Engineering and Construction Academy Strategic Plan

Introduction

Pre Covid-Marlborough already had a skills a labour shortage with some businesses reporting staffing at 75% of capacity (*Solving Marlborough's Demographic Challenges*, Forte Management 2017). This situation has been exacerbated by covid and will be accentuated with a number of large infrastructure programs commencing over the next four years.

At the same time, Marlborough has a high NEET rate; 11.1% compared to its low unemployment rate 2.5% (*Infometrics Regional Economic Profile*). Nevertheless, this represents approximately 480 young people not in employment or training in the region, and nearly 2500 in Te Tauihu.

The Construction and Engineering industries are particularly affected by the skills and labour shortage. It has been reported that over the next three years Marlborough will be short 1800 people in these industries (Marlborough Express April 7, 2021). With some major infrastructure projects commencing in the region this will put additional pressure on the labour supply.

Academies: Switzerland meets Aotearoa

The Swiss Model

In their discussion of the Swiss Vocational Educational Training (VET) program Nancy Hoffman and Robert Schwartz (*Gold Standard: The Swiss Vocational Education and Training System,2015*) discuss this system where over 70% of students undertake an apprenticeship.

Students finish compulsory education at year 9 and move into a semi-apprenticeship system where learning becomes contextual and based around a student's chosen vocation. Time is spent both in class and in the workplace. Here they experience work culture, become familiar with the environment and develop skills in anticipation of their eventual work choice. Employers apply to host students and the ability to do this has mana within their community.

The success of the Swiss system is due in large part to the investment that employers make in the education of their workforce. Swiss employers recognise that this investment ensures their long-term skills and labour needs are met. They know that the time and funding spent supporting the development of their future workforce is more than offset by the bottom-line increases in productivity provided by the apprentice. As one Swiss CEO states, "It costs more to hire 10 inefficient people than to hire one efficient person, that costs a fortune." (Hoffman and Schwarz, 2015)

Swiss employer organisations and associations decide the content of the VET programs and develop new occupational programs to meet projected skills and labour requirements.

Both the Swiss government and the education community are clear that their system works because it is designed to meet the needs of industry.

The Swiss model in Aotearoa

There are a number of examples of rich relationships between business and education in Aotearoa where students experience vocational learning opportunities. They operate across a range of industries including Primary (Katikati Innovative Horticulture Program, Tokomairiro High School

"Toko Training") construction/engineering (Massey High School, the SOREC collective of schools, Hastings Boys High School, Dargaville High School) Hospitality (Massey High School, Dargaville High School) and business (Manurewa High School Business Academy).

These programs have at their core a strong relationship between the school and industry, with curriculum supported by workplace experience and employer investment. Through industry assistance schools' capital expenditure programs in these departments increases. This ensures students gain experience using tools in their school-based learning and can transfer that to the workplace where they find the same equipment.

At its best these school-business relationships allow a transition through the student's secondary schooling career. It takes them from exploration of the world of work, through experimentation and selection to a "Foot in each world" transitional work experience. As Johno Williams of Patton engineering noted, "These young people coming into my workplace already know how it works, familiarity has made it less scary for them to come to work".

Case Studies

Dargaville Building Academy

Background

Operating for 8 years, in 2020 they commenced a contract with Kainga Ora and are building three houses per year. Currently have 9 year 13 students and 2 year 12 students. They must pass literacy and numeracy to enter the program, or in the case of the year 12 students they spend time in school doing literacy and numeracy.

Operation

Students achieve 60 credits at NCEA Level 3 and they attend the building academy full time which operates separately to the school. Dargaville High School does not use the building academy for contextual education opportunities outside the core building academy focus.

Governance/Finance

For historical reasons, a separate trust was formed with school and community members holding office. The Trust contracts for the houses on a per m2 basis, with invoicing to Kainga Ora occurring monthly for cash flow reasons. TEC's Trades Academy covers all students' course related costs, this includes site safety courses, hand tools, PPE which the students keep upon graduation.

Staffing

There are two LAT Teachers who work on the project, one funded through school staffing and the other funded from the profits from the Kainga Ora house. The Trust owns the power tools required for the project and the students leave with the hand tools at the end of the year when they pass.

