



Sector State of Play: Education

Discussion Document

Foreword

Our wellbeing depends on our infrastructure

Our way of life depends on infrastructure. Whether it's moving freight to keep the supermarket shelves stocked, warming our homes, driving to work or calling our friends, there are few parts of our lives that don't rely on the services provided by infrastructure.

Infrastructure decisions have intergenerational impacts, so it is essential that we take a strategic view of the planning, development and operation of infrastructure in Aotearoa. New Zealand Infrastructure Commission was formed to give infrastructure this strategic voice, and the significance of this task is reflected in our Māori name, Te Waihanga, which means *cornerstone*.

Our first task is to develop a 30-year strategy for infrastructure - this paper is a part of this work. It takes a closer look at the current state of play in New Zealand's education sector. By understanding where we are now we can set a course for where we want to go and the steps we'll need to take to get there over the next 30 years.

New Zealand faces a range of challenges and opportunities over the next 30 years which will have significant implications for infrastructure. Our changing climate, rapidly growing cities, aging population and evolving global technologies will change what we need from infrastructure in order to maximise the wellbeing of New Zealanders. Each of us has our own experiences of infrastructure, so we look forward to receiving your feedback to ensure this State of Play report accurately reflects the current state.



Ross Copland

Table of Contents

1. Executive Summary	8
1.1. Introduction	8
1.2. About the System	8
1.3. Current State, Issues, and Challenges	10
1.3.1. Variability in Physical Stock	10
1.3.2. Governance Issues	10
1.3.3. Lack of System Wide Approach to Infrastructure Investment in Tertiary Sector	11
1.3.4. Decentralised Provision of ECE	11
1.3.5. Recent State Schooling and Tertiary Reform	11
1.4. Looking to the Future	12
1.4.1. Technological Change	12
1.4.2. Shifting Demographics	13
1.4.3. Internationalisation of the Tertiary Sector	13
1.4.4. Flexibility of Physical Assets and Sustainability	14
1.5. Key Themes and Policy Implications	14
2. Context	16
2.1. Who We Are and What We Do	16
2.2. About Our Sector State of Plays	16
2.3. Our Next Steps	17
2.4. Have Your Say	18
3. About the Education System	19
3.1. The Education Pathway	19
3.1.1. Primary and Secondary Schools	19
3.1.2. Tertiary Education	19
3.2. Key Agencies	21
3.3. Physical Assets	23
3.3.1. Asset Ownership Structure	23
3.3.2. Information and Communication Technology (ICT) Systems in Education	25
3.3.3. The Living Standards Framework, Education and Wellbeing	25
3.3.4. Natural Capital	27
3.3.5. Social Capital	27

3.3.6.	Human Capital	27
3.3.7.	Financial Capital	28
3.3.8.	Net Capital Basis	28
3.4.	Services29	
3.4.1.	Early Childhood Education.....	29
3.4.2.	Primary and Secondary Education.....	29
3.4.3.	Tertiary Education	29
3.5.	Dependencies on Other Infrastructure Systems.....	30
3.6.	Wellbeing	30
3.6.1.	Early Childhood Education and Wellbeing	30
3.6.2.	Primary and Secondary Education and Wellbeing	30
3.6.3.	Tertiary Education and Wellbeing.....	31
3.6.4.	Māori Wellbeing	31
4.	What Shapes the Sector Today?.....	33
4.1.	Ownership and Governance	33
4.1.1.	Early Childhood Education.....	33
4.1.2.	Primary and Secondary	33
4.1.3.	Tertiary	34
4.2.	Regulatory Environment	35
4.3.	Funding	36
4.3.1.	ECE.....	36
4.3.2.	Primary and Secondary Education.....	37
4.3.3.	Tertiary Education	38
4.3.4.	Budget 2020	39
4.4.	Current Issues.....	40
4.4.1.	Inequitable Educational Outcomes	40
4.4.2.	Funding Inequities.....	41
4.4.3.	Variability in Physical Stock	42
4.4.4.	Governance Issues.....	45
4.4.5.	Inertia in Tertiary Educational Institutions.....	45
4.4.6.	Response to Technological Change.....	46
4.4.7.	Qualified Secondary School Teacher Shortages	47
4.4.8.	Private Provision of ECE	49

5. How the Sector is Performing Today	50
5.1. Early Childhood Education Performance Measures	50
5.2. Primary and Secondary Performance Measures	51
5.2.1. Access	51
5.2.2. Quality	51
5.2.3. Participation	51
5.2.4. School Property Portfolio Management	52
5.3. Tertiary Performance Measures	52
5.4. Comparison with International Peers	53
5.4.1. Students' Achievement	54
6. How the Sector is Responding to What Might Come Next	56
6.1. Economic and Technological Transformation	56
6.2. Shifting Demographics	58
6.3. Internationalisation of the Tertiary Sector	59
6.3.1. International Education Sector	59
6.3.2. International Market for Education	60
6.4. Sustainability and Flexibility of Physical Assets	61
6.4.1. Sustainability	61
6.4.2. Flexibility	62
7. Conclusions	64
Appendix A. Glossary	65
Appendix B. Overview of the New Zealand School System	66
Appendix C. New Zealand Cognitive Skills and Educational Attainment Over Time	67
Appendix D. OECD Comparisons – Educational Attainment and Cognitive Skills	68
Appendix E. LSF Wellbeing Domains and Indicators	69
Appendix F. Key changes in the Education and Training Act 2020	71
Appendix G. OECD comparisons on expenditure, educational attainment and progression and completion	72
Appendix H. Process, Assumptions and Limitations	74
H. 1. Our Process	74
H. 2. Limitations	74
Appendix I. Bibliography	75

Table of Figures

Figure 1: Relationship Between Education Infrastructure, Service Delivery, Outcomes, and Wider Wellbeing.....	10
Figure 2: Te Waihanga's Definition of Infrastructure	17
Figure 5: ECE Services Breakdown	29
Figure 6: Governance Overview for State and State-Integrated Primary and Secondary Institutions	34
Figure 7: Governance Overview for Publicly Funded Tertiary Institutions.....	35
Figure 8: Key Legislation within the Education Sector in New Zealand.....	35
Figure 9: Total School/Kura Revenue and their Sources (Billions of NZ Dollars), 2018-2019.....	38
Figure 10: Total School/Kura Expenditure (Billions of NZ Dollars), 2018-2019	38
Figure 11: Age distribution of School Buildings in New Zealand (Gross Square Meters by 5-year period)	43
Figure 12: Factors Contributing to Shortage in Qualified Teachers.....	48
Figure 13: Primary and Secondary School Attendance between 2015 and 2020.....	51
Figure 14: 2019 Performance Against TEC Indicators.....	52
Figure 15: Participation in Further Education by Ethnicity.....	53
Figure 16: Mean Mathematics and Science Achievement of Year 5 and 9 Students (2018/19)	55
Figure 18: Demand and Supply for Education and Training	58
Figure 19: Accessibility for all Learners.....	62
Figure 20: Overview of the School System for Young People of Compulsory School/Kura Attendance Age	66
Figure 21: Assessment of Cognitive Skills at Age 15 using Programme for International Student Assessment (PISA) Scores	67
Figure 22: Upper Secondary (NCEA Level 2 equivalent) and Tertiary (Bachelor's Degree) Attainment for Adults Aged 25 – 64 years.....	67
Figure 23: Cognitive Skills at Age 15	68
Figure 24: Educational Attainment of the Adult Population (Upper Secondary).....	68
Figure 25: Investment in Education as a Percentage of GDP (2017).....	72
Figure 26: Educational Attainment of 25-34-year-olds (2019)	72
Figure 27: Proportion of Children Enrolled in Formal ECE Settings	73
Figure 28: Children to ECE Teaching Staff Ratio (2018)	73

Table of Tables

Table 1: Key Themes and Policy Implications	14
Table 2: Key Agencies	21
Table 3: Participation in Early Learning 2019/20.....	50
Table 4: National Education Growth Plans (excluding Auckland)	59
Table 5: Auckland Education Growth Plans	59

1. Executive Summary

1.1. Introduction

The New Zealand Infrastructure Commission, Te Waihanga, is responsible for developing a 30-year strategy for infrastructure. With your input, we will build our understanding of future trends and likely challenges and make recommendations on how infrastructure can support New Zealand's future wellbeing.

