

Training New Zealand's workforce

Technological change and the future of work

The Productivity Commission aims to provide insightful, well-informed and accessible advice that leads to the best possible improvement in the wellbeing of New Zealanders. We wish to gather ideas, opinions, evidence and information to ensure that our inquiries are well-informed and relevant. The Commission is seeking submissions on the draft findings and recommendations and the questions contained in this report by 17 February 2020.

Training New Zealand's workforce

**Technological change and the future
of work**

Draft report 3

December 2019

The New Zealand Productivity Commission

Te Kōmihana Whai Hua o Aotearoa¹

The Commission – an independent Crown entity – completes in-depth inquiries on topics selected by the Government, carries out productivity-related research and promotes understanding of productivity issues. The Commission aims to provide insightful, well-informed and accessible advice that leads to the best possible improvement in the wellbeing of New Zealanders. The New Zealand Productivity Commission Act 2010 guides and binds the Commission.

You can find information on the Commission at www.productivity.govt.nz, or by calling +64 4 903 5150.

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¹ The Commission that pursues abundance for New Zealand.

About this inquiry

This inquiry explores the impacts of new and changing technology on the quantity and nature of work. It builds on research and modelling carried out by governments, academics and other organisations in New Zealand and throughout the world. It aims to answer two main questions.

- What are the current and likely future impacts of technological change and disruption on the future of work, the workforce, labour markets, productivity and wellbeing?
- How can the Government better position New Zealand and New Zealanders to take advantage of innovation and technological change in terms of productivity, labour-market participation and the nature of work?

This is the third of five draft reports. It addresses a more specific question in the inquiry's terms of reference:²

How can New Zealand's education and training systems be more effective in enabling adaptation to technological disruption?

More specifically, this report examines:

- why a high-performing education and training system for people in the workforce is important, and how it complements a dynamic economy (Chapter 1);
- the characteristics of the New Zealand workforce, trends in participation, outcomes for learners, and barriers to participation (Chapter 2); and
- how to make the education and training system more responsive to a dynamic economy (Chapter 3).

The inquiry will release five draft reports

The five draft reports address different aspects of this inquiry's terms of reference.

Report 1 – September 2019 New Zealand, technology and productivity

- Defining technology, technological change and disruption
- What factors affect technology adoption and diffusion?
- What are the labour-market effects of technology diffusion to date?
- What might future technology adoption and labour market change look like?
- Preparing for an uncertain future

Report 2 – November 2019 Employment, labour markets and income

- How has technology affected NZ's labour market?
- Are digital platforms and gig jobs changing the nature of work?
- How well do employment laws balance protections and flexibility?
- How can income support for displaced workers be improved?
- Can the Government better support those affected by labour-market change?
- What might improve NZ's technology adoption rates, and its labour market?

Report 3 – December 2019 Training New Zealand's workforce

- How well does NZ's education and training system support the working-age population to acquire new skills?
- What changes would make the system more responsive to the needs of a dynamic labour market?

Report 4 – January 2020 Firms, dynamism and labour markets

- How should governments think about economic dynamism, and the policies that might support or detract from it?
- How does competition policy affect firm productivity?
- How do markets for land, labour, capital and other inputs affect technology adoption?

Report 5 – January 2020 Educating New Zealand's future workforce

- How well does NZ's formal education system prepare young people for the work of the future?
- Does the system effectively empower young people to learn new skills, and to make choices at the right time?

² See the inquiry's [issues paper](#) or [draft report 1](#) for the terms of reference, or visit www.productivity.govt.nz/assets/Documents/8170d4518e/Terms-of-reference_Technology-disruption-and-the-future-of-work.pdf.

Register your interest

The Commission seeks your help in gathering ideas, opinions and information to ensure this inquiry is well informed and relevant. The Commission will keep registered participants informed as the inquiry progresses. You can register for updates at www.productivity.govt.nz/have-your-say/subscribe, or by emailing your contact details to info@productivity.govt.nz.

Make a submission by 17 February 2020

The Commission is interested in hearing comment, feedback and other evidence on the draft reports, and is conscious that different people and groups will have differing levels of interest in each of them. The Commission therefore welcomes separate submissions on each of the reports, submissions that respond to cross-cutting themes in multiple reports, or a single submission that covers all five. Please pick the format and approach that suits you best.

The **due date for submissions** on the five draft reports is Monday, 17 February 2020.

Anyone can make a submission. Your submission may be written or in electronic or audio format. A submission may be a short note on one issue or a substantial response covering multiple issues. Please provide relevant facts, figures, data, examples and documents where possible to support your views. Multiple, identical submissions will not carry more weight than the merits of your arguments. Your submission may incorporate relevant material provided to other reviews or inquiries.

Your submission should include your name and contact details and the details of any organisation you represent. The Commission will not accept submissions that, in its opinion, contain inappropriate or defamatory content.

Sending in your submission

Please make your submission via www.productivity.govt.nz/have-your-say/make-a-submission. The Commission appreciates receiving submissions in PDF format.

What the Commission will do with submissions

The Commission wants to have as much information as possible on the public record. Submissions will become publicly available documents on the Commission's website. This will occur shortly after receipt, unless your submission is marked "in confidence" or you wish to delay its release for a short time. Please contact the Commission before submitting "in confidence" material.

Other ways you can participate

The Commission welcomes feedback about this inquiry. Please email your feedback to info@productivity.govt.nz or contact the Commission to arrange a meeting with inquiry staff.

The inquiry team is running a blog on technological change and future of work topics until January 2020. Individual staff members post regularly at www.productivity.govt.nz/futureworknzblog/. You can subscribe at www.productivity.govt.nz/have-your-say/subscribe. Comments and guest posts are welcome.

Final report in March 2020

The Commission will deliver a **final report to the Government in March 2020** bringing together themes, findings, recommendations and participant feedback from the draft reports.

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Overview

The ability of workers to gain new skills and knowledge through education and training is of enduring importance to workers, to employers and to the wider economy. Education and training can equip workers to advance their career, change careers, minimise the impact of job displacement and promote greater income security. A more highly skilled workforce makes it easier for firms to adopt new technologies and to respond nimbly to changing business circumstances.

New Zealand workers have high rates of participation in work-related education and training, in comparison with other OECD countries. However, while overall participation rates are high, they vary across the workforce. Those in professional occupations or with higher levels of prior education are more likely to take part in work-related education and training. Workers and firms report barriers to training, including insufficient time, high costs, inadequate information, and uncertainty about the quality and relevance of available offerings.

The inquiry's terms of reference asked the question "how can New Zealand's education and training systems be more effective in enabling adaptation to technological disruption?" The inquiry's first draft report (NZPC, 2019c) found that there is no reason to expect that technological change in the next decade or so will not be within the capacity of New Zealand's well-functioning labour market to absorb. Yet the question remains relevant, as the Commission concluded that New Zealand needs to embrace technology as a path to higher levels of community wellbeing, rather than treating technology as a threat. More and faster technology adoption will improve New Zealanders' living standards.

Higher rates of technological change will increase demand from people and firms for education and training. However, just as it is impossible to predict how technology will play out in the future, it is impossible to predict what skills and training will complement such technology. The education and training system will need to be responsive to the requirements of firms as they emerge, and to people seeking to attain new skills. Further, the system will need to be responsive to people's learning preferences and their home, work and life circumstances. Providers will need the flexibility to tailor their programmes and delivery methods accordingly, and face appropriate incentives to do so.

Making New Zealand's education and training system more effective in the face of technological change means that the system will need to be more flexible. And that in turn involves reconsidering barriers that restrict participation, and restrictions on the products and services offered.

The Commission makes recommendations in this report to reduce barriers to workforce education and training, including widening access to student loans, easing constraints on the delivery of micro-credentials, and ensuring new migrants' eligibility to undertake government-funded vocational education. Work-based training should not be limited to employees. It should be accessible to contractors, the self-employed, employers and volunteers.

The Commission examined wider tertiary education policies in its inquiry into *New Models of tertiary education* (NZPC, 2017). That inquiry found a system marked by inertia and conservatism. This arose from regulatory barriers and a funding system with strong incentives for responsiveness to government, but weaker ones for responsiveness to student and employer demand.

The Government has recently announced significant reforms to the vocational education and training system, which aim to improve the relevance of learning, better integrate provider-based and workplace training, and increase the responsiveness of the system to employers and variations in regional demand.

These reforms could help resolve some of the problems identified in *New models of tertiary education*. Whether or not they do will depend upon details yet to be decided and announced. In progressing the reforms, it will be important that the Government assigns clear roles and accountabilities to the various system participants, and that the newly designed funding system encourages provider innovation and responsiveness.

This report is about work-related education and training for people in the workforce and for those soon to join it. Decision makers will also need to address some of the traditional boundaries and frictions in the whole education system, if education is to be truly innovative and responsive to a future of work with increased technological change.

A high-performing education and training system is important for workers and for employers, because it complements a dynamic economy that would offer sustained improvement in New Zealanders' living standards.

Commonly used terms

Term	Description
apprenticeship	A programme of study for a qualification, usually a national certificate or diploma on the NZQF, involving a mix of on- and off-job learning. Apprentices must be employed in the field for which they are training.
credential	A verification of an individual's qualification or competence issued by an education provider or third party with the relevant authority to issue that credential. Credentials vary from degrees to newer forms such as micro-credentials.
EFTS	Equivalent full-time student. It is the main unit of measurement of the production and consumption of education, and the basis for provider subsidies. One EFTS = one student enrolled full time for one year (1 200 learning hours over 34 weeks).
foundation education	One of three broad levels of tertiary education, along with higher and vocational education. Foundation education is at levels 1–3 of the NZQF. It provides skills for further learning, including literacy, numeracy, self-management and study skills.
higher education	One of three broad levels of tertiary education, along with foundation and vocational education. Higher education is at degree level or above (levels 7–10 of the NZQF).
industry training	Training for people in the workforce leading to a formal qualification (eg, apprenticeships and national certificates). Government-funded and NZQA-accredited industry training is currently arranged mainly by ITOs. It can include learning on the job in a workplace or offsite at a training provider, or a mix of both.
ITO	Industry training organisation. ITOs are industry-governed and recognised by government. They set national skill standards, develop training programmes, and monitor quality and assessment for industry training (but not for provider-based vocational education). Note that the current vocational education and training reforms will disestablish ITOs.
ITP	Institute of technology or polytechnic. Public tertiary education institutions that provide a wide diversity of continuing education, including vocational training. These will merge into the NZIST as part of the current vocational education and training reforms.
level	The NZQF stratifies qualifications across ten levels. See Appendix A for more detail.
lifelong learning	Learning pursued throughout a person's life. This contrasts to education as something a person does only in childhood and early adulthood, and prior to entering the workforce.
micro-credential	Short, modular courses focused on a coherent set of competencies.
NCEA	National Certificate of Educational Achievement. National qualifications for senior secondary school students, administered by NZQA at levels 1–3 of the NZQF.
NEET	Not in employment, education, or training. Usually refers to young people.
NZIST	New Zealand Institute of Skills and Technology. A new TEI to be created by merging the 16 existing ITPs into a single national entity. It will also (with other TEOs) take on ITOs' current role arranging work-based industry training. The name NZIST is provisional.
NZQA	New Zealand Qualifications Authority. Its role is to ensure that qualifications are seen as credible and robust, nationally and internationally. NZQA manages the NZQF, administers NCEA, assures the quality of non-university education providers, and performs qualifications recognition and standard-setting functions.
NZQF	New Zealand Qualifications Framework. A comprehensive list of all quality-assured qualifications in New Zealand (secondary and tertiary), administered by NZQA. See Appendix A for more detail.

provider-based tertiary education	Formal tertiary education and training at a wānanga, university, ITP or PTE. This excludes industry training programmes, but can include a combination of on-campus, extramural and work experience.
PTE	Private training establishment. A provider of post-school education or vocational training that is not a Crown entity.
qualification	A coherent set of credentialed learning outcomes, or the credential that signifies possession of these outcomes.
RSLG	Regional skills leadership group. The government intends to create 15 RSLGs by mid-2020, tasked to develop regional workforce plans and to advise education, welfare and immigration agencies, WDCs, the NZIST and other TEOs about regional skills needs. RSLG members will be appointed by government, drawing from regional industry leaders, economic development agencies, worker representatives, iwi and government.
RPL	Recognition of prior learning. A process that assesses what an incoming learner already knows and can do, and provides the learner with credit toward a qualification on that basis.
skills	Subject-specific knowledge, such as literacy and numeracy, and non-subject-specific abilities, such as critical and creative thinking. Technical and vocational skills are a mixture of knowledge and abilities used to perform specific jobs with clearly defined tasks.
TEC	Tertiary Education Commission.
TEI	Tertiary education institution. A university, ITP or wānanga, all of which are Crown entities established under the Education Act 1989.
TEO	Tertiary education organisation. A catch-all term for organisations that provide tertiary education services. It includes Crown TEIs, PTEs, ITOs, rural education activity programmes, community education providers, schools running secondary-tertiary programmes or adult and community education, and some firms directly funded to run training programmes.
tertiary education	In New Zealand, tertiary education is broadly defined to include all post-school education at three levels: foundation education (such as adult literacy and community education), vocational education (such as industry training, including apprenticeships), and higher education (such as certificates and diplomas, and bachelors and higher degrees). The OECD's definition of tertiary education is narrower, excluding lower-level education broadly equivalent to upper secondary education (ie, levels 1–3 of the NZQF).
trainee	Someone who takes part in industry training. Sometimes used to refer to trainees not enrolled in an apprenticeship. In New Zealand law a "trainee" is defined as an employee training under a training agreement that forms part of their employment agreement.
vocational education	One of three broad levels of tertiary education, along with foundation and higher education. Vocational education aims to provide students with practical skills for application in particular occupational fields, such as a trade. Most vocational education is at levels 4–6 of the NZQF. It excludes all university programmes regardless of their level or field of study, as well as Te Reo Māori and tikanga Māori education.
wānanga	A TEI providing programmes in a Māori cultural context, with an application of knowledge regarding āhuatanga Māori (Māori traditions) according to tikanga Māori (Māori custom).
WDC	Workforce development council. The vocational education and training reforms will create six WDCs from 2020 onwards. These industry-governed statutory entities will oversee both provider-based and work-based vocational programmes. WDCs must approve a programme's content, delivery model and assessment before it can receive NZQA recognition and TEC funding. WDCs will also advise the TEC on funding priorities and provide "skills leadership" for the industries they cover.
work-based training	Training organised and undertaken in the workplace, or as part of a person's job. It may be government-funded and recognised. Some such training may occur off-site.

1 Context for this report

Key points

- A high-performing education and training system is important for workers and for employers, because it complements a dynamic economy that would offer sustained improvement in New Zealanders' living standards.
- This report is about work-related education and training for people in the workforce and for those soon to join it. This includes training in people's workplaces, on-campus at a tertiary education provider, and through online or distance learning.
- People stay in the workforce a long time. They learn about themselves and their skills over time and may need new skills to adapt to changes in work. One in five switch jobs each year.
- Many new immigrants experience poorer employment and lower incomes than comparable New Zealand-born workers, especially during their first few years in the labour force. Education and training can help working-age migrants adapt and apply their skills to succeed in work and life in New Zealand.
- A responsive education and training system can supply the skills people need to work in new and different ways, and with productivity-enhancing technology. And, in turn, the adoption of new business models and new technology creates demand for education and training.
- For New Zealand to succeed in increasing its rate of adoption of new technologies, workers will need to gain new skills to adapt to changes in their existing jobs, to take up new jobs enabled by technology, or to find new work if displaced from their current job.
- If the education and training system is to meet the needs of a more dynamic economy with greater technological change, policy makers will need to rethink some of the boundaries and biases evident in education and training policy. This include policies that favour:
 - classroom delivery over that provided in workplaces or through technology (or through combinations of these three);
 - training for employees over those in other work arrangements (including business owners, the self-employed and volunteers); and
 - long-duration full-time programmes over shorter, targeted and "bite-sized" courses.
- A high-performing education and training system can contribute to greater income security. Flexicurity is a northern European model that combines income protection, public and private support for worker training, and labour market flexibility to support a dynamic economy open to technology adoption.
- The Government is undertaking significant reform of the vocational education and training system. However, much of the detail of the reforms is yet to be determined, including the foreshadowed redesign of the funding system, and how the various new and existing organisations with intersecting roles will work together. The Commission considers that an important goal for the newly reformed system is to support a dynamic labour market.

