive to operate, and it is much cheaper to take people out to site. If funding was available, that would make VR more feasible.

A few interviewees mentioned that their respective organisations were trying to incorporate more **technology into learning design**. For example, a mobile app that assists with their learning journey, including a function to transcribe speech to text, so that the learner does not have to write everything, and a function to upload photos and videos, so they can show their work in an alternative way. This interviewee added that vocational training models are moving towards these alternative ways of receiving information, as well as determining what information can then be accepted for assessment, which is a move away from solely written assessments.

As mentioned previously, **online learning** does provide an opportunity for better learning outcomes, but digital inequities can be a barrier. Online learning is increasingly used in vocational training, and several interviewees noted that school leavers are now used to learning from digital sources, particularly post-COVID 19 lockdowns, and may not do as well with traditional 'book' learning and written assessments. Interviewees and focus group participants agreed that there should be some digital skill aspect to training, noting that it also gives learners an opportunity to do more self-directed learning and the ability to learn at their own pace; for example, if they can look at the learning after hours/ once the course is completed. However, digital inequities should not be underestimated. As previously mentioned, digital confidence building (training) should be included as part of the course, and training establishments/ tutors may need to supply computers. There should not be an expectation that learners are already digitally literate, or that they have easy access to a computer or digital device. Similarly, the mental load as described previously should be taken into account; online learning can contribute to a culture of, or perceived pressure to do, work outside of class time, which may be difficult for those with family and domestic responsibilities.

The literature demonstrated that interactive technology combined with collaborative learning formats (e.g., peer or group discussion) is a highly effective tool for learning and knowledge retention for socio-economically disadvantaged students. Interactive technology and learning formats may help students that have challenges with self-directed learning or are unable to dedicate adequate time to study and understand concepts outside of class (e.g., because of part time work, household responsibilities). These students are proportionately more likely to come from socio-economic disadvantaged environments.

In addition, the literature highlighted that technology can be used to monitor student engagement levels through predictive analysis (e.g., GPS Advising) and pair low engagement individuals with support mentors to help re-engage students in classwork. Therefore, technology can benefit both learners and their teachers

as it can help to identify struggling students early that may require additional support. However, it should be noted that communicating with learners directly may be more effective in smaller classrooms, to create stronger relationships and trust between the teacher and learner.

4.5 Encouraging people into the TTM Industry

In both our stakeholder interviews and in our focus groups we investigated the ways in which people are encouraged into the TTM industry, and if there is more that can be done in this space.

All stakeholder interviewees and focus group participants agreed that more can be done to encourage school leavers into TTM training and into the industry more broadly. Focus group participants noted that TTM was not mentioned to them or introduced as an option while they were at school. For the most part, these participants found out about TTM through their whānau or friends.

Stakeholder interviewees and focus group participants did provide a few suggestions on how best to **encourage more school-aged children**, and especially those in high school into the TTM industry. One interviewee recommended that it should be pitched as a career, not just a job, because TTM has excellent career opportunities, including progression to management and opportunities to make a solid income. This is especially the case for those for whom university is not an option, due to cost or academic performance. Another interviewee suggested that trainees should go into schools, even as early as year 7 and 8, to show children the industry and the opportunities it has. It is important to put forward trainees that students will 'see themselves in', for example the priority groups of Māori, Pasifika, and women. Some initiatives for high school students were described by way of example. 'Girls with Hi Vis[1]' (Connexis) was one initiative; aimed towards senior high school girls, the programme gives female students the opportunity to gain hands-on experience, hear from inspirational women in the industry and learn what a career in the infrastructure sector is like. Focus group participants suggested that the TTM industry could attend career expos or work with schools to provide work experience. One participant commented that their company already provides work experience to some school students, and it seems to work well.

Although it was recognised in the stakeholder interviews and in the focus groups that there are increasing numbers of **women in TTM**, it was agreed that it is still overwhelmingly seen as a male industry. This can be hard for the women already working in TTM, but also may have an impact on the number of women who enter TTM training. For example, one female focus group participant highlighted that the lack of toilets for women out in the field is an issue. It was not always practical to tow a portaloo around, so women typically drive to a public toilet when they need to use the bathroom. Given that many women enter TTM because they are encouraged by whānau or friends, anecdotes like this from people they know may stop women from signing up.

Focus group participants also noted that there should be **more public awareness and education** on TTM, for example on social and mainstream media. This is not just to encourage people into the industry, but also to help with the increasing conflict and abuse that workers receive. One participant suggested that more detail on TTM, specifically its role and why it is important, should be included in the road code or in driver education. Similarly, a participant from a high tourist area highlighted a lack of understanding of New Zealand's roads from international visitors, and the safety implications of this. He suggested that there could be more done to inform and educate these drivers on TTM and road safety in general, before being able to hire a vehicle.

The literature emphasises that greater effort needs to come from businesses and industries to educate school leavers, teachers, and other advisors of potential career opportunities in their fields. Additionally, the literature showed that parental figures have an important role to inform and support their children to find

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[1] https://www.connexis.org.nz/girls-with-hi-vis/

appropriate career pathways, as children commonly ask their parents for help in deciding career options. To raise awareness of careers in TTM, schools, industry and other educational institutions should collaborate and work together to provide workshops and programs to educate parents and school leavers on opportunities within the industry.

4.6   Summary

The table below summarises the synthesized findings of this research. Further detail can be found in the previous sections of this report.

Themes	Summary of findings
Ways of learning	- Māori and Pasifika learners often benefit from and thrive in a tuakana-teina environment and a group learning environment more generally, as this closely aligns with their culture and indigenous worldview. - Focus group participants noted that they felt most comfortable in a learning environment where they could share knowledge with each other, rather than just being told how to do something by a trainer. - Gender may not have as great of an influence on preferred ways of learning compared to culture and experience. - The literature highlights the importance of helping students (particularly those with learning difficulties) to identify and develop effective study strategies and methods that suits their needs. - Not all learners will have one preferred way of learning, and it can be unhelpful to assign learners to groups or categories of 'learning styles'. Other factors are potentially of more importance, such as focusing on the provision of timely and specific feedback.
Learning and development barriers	There are many identified learning and development barriers for people going through TTM training, particularly for Māori, Pasifika, and women: - Real or perceived lack of literacy and numeracy skills – this is most acutely experienced by Māori and Pasifika and can affect confidence in entering a training course. - Culture – Pasifika workers are most likely to not question a decision that has been made by a superior, even if they know it is incorrect or unsafe. - Digital inequities - not everyone is experienced in using digital devices, or has access to them to complete online training. - Mental load, the invisible, non-tangible tasks involved in running a household, were often mentioned by women as a barrier to their learning, particularly outside of the classroom. - Limited time to dedicate to self-development, self-doubt, financial burdens, and educational disadvantages were also reported.
Learning and development opportunities	The research highlighted opportunities to enhance learning and development for Māori, Pasifika, and women going through TTM training. - Creating a safe, supportive, and collaborative group learning environment – incorporating more group working and learning could support better learning outcomes, particularly for Maori and Pasifika. - Trainers can be a key factor in positive learning outcomes. Ideally, they should be well qualified and well connected to the industry, reflect the diversity in the workforce and create a positive learning environment, including recognising individual needs and experiences, working with students to achieve, and modifying their practice where necessary.

Themes	Summary of findings
	- Providing wrap around support for those that need it - mentors were commonly cited both in the literature and by research participants as an effective way to support personal and professional growth, and break down barriers to learning. - More practical learning and assessments – a lot of TTM trainees are more practical by nature and have better outcomes when 'learning by doing'. - More training focused on better equipping people for the on the job safety realities of TTM – particularly including operational training elements, conflict management, and sexual harassment. - Increasing opportunities for more on-the-job training, and 'life skills' training that can help people to do their jobs better and progress in their careers. - Individualised training programmes – refresher training is not always needed/valuable or offered at the right level. - Providing training materials that reflect the cultural diversity of the workforce.
Technology/ innovation	- Interactive technology combined with collaborative learning formats (e.g., peer or group discussion) is a highly effective tool for learning and knowledge retention for socio-economically disadvantaged students. - Technology can also be used to monitor student engagement levels through predictive analysis and pair low engagement individuals with support mentors to help re-engage students in classwork. - Simulation / virtual reality and gamification could make TTM training more interesting, and appeal to a wider group of people. However, all interviewees agreed that VR is very expensive to operate, and it is much cheaper to take people out to site. - Online learning is increasingly used in vocational training, and organisations are trying to incorporate more technology into learning design. However, digital competency and inequitable access to devices (e.g., tablets) can be a barrier to this form of learning. - Interviewees and focus group participants agreed that there should be some digital skill aspect to training, noting that it also gives learners an opportunity to do more self-directed learning and the ability to learn at their own pace.
Encouraging people into the TTM industry	- More can be done to encourage school leavers into TTM training and into the industry more broadly. Some initiatives for high school students were described by way of example, such as 'Girls with Hi Vis'. - Focus group participants suggested that the TTM industry could attend career expos and/or work with schools to provide more work experience opportunities. - When visiting schools, one interviewee highlighted the importance of putting forward trainees that students will 'see themselves in', for example the priority groups of Māori, Pasifika, and women. - Several research participants thought that TTM should be pitched as a career, not just a job, because TTM has excellent career opportunities, including progression to management and opportunities to make a solid income. - Greater effort and collaboration is needed between schools, businesses, industry, and other educational institutions to educate school leavers, teachers, parents, and other advisors about TTM careers. - There should be more public awareness and education on TTM, for example on social and mainstream media. This is not just to encourage people into the industry, but also to help keep people safe, and address the increasing conflict and abuse that workers receive.

5   Conclusions and Recommendations

This research has comprised engagement with the industry and a review of the literature to help understand how an improved TTM Credentials Framework could more adequately addresses the unique needs of the TTM industry and its diverse workforce, and enhance training, competency, and safety outcomes for the TTM industry in New Zealand.

We explored if / how learning styles differ among different groups, the learning and development barriers and opportunities for people going through TTM training, particularly for Māori, Pasifika and women, the potential role that technology could play in an improved TTM training framework, and how the industry might encourage more people to pursue TTM careers. Based on the findings, we have made the following recommendations for the TTM Credentials Framework Governance Group.

5.1   Design of training programmes

- **Provide training methods that reflect the cultural diversity of the TTM workforce** – using culturally relevant concepts will help to engage learners with the curriculum. This could include framing ideas and concepts and providing examples that are relevant to learners' day to day lives, and including more visual and story-based learning. Collaborative learning techniques that involve problem solving as a group is important. Learning environments should also be welcoming and encouraging of students' whānau, as this can aid in students learning and help teachers to learn about the different worlds the student is a part of. The engagement of iwi and other cultural experts in the development of the TTM credentials framework would help to instil support from and enhance connections with Māori and Pasifika communities.

- **Provide access to digital devices for training purposes** – this will help to help to address digital inequities and improve digital skills which will support further career development. This will need to be undertaken alongside digital skills training, as identified above.

- **Incorporate frequent group meetings for trainees to support each other in their learning** – the research highlighted the importance of creating a safe, supportive, and collaborative learning environment that helps to create whanaungatanga, particularly for priority groups.

- **Provide additional learning opportunities and formal recognition for experienced TTM workers to develop their mentoring skills –** more senior/experienced team members often play a valuable teaching / mentoring role in their team; however, this is not always formally recognised or provided for.

- **Embed numeracy, literacy, and digital skills in the training programme** – this will help to lift the knowledge and skills of workers and address barriers to further career development. This could be provided through a third party that specialises in numeracy and literacy training (e.g., Upskills[2]).

- **Increase opportunities for more on-the-job training, and 'life skills' training** – additional training and certification can help TTM workers to do their jobs better and progress in their TTM careers. This may include things such as using the telephone, or electronic tablets to complete paperwork on site.

- **Provide training materials that reflect the cultural diversity of the TTM workforce** – this could include providing resources in the students preferred language (translated materials), the use of Māori and Pasifika concepts and values, and should also include profiling workers in TTM training

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[2] https://www.upskills.co.nz/

materials that students will 'see themselves in', for example the priority groups of Māori, Pasifika, and women.

- **Better equip people for the on-the-job safety realities of TTM –** specifically, ensure that the training programme includes training on de-escalation/ conflict management, relevant operational training (e.g., harnesses on the setup trucks), and sexual harassment.

- **Continue to incorporate technology into TTM training –** this could include the use of mobile apps to support the learning journey (e.g., to transcribe speech to text), incorporating videos or live footage into the classroom, more online learning opportunities (alongside access to digital devices and increased digital skills training), and the use of VR. It is recognised that VR is expensive to acquire and operate, so funding opportunities may need to be sought to incorporate this into a TTM credentials framework. The literature demonstrated that interactive technology combined with collaborative learning formats (e.g., peer or group discussion) is a highly effective tool for learning and knowledge for all groups, but particularly those with learning challenges.

- **Exploration of what information can be accepted for assessment –** this research found that practical learning and assessments, rather than theoretical classroom learning, was the most enjoyable part of the training. Engagement also identified that if we can capture learning in a practical way rather than a theorical way, it demonstrates that the task is understood and able to be performed. A move away from solely written assessments should be explored.

- **Consider incorporating a graduation or celebration that involves whānau and community** – inclusion of whānau and community in students learning and educational attainment is particularly important to Māori and Pasifika, and recognises that education has both individual and communal benefits.

5.2 Wrap around services

- **Identify individual learning needs and requirements and provide wrap around support services for those that need it –** specifically, offer a mentor, support person or 'buddy' to induct and train new TTM workers that the trainee can 'see themselves in', and/or provide individualised training that meets the students' needs. These wrap around support services should identify and recognise students emotional and spiritual needs as well as their academic needs and are important for those undertaking their initial TTM training, and for those that are completing additional TTM training at work (on the job training). These services could be provided at an organisational level, although may be more effective at an industry-wide level.

- **Educate trainers to accommodate for cultural diversity and different ways of learning –** teachers should be given the skills and training to provide multiple ways to access learning, such as using every day observations, hands on demonstration, and storytelling. Taking time to build relationships and trust is as an important part of any learning; the importance of whanaungatanga should not be underestimated. It is also important for teachers to recognise their own worldviews and how that impacts the way they teach. Learners who feel trusted by their teachers/ trainers or in their workplaces are more likely to feel more comfortable or empowered to ask questions or to identify issues, such as safety deficiencies, and also to explore different ways of learning.

- **Identify opportunities for increased cultural competence for non-Māori / Pasifika learners -** given the numbers of Māori and Pasifika people that undertake TTM training and enter a TTM career, it is important for fellow learners and colleagues to have a level of cultural competency. This could include incorporating language (e.g., te reo) into the curriculum, or by providing additional time for relationships and trust to be built (e.g.. through whanaungatanga). As above, learning

environments that welcome and encourage students' whānau are important, and can help other students (and teachers) learn about the different worlds the learners are part of.