This chapter provides a summary of New Zealand's current Education Sector (the Sector) and the infrastructure that supports it. Education infrastructure refers to the physical assets owned and maintained by the Sector. However, Education infrastructure is dependent on other infrastructure sectors (such as Telecommunications and Health) to function effectively, provide high quality services and achieve the best outcomes. This State of Play report therefore takes a system wide perspective with non-education related infrastructure and service delivery discussed in order to highlight the inter-dependencies within the system and the need for a system wide perspective on infrastructure management and investment.

Material from publicly available reports has been collated, and supplemented with findings from interviews with sector leaders, to present a summary of how well placed the Sector is to meet New Zealand's longer-term opportunities and challenges.

1.2. About the System

Education infrastructure is social infrastructure, designed to improve a person's quality of life through the provision of education, research and training services. For the purpose of this report the Sector includes Early Childhood Education (ECE), primary, secondary and tertiary education, and industry trade training and apprenticeships. Education services therefore span multiple levels, with delivery requiring a complex network of people and organisations.

Overall responsibility for the Sector sits with the Minister of Education, with support provided by the Ministry of Education (MoE).¹ MoE manages and funds the state school property portfolio, and is responsible for ensuring facilities are maintained to an appropriate standard and capital investment is appropriately allocated.²

The Education Review Office (ERO) evaluates and reports on the state of New Zealand's ECE, primary, and secondary education – specifically, the quality of education and the care of students.³ In their evaluation role, ERO recognises the contribution of infrastructure to education outcomes.

The Government's relationship with tertiary institutions is led by the Tertiary Education Commission (TEC). In addition to liaising between Government and universities, wānanga, Private Training Establishments (PTEs), and Te Pūkenga, TEC allocates funding, monitors performance and provides tertiary level education and employment information, services, and advice.⁴ Te Pūkenga was established in April 2020⁵ to consolidate Institutes of Technology and Polytechnics, and is in the process of

¹ Ministry of Education, "The role of the Ministry of Education."

² Ministry of Education, "Property and school transport."

³ OECD, *OECD Reviews of Evaluation and Assessment in Education: New Zealand*, 112.

⁴ New Zealand Productivity Commission, *New models of tertiary education*, 127.

⁵ Tertiary Education Commission, "Our role."

integrating existing Transitional Industry Training Organisations. The Reform of Vocational Education, of which the establishment of Te Pūkenga is just one initiative, encompasses the most significant set of changes for the tertiary sector in more than 25 years and will have implications for infrastructure in the Sector.

Ownership of the Education Sector is characterised by a mix of public and private structures. Whereas ECE is largely a privatised market, primary, secondary and tertiary infrastructure and services (with the exception of private, primary and secondary schools and PTEs in the tertiary sector) are largely Government owned and managed.

The physical infrastructure underpinning the Sector includes the buildings, classroom, laboratories, gymnasiums, theatres, libraries, equipment, playgrounds including courts and sports fields that constitute the learning environment in which ECE centres, schools, and tertiary providers operate and deliver services. Most ECE, primary, and secondary education occurs onsite and within school facilities. At the tertiary level, learning predominantly takes place on campus, but is trending towards increasingly flexible delivery, including a mix of on-site and online learning.⁶ As such, the importance of ICT (e.g. digital learning platforms and technologies) is only increasing. The heavy reliance on remote learning technologies following COVID-19 served to highlight how important it is to have effective ICT systems in place⁷ and to invest in digital literacy among teachers and learners.

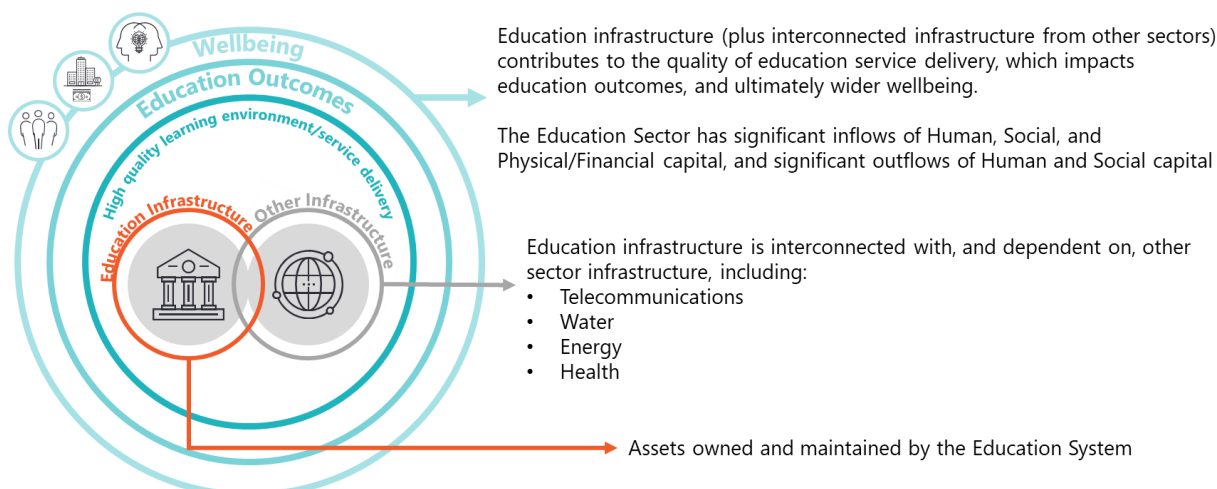
Understanding the link between infrastructure, service delivery and educational outcomes is important as more advanced educational achievement is associated with higher levels of physical, mental and emotional well-being including the ability for individuals and whanau to participate fully in their communities. The capital inputs and physical assets across the Sector contribute to the quality of education services, with a flow-on impact on the overall wellbeing of New Zealanders. The physical environment – such as adequate heating, ventilation, enough outdoor space, and green space – creates a learning and teaching environment conducive to positive educational outcomes. The quality of education infrastructure is also likely to, in part, have an impact on the attraction and retention of teaching staff with high quality infrastructure attracting high quality staff.

The Sector's service delivery is not just impacted by physical assets such as buildings and technology. The Education Sector is dependent on other sectors – including water, energy, transport, and telecommunications – if it is to contribute to an educated population, skilled workforce and thriving communities. This State of Play report therefore recognises the context of a system with wider system issues, which are discussed to provide context to infrastructure's role in the quality of service delivery and educational outcomes.

⁶ EY, Can the universities of today lead learning for tomorrow?,9.

⁷ OECD, *School education during COVID-19 - Were teachers and students ready?* 3.