Employer-School engagement

Dargaville is a small community and as such presents few opportunities to secure industry partnerships with the school. Some funding was sourced from a local company to build the pad for

construction of the three houses, but there is no ongoing financial or work experience relationship with local businesses.

Massey High School

Background

The MHS academies offer students the opportunity to get involved in a skills-based Vocational Pathway at Massey High School, with aligned onsite tutoring at various providers. They all involve studying for NCEA, working towards a National Certificate, and gaining BCAT Level 4 micro qualifications. They will undertake skills-based learning at a provider and the opportunity to have their NCEA endorsed with a Vocational Pathways Award at Level 2.

Operation

The building academy starts at year 11 with a day per week spent in a multi-skills program on skills acquisition for the following year. Students progress to a full-time building program at year 12 and 13. With 40 students they build 6 houses per year.

Governance/finance

A separate trust exists which holds the contract with MHS. They are registered as a TEC Trades Academy provider, and this supports some of the funding for their 6 builders. The remaining funding is derived from the profits from the six houses, and any profit is returned to the school.

Employer School engagement.

Allied trades and builders come to the school to give lessons or provide oversight with one plumbing business employing a plumber to help on site with lessons and support. Students will visit work sites from building companies aligned with the course. Holiday work is available, and students leave into apprenticeships with several credits towards their building qualification already achieved.

Hasting Boys High School

Background

The Initiative aims to utilise the dynamic and well-resourced Technology Department at Hastings Boys' High School exposing students to different pathways, while giving them real life exposure to Technology within the Hawkes Bay community.

It's important to note that The Initiative has become a well-resourced vibrant department based largely on the relationship between Salla Delport, HBHS Head of Faculty, and Johno Williams MD, Patton Engineering. This represents a strength and a possible point of failure if one or both parties leave or become disenchanted with the programme. They both point to the importance of a supportive and enabling Principal, and a strong relationship with the businesses involved.

Operation

The Initiative runs four programs, Design and Visual Communication, Product Design, Engineering, and Woodwork. They have well equipped workshops funded in part by donations, applications to charitable trusts and gifts by old boys and businesses. The program started with the Year 12

engineering courses visiting Patton Engineering, and a group of boys then spending a day a fortnight at Patton. PE also invested and supported the school to purchase welders and guillotines which helped them improve the quality of project the boys were able to undertake.

Subsequent investment over the four years has seen the department create a pathway of skills from year 9 to year 13. Boys gain the skills in design using CAD that allows them to produce exciting projects in their final year. They progress through design concepts and develop their skills in 3D printing, laser cutting and a range of tasks that allow them to competently build their final projects. These include BBQ smokers, stools, a double bed to name a few.

A construction academy is in its infancy at HBHS. A recently signed MOU with Kainga Ora will see a program of building eventually build three houses a year. This means there is a secure and sympathetic purchaser who guarantees a price for the house thus removing risk for the school. Profits from the house are reinvested in the program. A range of courses are built around this academy, Years 12 and 13 are full time on the build with "pathways courses" providing alternative learning options for re-engaging disengaged students.

The program of fortnightly work placements sees the students gain skills in engineering that they would not otherwise gain. As Mr Delport says, in a single day at Patton the boys do more welding than they would in two years at school.

Governance/Finance

As previously discussed, The Initiative receives funding from Charitable Trusts, Old Boy donations and gifts. These are all invoiced and reported against, and this becomes part of the school funding.

HBHS is fortunate to have a dedicated HOF who spends more than 20 hours a week over and above his normal duties organising and coordinating the workplace relationships. This includes fundraising and reporting, inventory resupply, cap-ex and op-ex planning. It also involves developing relationships such as the Kainga Ora partnership, and reporting to his industry partners.

Observations

There are some common themes that arise in every conversation with people involved in the academies, and of those, sustainability is the most frequently raised. Academies flourish when the relationship between the school and the business partners are strong. Often these relationships exist between one or a few people in the school and one person in the business partnership. This represents a risk to the academy; what happens with changes in staff in either partner and who carries the kaupapa of the partnership to ensure it continues.