5.3   Encouraging people into the TTM industry

- **Develop an initiative/s to attract more school students to a TTM career –** this should pitch TTM as a career, not just a job, with excellent career opportunities, including progression to management and opportunities to make a solid income. Public-facing representatives of the industry should reflect the social and cultural diversity of the TTM workforce, for example Māori, Pasifika, and women. Having a clear professional or vocational focus also enables students to understand how their role could affect their community, and affirms their role in it, which is of interest to cultures with a strong community focus, such as Māori and Pasifika.

- **Increase public awareness and education on TTM –** this is not just to encourage people into the industry, but also to help keep people safe on the roads, and address the increasing conflict and abuse that workers receive.

- **Improve conditions for female TTM workers –** specifically, ensure women have good access to a toilet while out in the field. This may require monitoring, to determine the extent of this issue across the industry, and the provision of support for employers/ training providers to implement appropriate facilities. The timing and structure of any training programme should also recognise and account for childcare responsibilities and allow flexibility where required. This is likely to benefit female trainees more, as they are typically the primary caregivers and/or household managers.

- **Conduct further research to understand the unique needs of people within the TTM industry –** specifically, their experience working in the TTM industry, and how training, competency, and safety outcomes, as well as any contractual issues such as pay equity or contractual model could be improved. The introduction of an annual (or regularly occurring) survey for all those within the TTM industry could explore these issues and provide a foundation for this research. Considering and designing for diverse needs and perspectives will benefit all users.

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Appendix A – Literature Review Tables

Literature Review

Current State

Temporary traffic management training in New Zealand

Table 1: Literature relating to temporary traffic management in New Zealand.

Citation	Subject	Argument	Country
Waka Kotahi New Zealand Transport Agency (2019), *Training and Competency Model: Temporary Traffic Management*, V5.3	The document explains the training and competency model under the Code of Practice for Temporary Traffic Management (CoPTTM). The model provides an explanation of the key roles within TTM, the learning blocks required to reach them and an in-depth profile of objectives and expectations of knowledge within each role.	• Under the CoPTTM, Waka Kotahi is responsible for setting and monitoring the training and assessment requirements, including several core activities: - Developing training and assessment materials - Moderating training and assessments - Issuing warrants for TTM roles including trainers, assessors, and mentors - Setting and collecting registration fees. **Theory-based training:** • General Worker course (recommended) – 3 hours - Assessed through Unit Standards 31957. • TTM Worker course (prerequisite for TMO) – 1 day - Assessed through Unit Standards 31958. • 2 Part Course to get TMO role • TM Operative (non-practicing) theory – 1 day - Assessed through Unit Standards 31959 and results in a NZTA-warranted qualification. • Universal site traffic management specialist (STMS-U) – Non-practicing warrant – 2 day – Assessed through Unit Standard 31961. • Site Traffic Management Specialist – Category A/B – Non-practicing warrant - 1 day for Cat. and half a day for Cat. B– Assessed through Unit Standard 31962 and is a Waka Kotahi NZTA Warranted qualification. • STMS-A (NP) and STMS-B (NP) are commonly offered as a single course in which the participant can complete one or both qualifications (i.e., Parallaxx, TTM Training and Compliance).	New Zealand

Citation	Subject	Argument	Country
		• Site Traffic Management Specialist Category A/B (STMS-A and STMS-B) – Practicing/Full warrant – one day practical assessment (100% practical) - Assessed through Unit Standard 31963 and is a Waka Kotahi NZTA Warranted qualification. • Site Traffic Management Specialist Category C – Non-practicing warrant – one day knowledge workshop (100% theory) – Assessed under Unit Standard 31962 and is a Waka Kotahi NZTA Warranted qualification. • Site Traffic Management Specialist Category C (STMS-C) – Practicing/Full warrant – one day practical assessment (100% practical - on-job coaching from a TTM mentor) - Assessed through Unit Standard 31963 and is a Waka Kotahi NZTA Warranted qualification. **Practical-based training:** • TM Operative – Practicing/Full Warrant – half day per road category (A/B/C) - assessed through Unit Standards 31960 and is a Waka Kotahi NZTA-warranted qualification. • Site Traffic Management Specialist Category A/B (STMS-A and STMS-B) – Practicing/Full warrant – 1 day practical assessment - Assessed through Unit Standard 31963 and is a Waka Kotahi NZTA Warranted qualification. • Site Traffic Management Specialist Category C (STMS-C) – Practicing/Full warrant – 1 day - (on-job coaching from a TTM mentor) - Assessed through Unit Standard 31963 and is a Waka Kotahi NZTA Warranted qualification. **Theory and Practical training:** • Site Traffic Management Specialist Mobile – Non-practicing warrant – 1 day theory and practical assessment - no current NZQA unit standards.	
Civil Contractors New Zealand (Dec 22, 2022), *Recognition, qualifications on the way for NZ road workers*	The article discusses the possibility of formal qualifications being created for temporary traffic control training.	• Currently, Waka Kotahi uses a warrant system to recognise the competency and skills of TTM workers. • However, the skills and achievements of TTM workers are not internationally recognised in formal qualifications (they receive NZQA credits but not a formal qualification).	New Zealand

Citation	Subject	Argument	Country
		• The Temporary Traffic Management Credential Framework Governance Group has been established to align temporary traffic control training with formal qualifications through the New Zealand Qualifications Framework (NZQF). • Civil Contractors New Zealand Technical Manager Stacy Goldsworthy[3] chosen to chair the 14-person governance group, to create a TTM Credential Framework aligned with both industry training practices and nationally recognized qualifications. • The group will develop better training pathways and nationally recognized qualifications based on training and competency requirements. • Once the credential framework is drafted by the group, it will be submitted to stakeholders for wider consultation then aligned with NZQF.	

Temporary traffic management reform

Table 2: Literature relating to temporary traffic management reform in New Zealand.

Citation	Subject	Argument	Country

Stella, T & Greaves, N (2015), Raising the bar in CoPTTM Training, 2015 TTM Conference, Taupō	This presentation contained brief suggestions to help provide higher quality training under the CoPTTM.	• To improve overall training experiences and trainer competency to ensure each student is trained with the knowledge and skills required.
		
		Trainer
		
		• Firstly, it was suggested that groups of trainers within a region (Centres of Excellence (COE)) should work together to uplift the quality of TTM training.
		   o The groups could meet 2-3 times per year to discuss:
		      ▪ challenges and gains
		      ▪ establishing RCA local requirements
		      ▪ mentoring
		      ▪ options for delivery
			New Zealand

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[3] Stacy Goldsworthy was the Technical Manager at the time this article was written (2022).

Citation	Subject	Argument	Country
		▪ moderation ▪ proposes to change training material to NZTA • The CoPTTM Governance Group Meeting Minutes 2018 discuss that the implementation of this system in Auckland, Hamilton, Wellington and Napier had positive results, and it was posited that trainers should attend COE meetings, once they are occurring in all regions. Minutes stopped in December 2018, so it is unclear if the meetings progressed to other regions. • There should be a moderation or audit report to ensure the trainer is facilitating training to a high standard under the CoPTTM. • Course evaluations should be introduced as a part of the COE programme, to give feedback on the trainer and identify areas of weakness that may need improvements. **Training** • Recommended increasing locations and duration of courses throughout the country. • Recommended increasing length of refresher courses from one day to two and require an 80% pass mark. • All trainers must use NZTA-approved course presentations. • Increased use of visuals and terms used in CoPTTM throughout training presentations. • Smaller group sizes (e.g., 15 preferred, 18 maximum) as they are better for learning, and can provide better learning outcomes. • All workshop participants must have the CoPTTM handbook during the training (either print or electronic).	
Ministry of Business, Innovation and Employment. Construction Sector Accord (2021, Nov 3), *The Reform of*	This presentation explains how the Reform of Vocational Education (RoVE) has a greater focus on creating relationships with employers to ensure they are providing sufficient training and	• Under the RoVE, all polytechnics across New Zealand are amalgamating into *Te Pūkenga – New Zealand Institute of Skills and Technology*. • The reform intends to create a united voice to ensure workers obtain necessary knowledge and skills that employers value and require.	New Zealand

Citation	Subject	Argument	Country
Vocational Education and the construction sector, [Video]. YouTube	skills to students throughout the country. The panel includes experts from central government, the construction industry and tertiary education providers.	• A single institute creates an easier opportunity for the industry to engage with vocational education providers throughout the country. • In the past, employers have not received much support to train their staff. This reform will help provide support to employers in the provision of high-quality training for their workers. • Normally work based learning, campus learning, digital learning are all pitted against each other, but this reform helps them work together.	
Te Wānanga o Aotearoa, (13 September 2021), *Understanding the Review of Vocational Education (RoVE)*	The article briefly explains what the RoVE reform means for vocational education and how it will impact Māori and businesses throughout the country.	• The Vocational Education and Training Reform amendment act came into effect on April 1st, 2020. • The reform focusses on having greater involvement from industries and employers to ensure appropriate training content and context is given to create strong future workers. • Practical work experience will become a larger part of vocational training. • The reform also creates an opportunity to provide culturally responsive teaching and learning for Māori and Pasifika and provides better support for Māori-lead businesses and iwi development.	New Zealand
Goldsworthy, S. (Jul 7, 2022). *Temporary traffic management – what you need to know*, Civil Contractors New Zealand	This article provides a summary of changes with the transition under the new NZGTTM.	• There is overwhelming support that TTM needs to be a career opportunity supported by long-term competency training and recognition of achievement and competence. • An NZQA framework should be required for the TTM industry. The opportunity needs to be inclusive to all and will require training support structures and different training outcomes such as adult learning to uplift the standard of training and competency across the industry. • Civil Contractors NZ collaborated and helped to form an advisory group of industry experts to develop a framework alongside industry, which enables those entering into the industry to have a clear pathway for career progression.	New Zealand
Waka Kotahi New Zealand Transport Agency (2023), *New Zealand guide to*	The guide supports system-level changes to TTM that Waka Kotahi deems necessary for all parties involved in the transport sector to achieve the	• Waka Kotahi is transitioning to a new process as it changes from CoPTTM to the New Zealand Guide to Temporary Traffic Management (NZGTTM). • The guide was recently published and open to the public in April 2023.	New Zealand

Citation	Subject	Argument	Country
temporary traffic management	goals of the Road to Zero New Zealand Road Safety Strategy.	• The reform places a greater focus on the risk assessment and planning stages of TTM compared to the CoPTTM. This risk-based approach encourages greater responsibility, ensure peoples' safety and awareness of risks before setting up on-site. • *'Training will eventually become industry-led and provided by vocational education organisations. For the purposes of Version 1 of the NZGTTM the current Training and Competency Model (V5.3 August 2019) from Waka Kotahi remains live and usable to support training requirements.'* (pp. 58).	
Waka Kotahi New Zealand Transport Agency. (2023, May 11), *TTM webinar 11 May 2023*, [Video]. YouTube	This webinar provides an update on the TTM industry steering group, how training and competency is changing and explains the next steps into the transition of the NZGTTM reform.	• The purpose of the TTM Steering Group is to connect and represent people in the TTM industry, to 'provide guidance and enable aligned decision making' to meet requirements under the Health and Safety at Work Act (2015)'. • Waka Kotahi wants to replace the 'warrant' system with an alternative that is created by the industry-led steering group. This pathway has not been decided yet, but the steering group will decide how each warrant is translated into the new NZGTTM micro-credential system. • The group wants to issue a unit standard (NZQA) to replace each Waka Kotahi warrant before a micro-credential is created. • The publishing of the NZGTTM does not create any immediate changes to the current training system. The change to training will be gradual and tested with TTM trainers and mentors.	New Zealand

International examples of temporary traffic management training

Table 3: International examples of temporary traffic management training

Citation	Subject	Argument	Country
Traffic Control Training Course Overview V1.3 May 2016, Roads & Maritime	Description of different trainings within two states in Australia	• Each state runs their own training and certification programme. • Three workshops: Traffic controller (Stop/go operator), Implement Traffic Control Plans (set up and work with Traffic Control Guidance Schemes/Traffic Control Plans at a work site) and Prepare a Work Zone Traffic Management Plan (design new management plans, produce major upgrades of standard plans and/or inspect traffic control plans on any road construction). Assessments are both practical based and theory based. E.g., theory questionnaires and activities during workshops, on the job practical application and observation, development of plans, etc.	Australia
Canadian Centre for Occupational Health and Safety. (Sept 14, 2017). *Road work – Traffic control person*	A Canadian government website explaining the general role and training required for a Traffic Control Person in Canada.	• Training is required to work in traffic control in most provinces and territories (Nova Scotia and the Canadian Federal jurisdiction's do not address traffic control training). However, each jurisdiction has specific requirements that are unique to the region. • For example, Ontario requires that employers provide each control person adequate oral and written instruction in a language they understand before performing traffic control duties. • In contrast, the Northwest Territories delegates the task of ensuring competency and training to the employer.	Canada
Skills Training Centre (2019), *LANTRA: Highways Sector Scheme 12D*	This document specifies the training and assessment standards under the LANTRA National Highways Sector Scheme in the United Kingdom.	• There are 10 different training units in total. All include assessments which range between a half day up to three days. These assessments are a mixture of theoretical and on-site. • Each training unit has a unique set of pre-requisites, and some do not require any previous knowledge. • TTMBC is the entry level course. TTMBC to T6 are a progression from the previous workshop; therefore, you need to do the previous workshop to get into the next one.	United Kingdom

Citation	Subject	Argument	Country
		• Each workshop is based on different road environments/conditions such as differing speeds and carriageways, and activities being undertaken such as pothole repair, street lighting maintenance, and stop and go etc. • Assessments are undertaken by accredited assessors. • Recertification occurs every 5 years and there is a short refresher session to each relevant training session.	

Institute of Highway Engineers (2019), Temporary Traffic Management (Certificate)	This website provides information (e.g., duration, content and examination type) for a Temporary Traffic Management (certificate) at the Institute of Highway Engineers at training facilities in Birmingham, United Kingdom.	• This certificate is an extension of the LANTRA qualification and for those that have vast practical experience in TTM. Compared to the LANTRA system, it provides a more formal qualification. Alternatively, you can also earn a diploma from the same institute if you make a portfolio.
		
		• The training focusses more on theoretical knowledge about TTM and includes theoretical assessments.
		
		• This qualification helps give a person more credibility when approving plans and other documentation to clients.
		
		• The training is aimed at businesses or authorities who are involved in:
		   o Managing the efficient movement and safety of traffic on clients' highway networks.
		   o The development and planning of highway maintenance and improvement construction.
		   o The design and implementation of improvement schemes on highway networks, including the motorway and trunk road network on behalf of clients.
		