Figure 1: Relationship Between Education Infrastructure, Service Delivery, Outcomes, and Wider Wellbeing



1.3. Current State, Issues, and Challenges

1.3.1. Variability in Physical Stock

Educational outcomes are impacted by the current state of physical assets in the Sector. The physical stock is ageing (the schooling estate has an average age of 42 years) and is characterised by variable quality across primary and secondary levels⁸ as a result of deferred maintenance and capital investment. For schools, this can be attributed (in part) to the delegation of maintenance and capital project oversight to community elected school Boards of Trustees with essential capabilities required to manage infrastructure often lacking.⁹ Maintenance funding has also been insufficiently responsive to the different needs across the school portfolio and a contributor to variable quality of assets.¹⁰

The fluctuations in the quality and condition of school infrastructure affects learner outcomes as some learners lack access to quality learning environments that are fit for their learning needs. The reset of Tomorrow's Schools reform in late 2019 sought to address this, with MoE taking on greater property-related responsibilities to free up Board time while ensuring schools retain the ability to provide input into how their physical spaces are designed.¹¹

1.3.2. Governance Issues

The devolved governance model which has historically characterised the education sector has meant that there hasn't been a national, system wide approach to planning and investment in infrastructure. Fragmented, long-term decision making with respect to infrastructure investment and curriculum development has been prevalent across the state school network.

In addition to variable quality, the school physical stock is characterised by inconsistent utilisation across the network.¹² This is due to demographic drivers changing the demand for services across geographic areas (with increasing demand in urban areas and rural areas experiencing roll decline).

⁸ Controller and Auditor-General, "The school property portfolio."

⁹ Ministry of Education, *The School Property Strategy 2030*, 32.

¹⁰ Ministry of Education, *Te Rautaki Rawa Kura, The School Property Strategy 2030*

¹¹ Ministry of Education, *Supporting all schools to succeed*, 20.

¹² Office of the Minister of Education, "Cabinet paper release: Towards a Comprehensive Reform of School Property."

The Education Infrastructure Service (EIS) was established in early 2014 to take a national system wide approach to infrastructure investment by working with Boards of Trustees to identify priority infrastructure at each school to promote access to safe and healthy learning environments.¹³

1.3.3. Lack of System Wide Approach to Infrastructure Investment in Tertiary Sector

Similar to state schools, tertiary providers are autonomous and investment choices have often been made at the discretion of the individual institution and their Board. Some institutions have invested heavily in facilities whereas others have chosen to defer investment and/or lease facilities and face the fluctuations of the commercial rental market.¹⁴ A lack of systems perspective and collaboration amongst tertiary providers due to individual profit incentives (which drives competition between institutions) and devolved governance means that limited consideration is given to alternative tertiary providers in business cases which ultimately results in ineffective use of collective assets and investments.¹⁵ The Review of Vocational Education intends to take a system wide perspective on the infrastructure needs of the vocational education system and is a step towards rectifying the currently fragmented approach to infrastructure investment.

While the university sector has a strong focus on ensuring that capital investment by individual institutions is strategically aligned with Government priorities, recommendations have been made for more cross-sector collaboration to ensure effective use of collective assets amongst universities.

1.3.4. Decentralised Provision of ECE

Similar to the tertiary, primary and secondary schooling system, ECE has been characterised by devolved decision-making around infrastructure investment and supply of services. This has resulted in over and undersupply of services in some areas.¹⁶ The 2019-29 Early Learning Action Plan shows that the Ministry of Education is taking a more active role in efficiently managing the physical provision of the ECE network to ensure an adequate and equitable supply of ECE services across the country.¹⁷

1.3.5. Recent State Schooling and Tertiary Reform

Recent reforms – such as the Education Work Programme, Tomorrow's Schools Reform and the Review of Vocational Education – aim to address many of the above issues. The 2030 School Property Strategy seeks to achieve an improved property portfolio for primary and secondary schools, while Tomorrow's Schools Reform is centralising key infrastructure decisions to ensure a strategic and system wide approach to investment.^{18, 19} There has also been significant investment to improve capital assets across different levels of the system, following the recognition of the physical environment as a key enabler of positive education outcomes through its impact on the quality of education and engagement of the learner.^{20, 21}

¹³ Ministry of Education, "5 Year Agreement (5YA) funding."

¹⁴ New Zealand Productivity Commission, *New models of tertiary education*, 187.

¹⁵ Controller and Auditor-General, *Investing in tertiary education assets*.

¹⁶ Office of the Minister of Education, "Cabinet Paper: The Early learning action plan 2019-29"

¹⁷ Kōrero Mātauranga, "Early learning action plan 2019-2029."

¹⁸ Ministry of Education, *The School Property Strategy 2030*.

¹⁹ Ministry of Education, *Supporting all schools to succeed*.

²⁰ Hipkins, "School infrastructure upgrades ramping up."

²¹ Office of the Minister of Education, "Cabinet Paper release: Towards a Comprehensive Reform of School Property."

1.4. Looking to the Future

Numerous forces are set to shape the future of the Sector including technological disruption, shifting demographics and emerging models of education delivery that traverse traditional geographic boundaries. Infrastructure plays a crucial role in enabling New Zealand to respond to these drivers and trends.

1.4.1. Technological Change

Technological disruption is undeniably shaping the future of work. As such, the nature of employment and what it takes to be work-ready is evolving.²² This will have consequences for the entire education system as individuals will require more flexible education that is customised to their learning needs and allows for continuous upskilling throughout their working lives as employer skill-needs change.²³ The Sector will need to adapt with new models of delivery²⁴ and new curriculum content if they are to meet the needs of the learner, employer and communities. Digital technologies will underpin these new models of delivery allowing for new forms of teaching, learning through digital mediums, and the augmentation of in-class content and experiences.²⁵

There are multiple advantages associated with the digitisation of learning including: the ability to scale education delivery which allows for a more efficient delivery model (especially when digital platforms and learning resources are shared across multiple providers); the potential for learners in remote geographic areas without a local tertiary provider to access learning; the ability of part-time learners to balance training with other commitments such as work and childcare; and enhanced resilience to campus or border closures resulting from impacts such as COVID-19.

Digitisation of service delivery (especially in the tertiary sector) also provides an opportunity to enhance educational outcomes across population groups (including for Māori, Pasifika and students from lower socio-economic backgrounds where significant disparities in attainment and educational outcomes exist).^{26, 27, 28, 29} Digital technologies, for example, allow for a bespoke, customised learner experience, which has the potential to contribute positively to inequitable outcomes as it can be harnessed to ensure that no learner is left behind. Education can be tailored to the individual learner including, for example, those at the bottom end of the achievement bell-curve, the top end of the bell curve and different ethnic groups. Data analytics can be harnessed to provide early intervention and support to those that need it the most.

While digitisation has the potential to improve learner access and the quality of education, the deployment of digital capabilities is dependent on the flexibility of physical assets, the capability and incentive of institutions to exploit these emerging opportunities and the ability of learners to access evolving technology (including hardware and connectivity requirements).

²² EY, Can the universities of today lead learning for tomorrow?

²³ New Zealand Productivity Commission, *Training New Zealand's workforce*.

²⁴ New Zealand Productivity Commission, *New models of tertiary education*.

²⁵ EY, Can the universities of today lead learning for tomorrow?

²⁶ Ministry of Education, *Annual Report 2020*.

²⁷ Tertiary Education Commission, "View educational performance using interactive charts."

²⁸ Meehan, Pacheco and Pushon, Explaining ethnic disparities in bachelor's qualifications: participation, retention and completion in NZ.

²⁹ OECD, The impact of COVID-19 on education: Insights from education at a glance 2020.