1.1 Technological change and the future of work – the story so far

The inquiry's first draft report, *New Zealand, technology and productivity* (NZPC, 2019c) examined concerns based on recent predictions that modern economies, including New Zealand, face significant labour-market disruption from emerging technologies. It noted that widespread and large-scale technological change over the past two-and-a-half centuries has not reduced the centrality of work to society, or the overall quantity of work and employment. Emerging technologies, particularly artificial intelligence, robots, software bots and autonomous vehicles, have not had significant effects on labour markets to date.

This does not mean that the New Zealand labour market is static. Over the past few decades it has seen substantial change to both the workforce and to firms' demand for labour; and it has adapted to that change without consequences that might qualify as "disruption".^{3,4} There is no reason to expect that technological change in the next decade or so will not be within the capacity of New Zealand's well-functioning labour market to absorb.

NZPC (2019c) concluded that New Zealand needs to embrace technology as a path to higher levels of community wellbeing, not treat it as a threat. More and faster technology adoption will improve New Zealanders' living standards. Embracing technology implies supporting people to adjust, and setting policies and institutional arrangements that encourage the creation and uptake of new knowledge, skills, processes, goods and services by firms. There are things New Zealand can do now to support smoother transitions and to seize these opportunities.

The inquiry's second draft report *Employment, labour markets and income* (NZPC, 2019a) considered the performance of New Zealand's labour market and opportunities for improvement that might both encourage technology adoption and better support people who face significant adjustment costs from labour-market change.

NZPC (2019a) found that better support for displaced workers might contribute to a populace more accepting of technology adoption, and to a more adaptable labour market where people's skills are better matched to their most productive use. New Zealand and Australia are outliers in the OECD in not having public (or government mandated) unemployment insurance of some form. "Flexicurity", a model common in Northern European countries, eases shocks to people's incomes while they look for a new job. These countries also tend to be more welcoming of technological change.

In contrast to income protection, job protections such as mandatory redundancy pay or minimum notice periods can discourage labour-market mobility and skill redeployment, and they favour workers who have these protections over those that do not.⁵ Income protection is part of a wider flexicurity model, which also offers labour-market flexibility to firms and training to workers.

This report is about work-related education and training for people in the workforce and for those soon to join it. This includes training in people's workplaces, on-campus at a tertiary education provider, and through online or distance learning.⁶

³ NZPC (2019c) defined technological disruption as unexpected change that creates significant adjustment costs across the economy. Yet technological change is both normal and ongoing, and planning for and adapting to it should be business as usual for individuals, firms and governments. A desirable feature of an economy is its ability to cope with technological change without disruption.

⁴ "Firm" in this report refers to for-profit firms, not-for-profit organisations, cooperatives, and government entities that employ (or could employ) people, whether motivated by profit or by mission.

⁵ Redundancy pay and extended notice periods increase the costs of firm restructure, and so discourage firm-initiated labour mobility. Also, the anticipation of redundancy payments can reduce worker-initiated mobility.

⁶ The inquiry's fifth draft report, *Educating New Zealanders for the future*, will look at how the formal education system – from early childhood to tertiary education – can best support New Zealanders to succeed when they join the workforce.

1.2 An education and training system for people in the workforce

A high-performing education and training system for people in the workforce is important for many reasons.

People stay in the workforce for a long time

People already in the New Zealand workforce will still make up about half the workforce in 2040 and will likely contribute about 70% of all hours worked over the next 20 years.⁷ Skills that these people acquired earlier in life may depreciate, and they may need to upskill to keep pace with changes in the content of work.

A fifth of the workforce switch jobs each year

For firms, the largest source of skills is from workers changing jobs either directly, or on returning to work after a period out of the workforce. In new analysis of job-to job transitions in New Zealand, Coleman and Zheng (2020) show that in the period 2012–18, just over one in five workers switched jobs each year. People switching (or wanting to switch) careers may need to acquire new skills to make successful transitions.

People learn about themselves and their skills over their working lives

Over the course of their working lives, people gain new information, experience and insights about their skills, interests and attributes. People turn to education and training to stay up to date with the skill demands of their current job, and to prepare for other jobs.

A labour market with many available job openings creates opportunities for workers to switch to a job that better matches their skills or offers a higher income. That is why job-to-job transitions are sometimes referred to as the “job ladder”. A responsive education and training system can offer people a way to gain new skills, which can then help them to move up the job ladder.

Training can lift the skills of working-age migrants

One in four New Zealanders, and 30% of people employed in New Zealand, were born overseas.⁸ Working-age migrant arrivals each year (including returning New Zealanders) outnumber the annual cohorts of school leavers entering the workforce directly or after a period of full-time tertiary education (Figure 2.1).

Changes in policy and in the supply and demand for skills influence migration flows. These flows can respond more quickly to changes in demand for skills than can the flows of people completing school and tertiary qualifications. Education and training that helps migrants apply their skills more effectively benefits migrants and the firms they work for.

Migrants with English as a first language have higher average literacy, numeracy and problem-solving skills than New Zealand-born people, while those with English as a second language have lower skill levels on average (Ministry of Education & MBIE, 2016c).

Many new immigrants experience poorer employment and lower incomes than comparable New Zealand-born workers, especially during their first few years in the labour force. Stillman and Maré (2009) found migrants’ incomes converge with those of New Zealand-born workers over about ten years (with the income gap closing fully for females, fastest for degree-educated migrants, and least for older, low-qualified and Pacific migrants). While this income gap may have several underlying causes, it indicates that migrants’ productivity is initially lower. Education and training can help migrants adapt and apply their skills to succeed in work and life in New Zealand.

People need new skills to help them adapt to changes in work

Many submitters saw education and training as an enabler of worker adaptability and success in a changing world of work, including one in which there are greater rates of technological change (Box 1.1).

⁷ Productivity Commission estimate based on Stats NZ national labour force projections, 2017 (base)–2068.

⁸ People born overseas were 27.4% of the usually resident population in the 2018 Census, and 29.5% of all employed in the Stats NZ survey of working life, December 2018.

Box 1.1 Submitters' views on training to address changes in work

EdTech New Zealand (sub. 13, p. 4) submitted that to provide prospective students, including adults and those already part-way through a career, with the skills needed to make informed decisions about education and careers,

[Greater] transparency of and access to the tertiary education system, the ability to upskill as and when needed without committing to lengthy study, and financial support for retraining [were needed].

New Zealand Council of Trade Unions (sub. 41, p. 34) saw

... ongoing and universally available work-based training as a crucial need under any scenario. Technology is not the only reason for changes in work, and much better life-long learning arrangements are needed if New Zealand's economy is to increase its productivity.

Chartered Accountants Australia and New Zealand (sub. 15, p. 5) submitted that if

... job mobility continues to increase, we think it is likely greater support will be needed for people retraining in mid- to late career. This includes low skilled workers whose industries are automating and/or who experience redundancy, as well as higher skilled workers who need to retrain or upskill to adapt to new technologies.

Industry Training Federation (sub. 29, p. 3) noted that an

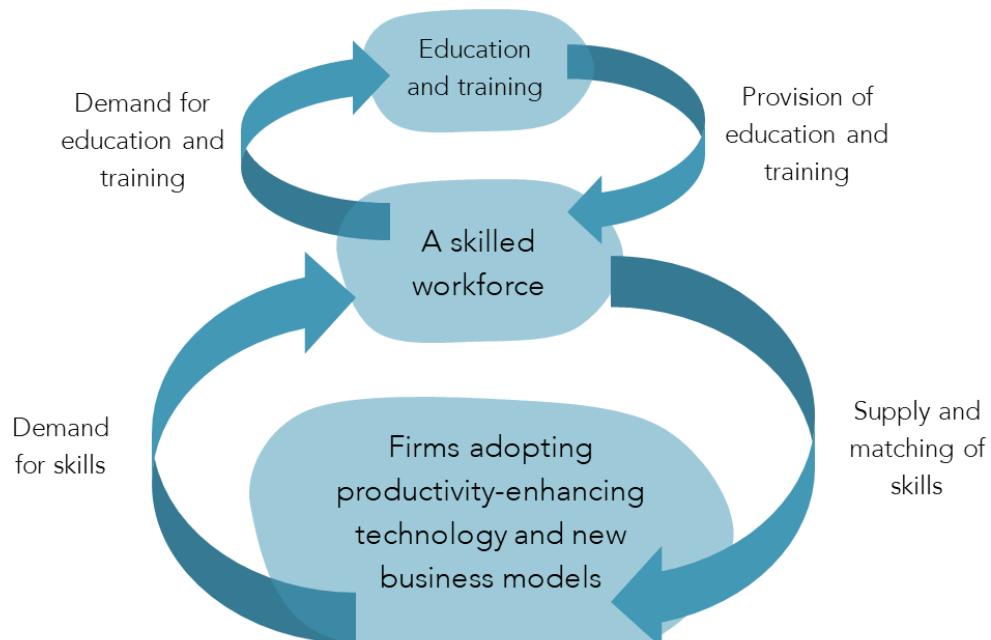
... effective system for retraining and re-skilling New Zealand's workforce will require a commitment to lifelong learning beyond that which consecutive governments have been prepared to make. Indeed, our aspiration should be to normalise lifelong learning in the workplace to the extent that "ongoing training" (an expectation of continual upskilling) replaces "retraining" (an expectation of retraining in the face of redundancies or role change) in the lexicon

To adopt new technology, firms need skilled people

The adoption of new technologies characteristically leads to jobs being both created and destroyed, and more job-to-job transitions as workers adjust to changes in the demand for skills.

The education and training system can help to supply the skills people need to work in new and different ways, and with productivity-enhancing technology. In turn, the adoption of new business models and new technology creates demand for education and training (Figure 1.1).

Figure 1.1 The demand and supply for education and training



1.3 An education and training system for a world with more technological change

A major finding of *Employment, labour markets and income* (NZPC, 2019a) was that high-income economies are characterised by highly skilled workers with high capital-intensity jobs and the rapid uptake of emerging technologies.

For New Zealand to succeed in increasing its rate of adoption of new technologies, workers will need to gain new skills to adapt to changes in their existing jobs, to take up new jobs enabled by technology, or to find new work if displaced from their current job (NZPC, 2019a).

Meeting greater demand for skills requires a responsive and innovative system

An implication of greater technological change is greater demand from people and firms for more education and training. However, just as it is impossible to predict how technology will play out in the future (NZPC, 2019c), it is impossible to predict what skills and training will complement such technology. The education and training system will need to be responsive to demand from firms as it emerges, and to people seeking to attain new skills.

Further, the education and training system will need to be responsive to people's learning preferences and their home, work and life circumstances. The system should tailor programmes and delivery accordingly.

Greater responsiveness means rethinking arbitrary boundaries ...

If the education and training system is to meet the needs of a more dynamic economy with greater technological change, policy makers will need to rethink some of the arbitrary boundaries that currently guide education and training policy. These include policies that favour:

- classroom delivery over that provided in workplaces or through technology (or through combinations of these three);
- learning by employees over those in other work arrangements (including business owners, the self-employed and volunteers); and
- long, full-time programmes over shorter, more targeted and "bite-sized" learning opportunities.

... including the boundary between general and firm-specific skills

Some argue that public policy should distinguish between "general" and "firm-specific" programmes, and give clear preference to the former, which (at least in theory) are less likely to be funded by employers and may be undersupplied (Box 1.2).

The Commission does not see much benefit in pursuing this distinction. General and specific skills are hard to differentiate in practice, and people typically gain them concurrently. Firms can benefit from investing in general skills in a variety of ways. Such investment can improve recruitment and retention, create innovation and knowledge spillovers within the firm, and improve efficiency and workforce utilisation.⁹

⁹ Cappelli (2004) cited US evidence of significant employer support for staff to undertake general degree courses and qualifications; and concluded that employers do so to attract and retain more productive workers.

Box 1.2 General vs. firm specific skills

The distinction between firm-specific and general skills goes back to Becker (1962).¹⁰

- Firm- or job-specific skills relate closely to the technologies, processes or culture of a particular organisation or job within that organisation. They have less value and application in other contexts. Such skills tend to be more efficiently gained through on-job experience and in-house education and training. Employers have stronger incentives to invest in education and training for job- and firm-specific skills than they do to invest in more transferable or generic skills, as they are more likely to be able to recoup their investment.
- Skills that have value in multiple contexts enable workers to bid up their wages and capture more of the productivity benefits of education and training, so workers have an incentive to bear more of the cost.¹¹

That said, there are plenty of examples of firms investing in the “general skills” of their workforce, including in basic literacy and numeracy. There are many reasons why firms make such investments, including that:

- workers may have other skills that are in short supply;
- education and training may be attractive to potential recruits, and improve staff retention; and
- firms may find it cheaper overall to train existing workers than to displace them and recruit new ones.

Public funding for education and training can support change, technology adoption and productivity growth

The right skills and other complementary inputs are needed for the successful adoption of technology by firms (NZPC, 2019c). Expanded access to education and training can help improve the supply of these skills and better support technological adoption and change.

In an environment of greater technological change, public funding for expanded access to education and training might be justified on the grounds if there are sufficient positive spillovers and productivity gains from a high-skilled workforce. However, public funding should be designed to avoid “crowding out” private investment.

Access to education and training can promote income security

Flexicurity is a northern European model that combines income protection, public and private support for worker training, and labour market flexibility to support a dynamic economy open to technology adoption. One key objective of this model is to promote income security, rather than job security. A high-performing education and training system is an important pillar of this model. Generous public support for training is a core element of the Danish flexicurity model (NZPC, 2019a).

¹⁰ A sophisticated skill weights approach is developed in Lazear (2003). For a good discussion of firm-specific skills and market structures see chapters 8 and 9 of Acemoglu and Autor (2011).

¹¹ Despite this incentive, liquidity constraints may deter or prevent workers investing in their own education and training. Loans or other financial support can assist workers in such circumstances.

1.4 The current vocational education and training system reforms

The Government has embarked on major reforms to the vocational education and training system – “the reforms” (Box 1.3).

Box 1.3 What do the reforms aim to achieve?

The reforms announced by the Minister of Education in August 2019 aim to create a single public vocational education system that:

- gives all learners the education and training they need for the workplace;
- gives employers greater access to a skilled, work-ready workforce across all regions; and
- ensures all regions have collaborative, flexible, innovative and sustainable providers.

Key elements of the reforms are outlined in Ministry of Education (2019d). These include:

- establishing the New Zealand Institute of Skills and Technology (NZIST) from April 2020, merging the 16 institutes of technology and polytechnics into one national institution;
- phasing out Industry Training Organisations, with the NZIST and other tertiary education providers taking over their role arranging work-based education and training;
- creating six workforce development councils to oversee and approve all vocational qualifications, and 15 regional skills leadership groups to advise on local skill supply priorities; and
- a new unified funding system, replacing the currently separate funding systems for work-based and provider-based vocational education and training.

Vocational education within the scope of the reforms includes all non-degree education and training for certificate and diploma qualifications at levels 1–7 of the New Zealand Qualifications Framework (NZQF), except for courses in English as a second language, Te Reo Māori and tikanga Māori. It also includes all work-based industry training programmes at any level.

Institutes of technology and polytechnics, wānanga and private training establishments are all affected by the reforms, but their degree programmes and foundation education programmes are outside the government’s definition of vocational education. All university programmes are outside the scope of the reforms, even though universities offer programmes oriented to specific occupations and professions, and are seeking to offer more work-integrated learning to their students (Ministry of Education 2019a).