		• Planning temporary traffic schemes for events and other non-construction related changes to the highway network.
			Birmingham, United Kingdom

Worksite Safety (2023). *Traffic Control Person Online Training*.	This website provides a description of an online traffic control training course in Canada.	• Most training is delivered as online courses (fully online). • Affordable pricing averaging $49.95 Canadian dollar per person (60.96 New Zealand dollar).	Canada

Citation	Subject	Argument	Country
		• Training includes five chapters and a final exam. • Online training can be paused and resumed at any time. • This beginner training is accepted across Canada – although additional courses or on-site training for different regions may be required. • Can apply for supplementary on-site training.	
Association Quebecoise des Transports (2023), *Traffic Control Person*	This website provides information (e.g., duration, content, and examination type) for an online Traffic Control Person course supplied by the Quebec Transportation Association in Canada.	• Before undertaking this course, the Commission for Standards, Equity, Health and Safety at Work (CNESST) require that participants undertake the *Health and General Safety on Construction Sites* online course (30 hours). • Once the training is activated, the participant has a year to complete the training and undertake an exam at an approved service point or online. • Duration of Traffic Control Person training program is 3 hours. • Renewal period every three years. • Learning points: o Describe what is a Traffic Control Person on roadwork sites. o Identify the key elements of roadwork sites. o Differentiate mandatory, recommended, and prohibited equipment of the Traffic Control Person on roadwork sites. o Choose a safe area where to stand. o Select appropriate signals and communication modes according to clientele. o Recognize special circumstances. • The website uses masculine pronouns (e.g., he, his) to describe a person undertaking the training process.	Quebec, Canada
American Traffic Safety Services Association (2023). *Training and products: For the roadway safety industry*	This website provides information (e.g., duration and content) on the different TTM courses offered by the American Traffic Safety Services Association (ATSSA).	• In America, each state has different training requirements, and some have state-specific courses (e.g., Virginia Basic Training (1 day/8 hours), Washington State TCS (3 days/24 hours). • The American Traffic Safety Services Association (ATSSA) runs a mixture of online and in-person courses (most entry courses are online).	United States of America

Citation	Subject	Argument	Country

		• In some states the ATSSA is not recognised as an authorised training provider for all training courses. For example, in Maryland, the ATSSA is only a recognised provider for flagger training.
		
		• Workshop duration is between four hours to 2.5 days depending on the qualification you need. There is a course that is for a type of road/zones, for example, the Urban Work Zone Design Course.
		
		• A grade of 80% or better is required to gain the qualification.
		
		• The assessments are based on theoretical knowledge gained from the course which includes:
		
		For the Truck-Mounted Attenuators (TMAs) course:
		
		  - Application of the TMAs including, federal standards and guidelines, types of highways and lane closures, uses and positioning of the TMA etc.
		
		  - Operation of the TMAs including, different types of TMAs, crash-testing requirements, components of the TMAs etc.
		
		  - Personal safety considerations such as, PPE gear, equipment storage, entering/existing TMA and traffic.
		
		  - TMA operator responsibilities such as inspection of the TMA and operational checks.
		
		• Recertification occurs every 4 years.
		
		• For Traffic Control Technician (TCT) you need 2,000 hours experience to become qualified.
		
		• For Traffic Control Supervisor (TCS) you need 4,000 hours experience to become qualified.	

Austroads National Training Framework for Temporary Traffic Management	Sets out the requirements of the National Training Framework for Temporary Traffic Management	The National Training Framework is designed under the Vocational Education and Training (VET) framework based on Skill Sets and Units of Competencies and provides: • graduated learning across Temporary Traffic Management categories • greater opportunities and a more structured genuine career path	

Citation	Subject	Argument	Country
		• theoretical (classroom) and practical training • mutual recognition - individuals who have successfully completed the training requirements in one state/territory will have this training recognised in another participating state/territory. It notes that there may also be additional localised training requirements. Training requirements • There are three core roles [Traffic Controller, Traffic Management Implementer, Traffic Management Designer]; the role and where the work is being undertaken including its complexity determines the temporary traffic management category of training required. • There are eight temporary traffic management national training programs across the core roles and temporary traffic management categories. The programs comprise Skill Sets, Units of Competency, responsibilities of the different parties, and the Austroads temporary traffic management national training material. • Mutual Recognition of an Individual's Temporary Traffic Management Qualifications Across Jurisdictions: Individuals who have achieved a relevant temporary traffic management qualification (i.e. Statement of Attainment) will be mutually recognised across participating states and territories. There may be additional requirements in states and territories specific to the jurisdiction, for example, different personal protective equipment requirements. This aims to make it easier and more efficient for individuals when moving from one state or territory to another. • Individual Entry Requirements: Apart from the jurisdictional 'white card', there are no entry requirements for individuals who wish to attend a training course to become a Traffic Controller or Traffic Management Implementer for category 1 environments. There are entry requirements to become a Traffic Management Designer working in category 1 environments, and before a person can attend a training course to work in more complex environments. These entry requirements pertain to the practical experience of an individual. This	

Citation	Subject	Argument	Country
		aims to achieve a nationally consistent set of training entry conditions and ensure only people with appropriate qualifications and experience can be trained in the more complex TTM environments. • Theory and Practical Learning: An individual will be required to undergo theory (in-class/face-to-face) training, and successful assessment, before being permitted to undertake practical learning. Successful assessment in this practical learning is then required before being approved. This aims to ensure that individuals gain sufficient practical experience before working independently. The graduated training approach, which requires individuals to build up their skills and experience before they undertake qualifications to work in more complex environments, is also designed to enhance safety.	

Other vocational training in New Zealand

Table 4: Current state of other vocational training in New Zealand.

Citation	Subject	Argument	Country
Surf Life Saving New Zealand (n.d.). *Lifeguard Education*	This website provide a brief description of the roles and training Surf Life Saving New Zealand provides.	• Before beginning the first course, an individual must be at least 14 years of age and be a current member of an SLS club (each club has a membership fee). • **Patrol Support** – 2-8 weeks duration – taught by SLS instructors and assesed by local examiners. The course is designed for individuals who are interested in becoming a Patrol Support member or any member who is unable to complete the water-based requirements of the Surf Lifeguard Award. The exam contains a theory paper (requires at least 80% correct), First Aid, Radio Operations, CPR and Signals. • **Surf Lifeguard Award** – 2–8 weeks duration - taught by SLS instructors and assessed by local examiners. The exam comprises of a 400m pool swim under 9 minutes, Run-Swim-Run in the Surf, Tube Rescue in the pool and surf, First Aid and CPR, Communication Signals, Radio Communication, Theory questions and Rescue tows and releases.	New Zealand

Citation	Subject	Argument	Country
		• **Board Rescue Module** – 2-3 weeks duration – taught and assessed by Club Instructors, Club Examiners or Patrol Captains. The exam comprises of a conscious patient resuce and an unconscious patient rescue. • **Rock Training & Rescue Module** -half-day (3-4 hours) duration – conducted and assessed by club members who hold a Rock Instructors Award. The exam requires individuals to identify equipment and safety considerations required, perform a Rock Entry, perform a Rock Exit and conscious patient rescue**.** • **Marine VHF Radio Operators Award** – no duration specified – delivered by regional facilitators. The assessment requires participants to complete a take home guide and syllabus. • **Intermediate Lifeguard School** – 2 days duration – delivered by regional instructors. The assessment covers topics such as roles and responsibilities, tube and board rescue, first aid scenarios, scanning and surveillance, helicopter landing zones, intro into rock navigation, intro into search and rescue, run/swim/run, goal setting, professionalism & image and working with external agencies. • **Senior Lifeguard Award - Patrol Captain** – 1 day duration – delivered by regional facilitators. The assessment is an online course comprising of 7 modules: roles and responsibilities, team leadership, building rapport, motivate others, nsops/ csops & risk, patrol management, summary. • **Advanced Lifeguard Award** – 3 and a half days duration – assessed by SLSNZ appointed instructors. The candidate must obtain all pre-requisites (all previous training) and complete National Lifeguard School (NLS). • **Recognition of Prior Learning (RPL)** – ability to gain an award from prior learning/achievements. Personal interview, CV, reference checks, obervation of performance and competence.	
Toi Ohomai Institute of Technology (n.d.). *Forestry Courses.* Te Pūkenga	This website describes the diverse range and levels of forestry qualifications available at Toi Ohomai Institute of Technology.	• Only Competenz, Toi Ohomai and Telford provide practical training courses for forestry in New Zealand. • Prior to starting any course an individual must be at least 16 years old and have NCEA Level 1 with 10 credits in Numeracy and 10 credits in Literacy, OR have equivalent knowledge and skills. • **New Zealand Certificate in Forest Industry Foundation Skills** (Level 2) – 15 weeks full time – topics covered include environmental and cultural requirements, working in forestry operations and safe forest operations.	New Zealand

Citation	Subject	Argument	Country
		• **Introductory Chainsaw Skills** (Level 3) – four weeks full time – need to complete 10 hours of practical cutting recorded and verified by a trainer. Fees are $541 for domestic students. • **New Zealand Certificate in Forest Harvesting Operations** (Level 3) - Strand in Basic Machine Operation and Landing Operations – 27 weeks full time – learning to operate, maintain and sharpen a chainsaw to cut logs to industry length. Fees are $6,405 for domestic students. • **New Zealand Certificate in Solid Wood Manufacturing** (Level 3) (Timber Machining Strand) – 23 week course – learning to process raw timber into materials for the building industry. Fees are $4,968 for domestic students. • **Introduction to the New Zealand Forestry Sector** (Level 5) – four days full time (2 days in class, 2 days on field trips) – introduces learners to the forestry industry and teaches them the history of New Zealand forestry. Fees are $2,364 for domestic students. • **New Zealand Diploma in Primary Industry Business Management** (Level 5) – 2.5 years part time – designed for people already working in the forestry industry to help them make their businesses more profitable. Fees TBC. • **New Zealand Diploma in Forest Management** (Level 6) – two year diploma – mix of theory and practical learning on forestry operations, business plans and learning to set up a forest management company. Fees are $6774 per year for domestic students.	

Careers NZ. (n.d.). *Apprenticeships*	This webpage provides an overview of New Zealand Apprenticeships, including which industries commonly offer apprenticeships and the benefits of completing one.	• All New Zealand Apprenticeships are approved and audited by the Tertiary Education Commission. A register of all apprenticseships and providers is located here: https://www.tec.govt.nz/assets/Forms-templates-and-guides/NZ-Apprenticeships-Register-for-Learners.xlsx
		• An individual must be 16 years old to become a New Zealand Apprentice. However, each industry has different entry requirements. For example, Level 2 NCEA or equivalent is required before enrolling in an electrical apprenticeship (New Zealand Certificate in Automotive Electrical Engineering (Level 4)).
		• Once an apprenticeship is completed, the individual receives a Level 4 New Zealand certificate in the area they studied (e.g. New Zealand Certificate in Automotive Electrical Engineering (Level 4)).
		• As an apprentice, individuals will:
		    o work for, and learn from, an employer who support people through their apprenticeship
		    o complete practical, on-the-job assessments
			New Zealand

Citation	Subject	Argument	Country
		○ attend courses that are part of the apprenticeship such as block courses, evening courses and day-release classes ○ complete written assessments. - Some benefits of undertaking an apprenticeship include: ○ earning at least the training minimum wage (employers often pay more as you become more skilled) ○ gaining technical, practical skills ○ gaining a Level 4 New Zealand Certificate when you complete the apprenticeship, which means you are likely to be paid more and have better work opportunities.	
Ministry of Education (n.d.). *Apprenticeship support programme*	This website explains various financial support initiatives in place to encourage employers to maintain apprenticeship programmes in New Zealand.	- On the 15th of June 2020, the New Zealand government implemented a $519.8 million Apprentice Support Programme which covers four key job-focused intitiative to support apprentices: ○ **Apprenticeship Boost** – financial support for employers to keep existing apprentices and employ new ones (delivered by the Ministry for Social Development). ○ **Mana in Mahi** programme – new funding to expand the existing programme which supports at-risk people through an industry training pathway and into long-term sustainable work (delivered by the Ministry for Social Development). ○ **Regional Apprenticeships** initiative – an investment in new apprenticeships in regional New Zealand, particularly Māori and Pacific peoples into jobs (delivered by MBIE's Provincial Development Unit). ○ **Group Training Scheme** support – funding to support the seven existing Group Training Schemes to continue to employ apprentices and provide related services to host businesses, focusing on employers (primarily small construction businesses) who aren't able to afford apprentices (delivered by the Tertiary Education Commission). - The scheme was created to ensure job security for existing apprentices and that new apprentices could continue to be employed throughout the recovery from COVID-19. Therefore, avoiding future skills shortages and supporting future development and economic recovery.	New Zealand
Electrical Training Company Limited (n.d.). *Get an apprenticeship*	This website contains information about applying for and completing an electrical apprenticeship with Etco Ltd. Etco is a training facilitator that employs	- Etco is an electrical training company that employs apprentices and connects them with host companies through their group apprenticeship scheme. - Etco employs apprentices for three years and nine months during their apprenticeships. The company hires 3 months longer to give	New Zealand

Citation	Subject	Argument	Country
	apprentices and places them with host companies to ensure their learning is relevant to the current industry.	candidates a greater range of experience and thus greater chance of employment after they graduate. • In addition to providing paid apprenticeships, the company also offers extra learning support and advice. • At the end of their apprenticeship, individuals will gain a qualification known as the NZ Certificate in Electrical Engineering Theory and Practice (Trade) (Level 4). • As a prerequisite, individuals must have Level 2 NCEA or equivalent. If an applicant does not have the skills, they may undertake the Pre-Trade Foundation NZCEE (L3) course (NCEA Level 1 required). • This course has a duration of 3 days a week for one year and a fee of $3750 (fee covers tablet). At the end of the course, trainees must complete a final closed-book examination (capstone assessment).	

Best Practice

Temporary traffic management training best practice

Table 5: Literature relating to best practice of TTM specifically, construction industry-related training and vocational training, and education more generally.

Citation	Subject	Argument	Country
Kirsh, B., Cockburn, L., Gewurtsz, R (Dec 2005), Best practice in occupational therapy: Program characteristics that influence vocational outcomes for people with serious mental illnesses, 72(5), Canadian Journal of Occupational Therapy,	Despite the known benefits of work for people with mental illnesses, vocational outcomes of this group remain poor. The purpose of this paper is to provide information about key characteristics related to outcomes in the field of vocational rehabilitation for people with serious mental illnesses.	A set of twelve characteristics was identified that appear to influence vocational outcomes. These characteristics relate to the types of services offered, the manner in which services are delivered, and the work environment. • Having a vocational or employment specialist on the team leaders to improved competitive employment outcomes and employment status. • Ongoing and available support from family and social support (friends) may improve job productivity. • Early entry into competitive employment is more effective than traditional approaches. Rapid placement is associated with higher proportion, and longer duration, of work participation, greater number of hours worked, and higher wages. • Paid work is associated with greater participation, increased number of hours worked, higher earnings and higher quality of life compared to non-paid work. • Participation in psychoeducational sessions are associated with improved work behaviour and higher income status • Reasons for job terminations such as substance abuse, interacting with others etc, show the areas they need the most support. • Individual placement and support was identified as important, but they also suggest providing a range of services to enhance individual choice. • Job matching to the participants' preferences is important for job tenure and satisfaction. For a successful vocational program, emphasis on personal choice is important.	Not specified

Citation	Subject	Argument	Country
		• Vocational services need to be integrated into services and systems so that a focus on work is instilled. • Work environment is important for good social outcomes and continued employment. • Programs that specifically emphasise vocational activity relate to an increase in work participation even for those people that did not initially express interest in work. • On the job training is better than training in anticipation of work. Programs that integrate with employer education and trust are associated with improved vocational outcomes.	