1.4.2. Shifting Demographics

In addition to technological change, the Sector's infrastructure will need to adapt to changing demographics (especially with respect to ethnicity, population size, age and place of residence). The Asian community is experiencing rapid growth and is predicted to exceed the Māori population by 2023. By 2038, 22% of our population will be Asian.³⁰ Māori and Pacific peoples are also a growing portion of the workforce in New Zealand.^{31, 32} These factors highlight the need for infrastructure in the education sector to support service delivery that meets the needs of different population groups and provides equality of access. Increasing urbanisation and population growth are also likely to trigger supply shortages in high growth areas, and surpluses in relatively lower-growth areas, which further highlights the need for effective long-term planning, prioritisation and flexibility of capital investment. To help address this, MoE has developed a \$1.2 billion investment plan – the National Education Growth Plan – to ensure physical assets for primary and secondary schooling meet future demand.^{33, 34} Flexible infrastructure solutions such as modular buildings may become an increasingly important way to accommodate demographic shifts in demand to avoid locking in long-term capital investments.

The digitisation of education and shift to online learning – accelerated by COVID-19 – allows learners to increasingly study anywhere in the world. Education, especially at the tertiary level, is increasingly becoming an international market as international providers disrupt the education market with new, innovative models of delivery and learning offerings. The future of work, along with an increasing array of international learning options, suggests that learners will be less inclined to undertake lengthy degrees and traditional qualifications when they can obtain 'nano-degrees' and micro-credentials from high profile providers that are delivered flexibly and tailored to an individual's education requirements.³⁵ This presents an opportunity for the tertiary sector in particular to reconsider its offerings³⁶ and position itself so that it responds to the future of work and provides an internationally competitive learning experience. Underpinning this will be flexible, fit for purpose infrastructure (including buildings that can be repurposed to accommodate new digital technologies),³⁷ access to high-quality telecommunications and digital literacy of teachers and learners. Strategic, long-term infrastructure planning as well as agile institutions and capital will also be critical.

1.4.3. Internationalisation of the Tertiary Sector

While international education has been a significant contributor to the New Zealand economy (contributing \$5.0 billion to the New Zealand economy in 2019),³⁸ the sector has been significantly impacted by COVID-19 given closures of campuses in response to lockdown measures and border restrictions. As the market for education becomes increasingly international, New Zealand will need to look at how it can provide an offering to international students that is tailored to their needs. ICT and the digitisation of learning has the potential to be harnessed so that the international learner receives a customised learning experience. This is likely to be key if New Zealand is to remain competitive in a global market for education.

³⁰ The Treasury, Human Capital and the Living Standards Framework, 9.

³¹ Ibid.

³² Hillmarè Schulze, *The future Māori workforce – Part three*.

³³ Ministry of Education, National Education Growth Plan Auckland and Te Tai Tokerau.

³⁴ Ministry of Education, "National Education Growth Plan."

³⁵ EY, *Can the universities of today lead learning for tomorrow?*

³⁶ Office of the Minister of Education, *Cabinet Paper release: A strategic recovery plan for the international education sector*.

³⁷ EY, *Can the universities of today lead learning for tomorrow?*

³⁸ Ministry of Education, *Annual Report 2020*.

1.4.4. Flexibility of Physical Assets and Sustainability

Physical infrastructure that adheres to sustainability principles will become increasingly important as New Zealand transitions to a carbon neutral, climate resilient world. Physical assets that are sustainable and energy efficient are not just good for the environment but also contribute positively to students' achievement and retention rates of teachers.³⁹

It is also important that physical assets in the education sector are managed in a way that allows them to be repurposed or remodelled as teaching strategies and learner needs change. Flexible learning spaces in classrooms are becoming more common as the physical environment in schools grows to embrace innovation, inclusivity and new ways of learning.⁴⁰

As well as infrastructure that meets the needs of the international learner, it will be crucial that New Zealand utilises its infrastructure in a way that is inclusive and meets the needs of learners with learning support needs (such as those with physical/sensory/cognitive disabilities). Through the school property reform, the design and functionality of properties will need to be maintained in a way that minimises any potential accessibility issues for learners with higher needs,⁴¹ and complemented with accessible teaching methods and classroom practices.

1.5. Key Themes and Policy Implications

Table 1: Key Themes and Policy Implications

Key Theme	Policy Implications
1. Variable quality of state school infrastructure due to age and deferred maintenance	The 2030 School Property Strategy looks to ensure all schools will have quality learning environments by 2030. The Government's New Zealand Upgrade Programme (NZUP) also includes investment through the School Investment Package (SIP) to support schools to upgrade their physical infrastructure.
2. Historically devolved governance and planning in primary and secondary schools and the tertiary sector	Tomorrow's Schools reform looks to vest responsibility for key infrastructure planning and management to MoE so school Boards can focus on curriculum development and education delivery. The Review of Vocational Education and the establishment of Te Pūkenga will take a national level view of infrastructure needs (including physical buildings and ICT systems) in the vocational education sector. Whilst no reform is currently planned for the university sector, recommendations have been made for more cross-sector collaboration to ensure effective use of collective assets amongst universities.
3. Economic & technological transformation	ICT systems need to support the transition to blended and online learning platforms. Increasing digitisation of curriculum may mean there is less demand for physical spaces for learning, and/or physical spaces may need to be repurposed so that they can accommodate new technologies. Within the tertiary sector, some institutions have divested physical assets and are reinvesting in online platforms to support virtual delivery or new teaching programmes. Digital strategies (including ICT systems) can also be harnessed so that they offer tailored and bespoke

³⁹ New Zealand Green Building Council, *Green Star Schools Handbook*, 3-4.

⁴⁰ Ministry of Education, *Designing schools in New Zealand*.

⁴¹ Office of the Minister of Education, "Cabinet Paper release: Towards a Comprehensive Reform of School Property."

Key Theme	Policy Implications
	learning experiences for Māori and other population groups, which can contribute to enhanced educational outcomes. Economic and technological transformation is set to change what and how we learn (and a policy and regulatory setting that enables these changes to the curriculum and education products is essential). The Review of Vocational Education and the establishment of Te Pūkenga has been initiated to respond to these trends in the vocational education sector.
4. A decentralised ECE sector has resulted in uneven access across regions and populations	The Education and Training Act 2020 looks to address the limitations of a decentralised ECE sector by regulating the supply of ECE services and incentivising the opening of new centres in areas typically under-served. Further, recent Budget announcements have provided funding to increase teachers' salaries to incentivise high quality teachers to remain in the sector.
5. Shifting demographics (including population change)	Increasing diversity of our population requires education to be culturally appropriate. As ICT systems have the potential to support the delivery of culturally sensitive education, a nationally coherent digital strategy will be important. Future planning and flexible building solutions are essential, so education infrastructure is able to respond to geographic shifts/urbanisation of demand – the enactment of National Education Growth Plan should support this.
6. Internationalisation of the tertiary sector	With the digitisation of education, tertiary education is increasingly becoming an international market. A policy and regulatory setting that enables the digitisation of education, re-bundling of traditional degree programmes and other new models of delivery (such as micro-credentials, nano-degrees, online delivery and inter-disciplinary learning) will be important.
7. Sustainability of design	The MoE incorporates environmentally sustainable principles into the design and construction of state school infrastructure and provides support for schools to be environmentally sustainable in the operation of schools with the intention of reducing energy consumption and minimising waste.
8. Flexibility of physical assets	Designing/repurposing of learning spaces so that they are flexible and accessible to create a supportive and collaborative learning environment for all learners is an investment in supporting pedagogy.

