



Briefing Note: STEM – Update on industry connections and programmes supporting STEM in NZ

To:	Hon Jan Tinetti, Associate Minister of Education		
Date:	19 February 2021	Priority:	Low
Security Level:	In Confidence	METIS No:	1250523
Drafter:	Patrick McKibbin	DDI:	s 9(2)(a)
Key Contact:	Rose Jamieson	DDI:	s 9(2)(a)
Messaging seen by Communications team:	No	Round Robin:	No

Purpose of Report

In our agency meeting (11 Feb) the Secretary for Education agreed to provide you with this paper.

The purpose of this paper is to advise you of engagement with employers, business and industry that represent and have an active interest in Science, Technology, Engineering and Maths (STEM).

Note that we will keep you advised through the Education Weekly Update (EWU) on progress on this work and the ongoing conversations with employers, business and industry representing the STEM sector.

Agree to forward this paper to the Minister of Education, Associate Minister of Education (Māori Education), and Associate Minister of Education (Pacific Peoples)

Agree that this Briefing will be proactively released.

Agree / Disagree

Agree / Disagree

Summary

- The Ministry of Education has ongoing engagement with employers, business and industry. The majority of employers believe there is a role for them in guiding young people into pathways for their future careers.
- There is increasing interest from employers, business and industry in STEM education and pathways for Māori and Pacific learners into STEM careers.
- The technology industry has recently contributed to this STEM conversation with the release of the *Digital Skills for our Digital Future* report. This report identified a number of challenges and opportunities with a number recommendations for their industry and education.
- We have collated a list of organisations that have established programmes to inspire and engage learners in STEM education and industry pathways. This list is attached for your information.



Rose Jamieson
Deputy Secretary
Parent Information Community Intelligence

19 February 2021



Hon Jan Tinetti
Associate Minister of
Education

19/02/2021

Background

1. There is an increasing interest in STEM education and career pathways from employers, business and industry. This has been highlighted by two recent events:
 - The release of the New Zealand Digital Skills Forum report *Digital Skills for our Digital Future* on 27 January 2021,
 - Engagement between the Secretary for Education and the Chief Executives from Transpower and the Government Communications Security Bureau (GCSB).
2. Increased interest in STEM education is due to a number of factors including:
 - Continuing growth in the technology sector and the number of jobs generally requiring STEM-related qualifications
 - Desire to attract talent and to diversify their workforces, particularly Māori and Pacific young people
 - An increased awareness of aging workforces and need to attract new talent.
3. There are many STEM related programmes operating across Aotearoa. These are generally designed to increase learners' knowledge, excite and inspire them, or to connect them to a specific industry.
4. In addition to the ongoing Ministry work on the Digital Technologies and Hangarau Matihiko curricula, we are also active in supporting some STEM related work with a small number of community-based organisations and employers.

The *Digital Skills for a Digital Nation* report

5. The New Zealand Digital Skills Forum *Digital Skills for our Digital Future* report was officially launched on 27 January 2021 by Minister Clark. The report was partly funded by the Ministry of Business, Innovation and Employment as part of their Digital Technologies Industry Transformation Plan. The Ministry of Education provided data and support for the report.
6. The New Zealand Digital Skills Forum is a coalition of industry associations and government organisations that work together to identify key issues and opportunities across ICT, high-tech and digital skills. The group includes NZRise, NZTech and IT Professionals NZ.
7. The report provides an analysis of our digital skills landscape and actionable findings. The report's purpose is to highlight how Aotearoa New Zealand can realise our potential through development of a skilled capable workforce that is prepared for the future of work.
8. A key issue identified by the report is a digital skills shortage. The demand for digital skills is already high, the supply of digitally skilled workers is low, and demand is forecast to grow. The report suggested critical investment in needed by both private and public sector organisations in the development of their staff.
9. The report identified a range of education-related recommendations. These included building a talent pipeline, supporting the transition to work, and upskilling and reskilling the New Zealand workforce. We have included all recommendations from the report in Annex 1.
10. Since the report launch key people from the technology industry have reached out to the Ministry to meet with us and the Tertiary Education Commission (TEC). Technology leaders wish to start a conversation about the recommendations and the following areas:

- How quickly can we develop a digital apprenticeship?
 - What can industry be doing to help encourage more students to study tech?
 - Can we make internships easier and better for both industry and graduates?
 - What changes to courses are needed to better support upskilling of the workforce?
11. We have scheduled a meeting for 24 February that will be attended by key executives from NZ Tech, NZRise, IT Professionals NZ, and Internet NZ. The Secretary for Education and the Chief Executive from TEC will attend the meeting with key people from their teams.