Asian Development Bank (2009). Good Practice in Information and Communication Technology for Education and Training,	How to make technical and vocational education and training (TVET) successful.	• Link with the labour market and industry. This can be done by:
		
		   - Providing incentives for employers to participate in directing, advising and evaluating training
		
		   - Providing incentives for managers of training institutions to involve industry in training provision
		
		• Having a direction and clear purpose for the training that reflects the labour market.
		
		• Success in training requires good pre-training so people are prepared to successfully complete the training and the training are getting the type of people needed in the job.
		
		• There is also a need for post-training activities. These activities provide support for people to get jobs post-training.
		
		• National Qualification Frameworks can facilitate labour mobility and more efficient use of training resources.
		
		• Political will is necessary for successful education reforms.
		
		Ensuring equitable access to training:
		• Providing scholarships or subsidies based on financial need to support lower income students
			International / developing countries focussed

Citation	Subject	Argument	Country
		• Provide training closer to the locations of the lower income groups to make it easier to travel to and access. • Allow part-time training so students can keep working while acquiring skills. • TVET institutions' location needs to be close to job opportunities. • Inequity may occur with funnelling females into traditional female occupations. To combat this, have female trainers to become role models for the students entering the industry.	
European Agency for Special Needs and Inclusive Education (2012), 20 key factors for successful vocational education and training.	VET training for people with special education needs and disabilities.	Factors to produce equitable education for Vocational Education and Training (VET): • Legal framework that enables enough funding to support various learners' abilities (e.g., additional funding, higher staff-learner ratios, support staff etc), and allow them to offer different levels of apprenticeship / different curricula / different qualification levels. This enables people to get qualifications according to their individual learning-specific needs. • Authentic and positive atmosphere created by staff of commitment, care and belonging. • Good leadership • Staff are well-qualified by formal university-level qualifications, a vocational qualification and/or industry-based experience. • Small class sizes • Staff (careers counsellors) being available to support and follow up on transition from study to (during) work • Clear link to job opportunities • Learner centred approaches • All these approaches were successful across various countries.	The Agency has 31 member countries, covering 36 jurisdictions (England, Northern Ireland, Scotland, Wales, and Belgium's French, Flemish and German communities are each represented separately).
Tilton, D (2013), Training our People: Matching	How to align theory taught in the course with practical needs for the workforce.	Take a three-pronged approach:	Not specified, but presented

Citation	Subject	Argument	Country
practical with theory, 2012 TTM Conference, Rotorua,		• Have onsite auditing and coaching to gain visibility within the industry and show Get some visibility (have onsite auditing and coaching) • Keep training and information provided relevant to the current situation. This includes the information and practical activities. • A system for practical training. The training needs to be relevant to what the trainer/industry lead wants them to do, and they need to be provided with practical tools.	in New Zealand
Loose G & Spöttl, G (Nov 2014), Securing quality in TVET – A compendium of "best practices": fourteen main principles for the improvement of Technical and Vocational Education and Training, ResearchGate (2014)	The development of quality training programmes. The article outlines fourteen main principles for quality vocational education and training.	The principles most applicable to this research are detailed below: Mission and opportunities: 1: Define a clear goal for Vocational Training Centres 2: Emphasize the training of "skilled workers" and offer them opportunities for future training. Concept, design and teacher training: 3: Introduce a clear concept for the role of private institutions in training and technical education 4: Design/ implement a comprehensive programme for training instructors Network and curriculum development: 5: Create a network for the cooperation of vocational training with industry for on-site, practical learning activities – learners remember 90% of info (compared to 50%) when doing things practically 6: Enforce a common format for curriculum development 7: Establish a network of vocational guidance services to help match job opportunities with learners' aspirations. Political support and programmes: 9: Design the programme so it contributes to economic, social and individual goals to create a holistic programme. Competence development and occupational standards: 11: Trainings should be a mix of theory and practice 12: Training standards and qualifications should align with skill-based expectations of the employers.	Not specified

Citation	Subject	Argument	Country
		Effective training and learning support:	
		13: Have a balance between maintaining a quality minimum training standard while allowing flexibility to account for everyone's learning requirements.	
		14: Work needs to be seen as a positive outcome of the training for the training to be successful	
Evidence for Learning (2017) Teaching and Learning Toolkit (Feedback: Very high impact for very low cost based on extensive evidence)	Evidence for Learning works with education systems, early childhood education and care providers, schools, researchers, government and philanthropists to provide free, evidence-based material. Its Teaching & Learning Toolkit summarises the global evidence base on different approaches to lift learning outcomes in schools. One topic presented in the Toolkit is feedback.	The key findings from the evidence on feedback is: 1. Providing feedback is a well-evidenced and has a high impact on learning outcomes. Effective feedback tends to focus on the task, subject and self-regulation strategies: it provides specific information on how to improve. 2. Feedback can be effective during, immediately after and some time after learning. Feedback policies should not over specify the frequency of feedback. 3. Feedback can come from a variety of sources -– studies have shown positive effects of feedback from teachers and peers. Feedback delivered by digital technology also has positive effects (albeit slightly lower than the overall average). 4. Different methods of feedback delivery can be effective and feedback should not be limited exclusively to written marking. Studies of verbal feedback show slightly higher impacts overall (+7 months). Written marking may play one part of an effective feedback strategy – but it is crucial to monitor impacts on staff workload. 5. It is important to give feedback when things are correct -– not just when they are incorrect. High-quality feedback may focus on a task, subject, and self-regulation strategies.	Australia and New Zealand
World Federation of Colleges and Polytechnics (2018), World's Best Practice Guide in professional and technical education and training.	Best practice guide in professional and technical education and training.	The article provides various examples of best practice training and education institutions that have won awards for access to learning and employment, applied research and innovation, student support services, higher technical skills and so on. Access to learning and employment and student support services are the most relevant to this literature review.	Australia-Pacific

United States of America

Australia |

Citation	Subject	Argument	Country
		Australia Pacific Training Coalition (APTC): • Training needs to work with industry to create people who are job-ready • APTC has an inclusive approach and various equity-based programs by prioritising leadership positions for Pacific Island Citizens when nationalising their workforce so their staff that reflect the workforce • Promotes vocational training as a gateway into employment and APTC is an example of how vocational training supports regional economic growth Global Learning and Inclusion with Borders project (USA): • This project was regarding improving minority groups such as Mexican-origin minorities, access to higher education. • They aimed to develop bicultural pride and strengthen ties among bicultural communities. They did this by - establishing and strengthening relationships with numerous Mexican institutions such as, universities, colleges, national and state governments and the business and industry sectors. - developed strategic relationships with various community organisations that engage with Mexican-origin populations. • Stay aligned with your principles and work in partnership with the community to achieve positive community outcomes that are aligned to their needs and solve their reduced access to education. Apprentice Support Centre at Holmesglen Institute (Melbourne, Australia): • Young people experience challenges, including socially, emotionally, financially, and cognitively during their apprenticeship training. This has caused a decline in completion rates of training (up to 48%). There are increasing rates of apprentices taking their own lives or experiencing mental health issues. • In response to these statistics, Holmesglen established the Apprentice Support Centre in 2016 which provides holistic support for students studying at the institute.	

Citation	Subject	Argument	Country
		• It aims to break the previous cycle by proactively identifying and supporting apprentices at risk of not completing the course. • It is a mentoring approach to engage with apprentices and the mentors are trained in providing pastoral care and building empathetic relationships. • Tips for replicating this initiative were: - establishing rapport with apprentices to gain their trust and confidence - completing this support in person and online (social media) to show you are present and accessible to the apprentices' needs - identify the support peoples' boundaries so they know when to refer apprentices to more specialist support services - ensure there are sufficient resources for support people - build a knowledge base and information network so support people are well informed and give consistent advice as well as consistently communicating and consulting with teaching departments to build a 'one-team' approach so if teachers identify at risk apprentices, they can refer them to the support people.	
Ismail, A. et al (2018) The Development of TVET Educator Competencies for Quality Educators	Malaysia is taking steps to strengthen policy guidance and regulatory frameworks for technical and vocational education and training (TVET). The objective of this paper is to propose effective competencies of TVET Educators, particularly focused on the Malaysia context.	This study outlines three main components for quality educators: personal traits and professionalism, teaching, learning and training, and technical innovation. Personal traits and professionalism • Familiarisation with the industry, close working relationship with colleagues, leadership, and softer skills Teaching, learning and training • Comprehensive understanding of relevant methodology and industry advances Technical innovation • Industry technical experience	Malaysia
Apanui, D. and Karauria, P. (2020) Māori Wardens	To identify the current capability (skills and qualifications) within and across the Māori Wardens Districts, their training	Feedback from Wardens on improvements that could be made to training: • Lack of a formal Role Description or way of 'framing' the capability needed to be a Māori Warden makes it difficult to determine if	New Zealand

Citation	Subject	Argument	Country
Capability Stocktake [for Te Puni Kōkiri]	needs, and the current approaches in identifying training needs, and sourcing, negotiating and evaluating training. The stocktake also sought feedback from Wardens on improvements that could be made to their training.	the training Māori Wardens are currently receiving is the right kind of training (providing all the skills/knowledge they need) and is delivered at the rights levels (e.g., beginner through to advanced). • Most of those interviewed felt that a greater variety of training needed to be available, to reflect the changing roles/activities and subsequent capability needs of the different Districts. • A number of those interviewed expressed a preference for training to be delivered by Wardens, as they understand their role, philosophy, values and ways of working. • Trainers that took the time to explain/reinforce procedures, used relevant case studies/scenarios, and adapted their training to meet Wardens' needs were all positives. "Death by Powerpoint", cultural ignorance ("we were told we couldn't start our hui with a karakia"), and not explaining the relevance of the content for Māori Wardens were some of the negatives. • Several of those interviewed felt that some elements of the training was too theoretical and wanted more practical training. Improvement areas identified: • A 'Licence to Practice' could be established alongside the Māori Wardens qualification. This could involve Wardens applying (every three years), to renew their Licence with evidence that they have undertaken all required professional development and been an active Warden for a specified number of hours. • There is clear opportunity to move from a generic package of training being provided through the Project, to training being delivered on the basis of District/Regional needs. • All contracted providers should be briefed on the Māori Wardens' role, philosophy/values, ways of working and training preferences, to ensure they plan their delivery accordingly – including accommodating cultural requirements	

Citation	Subject	Argument	Country
		• To support the effective management of training, databases should be established to record the details of all Wardens, training received, expiry/refresher deadlines, other relevant skills/qualifications, and skill/qualification needs • Rather than being seen as excluding some (e.g., less physically able) Wardens from doing training, they could undertake other training that better suits their abilities/roles (e.g., as mentors) instead. • Although face-to-face training is preferred by many, online platforms also offer the opportunity to provide short training sessions (e.g., webinars) to numerous participants and many times (if recorded and made available online). • Systematic evaluation of all training provides an opportunity to identify: • what worked well and why. • what didn't work well and why. • what could be improved/enhanced; and • whether it was 'value-for-money' training. • It can also help identify barriers to learning (e.g., limited literacy/numeracy, poor hearing, or eyesight etc.) that need to be addressed before any other training is attempted.	
Williams, J. and Ang, C. (2021) Taking Stock Defining an Excellence Framework for Vocational Education: An international literature review prepared for the Food and Fibre Centre of Vocational Excellence	This work forms an early part of a 'taking stock' set of research efforts undertaken as part of the establishment and benchmarking phases for the new Food and Fibre Centre of Excellence. The literature review traverses recent international studies looking at aspects of good and excellent practices in vocational education and training (VET) across multiple jurisdictions. It deliberately excludes New Zealand-	Defining an Excellence Framework • More generally, excellence in VET includes a number of desirable system features, including but not limited to: • Responsiveness to labour market and industry needs • Clear pathways and permeability to allow progression and career change • Formalising and credentialising skills and experience. • National-level employer recognition • Developing employability and mobility in the workforce.	Multiple countries (NZ excluded)

Citation	Subject	Argument	Country
	based examples. This review has not been designed to discover what is different, but to discover what is universally regarded as excellent.	• Increasing acceptance that inclusive vocational education is a marker of excellence. In particular, ensuring that VET systems and delivery are accessible to, and supportive of diverse groups in society and the economy (i.e., those needing most support to enter and succeed in the labour market, because they have been traditionally excluded, or historically been underserved or underrepresented). • The rise of digital technologies is changing vocational education, along with the industries that VET systems serve. This creates opportunities and challenges to deliver VET in new ways (mobile onsite learning, simulation, AI, virtual reality). Excellence Frameworks • Sets out the attributes of educators working in the VET system: Sets out the typology of delivery modes for VET:	

Citation	Subject	Argument				Country

Indicator	Acceptable minimum	Good	Excellent
Availability	VET programmes exist to meet a specific and evidenced need.	VET programmes offer a range of learning modes to meet learner needs	Delivery models are fully flexible and bespoke to individual learners.
Accessibility	Timetabled face to face delivery. Technology-enabled remote learning options offered as alternate modality	Technology-enabled remote learning as a default modality.	Fully flexible blends of F2F, online and workplace-based learning modalities. Use of augmented and virtual learning tools (VR, AI, simulation)
Acceptability	Students are offered support and guidance Overall quality of delivery is consistent and aligned to standards.	Overall quality of TVET and consistent operating methods by TVET providers Learner and educator peer support network Sharing of effective practices	Involves the learner in content development. Close cooperation with external stakeholders to allow students to practise real-world tasks in actual workplaces
Adaptability	Supports formal teacher-led learning.	Supports self-directed multi-mode learning.	Supports Learner-centred, self-determined, autonomous, supporting formal and informal learning.

Supporting school leavers to transition to vocational careers

Table 4: Literature relating to understanding the barriers and enablers to school leavers transitioning to vocational careers

Citation	Subject	Argument	Country
Bedson, L. and Perkins, D. (2006). A positive influence: Equipping parents to support young people's career transitions, *Brotherhood of St. Laurence*	This report analyses findings of a pilot study conducted to upskill and empower parents to help their children transition from school to work and/or further education.	• Parent As Career Transition Supports (PACTS) are workshops aimed to educate parents on modern career pathways. In addition they also teach how to help young people find their career pathway and encourage parents to begin conversing with their children about future transitions and options. • The workshops also demonstrated to parents the importance of supporting their children in a career or subject they enjoy and aspire to do.	Melbourne, Australia

Citation	Subject	Argument	Country

		• 78% of students that participated in the study expressed that they wanted help from their parents in deciding what to do (and how) after leaving school.
		• Parents have an essential role in helping young adults feel greater career certainty, less indecision and stronger ego identity, as they are considered a trusted source of information source and children often possess a desire to please parental figures.
		• Key lessons for workshop program design:
		   ○ Parents need to be made aware that they have an important role in transitions.
		   ○ Parents need to be encouraged to understand their conversations with their children about careers are vital for young people's self-investigation, value-forming, career exploration and decision making.
		   ○ Parents need access to the career resources that are available to their children so that they can provide informed and accurate advice and support.
		• There is a strong correlation between parents' level of education and the discussion of post-school options and education levels for children. Therefore, it is vital that parents with lower levels of education receive support and information from programs such as PACTS; enabling them to provide greater opportunities to the next generation.	