2. Context

2.1. Who We Are and What We Do

The New Zealand Infrastructure Commission, Te Waihangā is working to improve New Zealanders' lives through better infrastructure. It aims to lift the level at which infrastructure is planned and delivered, taking a strategic approach so that we maximise the social return on our investments and stand well prepared in the face of an uncertain future.

Our Māori name, Te Waihangā, means a cornerstone, or to make, create, develop, build, construct, generate. Te Waihangā therefore reflects the significance of long-term planning in shaping New Zealand's future.

A major part of this work is the development of a 30-year strategy for infrastructure. The strategy will look ahead to 2050, and consider how infrastructure might support environmental, social, cultural and economic wellbeing for all New Zealanders. This will be delivered to the government in September 2021 and will set out how we can make sure our investment in infrastructure delivers what we need, where we need it and at the right time.

2.2. About Our Sector State of Plays

We understand that our infrastructure works together - it is a system of systems. Our roads carry pipes and powerlines, and they connect to homes, workplaces, and schools. For this reason, our strategy will focus on cross-cutting themes rather than infrastructure sectors in isolation. However, we believe that it's important we understand the infrastructure we have today, why we have what we have, and how it's already contributing to New Zealanders' wellbeing.

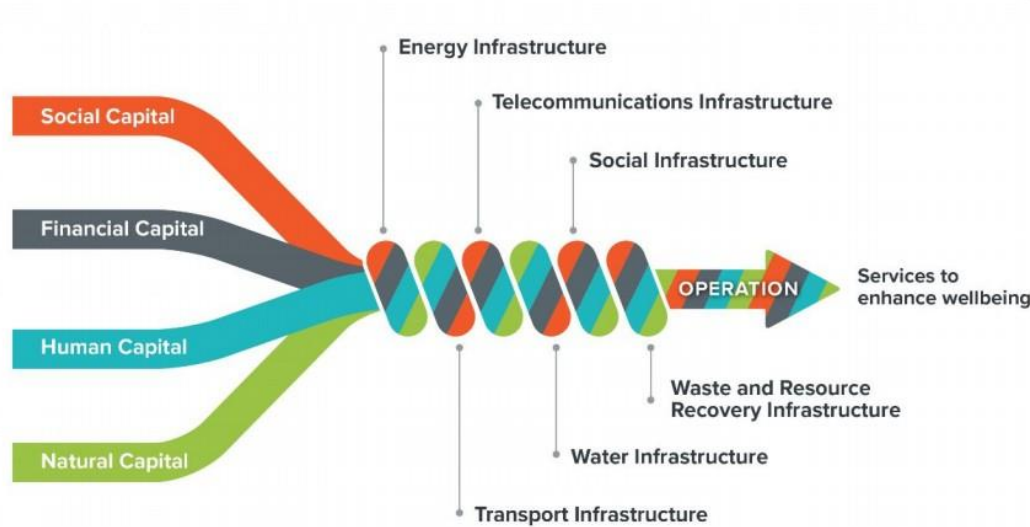
The sector State of Plays are structured around the components of Te Waihangā's working definition of infrastructure, set out in our discussion document, "Infrastructure Under One Roof".⁴² Our definition places wellbeing outcomes at the core, while recognising commonalities, including the use of capital such as financial and environmental resources; the interconnectedness of physical structures; and the delivery of shared services, as well as the wellbeing benefits we get from those shared services. In short, Te Waihangā defines infrastructure as follows:

"A system of inter-connected physical structures that employ capital to provide shared services to enhance wellbeing."

Figure 2 illustrates the components of our working definition, showing how they are related to one another in delivering wellbeing services.

⁴² NZ Infrastructure Commission, *Infrastructure under One Roof: Standardising How We Think about the Shared Services around Us* NZ Infrastructure Commission, December 2020.

Figure 2: Te Waihanga's Definition of Infrastructure



By defining infrastructure in this way, we have then been able to develop a common framework to think about the integrated management of infrastructure. This considers the relationship between the enabling environment for our infrastructure, the sustainable use of the capitals employed in its development, the investment management process and the wellbeing benefits created by infrastructure services.

Our sector State of Plays are the result of desktop research, augmented by insights from our survey of infrastructure asset owners, and engagement with sector experts. These reports will be updated over time. We want to improve the picture as our understanding grows and different elements come in to focus.

2.3. Our Next Steps

As well as continuing to build on our picture of the State of Play, next steps include building our understanding of future trends and likely challenges, including climate change, incorporation of Mātauranga Māori, demographic change, and the role of technology. We will look at what our way of life might be 30 years from now. Based on all of this, we will begin to make recommendations as to how infrastructure might support New Zealand's future wellbeing.

We'll share our thinking on what will be included in the strategy, focusing on the cross-cutting themes that affect all sectors, the opportunities and challenges we can expect in the future, as well as our initial recommendations and options for consideration.

This will then be followed by a draft strategy that firms up our thinking on recommendations and provides greater detail as well as the evidence base behind them. From there, we'll develop the document that goes to Ministers.

2.4. Have Your Say

We'll share our work as we go and are keen to hear what you think, starting now. Tell us what you think about our State of Play reports – have we got it right or are there issues, information or problems that we've missed?

You'll also have the opportunity to comment on the draft strategy. We'll be continually refining and assessing our work based on the feedback we get from you and others.

3. About the Education System

For the purpose of this report, we define the Education sector as ECE, primary, secondary and tertiary education and industry trade training and apprenticeships.

3.1. The Education Pathway

The New Zealand education system consists of multiple levels. ECE services are typically available for children from ages zero to six years, and consist of multiple, optional offerings. Primary and secondary schooling is generally from ages five to thirteen, and thirteen to nineteen respectively, being compulsory from six through to sixteen years of age.⁴³ Appendix B provides an overview of the New Zealand school system.

Within the primary and secondary levels, there are several schooling offerings available, including state, state-integrated, private, Māori or Pasifika-language immersion schooling. Further detail on some of these offerings is provided below.

3.1.1. Primary and Secondary Schools

- **State schools:** Publicly funded and free for New Zealand citizens and residents under 19 years of age.
- **State-integrated schools:** These schools have a 'special-character' (usually religious) and follow the national curriculum. They are government funded but are not usually free for students.
- **Private schools:** These differ from state and state integrated schools as the majority of funding is provided by parent fees and donations. They are not required to follow the national curriculum and generally have a specific educational philosophy as guidance.
- **Māori medium schools:** Managed by Māori communities, these schools provide offerings from full Māori language immersion through to participation in English-medium schools. They incorporate tikanga and mātauranga Māori into a student's educational experience.^{44 45}

Over 99% of those schooled at primary and secondary level attend a facility in-person for the purposes of education, with 0.9% of students schooled in-home. Approximately 85% of students at primary and secondary level attend an education facility wholly funded and owned by the Crown, with 11% attending a state-integrated school and less than 5% attending a private school.^{46 47}

3.1.2. Tertiary Education

In addition to eight universities, New Zealand's tertiary sector also consists of three wānanga, 240 publicly funded Private Training Establishments (PTEs), and Te Pūkenga which was established in April 2020.⁴⁸ Te Pūkenga brought together 16 Institutes of Technology and Polytechnics into one organisation and is in the process of integrating the 12 existing Transitional Industry Training Organisations (TITOs).

⁴³ Ministry of Education, "Education in New Zealand."

⁴⁴ Ibid.

⁴⁵ Immigration New Zealand, "The school system."