This report and the reforms

This report assumes that Parliament will enact the Education (Vocational Education Reform) Amendment Bill and the Government will implement the new structures and organisational roles it has announced. However, much of the detail of the reforms is yet to be determined, including the foreshadowed redesign of the funding system, and how the various new and existing organisations in the system will work together where their roles intersect. In the context of this inquiry, the Commission considers that an important goal for the newly reformed system is to support a dynamic labour market.

2 The New Zealand workforce and participation in training

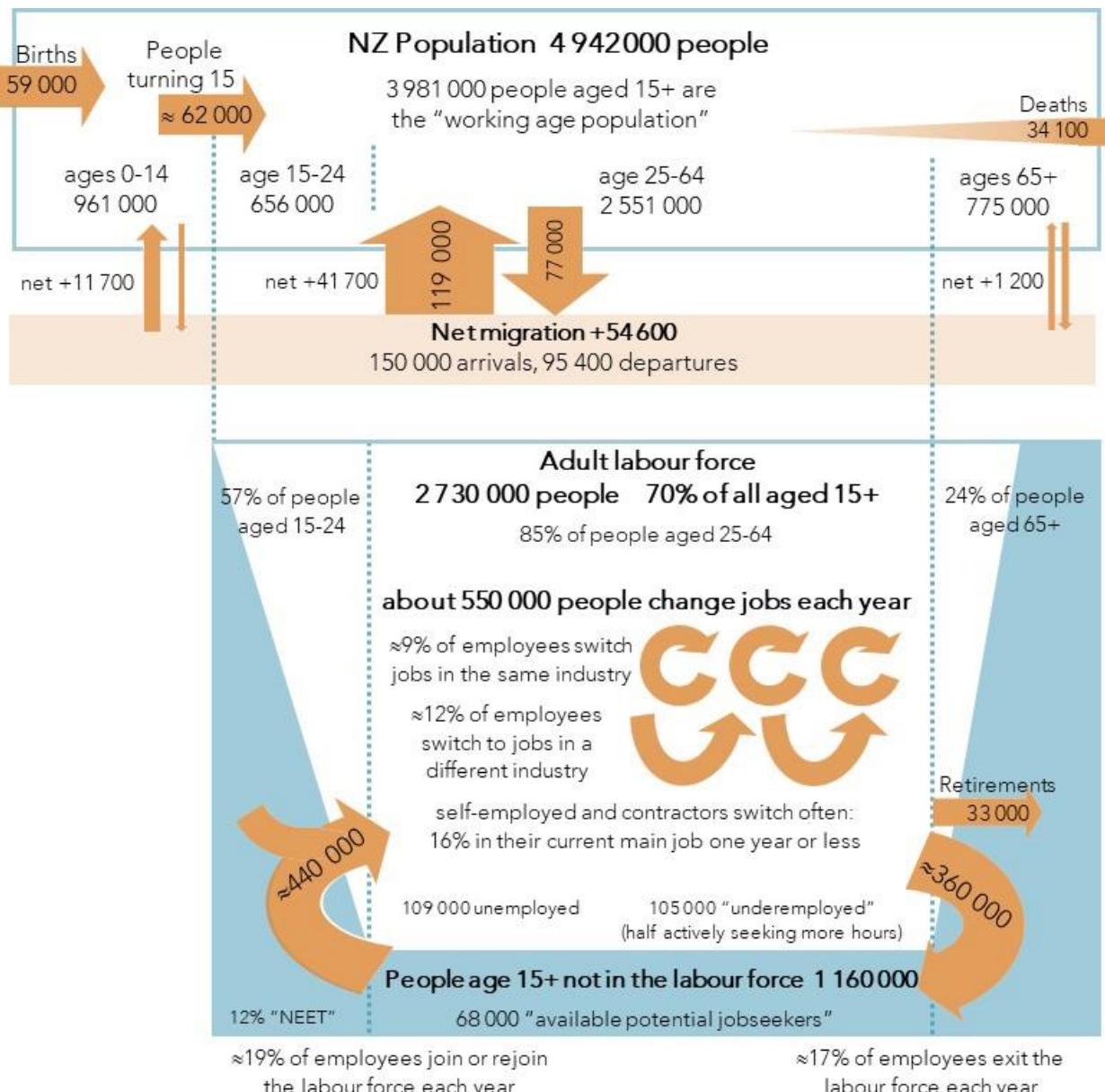
Key points

- Each year large numbers of people join or leave the New Zealand workforce, or change jobs. Approximately 70% of adults aged 15 years and older are in the workforce.
- Over half a million people change jobs every year. The great majority of these changes are voluntary moves. Of those who change jobs, a significant number move to a job in a different industry.
- New Zealand workers have high rates of participation in work-related education and training, compared to other OECD countries. Those in professional occupations or with higher levels of prior education are more likely to take part.
- New Zealanders with lower qualifications are less likely to participate in learning activities, and more likely to say they do not want to. However, in the subgroup of people who did *not* participate in training, there is little difference in willingness to train between people with higher or lower qualifications, or higher or lower skill levels.
- Participation in provider-based tertiary education declined around 20% between 2009 and 2018, with a proportionately larger decline for older age groups. Work-based training has increased, especially apprenticeships. There has been a notable increase in industry training by people with degrees and other post-school certificates and diplomas.
- Lower-level education and training (ie, NZQF levels 1–3) in New Zealand tends not to boost people's incomes but can improve their employment outcomes, compared to similar people who do not undertake training. The achievement of higher-level certificates and diplomas can improve incomes, although this varies by gender and field of study.
- Barriers to education and training, for both employers and workers, include insufficient time, the cost of training, lack of information, and concerns about relevance and quality.

2.1 The workforce

Figure 2.1 illustrates the stocks and flows of people in New Zealand's population and workforce, including:

- the contributions of births, deaths and net migration to the overall population;
- the contributions of young people turning 15, retirement and net migration to the working-age population; and
- movements of working-age people between work and various forms of non-employment; and
- people switching from one job to another.

Figure 2.1 New Zealand's workforce – stocks, flows and churn

Source: Productivity Commission analysis of Stats NZ population estimates, workforce and migration data for September 2019. Workforce churn is 2012–18 averages from Coleman and Zheng (2020).

Several points are noteworthy.

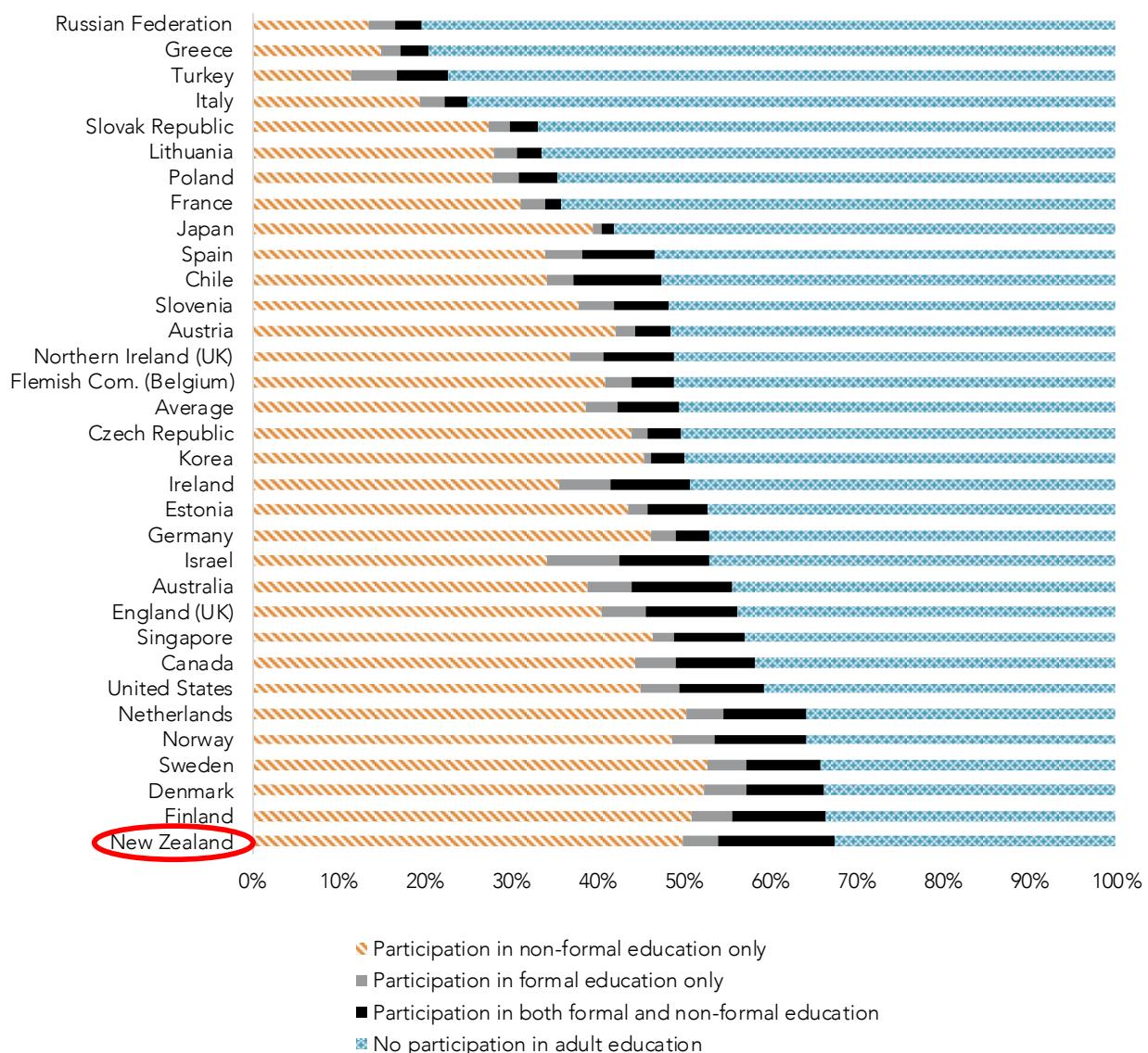
- Approximately 70% of adults aged 15 years and older are in the New Zealand workforce. Each year large numbers of people join or leave the workforce (temporarily or permanently) or change jobs.
- Inwards and outwards migration are responsible for numerically larger effects on the size and composition of New Zealand's workforce than is the output of its school system (NZPC, 2019a).
- Over half a million people switch jobs every year (Coleman & Zheng, 2020), 21% of the workforce. The great majority of these changes are voluntary moves. Around 9% of the workforce make within-industry switches, 12% switch to a different industry.

New Zealand currently has low rates of unemployment while having its highest-ever rates of labour-force participation (NZPC, 2019a). The proportion of women participating in the workforce increased from 55% to 66% between 1987 and 2019 (Maddock & Genet, 2019). Under-employment is also low and largely short term (*ibid*). That said, a significant number of people move in and out of paid work each year.

2.2 Who takes part in work-related education and training?

New Zealand has high rates of participation in work-related education and training (Figure 2.2). Consistent with findings in other countries, those in professional occupations with higher levels of prior education are more likely to take part. Professionals (71%) and community and personal service workers (68%) have the highest rates of participation in education and training. The lowest participation rates were for labourers (43%), and machinery operators and drivers (48%).^{12,13}

Figure 2.2 Share of adults aged 25–64 that participated in formal or non-formal adult education or training for job-related reasons, 2012 or 2015



Source: OECD (2017, p. 316).

Notes:

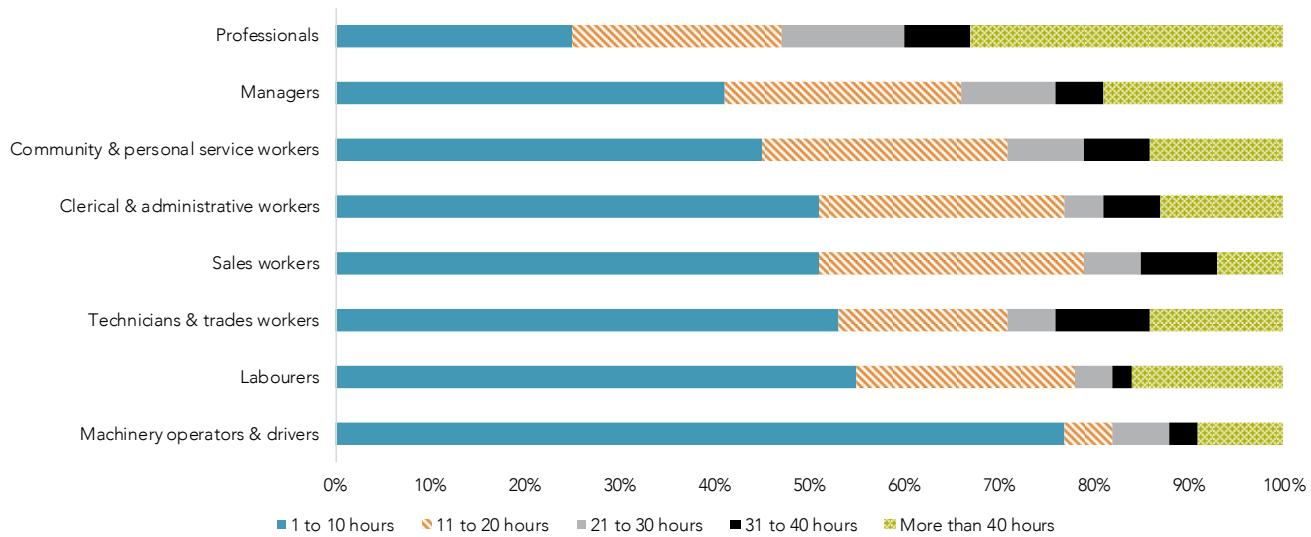
1. Data for Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey is for 2015. Data for other countries is for 2012.
2. Formal learning "includes organised internal workplace training such as on-the-job training (eg, experience of doing a job or task), open/distance learning, seminars/workshops and private lessons in the 12 months before respondents completed the questionnaire", while non-formal learning "includes learning from others (eg, co-workers or supervisors) and learning-by-doing from tasks performed on the job" (Ministry of Education & MBIE, 2016b, p. 19).

¹² Figures from Stats NZ's 2018 survey of working life.

¹³ The OECD survey of adult skills (PIAAC) similarly reported that professionals (63%), and technicians and associate professionals (58%) in New Zealand have the highest rates of on-the-job learning, while skilled agricultural and fishery workers (36%) and people in elementary occupations (28%) have the lowest (Ministry of Education & MBIE, 2016b).

‘Professionals undertook more hours of formal education and training on average, with a third undertaking more than 40 hours of education in 2015 (Figure 2.3).’

Figure 2.3 Time spent per year in formal education and training activities, by occupation, 2015



Source: Ministry of Education and MBIE (2016b).