Helme, S. (2010). Career decision-making: What matters to Indigenous Australians. *Australian Journal of Career Development*, *19*(3)	This article analyses three research projects that examined vocational education and career-decision making of Indigenous Australians.	• There are several barriers that limit the career opportunities and development for indigenous young people in Australia. • Common barriers include educational disadvantage, lower career aspirations, less knowledge about career options/pathways, social and cultural barriers. • Since the 1980s, there has been a significant increase in Indigenous enrolments in the VET sector. For example, in the mid-1980s there was about 3300 indigenous students in VET, however, this increased to 73,700 students by 2008. • This increase in enrolment rates is helping to decrease the gap in certificate completions between Indigenous and non-Indigenous students. • Despite various barriers, vocational pathways have several characteristics which make learning more accessible to indigenous learners. Vocational pathways are often easier to enter with lower levels of education and tend to offer greater levels of educational and financial support compared to university courses. • Multiple reasons were identified as to why Indigenous students chose to study VET. These included:	Australia

Citation	Subject	Argument	Country
		- desire to build basic literacy and numeracy skills - establishing a pathway to further TAFE study - providing a stepping stone to employment - providing a means of making a career change - supplementing an established career path - to help gain a promotion - to move into higher education. - Many students expressed the need to connect with their culture to strengthen their identity and pass on cultural knowledge to others. This desire is strongly represented for individuals enrolled in courses that involve art, design, history and Indigenous welfare. - The study identifies a need to intervene to provide Indigenous learners with careers information and support. Younger Indigenous students want more guidance from secondary school teachers to see where they should improve, what type of career would suit them and how to apply for scholarships. It is important for teachers and trainers to encourage student to use indigenous-specific programs and support mechanisms without feelings of guilt or embarrassment. - Effective career development support for Indigenous people requires appropriate and adequate resources to help individuals make informed decisions and successful transitions. - A supportive institutional culture is vital to encourage feelings of safety and educational success. This involves genuine strives towards cultural understanding and respect from leaders and staff.	
Dommers, E., Myconos, G., Swain, L., Yung, S. and Clarke, K. (2017). *Engaging young early school leavers in vocational training*	This report examines how to engage early school leavers in vocational education and training in Australia.	- In Australia, almost one-third of young people are unemployed or underemployed (not being given an adequate amount of hours). - Young adults who leave school early are at a greater risk of experiencing disadvantage in multiple aspects of their lives (economic, social, health). Therefore, the role of Vocational Education and Training (VET) systems are critical to improve employment opportunities and quality of life. - Unfortunately, many students disengage from VET courses before completion. In 2015, young VET students (25 years and under) that did not undertake prior post-school programs (or foundational courses) had a completion rate of 58.3%. - There are multiple reasons for low enrolment, student disengagement and non-completion of courses. - The research demonstrated that school leavers tend to have little awareness and knowledge of the contents and outcomes of VET courses. Thus, causing confusion and apprehension to begin the enrolment process.	Australia

Citation	Subject	Argument	Country
		• Early school leavers often have multiple temporary or ongoing needs (e.g, housing and financial stress, literacy and numeracy skills, physical and mental health concerns) that may need additional support. Early recognition of struggling students and an offer of support can help to foster higher completion rates. • Programmes and courses that incorporate 'hands-on' learning and work experience tend to have higher engagement levels from early school leavers. • Access to safe, reliable and punctual transportation services significantly impacts young peoples engagement, particularly in regional, rural and outer urban settings. • Training providers should offer flexible pathways towards a wide range of qualifications that could target a range of interests and are of relevance to young people.	

Pickett, A. (2019, October 30). *Why employers need to engage with school learners.* Careers NZ	This website provides a quick overview of the benefits of employers engaging with secondary students and recommendations on how to build relationships and awareness of industry careers.	• Several employers indicated that they struggle to fill vacancies with skilled people throughout the country.
		• Careers NZ recommends that employers should build relationships with local schools to increase awareness and attract future talent.
		• By creating foundational relationships, employers have the ability to solve future skills shortages, save on recruitment costs, get fresh ideas for the industry and employ people with the right skills, education and ability to adjust quickly to working life.
		• Recommended methods to build awareness and relationships with young people included:
		    o Presentation about potential careers or industry.
		    o Sponsorship of school events (e.g., sport competitions, kapa haka groups).
		    o Creation of resources and tools to teach students about the industry (e.g., poster, website).
		    o Participation in mock job applications and interviews with learners.
		    o Competitions for young people to solve business problems business or sell products.
		    o Workplace visits and work shadowing.
		    o Work experience through Gateway or cadetships.
		• Attendance at industry events or career expos.
			New Zealand

Tertiary Education Commission (2022). *Transitions from secondary*	This report is a foundation piece that explores the transition period of secondary students to gain a better understanding of how school leavers	• In New Zealand, about 60,000 school leavers transition from secondary school every year.	New Zealand

Citation	Subject	Argument	Country

school: Research report – external version.	decide their next steps. A total of 500 school leavers were surveyed and in-depth interviews were conducted with 56 students across the country.	• Leaving secondary school is a significant transition for students, as it is the first major choice an inidividual makes about their unique pathway in life.
		• There is a growing proportion of ethnic minorities as school leavers. Today, approximately 25% of total school leavers are Māori, 13% are Pasifika and 13% are of Asian descent.
		• Approximately 40% of learners leave with University Entrance requirements. Additionally, about 1 in 5 students leave with NCEA Level 1 or less.
		• 82% of school leavers have at least one responsibility outside of school. Out of this percentage, 62% have paid work, 29% have caring responsibilities and 21% have volunteer roles.
		• Most participants expressed that the primary reason for choosing a certain career was based on the level on enjoyment they expect to experience in the job. However, Pacific students were more likely to value supporting their family over anything else (32% shared that supporting family was more important than a fulfilling life). Neurodivergent or disable learners tended to value stability over fulfilment (32% of neurodivergent learners valued stability, vs 17% of neurotypical learners; and 24% of disabled learners valued stability vs 18% of non-disabled).
		• Planned career pathways tended to differ from students 'dream' careers (67% of school leavers planned to pursue a different career to their dream). Sectors such as construction and infrastructure featured higher in planned careers rather than 'dream' careers.
		• 50.4% of school leavers planned to pursue career pathways in the professional, trades and community sector.
		• Common motivations for career pathways included job security, accessible training and stable income.
		• Student barriers to preferred careers included study costs, connections (familiarity with people in the field or trainers), capacity (time and space), COVID-19 (mental and physical health) and systemic biases.
		   o Cost is a major barrier to almost half of all school leavers. 76% of Pacific students, 72% of disabled learners, 55% of Māori learners, and 52% of female students.
		• **The report also highlighted a number of systemic barriers:**
		   o Māori and Pacific learners (20% and 23% respectively) are less than half as likely as non-Māori and non-Pacific learners (51%) to leave school with University Entrance.
		   o Māori and Pacific school leavers are more likely to transition into the workforce than tertiary study. 41% of Māori and 30%	

Citation	Subject	Argument	Country
		o of Pacific school leavers transition into work, compared to 23% of non-Māori and non-Pacific learners. o Māori and Pacific learners that enter tertiary education are more likely to study at foundation levels compared to other groups. 49% of Māori and 39% of Pacific school leavers who enter tertiary education do foundation education, versus 19% of non-Māori and non-Pacific learners. Māori are also less likely to enter university than learners from other groups. o Women are less likely to enter apprenticeships than men. Common reasons included a fear of entering a male-dominated workplace and expectations of gender roles.	

Support services for students with diverse needs and experiences

Table 75: Literature relating to supporting students with diverse needs and experiences to achieve academic success

Citation	Subject	Argument	Country
Bagree, S. & Grimes, P. (2012) Equity and Inclusion for All in Education, *Global Campaign for Education UK*	This report analyses high-level education equity and inclusion for all children and adults around the world.	• The authors identified that the UK's Department for International Development (DFID) have increased attention to combating systematic marginalisation of girls and women in education. • However, to achieve a strategic alignment with Millenium Development Goal 2 (now Sustainable Development Goals) - achieve universal primary education – it is crucial to focus on other marginalised groups who are excluded from education including disabled people, ethnic and religious minorities and people living in vulnerable locations. • The research identified several examples of good practice to address wider issues of marginalisation in education including: **Systems-wide interventions:** Need to be set at a policy level, where countries provide financial support, appropriate legislation and policies to implement inclusive education (educational reform). • Positive attitude and committment to all types of learners makes a huge difference (not seeing people with disabilities or marginalised communities as being in deficit). • Legislation should be developed with marginalised groups.	UK and international examples

Citation	Subject	Argument	Country
		Project in Mongolia by Save the Children, selected 1600 teachers who demonstrated they had the motivation and commitment for inclusive education training. Follow up support was provided to teachers involved and collaboration and sharing between schools was encouraged. **School-level interventions:** Making school environments 'learning-friendly' – ensure teachers and students are learning together, and where the learners are placed actively at the centre of the learning process. Features of a system that support learners whose first language was not English: • Capacity to deliver active learner-centred education against a clear curriculum • Finding and developing teachers who can communicate with learners • Ability to share and act on evidence about good practice • Capacity to coordinate changes across different areas of education management • Including inclusive values and attitudes as well as knowledge and skills into teacher training programmes is important	
Holland, C. (2012). *Cultural/Community Mentoring with Māori and Pacific Electrical Apprentices*	Success of mentoring with Māori and Pacific Electrical apprentices in the way it connects with their culture and sense of belonging.	Embedding literacy and numeracy delivery and assessment in vocational education and targeting Māori and Pasifika learners has been seen as the primary solution to low achievement in the past. • Govt strategy docs are exploring non-teaching support • Making bits of learning accessible to learners isn't enough, relationships and culture play a part. Industry Training Organisations (ITO) have been supported to establish mentor training within their industries. Examples of successful support systems include, • Weekly mentoring sessions that covered time management, gave them the ability to provide literacy and numeracy support needed to complete their required modules (example from two glass companies). • (Hairdressing ITO) incorporated trainers in every salon, and provided professional development that raises their skills in mentoring young apprentices.	New Zealand

Citation	Subject	Argument	Country
		Māori can become disenchanted when the European workplace does not acknowledge: • Whanaungatanga (relationship/togetherness/collectivity) • Preservation of mana • Mahakitanga (humilty) • Waruatanga (spirituality) Many young people training in apprenticeships don't do well in assignments due to, • Their strengths and interests involve working more practically, solving real life, practical problems, and engaging in hands on tasks and have no to little interest in school-like literacies. • Culture of the workplace to handle diversity. Literacy seems to be a barrier for Māori and Pasifika. Modern Apprenticeship Coordinators: • In the Electrical industry, these were implemented and had meetings every 3 months with apprentices but it was too infrequent to be effective • Over time these coordinators became co-ordinator and an assessor so the conflict between the power and support roles impacted the level of trust that can be developed. Relational Mentoring • Build trust through empathy where learners are valued as equal (rather than the traditional paternal relationship) • It is empowering and creates personal growth, development and enrichment for both mentors and learners. • Discussions aren't reported but it is somewhat structured with a specific goal, purpose and development areas. Mentors did swap notes with each other but only when it benefitted the learner • Mentors being from the local community was important to build trust and learners met them at a conference and could then choose who they wanted to be their mentor. Pasifika • For most apprentices, family and the church'sneeds goes before their own such as getting a job to then give a % back to the church or family overseas. Thiere exists parental resistance to apprenticeships since they're only being paid minimum wage. Mentors can then be used to bring up issues with decision makers, highlight their needs in the workplace and feel trusted to do so.	

Citation	Subject	Argument	Country
Georgia State University, *Student Success at Georgia State University* and Tertiary Education Commission, *How a student-centred approach and data insights transformed Georgia State University* (2017)	These articles identify ways Georgia State University improved their student success rate through equitable means.	Predictive Analytics – GPS Advising • When students are seen as having less engagement in the course, they are then matched with a support person. They used historical data and predictive analysis to identify 800 actions and behaviours that correlate to a higher risk of students dropping out. • These initiated 50,000 face-to-face visits with advisors each year. Academic Support such as peer tutoring opportunities • All students are set up in small learning communities and consisted of like-minded individuals. This creates a sense of community and helps overcome some of the sense of alienation of being a low-income first generation student. Financial Support is determined through a data-driven approach ensures that support is given to the students that need it and are likely to succeed when their need is met.	United States
General Medical Council, *How to support successful training for black and minority ethnic doctors* (2020)	This report details case studies and and actions for colleges and faculties to support successful training for black and minority ethnic doctors.	Who supports learning? Role models • Good for learners: role models inspires learners to aim higher and improve their sense of belonging. • Good for trainee doctors (workers): those working in less diverse areas and who may have been isolated from their personal network meant that role models were really helpful in making people feel less isolated and feel "seen". Mentoring, sponsorship and career coaching • Mentoring and sponsorship programmes enhance opportunities to access broader social networks, receive support tailored to their individual needs Support for trainers and early learning needs analysis • Build awareness of the complex factors which lead to the ethnic attainment gap • Challenge the 'deficit' model which attributes performance only to individual capability or motivation by recognising the impact of external factors (eg. Having knowledge that they are statistically more likely to fail, impacts the students' performance). • Recognising the positive influence trainers can have whgen they have high expectations of learners, set challenging goals and give regular honest feedback • Including unconscious bias, active bystander techniques and cultural competence training in courses for supervisors.	N/A

Citation	Subject	Argument	Country
		• Enabling trainers to share and support each other to build confidence in support learners from diverse backgrounds • Ensuring that formative assessments are designed to highlight development areas early and these are informed by research into common areas of challenge and also consider behavioural, health or environmental factors which may affect learning.	

Diversity Perspectives

Indigenous worldview and experiences

Table 8: Literature relating to indigenous worldview and experiences within the construction industry career pathway.