⁴⁶ OECD, *OECD Reviews of Evaluation and Assessment in Education: New Zealand*.

⁴⁷ Immigration New Zealand, "The school system."

⁴⁸ Universities New Zealand, "About the university sector."

Te Pūkenga was established as part of the Review of Vocational Education and seeks to bring about a unified, financially sustainable system for all vocational education that is responsive and delivers the skills that learners, employers and communities need to thrive. Furthermore, over 510 other providers exist outside of the Te Pūkenga structure.⁴⁹

Each category caters to different educational needs to reflect the expectations of a modern nation and growing population.^{50, 51}

- Universities offer degrees across a broad spectrum of subjects. Most universities in New Zealand offer predominantly on-campus learning, however some universities (such as Massey University) offer many online and distance learning options and there is a trend towards increasingly flexible delivery of education among universities. The shift to flexible delivery has been accelerated since the first COVID-19 lockdown with the University of Auckland, for example, providing online learning for international students who cannot return to New Zealand. Tertiary level education is increasingly online and accessible from anywhere in the world with companies such as Coursera providing a centralised platform and access to online courses, specialisations and degrees from many high-profile universities. This is disrupting the medium of how tertiary learning is delivered, as evidenced through the growth in the offering of nanodegrees and the rise of Udacity and Singularity University in USA.⁵² The uptake in off-shore online learning is only likely to grow given low barriers, as it is often cheaper than domestic providers (due to scale and lower fixed costs of provision), and is typically on-demand so it is able to be undertaken at a time that is suitable for the learner.
- Te Pūkenga will provide both vocational and professional education courses, micro-credentials, qualifications and degrees utilising a mix of on-campus, on-job and online learning models of delivery. Currently, most Institutes of Technology and Polytechnics (ITPs) in New Zealand predominantly offer on-site learning. However, the Open Polytechnic offers wholly distance learning and there is a trend across Polytechnics to offer blended delivery to meet the needs of the adult learner.⁵³ The importance of digital learning platforms, technologies and capabilities will therefore become increasingly important in the vocational education sector.
- Wānanga offer certificates, diplomas, and degrees taught in an environment that fosters tikanga Māori principles and values. COVID-19 has shifted their mode of teaching to a mixed delivery of on-site and online learning, with wānanga ensuring this new method is conducive towards learning in a Māori environment where face to face contact is highly valued and prioritised, especially for courses like weaving and carving.
- Transitional Industry Training Organisations facilitate training for trainees and apprentices in specific industries. This typically includes a mix of in-work and off-site training (at an Institute of Technology and Polytechnic).
- Private Training Establishments generally offer certificate and diploma level vocational courses both on and off-site.

As at the publication date of this report, tertiary education is currently undergoing significant changes under the Review of Vocational Education. The reform was brought about to bring together the two sides of the vocational system. One side of the system consisted of Industry Training Organisations (ITOs) for apprentices and trainees, and the other side was for students enrolled with Institutes of

⁴⁹ Tertiary Education Commission, *Annual Report 2019*.

⁵⁰ Universities New Zealand, "About the university sector."

⁵¹ Tertiary Education Commission, *Annual Report 2019*.

⁵² EY, *Can the universities of today lead learning for tomorrow?*

⁵³ Ministry of Education, *Reform of Vocational Education - Consultation discussion document*.

Technology and Polytechnics, wānanga, and Private Training Establishments. The two diverging systems didn't always meet student, employer, or regional needs and there was significant duplication of programme offerings and programme development. Further, the funding model combined with the inability of Institutes of Technology and Polytechnics to sufficiently pivot in their programme offering in response to changing enrolment patterns meant that some Institutes of Technology and Polytechnics were not financially viable.

The Education (Vocational Education and Training Reform) Amendment Act came into effect on 1 April 2020. It amends the Education Act 1989 and repeals the Industry Training and Apprenticeships Act 1992 to create a unified and cohesive vocational education and training system. As outlined by TEC, the reform will primarily:

- Create Workforce Development Councils
- Establish Regional Skills Leadership Groups
- Establish Te Taumata Aronui
- Create a New Zealand Institute of Skills & Technology
- Shift the role of supporting workplace learning from Industry Training Organisations to providers
- Establish Centres of Vocational ExcellenceUnify the vocational education funding system⁵⁴

3.2. Key Agencies

Multiple entities in New Zealand contribute towards the delivery of education services throughout the country. Management of the education sector and delivery of education services is provided by six key agencies, as outlined below.

Table 2: Key Agencies

Agency	Description
The Ministry of Education (MoE) 	The Ministry of Education is the Government's lead agency on the New Zealand Education Sector, providing leadership, property portfolio funding and management for state schools ensuring facilities are maintained to an appropriate standard and that capital investment is allocated where needed⁵⁵, and support across the sector.⁵⁶
The Tertiary Education Commission (TEC) 	The TEC is responsible for leading the Government's relationship with tertiary institutions - allocating funding and providing information, services, and advice regarding further education and employment.⁵⁷ Most TEC funding requires providers to submit an investment plan with subsequent performance monitoring ensuring funding is allocated to investments that align with the

⁵⁴ Tertiary Education Commission, "Reform of Vocational Education (RoVE)."

⁵⁵ Ministry of Education, "Property and school transport."

⁵⁶ Ministry of Education, "The role of the Ministry of Education."

⁵⁷ Tertiary Education Commission, "Our role."

Agency	Description
The New Zealand Qualifications Authority (NZQA) 	Government's Tertiary Education Strategy, which sets out TEC's long-term strategic direction for tertiary education.⁵⁸ NZQA ensures credible and robust qualifications in the New Zealand Education Sector.⁵⁹ NZQA does not directly contribute to capital investment.⁶⁰ However, ensuring infrastructure such as digital learning and assessment systems are robust and recognising delivery mode as a contributing factor to qualification quality are important considerations for NZQA.
Teaching Council of Aotearoa New Zealand 	The Teaching Council is the professional body for ECE, primary, and secondary teachers. It registers teachers and maintains professional standards across the system⁶¹ and helps ensure that the education system has a supply of qualified teachers.
The Education Review Office (ERO) 	ERO evaluates and reports on the state of New Zealand's education system at the ECE, primary and secondary level, with respect to the quality of education and the care of students.⁶² In its evaluation role, it recognises the contribution of infrastructure to education outcomes.
Careers New Zealand 	Careers New Zealand provides support pertaining to careers and skills for New Zealanders.⁶³ It provides an overview of the economy's skill needs and educational options for learners.

⁵⁸ Tertiary Education Commission, *Plan Guidance*.

⁵⁹ New Zealand Qualifications Authority, "Our role."

⁶⁰ New Zealand Qualifications Authority, *Briefing to the Incoming Minister*.

⁶¹ Teaching Council of Aotearoa New Zealand, "What we do."

⁶² Education Review Office, "About ERO."

⁶³ Tertiary Education Commission, "About us."

3.3. Physical Assets

3.3.1. Asset Ownership Structure

Asset ownership structures varies across the sector and are categorised by the level, or type, of education and the responsible agency.

3.3.1.1 Early Childhood Education

The 5,000 ECE facilities across New Zealand⁶⁴ are generally privately owned and operated as either a business or not-for-profit organisation (e.g. charities, churches, or other community groups). The private ownership structure evident across the ECE sector is distinctive from other levels in the sector, which consist of a majority of state-owned property and/or institutions.