2.3 Workers’ willingness to train

There are two likely explanations for the differences in education and training intensity by occupation or by prior qualifications. It could be that less-educated workers receive lower economic returns to future investment in education and training, or it could be that they have a lower propensity to invest in education. Using data on Dutch workers, Fouarge, Schils and de Grip (2013, p. 1) reported that

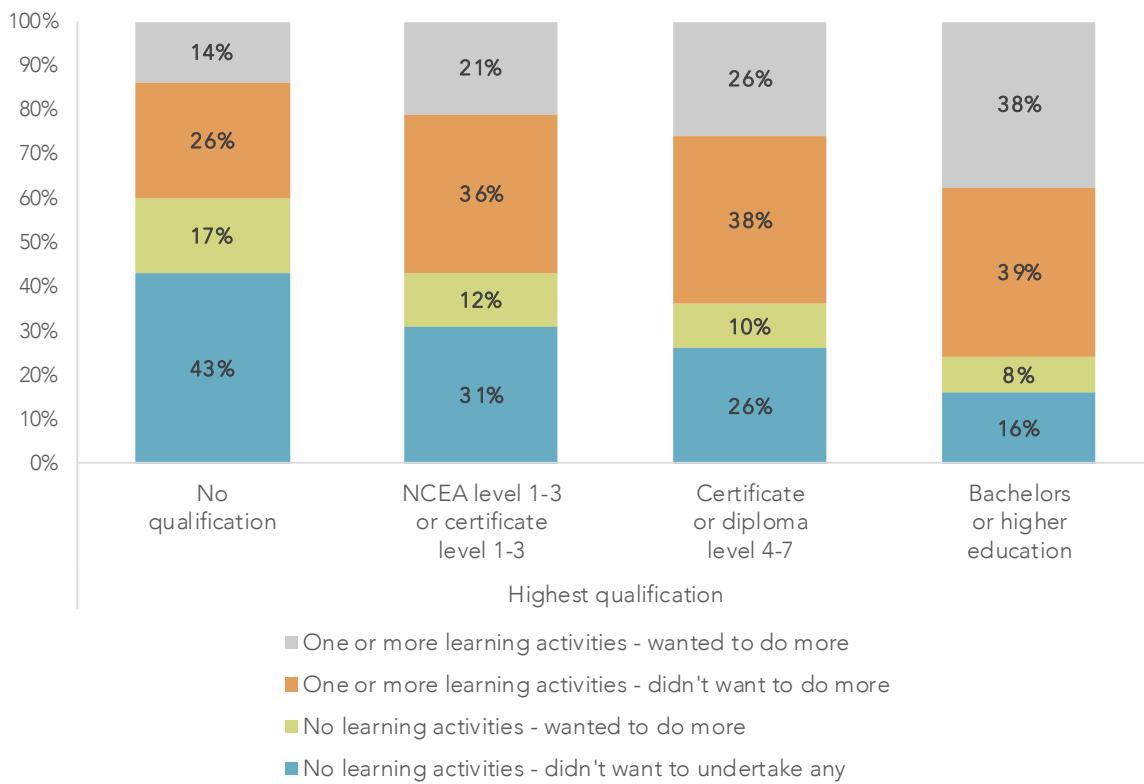
the economic returns to training – in terms of higher wages – for the low educated are positive and not statistically different from those for high-educated workers ... Nonetheless, we find that low-educated workers have a significantly lower willingness to participate in training than high-educated workers, because of different economic preferences (future orientation, preference for leisure) as well as personality traits (locus of control, exam anxiety, and openness to experience).

New Zealanders aged 25–65 with lower prior qualifications are less likely to participate in training, and more likely to say they do not want to (Figure 2.4).

However, in the subgroup of people who did *not* participate in training, there is little difference in willingness to train between people with higher or lower qualifications, or higher or lower skill levels:

- In each of the three lower-qualification groups in Figure 2.4, 28% of those who did no training said they wanted to, while 33% of people with bachelors degrees who did no training wanted to.
- The difference in willingness to train between New Zealanders with high and low skills in literacy, numeracy and problem-solving is less than four percentage points – a quarter of the OECD average gap and the smallest of any country in the survey of adult skills (OECD, 2019c).

Figure 2.4 Learning activities in the past year and desire to do more, by qualification, people aged 25–65, 2014



Source: Ministry of Education and MBIE (2016a, p. 20).

F2.1

New Zealand workers have high rates of participation in work-related education and training, compared to workers in other OECD countries. People in professional occupations or with higher levels of prior education are more likely to take part in work-related education and training.

2.4 Trends in participation

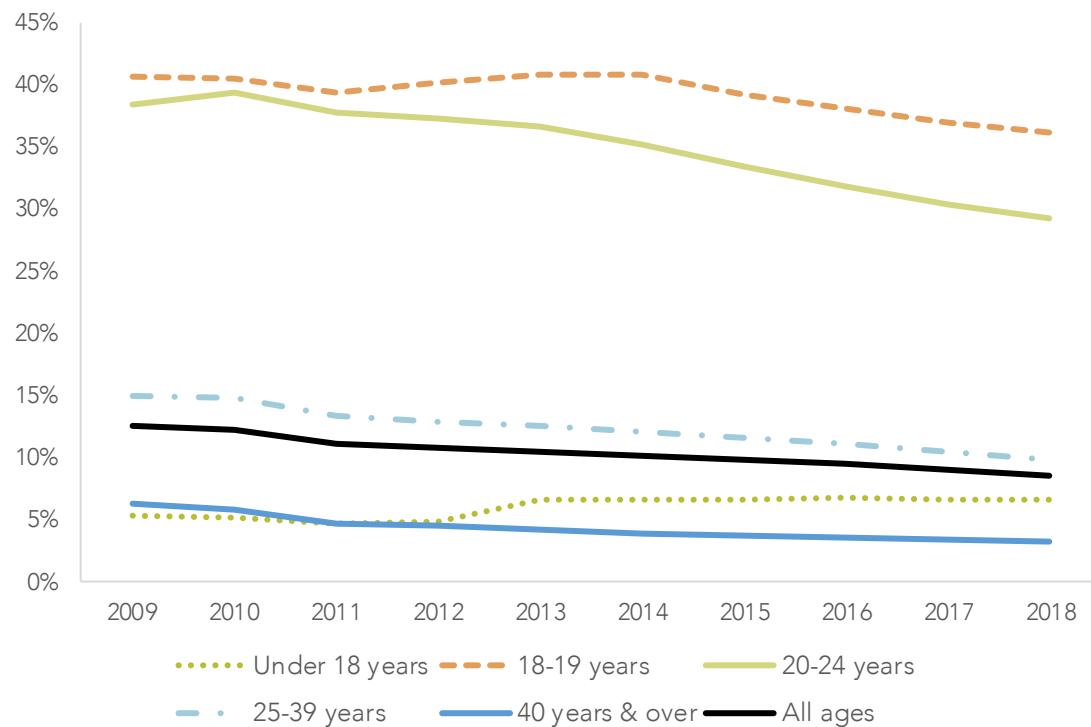
This section examines trends in participation using administrative data on government-regulated and/or funded education and training (ie, provider-based tertiary education and work-based training). While there is good data available on participation in the publicly funded parts of the education and training system, the data is sparse on other work-related education and training such as training conducted in-house by firms and for credentials that are not part of the NZQF. Such learning is, however, included in the survey reported in Figure 2.4.

Participation in provider-based tertiary education has declined, especially for those of working age

Participation in provider-based tertiary education by domestic students has fallen consistently since 2009. Headcounts fell from 423 000 in 2009 to 335 400 in 2018 (about a 20% decline).

Participation by people of working age (ie, aged 25 years and older) fell at an even faster rate. The numbers of students aged 25 years and older fell by 31% over 2009–18, and the participation rates for those aged 40 years and older roughly halved over the same period (Figure 2.5).¹⁴

¹⁴ The total participation rate is the percentage of the population group who were enrolled at a tertiary provider at any time during the calendar year. In the case of people aged 40 years and older, their participation rate fell from 6.4% in 2009 to 3.2% in 2018

Figure 2.5 Tertiary education participation rates by age, 2009–18

Source: Productivity Commission analysis of Ministry of Education data (2019b, sec. PPN.6).

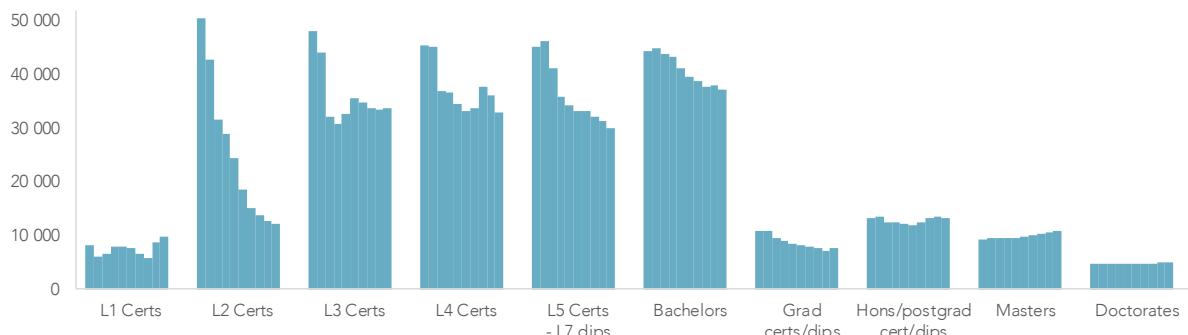
Notes:

1. International students excluded from this figure.

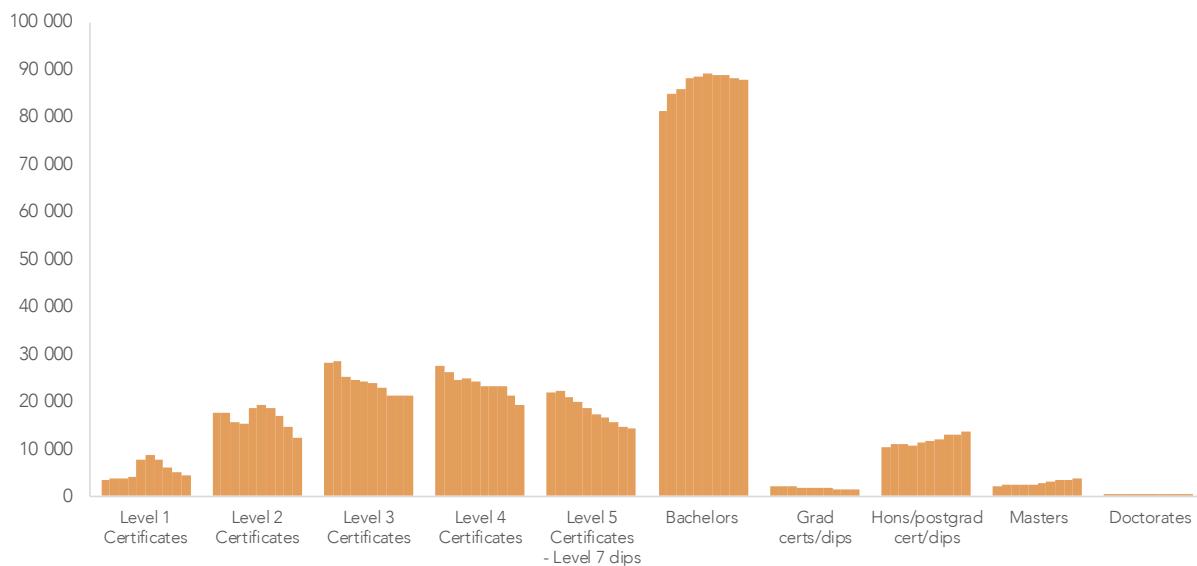
A significant proportion of users of the tertiary education system are active or recently active in the workforce. Forty-one percent of all domestic enrolments in 2018 were employed or self-employed in October 2017. However, the enrolments by this group fell 32% over 2009–18.

There are at least two reasons for the overall decline in provider-based tertiary education participation by adult students and those active in the workforce.

- Student enrolments tend to go up as unemployment rises, and fall as labour-market conditions improve. Unemployment rates hit a peak about 2009 and have since declined. This effect is greatest for adults active or recently active in the workforce, and for vocational education and foundation education programmes where a smaller proportion of learners are young full-time students.
- Half of the drop in enrolments for people aged 25 years and older was in level 2 foundation education programmes. This was a result of changes over 2009–11 that cut funding and regulatory approval for many level 2 programmes, responding to concerns about poor quality and low value for money. This disproportionately affected students aged 25 years and older, since enrolments at level 2 were the most popular choice for this cohort in 2009 (Figure 2.6). In comparison, the majority of enrolments by younger students have consistently been at bachelors degree level (level 7 on the NZQF, Figure 2.7).

Figure 2.6 Trends in tertiary education enrolments, people aged 25 years and older, 2009–18

Source: Productivity Commission analysis of Ministry of Education data (2019b, sec. ENR.9).

Figure 2.7 Trends in tertiary education enrolments, people aged 24 years and younger, 2009–18

Source: Productivity Commission analysis of Ministry of Education data (2019b, sec. ENR.9).

Notes:

1. International students are excluded from this figure and Figure 2.6.

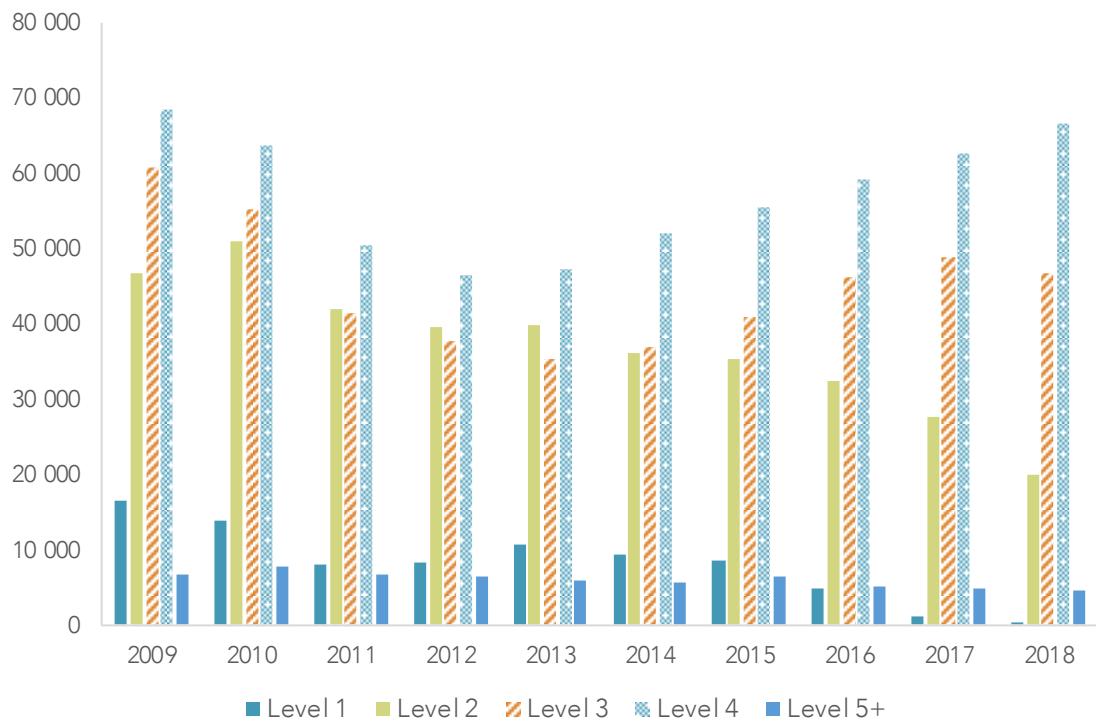
F2.2

Participation in provider-based tertiary education by people aged 25 years and older, and by those who are active or recently active in the workforce, has fallen since 2009. These declines have been faster than for younger cohorts. This fall in participation is due to an improving labour market, and to policy changes which cut funding for lower-level programmes.

Work-based training has increased

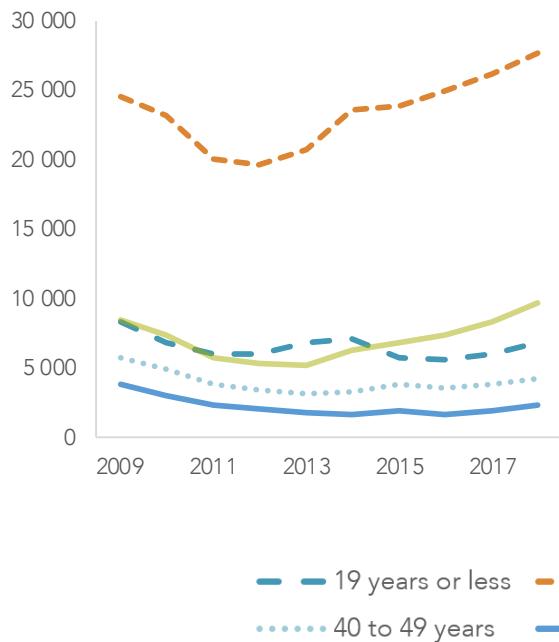
Work-based training for government-recognised and funded qualifications is largely arranged through Industry Training Organisations (ITOs). This includes short certificate programmes and multi-year programmes like apprenticeships (mostly at NZQF level 4) and can combine on-the-job learning in a workplace with offsite courses.