Teachers also report their increased workload managing the academy. This includes strategic planning, transport to and from workplace, ordering materials, seeking funding, developing relationships with new partners to name a few. Salla Delport reports an extra 10 to 20 hours above his normal teaching load organising the academy. All this must be balanced with the job at hand; teaching

The range of academies in Aotearoa is small but growing. A number of schools partner with Kainga Ora and local businesses to provide vocational opportunities for their students. In conversation with them the schools all report increased retention of students to higher levels of schooling, and better outcomes when the students leave.

Businesses also report an increased level of student skill level, and a lower dropout rate when they do take these apprentices into their business. A GoodMeasure Report on HBHS's "The Initiative" produced by ImpactLab will give empirical evidence about the efficacy of programs like this. Anecdotal evidence is overwhelmingly positive from business owners such as Johno Williams. This supported by the number of businesses who are now taking part in the Hastings Academy

In conversation with Johno Williams two points stand out. Previously he was hiring apprentices and turning them over after three months due to work readiness and suitability issues. He now says "Normally an apprentice will take a year to start delivering value to my business, now they make me money from the day I hire them". He also notes that some students try engineering at school and discover it's not for them, so they move on to something else. This allows those students to "fail safe" within the school system and circle back to try something else. This is a preferable situation to a school leaver "failing" in an apprenticeship situation when they've left school and the support they find in that environment to try another pathway.

In the Swiss tripartite system between state, canton and industry, the state is responsible for setting policy and ensuring the institutions are in place to deliver the labour and educational needs. Careers guidance, advice and navigation is the responsibility of the Canton. Communication of industry training needs at the local level occurs on boards where representatives of industry and schools and educational providers communicate directly.

New Zealand's state entities such as the Tertiary Education Commission, the Workforce Development Councils and Te Pukenga have roles analogous to the role of the Swiss Federation. Responsibility for careers guidance and ongoing training rests largely with schools and Private Training institutions with very little formal support for navigating the myriad career progression opportunities outside of school.

RSLGs are tasked with determining the workforce requirements at a regional level. However, there is no mechanism for industry to directly communicate their labour force requirements to, or to collaborate in training students with schools, PTEs or Training institutions such as NMIT.

Currently MOE is implementing the government's Statement of National Education and Learning Priority (NELP) which sets out the priorities for education to ensure the success and wellbeing of all learners. Priority 7 asks schools to report on how they "Collaborate with industries and employers to ensure learners/ ākonga have the skills, knowledge and pathways to succeed in work".

In the subsequent recommendations this document will suggest some opportunities to establish the academy to maximise the benefit to the students, the business community and ensure our schools are supported to create a pipeline of a skilled, motivated workforce driving the economic development of our region.

Recommendations

Which School?

I have focused on two schools, MBC and QCC for the Engineering and Construction Academies and recommend a separate board for each of these schools. This does not preclude other schools joining later but QCC and MBC have been involved from the beginning and are someway down the road on this work.

The primary purpose of the formation of a board is to develop a conversation between industry and education, and to ensure that relationship is maintained beyond the lifetime of the involvement of a single individual or individuals.

Schools move at different paces and while the outcome should remain the same some of the steps along the way will differ between schools and communities; the solution for Picton and QCC will not be the same as that of MBC and Blenheim. That is not to say that QCC cannot form a relationship with Blenheim businesses, or that MBC can't access the Port Marlborough reconstruction project for example, just that the priorities and processes to establish and operate the academies will be different and they will most easily be met through separate boards.

Each school and community should form its own board and establish relationships between them. It should be noted that this format also allows for similar relationships with other significant areas of the region's economy. The trust deeds should be written such that it allows for development of further academies with (for example) the primary industries such as forestry, viticulture, or aquaculture.

1) **Governance and Finance**

Establish a foundation similar to the Manurewa High School Business Academy Foundation to create pathways for students into the construction and engineering industries in the region. The Board should develop a vision of partnerships between school, industry, alumni, and tertiary institutions to deliver measurable benefits to students and industry. They are responsible for creating skills-based pathways into the roles and opportunities for vocational employment for school leavers in the region.

The foundation insures against changes in staff and personnel as the vision and mission are held in the constitution. The vision is for the school and the foundation to work together in a way that transcends changes of personnel and ensures sustainability. The foundation's trust deed should allow for a partnership with the school Board of Trustees and management, to ensure the development of a successful Engineering and Construction Academy at the school.