Most ECE centres are single tenant investments where the tenant manages the property. These centres tend to have long ownership periods. The use of full physical life of the asset is the preference over the premature development of new assets. As such, the quality of ECE property is crucial to the commercial potential and attractiveness of the sector.⁶⁵ The tendency of the ECE sector to rent rather than own property suggests that the ECE sector may be more flexible than other parts of the Education Sector. This gives rise to the risk that ECE sector participants may make investment decisions on the basis of profitability rather than national, strategic priorities.

3.3.1.2 Primary and Secondary Schools

School land, buildings and facilities of state schools are mostly owned or leased by MoE. State-integrated and private schools own or lease their land and buildings independently.^{66 67}

The MoE school property portfolio contains around 2,100 schools, 15,000 buildings, 35,000 teaching spaces, and 9,000 hectares of land, with a replacement value of approximately \$30 billion; the second largest social property portfolio in the country.⁶⁸

Although MoE owns most state school property, management and maintenance of property has historically been delegated to each school's respective Board of Trustees. This is the result of changes implemented following Tomorrow's Schools (one of the output reports from the 1989 education reform) to make schools autonomous bodies. A fundamental premise of the Tomorrow's Schools reform is that MoE relies on each school's Board and staff to manage their schools as autonomous entities.⁶⁹

Each Board generates a 10-year property plan of priorities, which MoE uses to provide support and funding to ensure buildings and facilities are adequate. This excludes self-funded, non-government owned facilities – these remain the school's independent responsibility. State-integrated schools also receive some funding for maintenance of their properties.⁷⁰

The disaggregated governance model within the primary and secondary school sector has had an impact on the coherency of long-term decision-making about system wide infrastructure investment

⁶⁴ Immigration New Zealand, "Preschool care and education."

⁶⁵ Establish, *Child's Play*.

⁶⁶ Ministry of Education, *The School Property Strategy 2030*.

⁶⁷ Ministry of Education, "Enrolments, school property and facilities."

⁶⁸ Ibid.

⁶⁹ Ministry of Education, *The School Property Strategy 2030*.

⁷⁰ Ministry of Education, "Enrolments, school property and facilities."

needs. One shortcoming of this self-governing model is the lack of trustees' relevant expertise and their varying capabilities in managing schooling properties (it is not reasonable to expect that over 2,000 autonomous schools would be able to elect voluntary trustees with appropriate asset management expertise). This has led to fluctuations in the quality and condition of school infrastructure with a resultant impact on learner outcomes and inequality across schools. The absence of definitive information on the roles and responsibilities of the Board regarding the maintenance and management of property was confusing and property management matters often served as a distraction from a school's core purpose of delivering teaching. The reset of Tomorrow's Schools reform in late 2019 centralised key services with MoE taking on more property related responsibilities from Boards to free up Board time, while ensuring schools still have input into how their physical spaces are designed.⁷¹

3.3.1.3 Tertiary Institutions

Tertiary Education Institutes primarily own their property under the Crown Entities Act 2004 but need the consent of the Secretary for Education.

before they sell any land and buildings they own. However, some universities have use of property in Crown title, which are subject to Crown asset transfer and disposal policy (2009) with restrictions on the ability to realise assets and constraints on the ability to keep net sale proceeds.^{72 73}

The value of the assets in the tertiary education sector is significant. In 2015, tertiary institutions in New Zealand cumulatively held \$9.5 billion in capital assets. Of this, \$7.3 billion was owned by universities, \$1.9 billion by the ITPs, and \$0.3 billion held by wānanga.⁷⁴

As universities are autonomous, investment choices can be made at the discretion of the individual institution. As such, there are differences in approaches to investment between institutions, with some being asset-rich and cash-poor, and those that are asset-poor but cash-rich instead choosing to lease certain facilities and face the fluctuations of the commercial rental market.⁷⁵ In a report published in 2017, the Office of the Auditor General assessed tertiary investment decisions and found that there was limited consideration of current provision by alternate tertiary providers in business cases. This results in potentially ineffective use of collective assets and investments, whereby devolved, individualistic investment prioritises attracting potential students, as opposed to exploitation of investment synergies and holistic outcomes. In 2017 the Auditor General recommended TEC work with MoE and other agencies to improve business case guidance and ensure investments address the aforementioned areas⁷⁶ and ensure sector-wide priorities are managed effectively.

⁷¹ Ministry of Education, *Supporting all schools to succeed*.

⁷² Universities New Zealand, "About the university sector."

⁷³ New Zealand Productivity Commission, *New models of tertiary education*.

⁷⁴ Controller and Auditor-General, *Investing in tertiary education assets*.

⁷⁵ New Zealand Productivity Commission, *New models of tertiary education*.

⁷⁶ Controller and Auditor-General, *Investing in tertiary education assets*.

3.3.2. Information and Communication Technology (ICT) Systems in Education

MoE describes ICT as enabling “core business function through provision of hardware and software.”⁷⁷

ICT systems are a crucial enabler of an education system that functions effectively in the 21st century. Achieving reliable ICT solutions across the sector is immensely challenging with strong underlying infrastructure necessary to withstand the network requirements of education systems, multi-media technologies, monitoring systems, collaborative tools, and other cutting-edge applications and innovations.⁷⁸

In 2005, the School Network Upgrade Project (SNUP) was initiated to ensure all State and State-integrated schools had the ICT systems to support the fast, quality internet access needed for learning. Spanning 11 years and totalling \$280 million across 2,400 schools, SNUP was a reflection of the need for, and Government commitment to, quality ICT systems.⁷⁹

COVID-19 further highlighted the importance of quality ICT systems, especially remote technologies. To reduce the impact of school closures on education, online learning and home schooling replaced face-to-face teaching. This created an imperative for schools to adapt and has accelerated an overhaul of education delivery. The availability of ICT systems made this possible, while preparedness and familiarity on the human side was crucial.⁸⁰ However, COVID-19 also highlighted the digital divide that exists for some students and whānau, some of whom experienced limited or no access to digital devices or the internet outside of school hours.⁸¹

3.3.3. The Living Standards Framework, Education and Wellbeing

The Living Standards Framework (LSF) has been developed by the New Zealand Treasury to consider the collective impact of policies on intergenerational wellbeing. As part of the framework, four capitals (Natural, Social, Human, and Physical/Financial) have been defined to organise indicators of intergenerational wellbeing. These capitals are all interlinked and work together to support wellbeing now and into the future.

⁷⁷ Ministry of Education, *Designing schools in New Zealand*.

⁷⁸ Ministry of Education, *Technology in Schools - Information and Communications Technology (ICT) Switching Infrastructure: Policy and Standards for Schools*.

⁷⁹ Kaye, “School Network Upgrade Project completed.”

⁸⁰ OECD, *School education during COVID-19 - Were teachers and students ready?*

⁸¹ Greater Christchurch Schools Network (GCSN), *Closing the Digital Divide during the COVID-19 Lockdown: Student, Whānau and Staff Perspectives* (www.gcsn.school.nz)

Figure 09: Treasury's LSF Four Capitals

Natural Capital

All aspects of the natural environment needed to support life and human activity. It includes land, soil, water, plants, and animals, as well as minerals and energy resources.

Human Capital

This encompasses people's skills, knowledge, and physical and mental health. These are the things that enable people to fully participate in work, study, recreation, and society more broadly.

Social Capital

The norms and values that underpin society, including trust, the rule of law, the Crown-Māori relationship, cultural identity, and the connections between people and communities

Financial/Physical Capital

This includes things like houses, roads, buildings, hospitals, factories, equipment, and vehicles. These are the things that make up the country's physical and financial assets, which have a direct role in supporting incomes and material living conditions.