Figure 2.8 shows the number of participants in industry training over the past decade by level of study. Apprentice numbers rose to 50 500 in 2018, an increase of 39% from a low point in 2012.

Figure 2.8 Participants in all forms of industry training by level of qualification, 2009–18

Source: Productivity Commission analysis of Ministry of Education data (2019b, sec. ITP.2).

Figure 2.9 and Figure 2.10 show the trends in participation for apprenticeships and other (mainly short duration) industry training programmes by age.

Figure 2.9 Apprentice numbers by age, 2009–18**Figure 2.10 Industry trainees (excluding apprentices) by age, 2009–18**

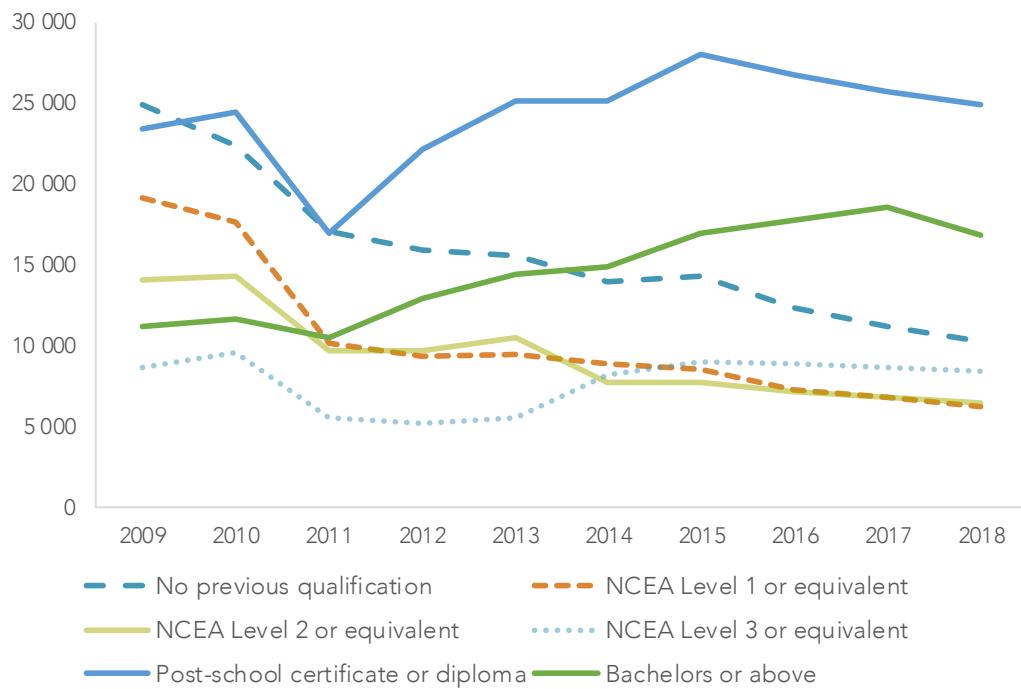
Source: Productivity Commissions analysis of Ministry of Education data (2019b, sec. ITP.3, ITP.12).

Recent growth in apprentice numbers has largely been among people in their 20s and 30s, indicating learner demand is from, and employers' hiring preferences are for, people with prior work experience. The decline in the number of people aged 30 and above taking part in other industry training programmes since 2009

reflects the reduction in industry training provision at levels 1 and 2, in which these people were over-represented.

Figure 2.11 shows that people with degrees, or with other post-school certificates and diplomas, are undertaking an increasing proportion of industry training. In part, this reflects the higher participation in ongoing education and training among people with higher qualifications, as noted in section 2.2. However, it could also reflect a decline in the proportion of people leaving school with less than a level 2 qualification.

Figure 2.11 Industry trainees (excluding apprentices) by prior qualification 2009–18



Source: Productivity Commission analysis of Ministry of Education data (Ministry of Education, 2019b, sec. ITP.3).

F2.3

Work-based training has increased since 2012, especially the numbers undertaking apprenticeships. There has been a notable increase in industry training by people with degrees and other post-school certificates and diplomas. This is further evidence of how those with higher prior educational achievement are more likely to train than those with less.

Outcomes of work-related education and training

Box 2.1 presents results of research on the outcomes for those undertaking education and training in New Zealand. Available studies measure the impact of education on worker incomes and changes in their probability of employment.

There is no specific research on the impact of work-related education and training on outcomes more directly relevant to the inquiry's terms of reference. For example, on worker adaptability and the acquisition of skills that assist the adoption of technology.

Box 2.1 Income and employment returns from education and training in New Zealand

Lower-level education tends not to boost incomes, but can boost employment

Several studies have found that completion of qualifications at NZQF levels 1–4 provides little income benefits to graduates, but sometimes offers employment benefits.

- Crichton (2009) examined the labour-market outcomes of employees who had left a programme of industry training during 2003–05. She found that gaining a qualification at NZQF level 1 or 2 or completing a limited credit programme did not improve average earnings during the 48-month period after training started. However, employment rates for this group were 3–8% higher.¹⁵
- Crichton and Dixon (2011) investigated the labour-market returns obtained by working adults aged 25–64 years, who enrolled with a tertiary education provider and completed a certificate or diploma at levels 1–6, from 2003–05. The study compared their pre- and post-study earnings with those of a matched group who did not return to tertiary education. Except for certificates in a small number of fields of study, students who completed a level 1–4 certificate generally did not increase their average earnings (relative to the comparison group) within three years of completion.
- Tumen, Dixon and Crichton (2018) found that young adults (aged 15–21) who completed a level 1–4 NZQF certificate, after previously having left school without completing NCEA level 2, were more likely to be employed than those who did not complete a certificate. But they also found “no evidence that having a higher qualification led to higher levels of earnings for those with jobs” even after six years (2018, p. 41).

Higher-level certificates or diplomas provide higher, but mixed, returns

Achievement of qualifications at NZQF level 4 or higher tends to provide higher income and employment returns, although these results have varied by gender, age, and subject field.

- Crichton (2009) found that achievement of NZQF level 4 or higher qualifications improved students' earnings, with an average increase of 7% relative to the comparison group 48 months after training started. The earnings of men aged 15–24 were 11% higher, while other men saw improvements of 1–4%. The earnings of women improved by 2%.
- Crichton and Dixon (2011, p. xii) found that gaining a level 5–6 diploma was “associated with an 8 percent increase in the relative earnings of women, on average, and a 6 percent reduction in the relative earnings of men, on average.” Income benefits varied by subject, with increase in relative earnings found for engineering diplomas (men) and education and commerce diplomas (both genders). Diplomas in other fields “were associated with no improvements or reductions in relative earnings” (*ibid*).

F2.4

Lower-level education and training (ie, New Zealand Qualifications Framework levels 1–4) in New Zealand tends not to boost people's incomes but can improve their employment outcomes compared to similar people who do not undertake training. The achievement of higher-level certificates and diplomas can improve incomes, although its effects vary by gender and field of study.

¹⁵ Defined as a “subset of a qualification … (typically between 20 and 40 credits) [that] does not result in the achievement of a national qualifications” (Crichton, 2009, p. 8).

A more complete picture of education and training outcomes is lacking

The studies cited in Box 2.1 focus on a subset of education and training – that which results in the award of a certificate or diploma. To supply a more complete picture of the outcomes from education and training, the Commission has contracted Motu Economic and Public Policy Research to examine the impacts of education and training on earnings and employment, including higher-level learning (levels 7–10) and non-formal education. This will include investigating the:

- effects of different types of education on income, employment type, security of employment;
- effects of different learning pathways (eg, studying while working vs. stopping work to study); and
- the most influential characteristics (eg, age, gender, field of study, prior achievement) on outcomes.

The results of this project are due in March 2020 and will inform the inquiry's final report.

2.5 Barriers to education and training in New Zealand

Survey results emphasise time and costs as barriers

Several surveys have investigated worker and employer views on the barriers to workplace education and training in New Zealand. Both groups cite insufficient time and costs as major barriers to education and training.¹⁶

New Zealand workers reported insufficient time as a barrier to education and training at higher rates than the OECD averages, and time barriers were particularly prominent for the self-employed (OECD, 2019c). Fifty-six percent of employers surveyed for the 2012 Industry Training Review said that cost was a “main barrier to organising further training” and 58% cited the cost of having staff away from work (Ministry of Education, 2012, p. 30).

Quality, relevance, and information also feature

Insufficient information about education and training, doubts about its impacts, and a lack of suitable, relevant or quality education and training were also cited as significant barriers by employers in responses to the 2016 business operations survey (Table 2.1) and the 2012 Industry Training Review survey (Figure 2.12).

Table 2.1 Proportion of firms reporting factors restricting staff training to a “medium” or “high” degree, by number of employees, 2016

Factor	6–19	20–49	50–99	100+
Lack of information on the type of training most needed	13%	10%	12%	12%
Concern that employees will leave or be poached	16%	20%	15%	12%
Uncertainty over whether training would make a difference	18%	19%	19%	17%
Lack of interest from staff	18%	15%	16%	13%
Lack of management time to organise training	20%	21%	20%	17%
Lack of suitable courses or training providers	24%	24%	24%	22%

Source: Productivity Commission analysis of Stats NZ business operations survey 2016 data.

Firm size appears to make little difference to the factors reported in Table 2.1.

¹⁶ In, for example, the 2016 Business Operations Survey, the 2015 PIAAC round, and a survey of employers conducted for the 2012 Industry Training Review.

Figure 2.12 Barriers for firms in organising further education and training, 2012

Source: Ministry of Education (2012).

F2.5

Barriers to education and training, for both employers and workers, include insufficient time, the cost of training, lack of information, and concerns about relevance and quality.

High employment rates and rising wages both increase the cost of spending time out of work. Higher time costs tend to increase demand for flexible models of education and training that people can pursue without forgoing work opportunities. The high share of New Zealand workers reporting time as a barrier to education and training suggest that the system is not meeting this demand for flexible delivery. Chapter 3 recommends policy changes that would make it easier for working-age adults to access education and training, and that would encourage providers to be more responsive.

3 Improving the education and training system

Key points

- In implementing its reforms of the vocational education and training system, the Government should widen access to work-based education and training for all people in the workforce and for volunteers, rather than restricting access based on employment status. This includes widening access to student loans, and ensuring new migrants' eligibility to government-funded vocational education.
- Existing policies limit short courses, micro-credentials and recognition of prior learning. These limits, if addressed, could support labour-market dynamism.
- The current education and training system favours on-campus full-time study for long qualifications, but such study is not well suited for people already in the labour force. The Government should extend funding eligibility to providers for students who do not intend to pursue full qualifications.
- Restrictions on the provision of micro-credentials (such as funding caps) and on the recognition of prior learning (such as funding policy decisions relating to minimum learning hours) should be removed.
- The proposed new vocational education and training system should have clearly specified roles and accountabilities for its component organisations. These should cover programme design and approval, resource allocation and provider accountability.
- The lack of significant funding reallocation between tertiary providers over time has led to inertia and conservatism. It has dampened incentives for providers to innovate and to be responsive to student and employer needs. It will be important to avoid creating more inertia and conservatism in the proposed, but yet to be designed, unified funding system.
- Government could look to active labour-market policies, rather than education interventions aiming for qualifications, for low-skilled at-risk young people to help them achieve sustainable employment and economic independence. The current review of active labour-market policies by the Ministry of Social Development is an opportunity to investigate such a change.

3.1 Widen access to work-based education and training

Everyone in the workforce should have access to work-based training

The Industry Training and Apprenticeships Act 1992 states that a "trainee" must have a training agreement that forms part of their employment agreement. A trainee must therefore be an employee, as defined by the Employment Relations Act 2000. ITOs cannot arrange training for, or fund the training of, anyone who is not an employee. The Education (Vocational Education and Training Reform) Amendment Bill currently before Parliament continues this approach, also defining a trainee in a way that requires them to have a training agreement attached to an employment agreement.

Nearly one in five people in New Zealand's workforce are excluded by this legal definition, because their job is as an employer (eg, small business owners), or because they are self-employed. It also excludes people in approximately 1.2 million volunteer roles in New Zealand (Volunteering New Zealand, 2019).

Figure 3.1 details the work arrangements of the 2.6 million people employed in New Zealand in 2018.

Figure 3.1 Types of work arrangements across the paid workforce in New Zealand, 2018

Source: Productivity Commission analysis of Stats NZ December 2018 survey of working life.

Tying the statutory definition of a trainee to employment status serves no apparent policy purpose. In the case of longer training programmes such as apprenticeships, it may be desirable to promote a long-term commitment and ongoing relationship between the trainee and those supervising their training. But such a commitment can be specified in the quality standards for particular training programmes and qualifications, rather than by legislation that excludes anyone who is not an employee from being a “trainee”.

No aspect of the Government’s vocational education and training reforms appears to *require* a trainee to be defined by employment status. Embedding distinctions between employees, other workers, and learners in legislation risks maintaining an unjustified disparity in access to education and training.¹⁷

F3.1

New Zealand’s industry training system unduly restricts access to work-based training to people who are employees. The Education (Vocational Education Reforms) Amendment Bill currently before Parliament continues the current definition of a “trainee” as a person with a training agreement that is part of an employment agreement as defined under the Employment Relations Act 2000. No aspect of the Government’s reforms appears to require a trainee to be defined by employment status. Embedding distinctions between employees, other workers, and others in legislation risks maintaining an unjustified disparity in access to education and training.

R3.1

In implementing its reforms of the vocational education and training system, the Government should widen access to work-based education and training to all people in the workforce and to volunteers, rather than restricting access based on employment status. Where apprenticeships or other training programmes need long-term ongoing relationships between trainees and their work-based supervisors, this should be specified in programme requirements, rather than through a legal definition of “trainee”.

¹⁷ Current employment case law also constrains the ability of platform or temporary employment agencies to offer training to contractors. NZPC (2019a) made recommendations to address this constraint.

Ensure new migrants' eligibility to government-funded vocational education

Migrants make a numerically larger contribution to the flow of skills into the labour market and school leavers (section 2.1). Allowing migrants to gain new skills promotes their smoother integration into work, and can improve productivity.

At present, any employee legally entitled to work in New Zealand can participate in work-based training arranged by an ITO, supported by government funding. Access is tied to a person's right to work, not to their residency status or how long they have lived in New Zealand.

For people studying at a polytechnic or other tertiary provider, their citizenship or residency status and length of residence determines their eligibility for government tuition subsidies, regulated tuition fees, student loans and student allowances. "Domestic student" status applies to New Zealand citizens, Australians, people with residence class visas, and refugees. Student loans and allowances are available to Australians and people with residence visas after three years being "ordinarily resident" in New Zealand.

Apprentices and other industry trainees who enrol with a tertiary education provider as part of their training programme qualify as domestic students regardless of their residency status or length of residence.

The vocational education and training reforms aim to align work-based industry training and provider-based tertiary education programmes, and to fund them through a unified funding system. It is not yet clear what eligibility and funding rules will apply to workers who wish to access vocational education and training, but who do not (yet) have ongoing residency rights. Rules will be needed to distinguish between these trainees and "international students" who may enrol in the same programmes (and who may seek work experience as part of their study).

The proportion of industry trainees who do not have residency status is unknown. At 31 October 2019, there were 58 000 people in New Zealand with essential skills temporary work visas, and 38 000 people with recent residents and partnership visas (MBIE, 2019). Approximately 40% of essential skills visa holders gain residency within three years. In 2015, only 2.7% of apprentices held temporary work visas, but the proportion of temporary visa holders in shorter industry training programmes will be substantially higher (Ministry of Education, 2017).