An additional advantage of a Foundation or Board not within the school system is that it allows applications for funding to entities such as the He Poutama Rangatahi Fund who are not able to fund schools directly. This could include re-engagement programs focused on NEETs etc.

The board membership could include:

- Principal
- Iwi representatives
- School Board Member
- RSLG member

- Economic Devt representative
- 2 x Industry representative (Construction)
- 2 x Industry representative (Engineering)
- Alumni representative (Old Boys Assn etc)
- Current Student representative

2) Strategic Plan

Develop a four-year strategic plan for Construction and Engineering faculty courses based on workforce planning with schools, industry, Iwi and RSLG

- Capital Expenditure:
    - What equipment does the school have and what equipment do they need to support the courses
- Operational Expenditure
    - What agreements exist for the supply of consumables and what opportunities are there to establish agreements for supply
- Staffing
    - What staffing resources exist and how can we augment these using the resources at hand (Men's Shed, retirees etc)
    - Creating attractive packages to assist the school to find talent for hard to recruit roles
- Workplace Experience
    - Establish workplace experience MOUs with industry for all age groups using Dave Turner's WE3 model of vocational learning
- Curriculum Development
    - What opportunities are there to develop curriculum or courses

3) Kainga Ora relocatable housing project

Form a working group to establish a relationship with Kainga Ora to build relocatable social housing at MBC. The building project(s) will ideally be located on the school grounds to ensure it remains a part of the school and is a visible link to pathways into industry. The working group will develop a strategic plan for the Kainga Ora project taking the following steps:

- Prepare a budget for the project based on plans already supplied by KO:
    - Determine costs and likely profit from project
    - Determine staff resourcing required and costs
- Seek commercial partners to help offset costs of project
- Determine location of project
- Develop curriculum opportunities within the building project

4) Staff

"We can't expect teachers to be out in the community developing pathways and partnerships, when they need to be in the classroom. Yet we are not meeting the needs of our students if we do not prepare them to sense, value and seize opportunities." Former Nelson Boys College Principal and Companion of The Queens Service Order, Salvatore Gargiulo,

We recommend the employment of a Business Development Manager for the establishment of the Academy. The BDM will be an employee of the Foundation and report to them on progress. They will be required to collaborate closely with the teaching staff and will be an indirect appointee of the schools' BOT and have a reporting responsibility to them through the foundation. It is important that their work is seen as core business for the school and their operation is endorsed by the management and staff.

Funding for the BDM should be sought from charitable trusts, MDC Economic Development, MOE and or MSD and industry support. There will be a potential funding stream to come from the Kainga Ora project and this could also support this position.

Their role is to:

- In collaboration with SLT and teaching staff support the development of a strategic plan for the academy in accordance with the direction of the Board/Foundation
- Determine partnership opportunity with iwi
- Responsible for culture of faculty
- Fundraising and budget reporting
- To form relationships with industry and to manage the growth of the program
    - Assist in sourcing material and brokering partnerships with industry
- Develop relationships with the relevant WDCs to enable the creation of micro-credentials or accreditation to level 4
- Work alongside the school faculty to develop
    - Capital expenditure budget
    - Operational expenditure budget
- Develop a program of regular workplace experiential learning opportunities and visits across the age groups including:
    - MOU's with industry partners
        - Conditions of engagement for an industry partner
        - Benefits to industry partners (e.g. allocating a quota apprentices recruited from program per year)
    - Monitoring and managing student/employer relationship
    - Addressing H&S requirements
    - Logistical support (student travel to and from employers)
- Working alongside the teaching staff to support development of curriculum areas
- Identify staffing needs and seek funding support for this where necessary

Potential Time line

Action	**Time frame**
Approach potential members and form Board	Immediate
Form Kainga Ora working group	Immediate
Approach iwi partners	Immediate
Employ BDM	Intermediate
School and industry create strategic plan for	Intermediate and ongoing

academy including cap-ex, op-ex, staff, curriculum, format	
Identify capital expenditure requirements for workshops	Intermediate
Develop MOU's for industry partners	Intermediate
Establish range of work place experiential learning opportunities with industry	Immediate