Engagement with Transpower and the GCSB

12. On 20 January 2021 the Secretary for Education met with Alison Andrew, Chief Executive of Transpower, and Andrew Hampton, Chief Executive of the GCSB. This meeting was at the request of these organisations.
13. Both Transpower and GCSB have existing work in STEM skills growth. Discussion included:
- Their attempts to attract into their organisations tertiary learners studying STEM-related qualifications
 - Their struggle to attract workforce largely due to competition between employers for these graduates
 - Their concerns over their aging workforces
 - Their interest in diversifying their workforce in order to provide equitable outcomes for Māori and Pacific learners.
14. Both organisations are actively attracting and supporting young people into their organisations:
- GCSB run a scholarship programme. They also encourage their younger workforce to be active in inspiring young learners in primary and secondary education towards STEM education and pathways
 - Transpower have had a year-long programme that has helped two young Māori learners towards a STEM (cyber security) pathway in their organisation. This programme has not been as successful as they hoped.
15. This meeting identified a number of immediate actions:
- **Action** - Help GCSB to connect and engage with a group of schools to discuss how they might work with Māori and Pacific learners in secondary education to excite and inspire them towards a STEM future
We are setting up a meeting between five secondary schools in South Auckland that are collaborating on career pathways through the Ara Education Charitable Trust.
 - **Action** – Provide a summary of STEM programmes. This will help Transpower see what is available as options to consider as an alternative to their current work
The Ministry has collated a list of different STEM programmes that we are aware of and shared this with Transpower and GCSB. A summary is provided below.

STEM programmes available in Aotearoa

16. To date we have identified over 60 different programmes that support STEM pathways across Aotearoa New Zealand (attached at Annex 2).
17. Programmes are being supported and run by different types organisations - community organisations, schools, employers, business and industry, the Ministry of Education and other government agencies. Some programmes support specific industries, and some provide broader STEM education.
18. Of the programmes identified we note:
 - Many are point solutions to a situation or gap, and are generally not coordinated centrally
 - Most are available to all students, of any ethnicity, and operate nationwide
 - A smaller number are specifically focused on Māori and Pacific learners. These instances often include a collaboration with employers and schools
 - Programmes are supported financially by many different organisations including community, philanthropic, employers, and government
 - A range of STEM activities include coding, technology, digital, engineering and gaming, along with some offering more general STEM activities
 - Most are supported by pedagogy.

Ministry of Education support for STEM activity

19. In addition to the ongoing work of the Ministry on the Digital Technologies and Hangarau Matihiko curricula the Ministry is active in supporting some STEM related work with employers, business and industry and community organisations. Three examples of our support are summarised below.
20. **P-Tech** - The Ministry provided some support for the IBM P-Tech programme that commenced at two schools in South Auckland in 2020. P-Tech is a collaborative industry education model that provides secondary school students from lower socio-economic backgrounds with the academic, technical, and professional skills and credentials they need for competitive STEM jobs. P-Tech operates across the world in over 200 schools. Our support includes:
 - \$12,500 each for the two schools involved (Aorere College and Manurewa High School). The funding was provided at the start of the programme in 2020 to support skills mapping and teacher release time
 - A member of the Auckland region education team is a participant on the P-Tech working group
 - We meet regularly with P-Tech and assist them to engage with other opportunities and communications (i.e. Education Gazette stories).
21. **Pūhoro STEM Academy** - Pūhoro is a transformative programme based in Massey University aimed at advancing Māori leadership and capability. The programme works directly with secondary school students and their whānau across the country. It provides students and whānau with mentoring, tutoring, wānanga, experiential learning/field trips, all within culturally appropriate settings to help them navigate career pathways into science and technology related industries. Our support includes:
 - The Ministry is currently working through a procurement process with the aim of providing funding support, 9(2)(f)(iv) Pūhoro have also been supported by Massey University, Ministry for Business

Innovation and Employment, and philanthropic funders such as the Tindall Foundation

- We support Pūhoro to connect with relevant employers and industry. This supports the ability to provide their students with opportunities to see and connect their STEM studies to the world of work.
22. **KiwiBots** (The NZ Robotics Trust) – KiwiBots provides opportunities that grow the capability of future innovators and creative thinkers through robotics. Our support includes:
- We have helped two North Island kura with funding (\$1,000) to attend the KiwiBots regional events for the first time. The learners attending the events excelled, with one kura coming second in the competition just missing out on a place to attend the virtual world championship in the USA later that year
 - We have invited KiwiBots to be part of the education stand at the Pasifika Festival in March 2021. KiwiBots will provide hourly hands-on sessions for learners and we will talk to parents about pathways into STEM careers.