F3.2

It is unclear what eligibility rules will apply to temporary work visa holders wishing to participate in, and receive government training subsidies for, vocational education and training following the Government's current reforms.

R3.2

In implementing its reforms of the vocational education and training system, the Government should ensure that people legally entitled to work in New Zealand will be eligible for both work-based and provider-based vocational education and training that is connected to their work, regardless of their visa status or length of residency.

Widen access to student loans

Alongside the reforms to the provision of vocational education and training, the Commission believes reforms are also needed to student loans, to better enable adults and workers to access the tertiary system.

Under current policy settings, access to student loan scheme finance for course fees is limited to people enrolled in course loads larger than 0.125 EFTS – equivalent to a typical undergraduate university paper. This means that someone studying one course at a time must self-fund their study.

People in the workforce are arguably better placed than those coming straight from school to fund tertiary study themselves, as they have an income and are therefore less likely to be credit constrained. This limit is most likely to affect those on lower incomes, who may not have the savings available to self-fund.

There seems little good reason to prevent people accessing student loans to pay fees for periodic and small bursts of training, provided access continues to be limited to approved courses. Those in employment will immediately begin repaying their loans as they earn, limiting the fiscal costs to government.

F3.3

The current limit on the ability of people to borrow through the student loan scheme for short courses is a barrier to work-related education and training. It is most likely to affect those on lower incomes, who may not have the savings available to self-fund.

R3.3

The Ministry of Social Development should remove the 0.125 equivalent full-time student minimum course load for access to student loans for compulsory course fees.

Other policies that might widen access to training

Other policy interventions could reduce barriers or address weak incentives to train, for workers or firms. The Commission briefly examines some of these interventions in Appendix B. It is not proposing to take the analysis further in this inquiry but welcomes feedback from submitters with alternative views.

3.2 Credentials for labour-market dynamism

This section examines policies that limit short courses, micro-credentials and recognition of prior learning. These limits, if addressed, could support labour-market dynamism.

The system favours on-campus full-time study for long qualifications

The Commission previously found that policy and funding settings, and providers' internal business models have generally been geared to favour on-campus full-time study for long qualifications by younger students (NZPC, 2017).

A high-performing education and training system for a dynamic labour market should support not only progress up a qualifications ladder but also lateral moves to new fields, and new skills that help people to adapt to changing circumstances.

Education policy makers can tend to assume that tertiary education and training should always involve progression to higher-level qualifications. However, people who are in the labour force may seek to develop particular job-specific and applied skills that are credentialled at the same level as, or at lower levels than, the qualifications they already hold. Although people may want to take only a few courses, providers are required to enrol students in whole qualifications in order to receive government funding.

The Building and Construction ITO (BCITO, sub. 25, pp. 4–5) submitted that current education paradigms and policies do not recognise that people's career and learning pathways are not always linear:

... as part of the emphasis on lifelong learning there needs to be clear recognition on a policy level that people's education pathways (and credential accumulation) may not be linear; people may undertake a Level 4 Apprenticeship, and then a micro-credential at Level 3, then a Level 6 or Level 7 advanced qualification, and then another Level 3 micro-credential.

In *New models of tertiary education* (NZPC, 2017) the Commission recommended that the government extend funding to providers for students who do not intend to pursue full qualifications (R14.10). The Commission reiterates that recommendation.

R3.4

The Government should extend funding eligibility to providers for students who do not intend to pursue full qualifications, and remove specifications that limit the provision of short courses.

An over-emphasis on completion rates encourages providers to chase full-time students

The education performance indicators (EPIs) that the Tertiary Education Commission (TEC) uses to assess and allocate funding to tertiary providers rely heavily on completion rates, that is, the proportion of those starting a course that complete a qualification.

Part-time students tend to have lower qualification completion rates. Providers' EPIs are marked down if their students do not complete the qualification in which they enrolled, even if they have passed all the courses they wanted to do, or if they stopped studying to take up a job offer.

The Commission recommended in 2017 that the TEC should change the way it measures completions so that provider performance is not penalised if a student finds a job.

The incentive for providers to prefer full-time over part-time students could be softened by having separate EPIs for full- and part-time students, and for students enrolling in a single course (if R3.4 was adopted).

Micro-credentials

Micro-credentials are "short courses focused on a coherent set of competences" (Ministry of Education, sub. 48, p. 6) that offer people an opportunity to gain a qualification that recognises existing skills and competencies, or to upskill. Stone (2010) suggested that this type of credential is compatible with the workplace, especially to encourage training in small firms. Given the finding of Coleman and Zheng (2020) that a significant number of job moves involve a change of industry, micro-credentials can help people move by giving them a portable qualification. This facilitates labour-market dynamism.

The Commission hosted a roundtable of industry and education stakeholders with expertise in micro-credentials to inform this report (NZPC, 2019b). Roundtable participants noted that micro-credentials are important for people at boundaries, such as those changing employers or careers.

Participants observed that current funding and approval rules (Box 3.1) constrain the growth of formal micro-credentials (ie, those accredited by NZQA). The Industry Training Federation similarly commented that the "recent introduction of micro-credentials as recognized (and fundable) educational products is a good start in this regard, but it remains a prescriptive system that should be seen as a starting point, rather than a full solution" (sub. 29, p. 3).

Box 3.1 Rules for the approval and funding of micro-credentials

From 1 August 2017 to 30 June 2018, the New Zealand Qualifications Authority (NZQA) carried out micro-credential pilot projects with three organisations (US-based online education firm Udacity, Otago Polytechnic and the Young Enterprise Scheme). The pilots aimed to "better understand the role micro-credentials could play in New Zealand's education, training and qualification system of the future".

Following these pilots, new NZQA rules for the approval of micro-credentials require that they must:

- be "a coherent arrangement of learning or training ... based on clearly linked aims, outcomes, content and assessment practices";
- demonstrate evidence of need from employers, industry and/or community;
- "typically ... not duplicate current quality-assured learning approved by NZQA";
- be reviewed annually to confirm they continue to meet their intended purposes; and
- be 5–40 credits in size (NZQA, 2018a).

In 2019, the TEC issued new guidelines for funding micro-credentials, which set four criteria to assess funding applications. To be funded, micro-credentials must fit a definition, have end-user buy-in, contribute to government priorities, and complement private investment (TEC, 2019). As of mid-December 2019, NZQA have approved 73 micro-credentials, including welding, project management, and exceeding customer expectations (NZQA, 2019a).

F3.4

Micro-credentials have the potential to facilitate labour-market dynamism. Despite the recent introduction of New Zealand Qualifications Authority (NZQA) rules for the approval of micro-credentials and Tertiary Education Commission guidelines for their funding, considerable barriers remain to the provision of NZQA-approved micro-credentials.

Two specific restrictions limit the provision of NZQA-approved micro-credentials.

Limits on provision

The TEC limits the availability of micro-credentials by restricting the amount of short-course delivery a tertiary provider or ITO can offer to 5% of the dollar value of its provision.¹⁸ The TEC will now “consider exceptions” to this cap (TEC, pers. comm. 4 November 2019). The cap (and the exception by application policy) appears unduly blunt and restrictive. It means that only large tertiary providers can offer these programmes, and only as peripheral to their offerings of longer qualifications. It also effectively prevents specialist providers of NZQA-approved micro-credentials entering the market.

R3.5

The Minister of Education should, under section 159L of the Education Act 1989, issue a determination of funding mechanisms for student achievement component funding that removes the 5% cap on the delivery of micro-credentials, subject to providers demonstrating sufficient resources, capability and internal processes.

R3.5 is a specific example of the more general recommendation R3.4, which recommends that Government “remove specifications that limit the provision of short courses”.

Limits on “stacking”

One of the potential benefits of micro-credentials is their ability to be “stacked” towards larger qualifications, that is, built on each other to “achieve mastery in a larger concept” via the creation of so-called “education playlists” (Ryerse, 2017).

It is not easy for students to stack NZQA-approved micro-credentials. NZQA (2018c) stated that

[w]hile it is possible to use micro-credentials to enable stackable learning, NZQA considers it important to avoid a situation where every programme currently delivered is disaggregated into its components and offered as micro-credentials. This will help to avoid duplication of learning, fragmentation of qualifications, and employer confusion.

An inability to stack micro-credentials devalues their potential to facilitate labour-market dynamism. Workers may be less likely to embark on study if they believe they may be unable to build a qualification over time.

At the Commission’s roundtable, participants considered that NZQA’s concern that micro-credentials would duplicate learning, fragment qualifications and cause confusion for employers is overblown. In many cases, firms prefer established qualifications, and value micro-credentials as add-ons, permitting specialisation or upskilling (NZPC, 2019b). Additionally, the Micro-credentials in Engineering Education Community of Practice contended that NZQA’s concerns are “overstated and fundamentally misunderstand the potential of micro-credentials” (Mischewski, 2019).

¹⁸ “Under the funding conditions for Student Achievement Component (SAC) funding, micro-credentials are counted as training schemes. Without TEC’s agreement, training schemes cannot comprise more than five percent of the total dollar value of a TEO’s delivery” (TEC, 2019, p. 4).

F3.5

"Stacked" micro-credentials are more valuable to workers, as they can build a qualification over time. Being unable to stack could discourage workers from embarking on study. Concerns that the stacking of micro-credentials could lead to duplication, fragmentation of qualifications, and employer confusion do not outweigh the benefits of stacked micro-credentials for workers and for labour-market dynamism.

Any industry body or other organisation can offer micro-credentials in New Zealand outside of the NZQA-approval framework. These may be suitable where technology is fast-moving as industry-provided micro-credentials are likely to respond more rapidly to change. However, NZQA-approved micro-credentials offer particular advantages for labour-market dynamism. For the workers who change industry when changing jobs, externally validated (such as NZQA-approved) micro-credentials are more likely to be recognised across industries (NZPC, 2019b).

Monitoring the system impact of greater volumes of NZQA-approved micro-credential delivery would be important, if the Government adopts recommendation 3.5 (or relaxes the limits on stacking micro-credentials).

Recognition of prior learning

Recognition of prior learning (RPL) "assesses what an incoming learner already knows and can do, and provides the learner with credit toward a qualification on that basis" (NZPC, 2017, p. xvii). Micro-credentials offer one avenue to credentialise RPL.

NZQA rules require that providers seeking approval for their programmes must have "clear, relevant, and appropriate regulations that specify requirements for ... recognition of prior learning" (NZQA, 2018b, p. 3). However, current funding policy creates a barrier to greater RPL. This barrier "stems from a requirement that providers deliver a certain number of learning hours per funded EFTS" (NZPC, 2017, p. 122).

In *New models of tertiary education*, the Commission recommended that the TEC "remove any reference to inputs [eg, learning hours] in its definition of an Equivalent Full-Time Student. It should instead rely on the relevant quality assurer's assessment of 'credit value' to determine the funded size of courses and qualifications" (NZPC, 2017, p. 419). That recommendation was not adopted (Goldsmith, 2017).

But even in a less restrictive funding environment, other constraints may limit an expansion of RPL. A 2015 NZQA survey of providers found that many offered RPL, but that there were several barriers to its wider use (NZQA, 2017).¹⁹ Many overseas jurisdictions also have low take-up of RPL and a failure to meet expectations (Hargreaves & National Centre for Vocational Education Research (Australia), 2006; OECD, 2019b).

F3.6

Recognition of prior learning (RPL) would make it easier for individuals to move from one industry to another, as in-work learning is formalised by RPL via a credential. However, current funding policy creates a barrier to RPL.

The Commission reiterates its 2017 recommendation on the grounds that removing any reference to inputs in the definition of an EFTS would make RPL more attractive to providers and more accessible to workers.

R3.6

To encourage providers to offer recognition of prior learning, the Tertiary Education Commission should remove any reference to inputs (eg, learning hours) in its definition of an equivalent full-time student.

¹⁹ The survey had 66 responses (about 10% of the tertiary sector), mostly private training establishments and polytechnics. Of the 66 respondents, 77% "offered some RPL either as credit toward a qualification, for an entire qualification, or for entry into a course" (NZQA, 2017, p. 3).

3.3 Improving system responsiveness

Making it easier to move money around the system

The current funding model is unduly conservative and compliance-heavy, dampening incentives for innovation and responsiveness. The Commission noted in its *New models of tertiary education* inquiry that

the more fundamental causes of system inertia, and the barriers to a system that is truly fit for purpose in a fast-changing society and economy, are baked into the system's architecture by the central allocation of funded places ... Government's investment in tertiary education, and the collective investment of students, do not flow to providers that are better at teaching, or more innovative, or offering what student want. Existing providers – especially TEIs – can rely with reasonable safety on being reallocated a similar volume of EFTS year after year, as long as their performance does not fall below minimum standards. (NZPC, 2017, p. 399)

Other aspects of funding policy that constrain innovation and responsiveness include:

- the EFTS funding formula based on inputs (eg, learning hours) rather than outputs or outcomes, which requires tertiary organisations to bundle up services that could be offered separately (eg, content design, teaching, assessment, credentialing and pastoral care); and
- allocation decisions that try to achieve goals other than teaching and learning (eg, regional economic development, maintenance of research capability, provision in small markets), and which therefore send mixed messages to providers.

The incentives created by the funding system do not reflect objectives of improving accessibility and responsiveness to students or employers.

The TEC (sub. 42, p. 2) acknowledged the need for change in its submission, observing that the "current funding system will need to become more flexible, agile and nimble with an ability for investment to be quickly and easily redirected to more relevant areas and courses as the economy shifts."

As part of the reforms to vocational education, the Government has announced it will develop a "unified funding system", bringing together both provider- and work-based training at NZQF levels 3 to 7 (excluding degree study).²⁰ This funding system would meet the following Cabinet-approved principles:

The unified funding system should:

- reward and encourage the delivery of high-quality education and training which meets the needs of learners, communities and employers
- support access to work-based education and training and encourage the growth of work-integrated delivery models
- supply strategically important delivery to meet national priorities, address regional labour-market demand, and be highly responsive to employer skill needs
- allocate funding through simple and transparent funding mechanisms which ensure provider accountability, and provide for greater stability as a platform to invest in innovation and growth. (Office of the Minister of Education, 2019, pp. 21–22)

The Commission previously noted problems with having separate funding models for workplace- and provider-based vocational training (NZPC, 2017). The unified funding system explicitly addresses this concern. It is important, however, that its design and implementation does not result in more inertia and conservatism. For example, the principle of providing for "greater stability" may lead to less, rather than more, innovation in the system.

The Cabinet-approved principles embody many, potentially conflicting, objectives. Without clarity over their relative priority, the new funding system may continue to suffer from the problems identified in *New models of tertiary education*.

²⁰ The unified funding system is currently being designed. The Government's expectation is that the new system will be phased in over several years, starting in 2021.

F3.7

The lack of significant funding reallocation between tertiary providers over time has led to inertia and conservatism. It has dampened incentives for providers to innovate and to be responsive to student and employer needs. It is important that the proposed unified funding system does not result in more inertia and conservatism.

In taking decisions on the new unified funding system for vocational education, the Government should aim to significantly increase innovation, responsiveness and the reallocation of resources.

Establishing clear roles and accountabilities

A responsive education and training system needs institutions that can make decisions, allocate resources, and be held accountable for their decisions. This, in turn, implies having organisations with clear roles and accountabilities (NZPC, 2014). As currently envisaged, the governance and funding arrangements for the proposed new vocational education and training system risk creating conflicting roles and responsibilities, and unclear lines of accountability. Examples of this can be seen in programme design and approval, resource allocation and provider accountability.

Programme design and approval

Multiple organisations are involved in programme design and approval.

NZQA will have the power to “grant or refuse to grant approval” of a programme [s. 249, Education Act 1989]. NZIST will enjoy academic freedom, including “the freedom of NZIST and its staff to regulate the subject matter of its courses” and “the freedom … to teach and assess students in the manner they consider best promotes learning” [Education (Vocational Education and Training Reform) Amendment Bill, clause 222E(2)]. Six new workforce development councils (WDCs) will

… get to decide whether programmes are fit for purpose, whether they are on-the-job programmes (like an apprenticeship), taught on-campus or taught online by a provider, or a combination of these three. Unless a programme has the Workforce Development Council’s confidence – effectively, industry’s confidence – it won’t be approved and won’t be funded (Ministry of Education, 2019a, p. 7).