Indigenous worldview and experiences			
Citation	**Subject**	**Argument**	**Country**

Holland, C. (2013). Māori and Pasifika Apprentices' and Relational Mentoring: A success story for The Skills Organisation. Good Practice Publication Grants Ako Aotearoa.	This research report highlights the experiences of Māori and Pasifika students throughout their apprenticeships and how relational mentoring can play a crucial role in motivating them to complete their qualifications.	• Different upbringing and cultural world views affects the learning process and challenges that apprentices face.
		• One of the challenges identified was different communications styles and a need for stronger relationships with mentors before comfort was reached with Māori and Pasifika compared to Pakeha students.
		  o Māori and Pasifika students were reluctant to ask help from their mentors and looked to the ground in respect.
		  o Mentors that were involved with their communities and spent more time with students, had better responses and ease of asking for help from their apprentices. Stronger relationships caused students to see the value in a mentoring relationship.
		• Relational mentoring also creates a better understanding of how different people operate and an awareness of how they may ask for help differently (more one-on-one time).
			New Zealand

Ministry for Women (2018). Māori and Pasifika women in trades: Stories of wāhine	Lived experiences from Māori and Pasifika women in trades.	Heavy Diesel Apprentice: • Occupation is a heavy diesel apprentice • Given scholarship to do 1st year training and then her employer paid for the remainder of her apprenticeship	

Indigenous worldview and experiences			
toa developing trade careers.		• Was encouraged by her mum to follow her passion of cars Painter/ Decorator: • Inspired by her son when he completed an apprenticeship • Demonstrates that you can re-train later in a career for a higher paying job • Support from education provider helped her find work experience Carpentry apprentice: • Her Dad encouraged her to pursue a trade • Her experience was of few other women in her training course • Gained a Pacific Scholarship to get into her training course • "*I feel like I have to work twice as hard to prove myself to the guys, prove that I'm worth their time to help me, and that I deserve to be here.*" Carpenter: • Discussed her view of the attitudes towards women in trades: *"because you're a woman, you're going to be a distraction and you can't keep up with the boys because this job is physically demanding", she wants the culture to be "I'm a tradie and I just happen to be a woman.".*	
Denny-Smith, G., Williams, M. and Loosemore, M. (2020). Assessing the impact of social procurement policies for Indigenous people. Construction Management and Economics, 38(12).	Social procurement policies aim to enhance social value for indigenous people through encouraging economic development and financial independence through training, business opportunities etc; but is this just fitting them into the western system? This article recommends using the Ngaa-bi-nya framework to assess policies and account for indigenous perspectives.	• Construction sector is largest growing employer of indigenous people: from 2011-2016, 38% increase of indigenous peoples employed. • Indigenous ways of knowing (epistemology), being (ontology) and doing (axiology) are not accounted for in these policies which make them do more harm than good. Ngaa-bi-nya is a framework to evaluate the success of procurement policies. Ngaa-bi-nya factors include, landscape, resources, ways of working and learnings. • Landscape: Giving people economic opportunities that require them to leave their families. This puts a financial burden on them as they have to pay for transport, rent, and also have to restart their social networks. Does not align with indigenous ways of being and their values and can create negative social value. • Ways of working: supporting staff to discuss challenges they are having and make improvements, which creates positive social value.	Australia

Indigenous worldview and experiences			
		• Social value can be created through the broad social landscape a policy is implemented in, the resources used and created, the way social procurement operates and reflecting on learnings from the process and outcomes. Construction industry inherently goes against indigenous modes of being/living/knowing. • Nomadic nature of working on different sites create a tension between indigenous value of kinship and connection to country. • High productivity and maximum efficiency (highly commercial imperatives) prevent people from connecting to country and community. • People operate under extreme time and cost pressures with everything being measured based on financial factors rather than wellbeing of workers. Culture of presentism and long work hours may cause people to miss important community events leading to a feeling of disconnect.	
	Hurt-Suwan, C. J. P., & Mahler, M. L. (2021). Social procurement to reduce precarious employment for Māori and Pasifika workers in the construction industry. *Kōtuitui: New Zealand Journal of Social Sciences Online*, 16(1), 100-115.	This article identifies how social procurement can reduce precarious/short term work for Māori and Pasifika workers.	• Social procurement is identified as having the potential to address economic inequalities within Aotearoa New Zealand. • Precarious/temporary employment is a relatively common pathway for labour jobs in New Zealand. • In the construction industry, workers in precarious positions are often hired through labour-hire or temporary agencies. Typically, they are employed on full-time, fixed-term, casual, independent contractor agreements, or as zero-hour employees. • Māori and Pasifika are highly vulnerable within precarious employment and struggle not only to obtain positions but to retain them as well. • A qualitative approach was used by distributing questionnaires among relevant stakeholders. The findings suggested that precarious employment for Māori and Pasifika construction workers is associated with low pay, low skills, and limited training opportunities.	New Zealand

Indigenous worldview and experiences			
		• 'Inequality on-site' was the primary negative effect identified for Māori and Pasifika in construction precarious employment. Responses related to inequality included 'no support systems', 'limited access to training', 'low pay', 'job insecurity' and a general lack of ability for 'future planning'.	
		• Female Māori and Pasifika jobseekers often face additional barriers including caring responsibilities for children, caring for ill, elderly, or disabled family members, experiencing domestic violence and abuse, encountering social and community barriers and a lack of access to or poorly developed social networks.	
		• Precarious/temporary employment was unanimously identified as not a choice. Participants felt that it was a result of 'structural racism' and a 'forced choice due to no other options'.	
		• Social procurement can create sustainable changes that incentivise and influence large organisations to change the way they operate to ensure the inclusion of social value on their projects.	
		• Social procurement can support the creation of jobs and increase training and development for workers. This means Māori and Pasifika workers would be able to upskill and get higher paying jobs compared to precarious jobs.	
Māori and Pasifika Trades Training (2022), *About Māori and Pasifika Trades Training*.	An organisation that is directly encouraging Māori and Pasifika to learn a trade by partnering with different trade organisations.	• Located in Auckland. This company offers free fees and tools, a coach to help with navigating life, a career and the trade and help them find work after training by supporting them in that, giving them a 'Work Ready Passport'. They are funded by the Tertiary Education Commission due to the shortages in tradespeople, and the underrepresentation of Māori and Pasifika more specifically.	Auckland, New Zealand

Learning styles of indigenous groups in other countries

Table 9: Literature relating to learning styles of indigenous groups in other countries.

Citation	Subject	Argument	Country

Hughes, P. and More, J. A. (1997). Aboriginal ways of learning and learning styles. *Paper presented at the Annual Conference of the Australian Association for Research in Education*	This paper explores the importance and usefulness of utilising Aboriginal ways of learning to improve educational opportunities and learning retention for Aboriginal children in Australia.	• In the late 1990's, Australian teachers were unable to effectively use teaching processes and tools that used the learning strengths of Aboriginal children.
		• There is an extremely wide range of cultural values and ways of learning, as there is NOT just one Aboriginal culture in Australia. Therefore, creating an overarching learning strategy for one 'Aboriginal' culture may not be appropriate.
		• Members of different cultural groups often obtain different learned mental abilities or cognitive learning styles. For example, Aboriginal learning is often associated with using images and imitation to demonstrate stories and lessons which creates a greater affinity for visual and story-based learning compared to verbal instruction.
		• Additionally, individual life experiences and training can have a significant effect on learning affinities. Learning styles from various cultural groups can be obtained in circumstances where contact occurs between multiple cultures (e.g., mixed race individuals).
		• The authors discuss four dimensions of ways of learning, including Global/Analytic, Verbal/Imaginal, Concrete/Abstract and Trial and Feedback/Reflective.
		• The paper argues that the 'best way of learning' for a particular task depends on:
		    1. the preferred learning style of the individual
		
		    2. the nature of the learning task
		
		• In general, the learner should be encouraged to use their own style. However, the task may require a better suited style or approach.
		• Similarly, ways of teaching are often tailored to the strengths of the Teacher/Trainer. Therefore, more focus needs to be given to the ability for students to obtain and reuse knowledge.
		• The paper recommends that a four-step process should be followed to improve the ability of Aboriginal children to learn within the classroom:
		    1. Identify learning styles of students in the classroom (e.g., pre-training survey or meeting).
		    2. Matching teaching styles for difficult lessons or content.
			Australia

Citation	Subject	Argument	Country
		3. Strengthen weaker or less used ways of learning (sometimes necessary for student to learn alternative methods as it can be more appropriate for certain tasks). o Develop learning style selection strategies (deciding which style is the most appropriate for the lesson or which each student can find easy to understand).	

Pewewardy, C. 2002. Learning Styles of American Indian / Alaskan Native Students: A Review of the Literature and Implications for Practice	This paper reviews theories, models, and research of the learning styles of American Indian / Alaska Native Students.	• American Indian/Alaska Native students have distinct cultural values such as conformity to authority and respect for elders (strong tribal social hierarchy where social acceptance and approval are sought from the elders), patrimonial/matrilineal cleans and an emphasis on learning which is formed in family socialisation patterns (this is quite different to other ethnic groups).
		• Education systems and the literature reviewed in the paper pre-1960s, viewed indigenous groups in a deficit way (reinforcing colonisers' primary intent of oppression). Therefore, to produce an educational environment for native peoples:
		    • Teachers should try to identify the learning styles of students, match their teaching styles to students' learning styles and broaden 'deficit thinking' learning styles through easier tasks and drills.
		    • Introduce cultural values into the curriculum – everyone benefits. Eg. Respect for your elders value will increasingy become desirable as the percentage of elderly Americans increase in coming years, or associating and living in harmony with nature may become essential due to climate change.
		
		Culture, environment and ways of learning are intrinsically entwined. The review found that:
		    • Native students would rather be presented with the big picture idea and then the detailed aspects of the idea are explained further, making it easier for students to connect back to the 'why' (why are they learning these small detailed pieces of knowledge).
		    • Collaborative learning techniques that involve problem solving as a group is important.
		    • Teachers need to be educated in ways to accomodate for cultural diversity and different learning styles, it is important for teachers to recognise their own worldviews and how that impacts the way they teach.
		    • As they are identified to be engaging in more observing and listening forms of learning (rather than impulsivity), teachers may
			Alaska, USA

Citation	Subject	Argument	Country
		see this as students being unmotivated or disinterested in learning. They may be apprehensive when answering questions (so making sure they have the answer before answering a question) so as to not be shamed for getting it wrong. Teachers need to be aware of this. The author identifies that only a few learning styles have been researched in-depth. It is unknown how these link with adult students as all of the research is assessed with children.	

Castagno, A. E. & Brayboy, B. M. K. (2008). *Culturally Responsive Schooling for Indigenous Youth: A Review of the Literature*, *78*(4)	This articles reviews literature on culturally responsive schooling for indigenous youth (American Indian and Alaska Native students) throughout the United States.	• Culturally responsive schooling (CRS) has been widely accepted as a strong strategy to improve education and academic achievement for American Indian and Alaska Native students.
		• CRS can benefit not only indigenous youth but ALL marginalised groups.
		• The word 'responsive' is deliberately used to show how this type of teaching has the ability to acknowledge the unique needs of diverse students, take action to address those needs, and adapt approaches as students needs and demographics change over time.
		• To teach using CRS, teachers need to have a certain degree of cultural competence. This requires additional time and energy devoted to this important goal.
		    ○ This can be achieved through teachers exploring the communities that their students' live, participating in community events and collaborating with community members on projects both within and outside of the school.
		• Use indigenous students' culture to help teach them effectively, rather than teaching students their culture. However, it should not be tokenistic by only using the material aspects of culture at the expense of systematic change within schools. Using indigenous examples, aspects that connect to native peoples' everyday lives, use interactive and visual learning activities, stories from Native knowledge (valuing indigenous knowledeges to be the same as western scientific knowledge) within the curriculum.
		    ○ A limitation of this is that it should be rooted in the context of self-determination, sovereignty, racism and Indigenous epistemologies, otherwise it would only provide surface level opportunities for Indigenous peoples to seethemselves in the education system.
		• The learning styles of indigenous youth often put them at a disadvantage in western-centric schools. These learning styles are
			Alaska, USA

Citation	Subject	Argument	Country

		acquired through life experiences which explains how culture has an influence on them.
		    ◦ The most commonly cited learning style included, visual, global, big picture, collaborative, holistic, observation preceeds performance, naturalistic and so on. Although it is important to note that it is dangerous to reduce people to one-dimensional generalisations.
		• It is important to recognise that there is variation within indigenous groups, including different cultural practices and beliefs.
		    ◦ The "Silent Indian" stereotype: they are not necessarily 'quiet' but listening and observing is highly valued in their community.
		• Inidigenous youth often learn by example in natural settings from ones' peers and community so Native peoples are more collaborative and less competitive.	

Pashler, H., McDaniel, M., Bjork, R. 2009, Learning Styles: Concepts and Evidence, *9*(3)	This article debunks the myth of separating learning styles of visual, kinaesthetic, auditory, read/write.	• This article concluded there has not had rigorous 'scientific' evidence to show that these different learning styles exist. • This testing requires a particular type of experimental findings with several necessary criteria. This includes students to be divided into groups based on their learning styles and they are then randomly assigned to receive one of multiple instructional methods and are then tested with a final exam that is all the same for students. • After this, students need to be taught through their 'preferred' learning style and the experiment must reveal a specific type of interaction between learning style and instructional method. • They identified through various literature that children and adults express preferences about instructional methods and there is research suggesting the people learn differently. But none of this research has identified this interaction pattern. • There is no adequate evidence base to justify implementing these learning styles in the general teaching curriculum.	N/A
Kral, I. & Schwab R. G. (2012). Design Principles for Indigenous Learning Spaces, *ANU Press*	This chapter outlines best practice design guidance for learning spaces in educational facilities throughout Australia. The guidance is based upon international theory and research, as well as input from Aboriginal students in remote communities.	• 'Learning Spaces' is a three-year study funded by The Fred Hollows Foundation and the Australian Research Council. It offers a unique and compelling guide for community members, policy makers and education facilitators to rethink their approaches to learning. • Most Aboriginal students face multiple instances of disempowerment and marginalization, causing them to be disinterested or exclude from regular schooling systems.	Australia

Citation	Subject	Argument	Country

		• After gathering positive results throughout the study period, the authors believe that the study shows the possibility to reengage Aboriginal young adults in further education and lifelong learning.
		• Eight design principles were identified to facilitate safe learning spaces and empower Aboriginal students:
		    ○ Design Principle 1: A space young people control.
		    ○ Design Principle 2: A space for hanging out and 'mucking around.'
		    ○ Design Principle 3: A space where learners learn
		    ○ Design Principle 4: A space to grow into new roles and responsibilities
		    ○ Design Principle 5: A space to practice oral and written language
		    ○ Design Principle 6: A space to express self and cultural identity through multimodal forms
		    ○ Design Principle 7: A space to develop and engage in enterprise
		    Design Principle 8: A space to engage with the world	

Merculieff, I. and Roderick, L. (2013). Stop talking: Indigenous ways of teaching and learning and difficult dialogues in higher education. *University of Alaska Anchorage*	This book analyses the strengths and weaknesses of Western teaching styles at the University of Alaska Anchorage and how it affects indigenous pupils at higher education. Futhermore, the book discusses the discourses and ways of knowing that can enhance the ability for Alaskan Native American people to achieve and meaningfully contribute to higher education.	• Indigenous ways of life and learning often involves teaching different skills of survival, cultural traditions the development of interconnectedness with nature. This way of learning is often highly different to Western ideologies of education. • Indigenous skills are often applied and students commonly struggle with data overload with no physical or applied action. Additionally, Alaskan Native Americans (ANA) struggle with Western testing of knowledge (e.g., essays and reports) as they are used to conveying knowledge via spoken word, song, dance or story telling. • In ANA culture, story-telling is central to education. A significant amount knowledge and skill is obtained from listening to village or tribe elders with vast experience and wisdom. Compared to Western culture, ANA youth are taught not to ask questions. Instead they are encouraged to watch and imitate other experienced members (non-verbal learning). • Compared to Western culture, ANA peoples commonly practice honing self-learning and first-hand experience (learning themselves from immersion and experience). • Developing and supporting alternative learning and assessment tools is useful for students of all backgrounds, not just ANA or indigenous peoples. • In futher education, greater emphasis should be placed on working together and valuing every student's strengths. Every person has a	Alaska, USA

Citation	Subject	Argument	Country
		way they can contribute and build upon the collective knowledge of the group. Finally, it is important to foster student discussion and participation without interruption. Thus, creating a safe space for everyone to talk without judgement or dismissal.	