Next Steps

23. We will update you following the meeting with the technology sector representatives through the Education Weekly Update.

Proactive Release

24. We recommend that this Briefing is proactively released as per your expectation that information be released as soon as possible. Any information which may need to be withheld will be done so in line with the provisions of the Official Information Act 1982.

Annexes

Annex 1: New Zealand Digital Skills Forum 'Digital Skills for a Digital Nation' report recommendations

Annex 2: STEM Programme Summary

Proactively Released

RECOMMENDATIONS: From the Tech Sector

The tech sector members of the Digital Skills Forum, NZTech, NZRise and IT Professionals NZ, have reviewed this study and its conclusion and have the following recommendations. The tech sector is committed to working with the Government via the Digital Skills Forum to continue to address the digital skills gap with both short term and long term policies and initiatives. Our recommended actions are:

Building the talent pipeline

1. Make sure every child is exposed to digital technologies

In the long term, we need to dramatically increase the supply of digitally skilled people in New Zealand. Therefore, the successful introduction of the digital technologies/hangarau matahiko curriculum is critical. Increased investment should be made to ensure teachers and principals are actively driving the new learning into their schools as quickly as possible.

2. Help all Kiwis to understand the importance of digital skills

The skills issue is not about the tech sector, it is about the future of work. We recommend investment to increase the understanding of the importance of lifelong learning and digital technologies.

3. Increase the numbers studying advanced digital skills

The number of students who study computer science or information technology at a tertiary level needs to increase. A national campaign should be designed to encourage

more students into relevant tertiary study.

4. Actively encourage a more diverse group of Kiwis into digital technology

The tech sector is actually very diverse thanks to immigration. Rather than import diversity, we must invest in the untapped potential of our own population. We recommend the development of significant policy approaches and initiatives to increase women, Māori and Pasifika in digital roles. Consideration should be made to applying positive discrimination to incentivise and encourage individuals into computer sciences and information technology courses, in the same way as it is applied for other nationally critical skills, such as medicine.

5. Undertake a programme of constant digital attraction

New Zealand should invest in building its Digital Nation brand and use ongoing digital campaigns to target and attract the best possible talent from abroad. After all, digital people use digital tools to find their next job. We recommend investment into building a database of digital talent looking to come to New Zealand and a programme of constant engagement.

Supporting the transition to work

6. Develop and promote pathways into digital tech roles

As there are multiple pathways into digital roles, these need to be clearly promoted. We recommend investment into updating pathway information and ongoing promotion of the various pathways into digital technology roles including ways to upskill or reskill into in demand areas.

7. Develop a platform to support internships

To help students transition faster into productive employees, most tertiary courses now include work experience and internships. However, this part of the market is fragmented with businesses being approached by multiple education providers. In addition, it is often unclear what to expect from an intern, which can lead to lower rates of participation. It is recommended that a neutral platform is developed to provide a central location for engaging with students looking for internships or work experience. The platform should be used to create consistency in the experience and help employers understand ways to get the best return from different experience levels.

Upskilling and Reskilling

8. Develop programmes to support re-entry to work

With less than 30% of the tech workforce being female, significant opportunity exists to improve gender balance and help address the skills shortage. We recommend developing programmes to help women return to the workforce and into digital roles.

We recommend extending the pilot Return to IT programme to include support from education providers to help women without digital skills to develop them, so they can return to the workforce in digital roles.

9. Create upskilling programmes for those likely to be hit by automation

The growth in demand for digital skills presents a unique opportunity in that the number and type of roles emerging is broad. Against this backdrop, the Government and tech sector should work together now, to create and pilot programmes specifically targeted at groups within society that may be hit hardest by potential automation of jobs. The focus should be on developing skills that the market will need most, not just on filling education quotas.

10. Educate the market on importance of training and development

The value of investing in training and development of existing staff needs to be promoted explicitly. The Government and industry should consider co-investing in a study on the economic benefits obtained by organisations that develop their digital staff. Successful high profile tech firms who have a policy of ongoing development should be highlighted as exemplars.

Proactively Released