The Commission notes that the notion of “industry” might not be not useful for policy or regulatory purposes (Box 3.2).

The Government should not place undue emphasis on the concept of “industries” or on WDCs to define the skills needs of the future workforce. Doing so may focus training on serving the old business models and technologies of incumbents, rather than encouraging innovation and new entrants.

Resource allocation

Fifteen regional skills leadership groups (RSLGs) will be established to “provide advice about the skills needs of their regions to the TEC, WDCs and local vocational education providers. TEC will be required to take their advice into account when making investment decisions” (Ministry of Education, 2019a, p. 8). The TEC will also have to “give effect to advice from a workforce development council about the mix of vocational education and training needed for the … industries covered by the workforce development council when deciding to give funding approval” [Education (Vocational Education and Training Reform) Amendment Bill, clause 159FA(1)(b)]. It is unclear how the TEC will or should balance competing advice from industry and regional interests.

The council of the NZIST will also have to take advice from the WDCs and RSLGs, as well as from internal staff, students’ and Māori advisory committees, which it must consult “on significant matters relating to its strategic direction that are relevant to the class of people represented by that committee” [Education (Vocational Education and Training Reform) Amendment Bill, clause 222L(3)(a)].

While the NZIST council will be responsible for managing its portfolio of programmes nationwide and allocating funding and capital across its network of campuses, the TEC is responsible for managing the network of tertiary education provision nationwide through the investment plan process. It is unclear how resources will be allocated by these two organisations across the NZIST’s various regions and campuses.

Box 3.2 The problematic term “industry”

Occupations do not always line up cleanly with industries. For example, accountants, engineers, drivers and salespeople working for Fonterra have more in common with people working in similar jobs elsewhere than they have with other dairy industry workers.

Multi-product firms

Statistical agencies group firms into “industries” based on their main product or service. This does not work well for multi-product firms. For example, Google is classed as part of the “advertising” industry, failing to reflect its dominant position in other markets. Google has much more in common with Amazon, Facebook, Netflix and other digital platform giants than with traditional advertising firms.

New entrant and innovative firms

Many new entrant and innovative firms do not fit comfortably within industry classifications and operate across multiple industries. Similarly, many new technologies and the skills required to manage them are more general purpose than industry specific.

Firms can change industries

Firms can change industries as they merge or divest operations, add or abandon products or change business models. Such changes are becoming more common – product and service variety has expanded in recent decades.

Industry classifications lag economic changes

It is unclear, for example, how Trade Me should be classified in the still-current 2006 Australia New Zealand Standard Industrial Classification coding framework.

Provider accountability

The 15 RSLGs “will hold the Institute to account, alongside other providers, for collectively meeting the needs of their local communities” (Ministry of Education, 2019a, p. 9). The NZIST will be accountable to the TEC for delivery against its Investment Plan, to the Secretary for Education for capital projects, and to the Minister for achieving its charter.²¹

Without clarification of roles and responsibilities, there is a risk that the reforms could create tensions between organisational functions, muddy lines of accountability, and make it hard for resources to move to reflect student and employer needs.

F3.8

Clear organisational roles, responsibilities and accountabilities underpin effective systems. Elements of the current vocational education reforms appear to create overlapping roles and functions and unclear lines of accountability.

R3.7

To reduce duplication and improve accountability, the Government should clarify the roles and responsibilities of the various agencies and organisations in the new vocational education system.

²¹ Accountability to the Secretary of Education for capital projects is for those over a set threshold and/or not already part of an approved capital plan.

3.4 Youth at risk of long-term poor employment outcomes might benefit from a different approach

Many government social services interventions are targeted at youth not in employment, education or training (NZPC, 2015). Improvements in employment outcomes for such youth could boost the country's productivity, social outcomes and wellbeing.

A recent meta-analysis of research findings suggests that the skills and opportunities these young people need are often best gained in work, with appropriate support (McGirr, 2019). This analysis further suggests that a different approach could better build their skills and employability, and improve their career opportunities and life outcomes.

Lack of work experience is a major barrier for young people because having work experience can signal employment capability and motivation, and demonstrate soft skills highly valued by employers. Pre-employment programmes can be counterproductive if they emphasise formal education and attaining qualifications, and delay or limit work experience. Young people can end up churning between low-level tertiary education programmes, short-term insecure work, and welfare dependency.

Eight percent of 24-year-olds in 2015 had limited employment every year since age 16, and a high risk of lifetime limited employment (16% for Māori; 10% for Pacific). A further 15% had limited employment most years since age 16, and a medium risk of lifetime limited employment (27% for Māori; 21% for Pacific) (McGirr, 2019, p. 26).

A Ministry of Social Development (MSD) review of employment services delivered in 2016/17 rated the service for youth not in education, employment or training (NEETs) as having a negative impact (de Boer & Ku, 2019). McGirr (2019) found that policies and programmes targeting NEETs can capture people at relatively low risk of long-run limited employment while missing others who, although not claiming jobseeker benefits or registering as long-term unemployed, churn between low-paid short-term jobs and/or low-level tertiary education.

Rather than (or in addition to) targeting NEETs, programmes could target those young people in long-term limited employment, which would include those in minimum-wage jobs, those frequently underemployed, and those underemployed for long periods. Such people may not be current or frequent clients of MSD.

Government could look to active labour-market policies, rather than education interventions aiming for qualifications, for low-skilled at-risk young people to help them achieve sustainable employment and economic independence. The current review of active labour-market policies by MSD is an opportunity to investigate such a change.

3.5 The wider education system

In taking decisions on the funding system and other aspects of the reforms of vocational education, the Government should aim to significantly increase system responsiveness to meet the needs of, and support, a dynamic labour market. The recommendations in this report, if implemented, would improve access to education and training, and assist in meeting the skill needs of New Zealand firms and workers.

However, decision makers will also need to address some of the traditional boundaries and frictions in the wider education system, if that system is to be truly innovative and responsive to a future of work with increased technological change. The forthcoming draft report *Educating New Zealanders for the future* will discuss these boundaries and frictions.

Summary of findings and recommendations

Chapter 2 – The New Zealand workforce and participation in training

Findings

F2.1

New Zealand workers have high rates of participation in work-related education and training, compared to workers in other OECD countries. People in professional occupations or with higher levels of prior education are more likely to take part in work-related education and training.

F2.2

Participation in provider-based tertiary education by people aged 25 years and older, and by those who are active or recently active in the workforce, has fallen since 2009. These declines have been faster than for younger cohorts. This fall in participation is due to an improving labour market, and to policy changes which cut funding for lower-level programmes.

F2.3

Work-based training has increased since 2012, especially the numbers undertaking apprenticeships. There has been a notable increase in industry training by people with degrees and other post-school certificates and diplomas. This is further evidence of how those with higher prior educational achievement are more likely to train than those with less.

F2.4

Lower-level education and training (ie, New Zealand Qualifications Framework levels 1–4) in New Zealand tends not to boost people’s incomes but can improve their employment outcomes compared to similar people who do not undertake training. The achievement of higher-level certificates and diplomas can improve incomes, although its effects vary by gender and field of study.

F2.5

Barriers to education and training, for both employers and workers, include insufficient time, the cost of training, lack of information, and concerns about relevance and quality.

Chapter 3 – Improving the education and training system

Findings

F3.1

New Zealand’s industry training system unduly restricts access to work-based training to people who are employees. The Education (Vocational Education Reforms) Amendment Bill currently before Parliament continues the current definition of a “trainee” as a person with a training agreement that is part of an employment agreement as defined under the Employment Relations Act 2000. No aspect of the Government’s reforms appears to require a trainee to be defined by employment status. Embedding distinctions between employees, other workers, and others in legislation risks maintaining an unjustified disparity in access to education and training.

F3.2

It is unclear what eligibility rules will apply to temporary work visa holders wishing to participate in, and receive government training subsidies for, vocational education and training following the Government’s current reforms.

F3.3

The current limit on the ability of people to borrow through the student loan scheme for short courses is a barrier to work-related education and training. It is most likely to affect those on lower incomes, who may not have the savings available to self-fund.

F3.4

Micro-credentials have the potential to facilitate labour-market dynamism. Despite the recent introduction of New Zealand Qualifications Authority (NZQA) rules for the approval of micro-credentials and Tertiary Education Commission guidelines for their funding, considerable barriers remain to the provision of NZQA-approved micro-credentials.

F3.5

"Stacked" micro-credentials are more valuable to workers, as they can build a qualification over time. Being unable to stack could discourage workers from embarking on study. Concerns that the stacking of micro-credentials could lead to duplication, fragmentation of qualifications, and employer confusion do not outweigh the benefits of stacked micro-credentials for workers and for labour-market dynamism.

F3.6

Recognition of prior learning (RPL) would make it easier for individuals to move from one industry to another, as in-work learning is formalised by RPL via a credential. However, current funding policy creates a barrier to RPL.

F3.7

The lack of significant funding reallocation between tertiary providers over time has led to inertia and conservatism. It has dampened incentives for providers to innovate and to be responsive to student and employer needs. It is important that the proposed unified funding system does not result in more inertia and conservatism.

F3.8

Clear organisational roles, responsibilities and accountabilities underpin effective systems. Elements of the current vocational education reforms appear to create overlapping roles and functions and unclear lines of accountability.

Recommendations

R3.1

In implementing its reforms of the vocational education and training system, the Government should widen access to work-based education and training to all people in the workforce and to volunteers, rather than restricting access based on employment status. Where apprenticeships or other training programmes need long-term ongoing relationships between trainees and their work-based supervisors, this should be specified in programme requirements, rather than through a legal definition of "trainee".

R3.2

In implementing its reforms of the vocational education and training system, the Government should ensure that people legally entitled to work in New Zealand will be eligible for both work-based and provider-based vocational education and training that is connected to their work, regardless of their visa status or length of residency.

R3.3

The Ministry of Social Development should remove the 0.125 equivalent full-time student minimum course load for access to student loans for compulsory course fees.

R3.4

The Government should extend funding eligibility to providers for students who do not intend to pursue full qualifications, and remove specifications that limit the provision of short courses.

R3.5

The Minister of Education should, under section 159L of the Education Act 1989, issue a determination of funding mechanisms for student achievement component funding that removes the 5% cap on the delivery of micro-credentials, subject to providers demonstrating sufficient resources, capability and internal processes.

R3.6

To encourage providers to offer recognition of prior learning, the Tertiary Education Commission should remove any reference to inputs (eg, learning hours) in its definition of an equivalent full-time student.

R3.7

To reduce duplication and improve accountability, the Government should clarify the roles and responsibilities of the various agencies and organisations in the new vocational education system.

Appendix A New Zealand Qualification Framework levels

Table A.1 Qualification types and knowledge types in the NZQF

NZQF level	Type of knowledge	Certificate	Diploma	Degree
10	Knowledge at the most advanced frontier of a field of study or professional practice			Doctoral degree
9	Highly specialised knowledge, some of which is at the forefront of knowledge, and a critical awareness of issues in a field of study or practice			Masters degree
8	Advanced technical and/or theoretical knowledge in a discipline or practice, involving a critical understanding of the underpinning key principles	Postgraduate Certificate	Postgraduate Diploma	Bachelor honours degree
7	Specialised technical or theoretical knowledge with depth in one or more fields of work or study	Graduate Certificate	Graduate Diploma / Diploma	Bachelors degree
6	Specialised technical or theoretical knowledge within a specific field of work or study	Certificate	Diploma	
5	Broad operational or technical and theoretical knowledge within a specific field of work or study	Certificate	Diploma	
4	Broad operational and theoretical knowledge in a field of work or study	Certificate		
3	Some operational and theoretical knowledge in a field of work or study	Certificate		
2	Basic factual and/or operational knowledge of a field of work or study	Certificate		
1	Basic general and/or foundation knowledge	Certificate		

Source: NZQA (2019b).

Appendix B Other policy measures to promote training

Training leave entitlements

One policy that aims to target insufficient time as a barrier is a training leave entitlement, which a worker can exercise to take time off for education activities. Leave entitlements are generally implemented as statutory rights or as provisions in collective agreements (Stone, 2012).

Training leave entitlements tend to have low take-up rates; according to Stone (2012, p. 15), "less than 2% is typical". This is due to several factors.

- *Selection bias.* Stanfield et al. (2009, p. 29) observed that individuals "intending to change careers are among the groups most likely to make use of the right, thus meaning that their current employer may receive little benefit, while there is mixed evidence on whether employees from vulnerable labour market groups make use of their rights."
- *Conflicts with organisational needs.* Exercising a training leave entitlement may conflict with an employer's business needs, especially where there is a need to find replacement staff for absent workers. This can be a particular issue for small firms, which do not have large number of employees to provide cover.²² Because training leave entitlements are triggered by individuals, the training supported may also not align with business priorities, making employers less supportive.
- *The need for other supportive institutions and policies.* Take-up of leave entitlements appears to be higher where it is supported by financial assistance, for firms (to offset the costs of replacement staff) or employees (eg, training cost fees, wage subsidies, career and training information and guidance). In European countries with leave entitlements, this funding is either provided by government budgets or through training levies applied to firms or industries.

Training leave entitlements also may not be effective for independent contractors, who do not have replacement staff to cover for them to ensure continued business and revenue.

Training tax credits

Training tax credits seek to reduce the cost of training for firms, by allowing them to deduct some, all or more than the costs of training from their taxes. Such tax credits are available in several US states, Austria and France (Fitzpayne & Pollack, 2018b).

Training tax credits come with high deadweight costs, as they often require high concession rates (OECD, 2017b; Office for Official Publications of the European Communities, 2009; Stanfield et al., 2009; Stone, 2012). Tax credits also do not appear to be very effective in increasing the participation of underrepresented groups. A review of tax incentives to promote education and training concluded that they

usually have perverse redistribution consequences as they end up favouring those groups overrepresented in education/training activities (highly educated/high income people, larger enterprise employees, young and intermediate age groups, etc), especially if these tax incentives are not targeted to specific groups; even here evidence suggests that introducing concrete targets may induce inefficient substitution effects across groups. (Office for Official Publications of the European Communities, 2009, p. 107)

A UK literature review of training incentives for firms and employers noted that tax credits "are more likely to appeal to firms which are already interested in developing their staff" (Stanfield et al., 2009, p. 22). Efforts to reduce the deadweight loss associated with tax credits by targeting their eligibility increases cost and administrative complexity, and risks reducing uptake of training and the impact of the tax credits.

²² That said, smaller firms (6–19 employees) were more likely than larger firms to report in the 2016 business operations survey that giving staff time did not restrict the firm's ability to train its employees.

Individual learning accounts

Individual Learning Accounts (ILAs, sometimes referred to as “lifelong learning accounts”) provide people with cash or vouchers to offset training expenses. Economic historian Frey (2019), the Aspen Institute (Fitzpayne & Pollack, 2018a), and the OECD (2019a) have proposed ILAs as a response to technological change and disruption. The AI Forum New Zealand (sub. 10, p. 5) recommended that consideration

be given to a “universal education basic income” model. This might be a lifelong annualised personal education budget which can be saved up over several years and enables people in all lines of work to fund productive time out from their careers (whether as an extended sabbatical or just 1 day of a week, for example).

Similarly, the TEC (sub. 42, p. 5) submitted that “initiatives which support people to invest in lifelong learning are worth exploring.”

Depending on their design, ILAs can have the benefits of:

- *flexibility*, allowing workers to pick the training that best suits their needs, interests and time constraints; and
- *neutrality*, providing support to workers regardless of their work arrangement (eg, permanent employee, independent contractor).