Simeon-Fayomi, B.C., Ajayi, E.A., Koruga, N. and Baswani, G. (2017). Enhancing employability through innovative teaching methods in adult learning and education: A comparative study of Nigeria and India. *Adult education and work contexts: International perspectives and challenges*	This chapter discusses a study that reviewed the practice and teaching methods of adult education in Nigeria and India.	• Adult learning and education are an aspect of lifelong learning that helps to equip adults with job-specific occupational skills and inter-personal skills that will allow them to enter and achieve success in the working world.
		• In both Nigeria and India, many university students discuss that their courses did not adequately develop skills relevant for employability in their chosen field.
		• Employability is a major concern for students in developing countries, as being enrolled in formal education often does not assure employment. Workforce employability is vital to transform structural change into an opportunity to benefit everyone.
		• To nurture employability skills, a teaching method should:
		   o encourage learning inquisitiveness
		   o encourage and move learners toward independence and self-directed learning
		   o ensure learners identify themselves as rich resources for learning
		   o revolve around real-world application of learners
		   o enhance performance in learners' lives through learning forums
		   o encourage and motivate adults to continually seek to update their knowledge and skills.
		• Current programmes which prepared individuals for the workforce were deemed to not be effective, especially in Nigeria. The courses employed traditional teaching methods that are content- and teacher-centred.
		• All participants expressed their desire for more participative and continuous educational programmes that facilitate the renewal of existing skills and the development of new professional/ employability skills.
		• Innovative teaching methods should explore an overlap between formal (e.g., active lecture, internship), non-formal (e.g., structured dialogue, storytelling, films) and informal (e.g., conversation, observation) learning contexts.
			Nigeria and India

Citation	Subject	Argument	Country

James, K. (2018). Universal Design for Learning (UDL) as a Structure for Culturally Responsive Practice, *Northwest Journal of Teacher Education*, *13*(1)	This article discusses the potential value of using Universal Design for Learning to support the learning of diverse students and begin enacting systemic change.	• After the impacts of colonisation, most indigenous peoples have struggled to access education that acknowledges, respects and promotes indigenous rights and knowledge.
		• Universal Design for Learning (UDL) is a set of principles for cirruculum development that gives every person equal opportunity to learn. UDL embraces the diversity and variability of learning for all students from the beginning of the teaching and learning process.
		• Six standards were developed by the Alaska Native Knowledge Network (2012):
		   o **Standard A**: Culturally-responsive educators incorporate local ways of knowing and teaching in their work.
		   o **Standard B**: Culturally-responsive educators use the local environment and community resources on a regular basis to link what they are teaching to the everyday lives of the students.
		   o **Standard C**: Culturally-responsive educators participate in community events and activities in appropriate and supportive ways.
		   o **Standard D**: Culturally-responsive educators work closely with parents to achieve a high level of complementary educational expectations between home and school.
		   o **Standard E**: Culturally-responsive educators recognize the full educational potential of each student and provide the challenges necessary for each of them to achieve that potential.
		• **Safe learning environments**: Helping reengage students through creating a safe environment for learning.
		• **Affirmation and positive reinforcement:** Native American students often receive positive reinforcement on a community level. Teachers being engaged in Alaskan Native communities could be greatly beneficial to both the student and the teacher.
		• **Engaging family**: Involving parents is an important component to creating a safe learning environment. Teachers need to communicate to parents that their skills and experience are an important aspect of their child's learning.
		• **Make learning relevant**: All learning must be relevant to the world around each student and their day to day lives. It is important for students to expand their knowledge while strengthening their personal and cultural identity.
			Alaska, USA

Citation	Subject	Argument	Country
		Multiple means of representation: Different means of representation in learning for culturally and linguistically diverse learners. Making every student feel valued and represented. **Varying methods of instruction**: Teachers should provide multiple ways to access learning (e.g., observations, hands-on demonstration, story telling). **Cross curricular learning**: Instead of dividing subjects, ANA students are used to learning organically. In traditional knowledge systems, all knowledge is interconnected and grounded in experience. **Multiple means of action and expression**: Creating opportunities for students to demonstrate their understanding in a way they choose (e.g., song, dance, storytelling, art).	

Learning styles of Māori, Pasifika, women and people with learning difficulties

Table 10: Literature relating to learning styles of Māori, Pasifika, women and people with learning difficulties.

Citation	Subject	Argument	Country
Severiens, S. E., & ten Dam, G. T. M., 1994, *Gender Differences in Learning Styles: A Narrative Review and Quantitative Meta Analysis*, 27(4) and Dippelhofer-Stiem, B., 1989, *The development of Research-Oriented Learning in Five European Countries. 4*(4)	These two papers analyse how gender can impact differences in learning styles.	- LSI (Learning Style Inventory) Kolb (1984) found that women tended to prefer concrete learning styles compared to men wanting more abstract conceptualisation modes of learning. - Dippelhofer-Stiem's 1989 article focussed on research-oriented learning as a better way of teaching and learning in university. Research-oriented learning is learning through autonomy, critical attitude, curiosity and exploration. - Both papers investigated differences between genders and found that there is a small consistent gender difference as men showed a greater preference than women for abstract conceptual modes of learning (acquiring knowledge and the meaning of concepts and linking them together). - Data on the influence of context variables on gender differences, such as teaching techniques and learning tasks is not reliable or well-known. - The following table provides a summary of preferred learning styles found in both papers for male and female genders:	Various European Countries

Citation	Subject	Argument	Country
Greenwood, J & Te Aika, L (2002), *Hei Tauira: Teaching and Learning for success for Māori in Tertiary Settings*, Ministry of Education	This research report identifies the enablers of Māori success in tertiary learning.	The report identifies a number of factors for Māori success in tertiary learning: A high level of iwi support • This impacts the way students perceive their programme, extent to which Māori students and staff describe a sense of ease and safety, access to Māori content and the ease in which it can be used. • It also provides the ability of each institution and/or programme to contribute significantly to the capacity building of the whole community. Strong institutional support • There are some mismatches between the expectations of quality, workloads, and provisions for student support between the institution and study programme. • Having strong support impacts ability of each programme to create a cohesive physical and pedagogical context, a degree of ease in administrative relationships and the programme is able to affirm and support what the Māori community values. Active consultation with iwi and engagement of iwi with the programme • Enable Māori to 'own' the programme and actively support it and provide resources A clear professional or vocational focus (strong links with industry) • This enables students to understand and own their goals, find the motivation to work through difficulties as well as develop their role within the community	New Zealand

The image content (embedded table in Argument cell):

Males	Females
Prefer more abstract learning styles	Prefer concrete learning styles
Had more extrinsic motivation	Had more intrinsic motivation (not all studies/groups showed differences in this but for the ones that did show differences, it was split between this)
More grade oriented and competitive	
Scored high on negative attitudes to studying and neuroticism (negative emotions, poor self-regulation, trouble dealing with stress etc.).	
After nine semesters studying, it was concluded that males had a more developed research-oriented learning style (autonomy, critical attitude, curiosity and exploration). They emphasise income, career and scientific and research occupations values for their career.	Women's choice in course may have been because women's value system is more socially oriented such as pedagogy, psychology and philosophy (Dippelhofer Stiem attributes this to traditional roles and values).

Citation	Subject	Argument	Country

		Accommodation of students varying levels of entry and needs
		  • Use different teaching techniques because different people have different styles of learning
		  • Staircasing, multiple entry levels, provisions for upgrading and individualised programmes are all provisions to provide varying levels of entry.
		
		Insistence on high standards
		Recognition of students emotional and spiritual needs as well as academic needs (a student is a whole and connected person as well as a potential academic).
		  • Holistic approach to learning and the way it changes the whole person
		  • Revitalisation of Te Reo Māori was seen as important to enhance this
		
		Affirmation of students connection to the community
		
		  • Students are interested in how they can affect the community once they graduate
		
		Creation of teaching spaces appropriate to the field of studies
		  • institutions perceptions of how the space should be used clashed with the needs of either tikanga or content which caused frustrations
		
		Implementation of tikanga Māori and Māori concepts and values (learning operates in a 'virtual marae')
		
		  • Tikanga needs to be lived and practiced, not just a theoretical concept
		  • The level of tikanga observed depended on how much relative independence the programme had from the institution as well as how easy it was to employ people which tikanga came naturally to them.
		  • Tikanga Māori impacts.
		Strong, clear-visioned and supportive leadership
		
		Significant Māori role models
		
		Teaching staff who are also prepared to learn	

Citation	Subject	Argument	Country
		Teaching staff who have professional credibility in their field Respectful and nurturing relationships with students • Relationships that are supportive, inclusive, and more of a family relationship compared to a professional relationship. Teachers are to be approachable and available to their students. Opportunities for students to redress previous unsatisfactory schooling experiences. Opportunities for students to develop effective learning strategies. Tuakana–teina relationships between students • Working in a whānau environment that allows learning from each other and for students to find their own level at their own pace. A personalised and preferably iwi-based induction • Personal interviewing not just test and score based. The importance of a graduation that involves whānau and community (education is for both a communal and personal good) • Strategic reduction of financial barriers to learning.	
Heiman, T. 2006, *Assessing Learning Styles among Students with and without Learning Disabilities at a Distance-Learning University*, 29(1)	This article examines learning styles among students with learning disabilities (LD) and without (NLD).	• Differences in the learning styles of students with and without learning disabilities at a distance-learning university were examined. • 212 students answered self-report questionnaires on their learning styles. The key findings include: • LD students preferred to use more stepwise processing, including memorizing and drilling, and focusses on ensuring that students understand the fundamentals of a new topic before moving on, than NLD students. • LD students reported a higher need for self-regulation strategies than NLD students, including controlling their learning process, self-orientation, planning, monitoring, and continuous evaluation of their learning process and results. • LD students claimed to lack regulation, noting their difficulties with monitoring the learning process (which can be attributed to some disabilities).	N/A

Citation	Subject	Argument	Country
		• In practice, this means helping students identify their learning styles, and develop effective study strategies and methods that suits their needs. Tailored learning workshops with students is recommended to give students the tools for success. • Adjusting instruction to students' learning styles is also important. For LD students, using stepwise processing – checking along the way of learning a new topic to make sure each step/new information has been sufficiently learnt – or using reflection during classes can be effective. • There was also an emphasis on collaborative learning because it helps students achieve a greater self-awareness of their own learning. • These may appear like negative assessments, but many other aspects of learning were tested for, such as deep processing, concrete processing, and external regulation (dependent on others to start or complete a task). In these aspects, LD students did not differ from NLD and therefore showing that LD students can successfully learn. There are just some aspects that differ and need to be considered when educating students.	

Auckland UniServices Ltd, 2009, *Success for all: Improving Māori and Pasifika student success in degree-level studies*	This research report examines non-lecture teaching scenarios to understand what Māori and Pasifika students need to succeed and learn.	• *Success for All* was a large multi-year project that examined the ways that non-lecture teaching helped or hindered Māori and Pasifika student success in preparing for and completing their degree-level studies.
		• The project involved collating and analysing international best practice and interviews with Māori and Pasifika students (24/26% Māori, 68/74% Pasifika) at the University of Auckland.
		• The findings demonstrated that students believed good teaching practices involve:
		  • a combination of practices that help holistic and academic success
		  • there is evidence that teachers who focus on getting students to pass are seen as the most helpful.
		• Māori and Pasifika students commonly felt pressure to represent their communities well, and feeling like they are not good enough to be there and relying on God (or others) to help them succeed.
		  • Alternatively, some students described practices where their cultural pride and mana were positively incorporated into class, which helped to strengthen and build their confidence. Culturally appropriate teaching approaches can greatly improve success in university studies, as students feel welcome and acknowledged in an educational context.
			New Zealand

Citation	Subject	Argument	Country
		Some interventions that were identified to improve student success included: • Educational resources in their own language • Career planning to help their transition to work. • Māori and Pasifika careers consultant were appointed. • Role models to enable them to show that it is possible for someone like them to succeed.	
Phillips, P., & Loch, B. 2011, *Building Lectures and Building Bridges with Socio-economically Disadvantages Students*, *14*(3)	This paper discusses the efficacy of teaching technologies with a focus on the engagement and performance of students with socio-economic disadvantages.	• This research examines the performance of two cohorts of university students (2008 and 2009) one of which was taught in a traditional approach to face-to-face and distance learning, the other was taught with the assistance of a Tablet PC and live lecture recording 'screencasts'. • This research found that the use of a Tablet PC in lectures (in place of power point slides) remarkably improved the engagement and performance of socio-economically disadvantaged students. • Standard PowerPoint slides are used as a record for distance learning students whereas, Tablet PC's are more of an interactive learning tool to facilitate discussion with images and prompts. This suggests interactive technology and collaborative learning formats are effective tools for the learning and development of socio-economically disadvantaged students.	Australia

Ministry of Education, 2018, *Tapasā: cultural competencies framework for teachers of Pacific learners*	This report provides a cultural competency framework for teachers of Pacific learners.	• Tapasā is a navigation compass and can also be referred to as a guide on a journey. Tapasā was developed by the Ministry of Education to increase the cultural competency of teachers of Pacific learners.
		• Three turu or competencies form the basis of the framework:
		  1. Teachers can demonstrate awareness of diverse and ethnic specific identities, languages and cultures.
		  2. Teachers establish and maintain collaborative and respectful relationships and professional behaviours that enhance learning and wellbeing for Pasifika students.
		  3. Teachers implement pedagogical approaches that are effective for Pacific learners.
		• According to Pacific learners, a 'good teacher':
		  • Understands that a student's identity, language and culture is important to them.
		  • Pronounces students name and words in their language correctly and makes an effort to learn and use simple words.
		  • Recognises that English may not be their first language.
		  • Communicates well and isn't afraid to ask students and their parents questions.
			New Zealand

Citation	Subject	Argument	Country
		• Does research to know more about students, their families, culture, and island nation(s). • Incorporates stories, legends, myths, events, activities and symbols that students understand and are relevant to them when they are teaching. • Understands students' values, spirituality (church), faith and family. • Is a strong, kind, honest, passionate, open-minded, understanding, flexible and compassionate leader who cares about students. • Knows that students want to learn but, in a way, and at a pace that is suitable for them.	
Ministry of Education, *Best practice for teaching Pacific learners: Pacific Evidence Brief 2019 – Executive Summary*	This pamphlet identifies areas for improvement in Aotearoa New Zealand's education system to support Pacific learners.	• The report highlights significant disparities at NCEA Level 3 and University Entrance. In 2018, 28% of Pacific 18-year-olds had not yet achieved NCEA Level 2 (this is the minimum level that is considered suitable for readiness for life outside of school). • The report identifies four key areas for improvement in Aotearoa New Zealand's education system to support Pacific learners. 1. Respecting and valuing identities, languages, and cultures – this is important to make learners feel valued by the whole learning community (teachers, learning leaders, peers, and the wider community). How to achieve this: • Employ Pacific teachers. • Implementing culturally appropriate curriculum • Supporting children's language development. • Appropriately and inclusively celebrating cultural events. • Having appropriate teaching and learning resources such as visual displays • Children showing a strong sense of pride in and knowledge about their culture. 2. Developing home and school partnerships – this is important to gain the culturally-located understanding required for quality teaching and learning. It also helps to align expectations from both home and school, ensuring that learning in both places can be meaningfully connected and effective strategies can then be implemented at home. 3. Lifting expectations of Pacific learners - appropriately high expectations drive good pedagogy and achievement.	New Zealand

Citation	Subject	Argument	Country

		4. Culturally responsive pedagogy - this is key for lifting achievement among Pasifika students.
		
		• Key elements of culturally responsive pedagogy:
		  • All teachers and learners are seen as culturally located not just a few from that culture
		  • Teachers know learners backgrounds, including the specific ethnicities with which Pacific learners identify
		  • The learner is a resource so they can share their knowledge during the appropriate lessons/tasks
		  • Teachers plan for and use culturally relevant materials and concepts to engage learners with the curriculum, including the use of Pacific languages to enrich learning
		  • Teachers provide multiple opportunities for effective collaborative learning that aligns with core cultural values
		  • Teachers explicitly teach and encourage behaviours that build the engagement and critical thinking skills that are required to advance through the curriculum.
		• The report highlights the significant challenge of implementing, sustaining and achieving the required changes in practice. In addition to outlining the importance of strong leadership and governance to drive change across the system, the report identifies the following conditions that are necessary to effect system change:
		  • allow sufficient time for the changes and improvements to be embedded, several years often.
		  • a small number of focussed priorities across the system » sufficient and sustained resourcing.
		  • external expertise and support to enable shifts in teacher and leader practice.
		  • an accountability focus on sustained improvement.
		• Change can be difficult, so allowing sufficient time for changes and improvements to be embedded, small number of focussed priorities across the system, sufficient and sustained resourcing, external expertise and support to enable shifts in teacher and leader practice and an accountability focus on sustained improvement are important.	

Alansari, M., Webber, W et al, (2022). *Conceptualising Māori and Pasifika*	This study explores the barriers and enablers to Māori and Pasifika success in education.	• The Conceptualising Māori and Pasifika Aspirations and Striving for Success (COMPASS) study aims to give effect to the Treaty, and notion of Whakatere Tōmua (wayfinding) and identifies the various punga (anchors) in the lives of Māori and Pasifika ākonga (students). • The research comprises of four primary studies, including:	New Zealand

Citation	Subject	Argument	Country

Aspirations and Striving for Success		1. What are the motivational and engagement patterns of Māori and Pasifika learners in Englishmedium schools?
		2. How to become inspiring, encourgaing and supportive role models for Māori students?
		3. What Pasifika students and their families pereive as effective teaching qualities and practices for teachers?
		4. What teaching and learning relationships, environments, practices, and experiences do kaiako Māori report make a positive difference for ākonga Māori?
		• The research argues that the traditional comprehension of academic motivation misses the role of whānau, kāiako and other community members in helping develop and sustain academic motivation.
		• A survey of Māori and Pasifika ākonga was undertaken as part of the research and Ward's hierarchical cluster analysis technique was used to distill various themes from the data to categorise respondents into 'flourishing', 'thriving' and 'struggling' categories. The survey questions reflected 3 types of motivation (intrinsic, extrinsic and whānau motivation). Key findings include:
		  • Māori ākonga saw the 3 types of motivation as interrelated and "positive motivation".
		  • More girls were identified in 'flourishing' and 'thriving' clusters with higher levels of engagement and motivation.
		  • Motivation and engagement at school predicts ākonga self-reported achievement, and it is also related to their perceptions of support networks and cultural pride.
		
		Māori ākonga (learners)
		Role models (or poutokomanawa) were found to be particualrly important to Māori ākonga academic motivation. They:
		  • provide vicarious learning for students
		  • display templates of behaviours that students recognise they will need to achieve success
		  • demonstrate that something is possible – whether that is by breaking barriers, self-stereotypes etc.
		
		Poutokomanawa (role model) may also play a mentor role for ākonga. They:
		  • model cultural competence and confidence
		  • support and mentor the student (and therefore are relatable)	

Citation	Subject	Argument	Country
		• encourage and celebrate the student's achievements • help the student achieve their dreams in the future Poutokomanawa are mainly whānau members, but they can also be teachers since they play an important role in ākonga's development. They could: • display traits that ākonga Māori value such as being kind, caring, resilient/tenacious and hardworking • show that Māori culture and language is important and valuable and have cultural awareness and interest in it • allow space for teacher to share their own passions and interests as well as investing in ākonga's • celebrate achievements • have high expectations of Māori achievement and expect them to meet or exceed those expectations • talk to ākonga about the future, their aspirations and goals and discuss with them steps to achieving that success. **Pasifika ākonga and families** The third study demonstrated that Pasifika students and families believed that establishing partnerships and relationships was an effective practice for teachers to engage in, so that they can better understand who the child is and the different worlds they are a part of. This enables a free flow of communication between teacher and family, as well as making families feel respected. Investing time to help and support learners and their families also demonstrates to students that they can trust and develop confidence in their teachers. **Kaiako/teachers perspectives** The fourth study involved surveying kaiako/teachers to further understand some of the teaching and learning relationships, environments, practices and experiences that postively impact Māori ākonga. These findings were distilled into some key themes: School-wide environments and conditions: • Embrace te ao Māori worldview and culture through education	

Citation	Subject	Argument	Country
		• Using cultural diversity as a learning opportunityand teaching point that are relevant and effective for diverse students. Whanaungatanga (relationships and connectedness) as the foundation for teaching and learning for ākonga Māori: • Strong and positive relationships between kaiako and ākonga has positive impact on ākonga learning, wellbeing and flourishing • Creates a community of care is supported when connectedness is based on collaborative and supportive partnerships. Manaakitanga as the foundation for caring, supportive and mana enhancing school environments: • Mana Māori needs to be upheld • Mana relates to sense of being, motivations for achieving and their personal and collective identities Practices, dispositions and qualities that make a difference: • Ako acknowledges learning as a lifelong process where people can be both teachers and learners which reinforces a relationship of respect and the relationship being mutually beneficial.	

Sexuality and gender perspectives and experiences

Table 11: Literature relating to sexuality and gender perspectives and experiences within the construction industry career pathway.

Citation	Subject	Argument	Country
Powell, A & Sang, K. (2013) Equality, diversity and inclusion in the construction Industry, *Construction Management and Economics*	Literature review of various research regarding equality, diversity, and inclusion.	Masculinity: • 'Alpha male' is associated with bullying, harassment, homophobia, and misogyny. This is just one form of masculine identity within the construction industry. • Building friendships within work can counter these exclusions. Using interactions as a form of inclusion than structural reform (changing the construction industry fundamentally). Women's experience of masculine culture: • Many workers did not perform femininity all the time, they would combine femininity and masculinity to 'achieve' in work • Gender was not important once engaged in the act of work.	Australia

Citation	Subject	Argument	Country
		• To attract women into the industry: Focus more on the pleasures shared rather than difficulties that divide between genders • Work/family/life balance (triad rather than binary view of just work/life balance) is suggested by Ani Raiden and Christine Raisanen, to enable inclusive measures of wellbeing. Masculinity problems for men: • Pressure to stay in the construction industry was associated with hegemonic masculine traits: keeping fit, continuing to work, maintaining a work identity, and continuing to earn an income • So, the opposite (leaving the industry) is being weak, fragile, old, "giving up" – all of which are considered less masculine traits. <u>Age</u> • Age: what constitutes age, age discrimination, legendary older workers (legendary because they are <u>still</u> working). • Physical process of ageing and getting worn out • Strategies used to 'keep going' • Retirement – how long do I keep going? • Financial considerations in retirement To adapt the industry to these workers, such as by adding part time work, shorter hours and assistance with more strenuous tasks, may also attract other minority groups (particularly women) to the industry.	
Wright, T. (2013), Uncovering sexuality and gender: an intersectional examination of women's experience in UK construction. *Construction Management and Economics,* 31(8), 832-844.	There is a lack of research on the experiences of lesbian, gay, bisexual, and transgender (LGBT) workers in construction. While women's sexuality soon becomes a focus of interest when they enter male-dominated work, little research has discussed how sexual minorities– and in particular lesbians– fare in such environments. This article	• Heterosexual women experienced sexual comments, unwanted sexual advances and touching. • While open lesbians mostly avoided sexual advances and touching, instead some faced bullying and abuse for failing to conform to expectations of heterosexual femininity or heterosexualized interactions.	United Kingdom

Citation	Subject	Argument	Country
	examines how both gender and sexuality interact to shape women's working lives within the UK construction sector, drawing on 22 interviews and a focus group with heterosexual women and lesbians in male-dominated occupations in construction.	• Homophobic harassment is currently not addressed in the construction industry for minority sexuality groups (lesbians in this case). • Sexuality immediately becomes a focus of interest when women enter the workplace and is used as a form of control of women (harassment). • Self-presentation through dress and appearance is a concern for women seeking to fit into a normative male environment, with some women opting for a more masculinized style of clothing in order to 'fit in'. Those who want to wear more feminine clothing are discouraged due to fear of unwanted attention. • While there may be increasing general awareness among employers of the need to eliminate sexual harassment, at least at corporate head office level, interviewees' experiences indicate that homophobic harassment is less well recognized as an issue. Until the industry begins openly to address the sexual diversity of its workforce, there is a danger that strategies for tackling homophobic harassment will remain underdeveloped.	
Barnard, S & Dainty, A. (2018). Coming out and staying in: how sexual orientation and gender identity matters in construction employment. *Proceedings of the Institution of Civil Engineers – Municipal Engineer,* 171(3), 141-148	Experiences of LGBTQIA+ people within the construction industry and various expectations held against them, and what can be done to make the industry more welcoming.	Better to actively make an inclusive environment than just making generalised policies. For example, the InterEngineering LGBT project is one of connecting, empowering and inform engineers from the LGBT community. It had a project with addressing harmful stereotyping within the industry.	United Kingdom
Struthers, K. and Strachan, G. (2019). Attracting women into male-dominated trades: Views of	Discusses the views of young women on construction trades and identifies the barriers preventing women wanting to work in male-dominated job. The study	• Tackling gender-segregation of construction trades is an issue that has been raised over many years.	Australia

Citation	Subject	Argument	Country
young women in Australia. *International Journal for Research in Vocational Education and Training*, 6(1), 1-19. DOI: 10.25656/01:17257.	interviews female secondary school students in Queensland, Australia to determine why young women are hesitant to work in construction trades.	• Low enrolment and completion of female students in male-dominated vocational education and training in Australia. • Male-dominated trades are often higher paying than female ones. • The fear of intimidation and harassment was the main deterrent for young women. The influence of gender stereotypes on careers, the lack of information about trade courses, fear of harassment and losing feminine identity were the four key barriers.	
Miletic, D. (2019, May 13). 'We get told off less than men': The one area of construction booming with women'. *The Age*	This article shares stories about women working in a male-dominated industry in Victoria, Australia. The article discusses how the presence of women is increasing in the construction industry.	• TTM is identified by female workers as a strong well-paid entry position for women to enter the construction industry. • The number of female traffic controllers in Australia has drastically increased in recent years. • Women often elicit less road rage from car drivers. A female presence tends to calm drivers and prevent public confrontation compared to male workers. • While there were no official figures [as reported in the document] it was clear there "were significant numbers of women" in traffic and that it was an area of the construction industry (of which men make up 88 per cent) where woman have found work.	Australia
Absolute Traffic Management. (2021, July 12). How traffic control is booming with women. *Absolute Traffic Management*	This article explores the multiple benefits of having female employees in the construction industry and traffic control. Additionally, it recommends ways that the construction industry can expand its female workplace.	• Benefits for the industry included higher productivity, traffic calming (calming road rage drivers with strong communication skills), facilitating stronger group cooperation, solves labour shortages and strengthens consumer trust. • Identified benefits for female traffic controllers included a financially rewarding career, an entry point into the construction industry, flexibility of working hours (as well as childcare rebate provisions, paid parental leave). • Lastly, the article recommends how the construction industry can expand its female workplace, such as including women in company culture, supporting women in leadership roles, creating suitable	Australia

Citation	Subject	Argument	Country
		working conditions (e.g., flexible working hours) and not tolerating disrespect towards any gender within the workplace.	

Disability perspectives and experiences

Table 126: Literature relating to disability perspectives and experiences within the construction industry career pathway.

Citation	Subject	Argument	Country
Bailey, S., Carnemolla, P., Loosemore, M., Darcy, S., & Sankaran, S. (2022). A Critical Scoping Review of Disability Employment Research in the Construction Industry: Driving Social Innovation through More Inclusive Pathways to Employment Opportunity. *Buildings*, 12(12),	Systematic literature review of relevant peer-reviewed research relating to the employment of people with disability in the construction industry.	• Construction sector is the world's largest employer but has historically struggled to increase its diversity. • In addition to diversity issues, the authors argue the lack of research into employing and retaining persons in minority groups in construction is surprising as the workforce is facing severe skills shortages. • Social procurement policies can help create training and employment opportunities for disadvantaged equity-seeking groups (e.g., disabled persons, indigenous people, refugees and migrants, ex-offenders, and disengaged youth). • Barrier key themes for the employment of disabled persons included 'requirements versus practice', 'stigma', 'timing of disability disclosure'. • Some employees with invisible disabilities chose to hide them from their potential employer. In some cases, people have received negative responses from employers to late disclosure. • Traditionally homogenous (male and able-bodied) workforce, inflexible employment (hours and conditions) and the common practice of employing tradesmen from established, narrow social networks create barriers for disabled people (and other minorities).	Australia

Citation	Subject	Argument	Country
		• Enablers included 'accommodation inclusive environments', 'relationship building', 'information and support to employers', 'hiring practices that invite people with disability'.	

B

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