Several jurisdictions have introduced ILAs to improve access to training (Table B.2), especially for people who have had poor prior educational achievement (OECD, 2019c). Some schemes are supplements to other support for education (eg, subsidies for higher or further education providers) or provide help to those not eligible for these subsidies. In practice, however, ILA schemes have been prone to abuse or raised public concerns about value for money (Box B.1).

As a result, many existing ILAs sacrifice some elements of flexibility or neutrality to manage fiscal pressures, improve accountability, or target resources to those deemed most in need. For example, ILA expenditure is often limited to specified courses, providers and types of trainee (Table B.2).

Like training tax credits, uptake of ILAs has been low. The OECD (2019c, pp. 276–277) reported that, for the time being:

existing schemes are far too modest in scale to be able, on their own, to increase training participation overall, even less so to reduce the gap between high-skilled, full-time permanent employees and the rest, at least in the absence of adequate counselling.

In the case of New Zealand, it is not clear what more an ILA scheme would add. The main sources of funding for training – the student achievement component tuition subsidy system for providers and student loan scheme for individuals – are largely uncapped, untargeted and promote access for learners.^{23,24} The recommendations in this report would further improve access and provider responsiveness.

However, if these recommendations are not taken up or if they prove slow to implement, then some form of ILA could be a second-best option to encourage more equitable access to work-related education and training. Training incentives aimed at individuals (such as ILAs) should ideally be accompanied by information, advice and guidance on learning and career options (OECD, 2017b, 2019a).

²³ The student achievement component is the largest of the Government’s tertiary education funds, used to purchase provider-based tertiary education.

²⁴ To continue to qualify for a student loan, a borrower must pass at least half of their study load upon completion of 1.6 EFTS. Lifetime eligibility for student loans has also been limited to seven EFTS, although exceptions can be granted for specific courses and circumstances – up to a lifetime total of 10 EFTS.

Box B.1 Individual learning accounts in the United Kingdom

The Blair Labour government introduced individual Learning Accounts in 2000, as means of widening participation on learning and overcoming financial barriers faced by individuals. Anyone aged 19 or over who met UK residency requirements could open an account, which provided:

- an initial incentive of £150 towards the cost of eligible learning for the first million account users, with a small contribution of at least £25 from the account holder;
- a discount of 20 per cent on the cost of broad range of learning capped at £100; and
- a discount of 80 per cent on the cost of a limited list of basic IT and mathematics course, limited to a total of £200 discount per account from October 2000. (National Audit Office, 2002, p. 4)

The take up of ILAs was faster than had been expected, with the government's target of a million account holders undertaking learning within two years achieved within eight months of the scheme starting. However, the government announced the closure of the scheme effective from December 2001, citing concerns about the quality of training provided. Later investigations found

- evidence of fraudulent behaviour, including the unauthorised extraction of ILA account numbers and their offer for sale, the unscrupulous emptying of some accounts by providers without offering any training, the opening of accounts without the agreement of the notional holder, and suspicious large-scale recruitment drives;
- insufficient monitoring of accounts by the responsible department; and
- inadequate contracting and accountability arrangements with the organisation responsible for setting up ILAs.

The controversy surrounding the misuse of funds led the Blair government to abandon its plans to reinstate some form of ILA.

Table B.2 Eligibility for individual learner accounts, by jurisdiction

Jurisdiction	Programme	Employed	Self-employed	Unemployed	Inactive
United States	Individual Training Accounts				
Flanders	Opleidingscheques				
Germany	Bildungsprämie				
Portugal	Cheque formacão				
Upper Austria	Bildungskonto				
France	Compte Personnel de Formation				
Scotland	Individual Training Accounts				
Geneva	Chèque annuel de formation				
Singapore	SkillsFuture Credit				

Source: OECD (2019b).

References

- Acemoglu, D., & Autor, D. (2011). *Lectures in labour economics*. Retrieved from <https://economics.mit.edu/files/4689>
- Cappelli, P. (2004). Why do employers pay for college? *Journal of Econometrics*, 121(1–2), 213–241.
- Coleman, A., & Zheng, G. (2020). *Job-to-job transfers and the regional job-ladder* (Productivity Commission Working Paper No. 2020/01). Wellington, New Zealand: New Zealand Productivity Commission.
- Crichton, S. (2009). *Does workplace-based industry training improve earnings?* Retrieved from Stats NZ website: https://www.educationcounts.govt.nz/_data/assets/pdf_file/0004/180643/does-workplace-based-industry-training-improve-earnings.pdf
- Crichton, S., & Dixon, S. (2011). *The labour market returns to further education for working adults*. Retrieved from http://www.educationcounts.govt.nz/_data/assets/pdf_file/0013/102550/further-education-working-adults.pdf
- de Boer, M., & Ku, B. (2019). *Cost-effectiveness of MSD employment assistance: Summary report for 2016/2017 financial year*. Retrieved from Ministry of Social Development website: <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/employment-assistance-effectiveness/ea-effectiveness-07022019.pdf>
- Fitzpayne, A., & Pollack, E. (2018a). *Lifelong learning and training accounts: Helping workers adapt and succeed in a changing economy*. Retrieved from The Aspen Institute website: <https://www.aspeninstitute.org/publications/lifelong-learning-and-training-accounts-2018/>
- Fitzpayne, A., & Pollack, E. (2018b). *Worker training tax credit: Promoting employer investments in the workforce*. Retrieved from The Aspen Institute website: <https://www.aspeninstitute.org/publications/worker-training-tax-credit-update-august-2018/>
- Fouarge, D., Schils, T., & de Grip, A. (2013). Why do low-educated workers invest less in further training? *Applied Economics*, 45(18), 2587–2601.
- Frey, C. B. (2019). *The technology trap: Capital, labor, and power in the age of automation*. Princeton, NJ, USA: Princeton University Press.
- Goldsmith, P. (2017). Response to the Productivity Commission report on tertiary education. Retrieved 13 December 2019, from <https://www.beehive.govt.nz/speech/response-productivity-commission-report-tertiary-education>
- Hargreaves, J., & National Centre for Vocational Education Research (Australia). (2006). *Recognition of prior learning: At a glance*. Retrieved from Australian National Centre for Vocational Education Research website: https://www.ncver.edu.au/_data/assets/file/0027/4986/nd2102g.pdf
- Lazear, E. P. (2003). *Firm-specific human capital: A skill-weights approach* (No. 9679). Retrieved from National Bureau of Economic Research website: <https://www.nber.org/papers/w9679.pdf>
- McGirr, M. (2019). *Not just about NEETs: A rapid review of evidence on what works for youth at risk of limited employment*. Retrieved from Ministry of Education website: <https://www.educationcounts.govt.nz/publications/80898/not-just-about-neets>
- MBIE (Ministry of Business, Innovation and Employment). (2019, May 12). Immigration NZ migration data explorer [Government statistics]. Retrieved 5 December 2019, from Migration data explorer website: https://mbienz.shinyapps.io/migration_data_explorer/
- Ministry of Education. (2012). *Industry Training Review: Results of the employer interviews & survey*. Retrieved from Ministry of Education website: <https://www.education.govt.nz/assets/Documents/Ministry/consultations/Review-of-industry-training/ResultsOfEmployerInterviewsSurvey.pdf>
- Ministry of Education. (2017). *Fees-free tertiary education in 2018: Advice on industry training*. Retrieved from Ministry of Education website: <https://education.govt.nz/assets/Documents/Ministry/Information-releases/100-days/1091986-Education-report-Fees-free-tertiary-education-in-2018-advice-on-....pdf>

- Ministry of Education. (2019a). *A unified system for all vocational education: Reform of vocational education*. Retrieved from Ministry of Education website: <https://conversation.education.govt.nz/assets/RoVE/AoC/A-unified-system-for-all-vocational-education.pdf>
- Ministry of Education. (2019b). Participation in tertiary education in New Zealand. Retrieved 12 December 2019, from <https://www.educationcounts.govt.nz/statistics/tertiary-education/participation>
- Ministry of Education. (2019c). *Reform of Vocational Education: Consultation discussion document*. Retrieved from Ministry of Education website: <https://conversation.education.govt.nz/assets/RoVE/Reform-of-Vocational-Education-Consultation-Discussion-Document.pdf>
- Ministry of Education. (2019d). *Summary of change decisions: Reform of Vocational Education*. Retrieved from Ministry of Education website: <https://conversation.education.govt.nz/assets/RoVE/AoC/RoVE-Summary-of-Change-Decisions.pdf>
- Ministry of Education, & MBIE. (2016a). *Skills and education: Survey of Adult Skills (PIAAC)*. Retrieved from Ministry of Education website: https://www.educationcounts.govt.nz/_data/assets/pdf_file/0005/173516/Skills-and-Education-Aug-2018.pdf
- Ministry of Education, & MBIE. (2016b). *Skills at work: Survey of Adult Skills (PIAAC)*. Retrieved from Ministry of Education website: https://www.educationcounts.govt.nz/_data/assets/pdf_file/0007/173572/Skills-at-Work.pdf
- Ministry of Education, & MBIE. (2016c). *Skills in New Zealand and around the world: Survey of adult skills (PIACC)*. Retrieved from Ministry of Education website: https://www.educationcounts.govt.nz/publications/series/survey_of_adult_skills/skills-in-new-zealand-and-around-the-world-survey-of-adult-skills
- Mischewski, B. (2019). *Letter to Hon Chris Hipkins*. Retrieved from <https://lnkd.in/fgJPtfw>
- National Audit Office. (2002). *Individual learning accounts* (No. HC 1235 Session 2001-2002). Retrieved from National Audit Office website: <https://www.nao.org.uk/wp-content/uploads/2002/10/01021235.pdf>
- NZPC (New Zealand Productivity Commission). (2014). *Regulatory institutions and practices* [Final report]. Retrieved from New Zealand Productivity Commission website: <http://productivity.govt.nz/sites/default/files/regulatory-institutions-and-practices-final-report.pdf>
- NZPC. (2015). *More effective social services* [Final report]. Retrieved from New Zealand Productivity Commission website: <http://www.productivity.govt.nz/sites/default/files/social-services-final-report-main.pdf>
- NZPC. (2017). *New models of tertiary education* [Final report]. Retrieved from New Zealand Productivity Commission website: <https://www.productivity.govt.nz/assets/Documents/2d561fce14/Final-report-Tertiary-Education.pdf>
- NZPC. (2019a). *Employment, labour markets and income* [Draft report 2, Technological change and the future of work]. Retrieved from New Zealand Productivity Commission website: <https://www.productivity.govt.nz/assets/Documents/437c9e3982/Draft-report-2-Employment-labour-markets-and-income-v3.pdf>
- NZPC. (2019b). Micro-credentials roundtable. Retrieved from <https://www.productivity.govt.nz/assets/Documents/4c731423ba/Summary-of-micro-credentials-roundtable-18-Sept-2019.pdf>
- NZPC. (2019c). *New Zealand, technology and productivity* [Draft report 1, Technological change and the future of work]. Retrieved from New Zealand Productivity Commission website: https://www.productivity.govt.nz/assets/Documents/740ce1e715/Draft-report-1_NZ-technology-and-productivity-v4.pdf
- NZQA (New Zealand Qualifications Authority). (2017). *Recognition of prior learning: Survey summary*. Retrieved from New Zealand Qualifications Authority website: <https://www.nzqa.govt.nz/assets/About-us/News/RPL-survey-summary/FINAL-RPL-Survey-summary.pdf>
- NZQA. (2018a). Guidelines for applying for approval of a training scheme or a micro-credential. Retrieved 13 September 2019, from <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/guidelines-training-scheme-micro-credential/>
- NZQA. (2018b). *NZQF programme approval and accreditation rules 2018*. Retrieved from <https://www.nzqa.govt.nz/assets/About-us/Our-role/Rules/prog-app-accred-rules-2018.pdf>

- NZQA. (2018c). Recognising micro-credentials in New Zealand. Retrieved 16 December 2019, from <https://www.nzqa.govt.nz/about-us/consultations-and-reviews/recognising-micro-credentials/>
- NZQA. (2019a). Register of NZQA-approved micro-credentials. Retrieved 16 July 2019, from <https://www.nzqa.govt.nz/nzqf/search/microcredentials.do>
- NZQA. (2019b). Understanding New Zealand qualifications. Retrieved 2 July 2019, from <https://www.nzqa.govt.nz/studying-in-new-zealand/understand-nz-quals/>
- OECD (Organisation for Economic Co-operation and Development). (2017a). *Education at a glance 2017*. Retrieved from OECD website: https://www.oecd-ilibrary.org/education/education-at-a-glance-2017_eag-2017-en
- OECD. (2017b). *Financial incentives for steering education and training*. Retrieved from Organisation for Economic Co-operation and Development website: https://www.oecd-ilibrary.org/employment/financial-incentives-for-steering-education-and-training-acquisition_9789264272415-en
- OECD. (2019a). *Getting skills right: Engaging low-skilled adults in learning*. Retrieved from Organisation for Economic Co-operation and Development website: <https://www.oecd.org/employment/emp/engaging-low-skilled-adults-2019.pdf>
- OECD. (2019b). *Getting skills right: Future-ready adult learning systems*. Retrieved from Organisation for Economic Co-operation and Development website: https://www.oecd-ilibrary.org/education/getting-skills-right-future-ready-adult-learning-systems_9789264311756-en
- OECD. (2019c). *OECD employment outlook 2019: The future of work*. Retrieved from Organisation for Economic Co-operation and Development website: https://www.oecd-ilibrary.org/employment/oecd-employment-outlook-2019_9ee00155-en
- Office for Official Publications of the European Communities. (2009). *Using tax incentives to promote education and training*. Retrieved from https://www.cedefop.europa.eu/files/5180_en.pdf
- Office of the Minister of Education. (2019). *Reform of vocational education: Key decisions*. Retrieved from <https://conversation-space.s3-ap-southeast-2.amazonaws.com/R+27+CP1+short.pdf>
- Ryerse, M. (2017). Competency-based micro-credentials are transforming professional learning. Retrieved 16 July 2019, from Education Week website: http://blogs.edweek.org/edweek/on_innovation/2017/11/competency-based_micro-credentials_are_transforming_professional_learning.html?cmp=SOC-SHR-FB
- Stanfield, C., Sloan, J., Cox, A., & Stone, I. (2009). *Review of employer collective measures: Final report*. Retrieved from UK Commission for Employment and Skills website: <https://dera.ioe.ac.uk//9795/>
- Stillman, S., & Maré, D. (2009). *The labour market adjustment of immigrants in New Zealand* [Motu Working Paper 09-10]. Retrieved from Motu Economic and Public Policy Research website: http://motu-www.motu.org.nz/wpapers/09_10.pdf
- Stone, I. (2010). *Encouraging small firms to invest in training: Learning from overseas*. Retrieved from UK Commission for Employment and Skills website: <https://core.ac.uk/download/pdf/4151307.pdf>
- Stone, I. (2012). *Upgrading workforce skills in small businesses: Reviewing international policy and evidence*. Retrieved from OECD / Danish Business Authority website: http://www.oecd.org/cfe/leed/Skills%20Workshop%20Background%20report_Stone.pdf
- TEC (Tertiary Education Commission). (2019). *Micro-credentials: Funding approval guidelines*. Retrieved from Tertiary Education Commission website: <https://www.tec.govt.nz/assets/Forms-templates-and-guides/Micro-credentials-funding-approval-request-guidelines.pdf>
- Tumen, S., Dixon, S., & Crichton, S. (2018). *The impact of tertiary study on the labour market outcomes of low-qualified school leavers: An update* [New Zealand Treasury working paper 18/03]. Retrieved from The Treasury website: <https://treasury.govt.nz/sites/default/files/2018-08/twp18-03.pdf>
- Volunteering New Zealand. (2019). *Submission on reform of vocational education*. Retrieved from <https://www.volunteeringnz.org.nz/wp-content/uploads/Reform-of-Vocational-Education-Sector-VNZ-submission-v1-1.pdf>