In addition to the four capitals which inform resource allocation decisions and infrastructure impacts on wellbeing,⁸² the LSF defines 12 Domains of wellbeing – each of which has a number of indicators to assess quality of life and material conditions.⁸³ Refer to Appendix E for further detail on the Wellbeing Domains and indicators.

Of these 12 Domains of wellbeing, the Knowledge and Skills Domain is particularly relevant to the Education sector and consists of the indicators outlined below:

1. Cognitive skills at age 15
2. Educational attainment of the adult population (upper secondary)
3. Educational attainment of the adult population (tertiary)

Appendix C illustrates New Zealand's performance against these indicators. On average, cognitive skills at age 15 have been decreasing in recent years. Educational attainment at both the upper secondary and tertiary level have been increasing, although disparities remain present between ethnic groups. Māori and Pasifika populations experience lower outcomes compared with European and Asian groups.

The OECD also measures cognitive skills at age 15 and educational attainment of the adult population (upper secondary) across its 37 member countries. New Zealand performs well against other OECD countries for the cognitive skills at age 15 comparator but is below the OECD average for the proportion of adults with an upper secondary education. Appendix D illustrates New Zealand's performance against these indicators between 2005 and 2016.

⁸² Burton, "The Treasury Approach to the Living Standards Framework."

⁸³ The Treasury, *Living Standards Framework*.

3.3.4. Natural Capital

Natural capital refers to raw materials consumed in the production of physical assets such as the stock of land that buildings in the education system reside on, as well as the energy used to power and heat these buildings. The Education Sector is resource intensive; as at 30 June 2018, MoE had around 9,000 hectares of land under its management for state primary and secondary school properties. However, recent Government initiatives have focused on improving the sustainability and energy efficiency of the physical stock in the Sector. In November 2019, the Government announced a \$16 million package to modernise all schools including making them sustainable and energy efficient by 2030.⁸⁴ Savings in power and energy will allow for reinvestment in other resources for teaching and learning. The package also includes a \$5 million contestable fund for sustainability initiatives supporting innovative energy projects in schools (such as installing solar panels and replacing inefficient heating systems and removing coal boilers).

3.3.5. Social Capital

Education contains an inherent social capital cost. The OECD describes social capital within education as a student's social networks, both internal and external to the education system, cultural aspects, parental expectations and obligations, and teaching professional networks.⁸⁵ Students have varying levels of social capital cost of education, largely due to the presence of support networks. Infrastructure can influence the degree of this cost, with supportive infrastructure promoting collaboration and coordination between people and groups in society.⁸⁶

Physical structures have an important impact on the social capital outflows of education. Innovative learning environments incorporate sociality and collaborative styles into physical design,⁸⁷ which diverges from more traditional styles of education. As such, students interact more with their peers in the learning environment instead of working alone.⁸⁸ This can enhance students' ability to derive social benefits in addition to pure education.

3.3.6. Human Capital

Human capital plays a pivotal role in educational outcomes. As the New Zealand Education Institute states; "the quality of an education system cannot exceed the quality of its people".⁸⁹ Teachers and academics across all levels of education should be sufficiently qualified, skilled, and experienced to meet the diverse needs of students. As such, human capital is consumed greatly in the form of educational provision, with a vast outflow of human capital in the form of a more skilled body of students and therefore greater skill in the population and future workforce.^{90, 91}

MoE states that, although the quality of teaching is the largest contributing factor to outcomes, the space-outcomes relationship is compelling. It is important that quality teaching is suited to the space in

⁸⁴ Hipkins, "More support for schools to reduce energy consumption and environmental impact."

⁸⁵ OECD, OECD Insights: Human Capital.

⁸⁶ Makhoul, "Social Capital and the Living Standards Framework."

⁸⁷ Ministry of Education, *The impact of physical design on student outcomes*.

⁸⁸ Kariippanon et al., "Flexible learning spaces facilitate interaction, collaboration and behavioural engagement in secondary school."

⁸⁹ New Zealand Educational Institute, *A people-centred recovery: Prioritising social infrastructure for a Just Transition out of the Covid-19 crisis*.

⁹⁰ Goldin, C. "Human Capital."

⁹¹ New Zealand Educational Institute, *A people-centred recovery: Prioritising social infrastructure for a Just Transition out of the Covid-19 crisis*.

which it is delivered to optimise outcomes. This goes two ways; spaces can be flexible enough to be conducive towards several teaching and learning styles, or teachers can adapt their style and programme to the space they have.⁹²

3.3.7. Financial Capital

Financial capital inflows include an array of government funding mechanisms in addition to private sources. ECE providers, though mostly private, are heavily publicly funded by MoE through mechanisms that primarily support operating expenditure⁹³ and gain additional revenue through private fees for services. State and state-integrated primary and secondary providers are funded mostly by MoE with operating expenditure funded by Government on the basis of roll size, community socio-economic condition, and a range of more targeted components⁹⁴. Capital expenditure is funded directly by MoE for state schools as the property is in the Ministry's portfolio.⁹⁵ State-integrated schools capital costs are mostly supported through MoE grants and they can request approval from MoE for additional use of public funds.¹¹² Optional donations are a form of private funding used by State schools, attendance dues can be levied by State-integrated schools, and school fees can be charged by independent (Private) schools for additional educational resources and facilities.⁹⁶ Private donations are especially important for private primary and secondary schools where private funding is a key source of revenue for new facilities. Tertiary institutions receive substantial public funding which subsidises their fees gathered privately from students. Most tertiary institutions have additional sources of revenue through services such as research. Generally, operating and capital expenditure varies by institutions, though investment is expected to meet the guidance agreed with TEC⁹⁷. Financial capital flows are combined with physical capital, such as buildings, classroom, laboratories, and equipment to provide educational services.

Financial capital outflows include both operating and capital expenditures relating to learning resources, administration, ICT and property, among an array of general expenses. Given the government investment in school property, education projects also make a significant contribution to the New Zealand construction sector. This has a stimulus impact on local and national economies and provides substantial job opportunities within regions.

3.3.8. Net Capital Basis

Overall, the Education Sector experiences lesser capital input than its outputs, due in part to the high impact the sector has in producing human and social capital, resulting in a net output flow.

⁹² Ministry of Education, *The impact of physical design on student outcomes*.

⁹³ Ministry of Education, "ECE Funding Handbook."

⁹⁴ Ministry of Education, "Operational funding components."

⁹⁵ Ministry of Education, "Capital works - state schools."

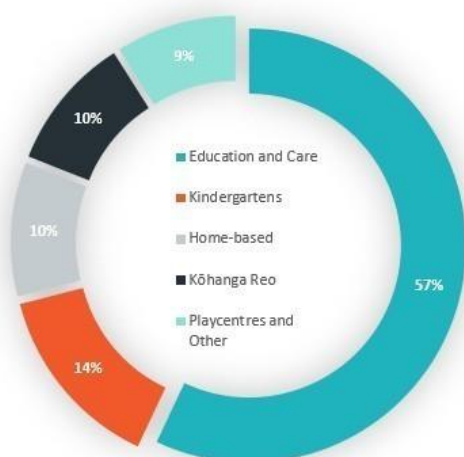
⁹⁶ Ministry of Education, "Capital works - state-integrated schools."

⁹⁷ Tertiary Education Commission, *Plan Guidance*.

3.4. Services

3.4.1. Early Childhood Education

Figure 3: ECE Services Breakdown



There are two broad categories ECE services fall under: teacher-led and parent-led. Teacher-led services include education and care services, home-based services, and kindergartens, while parent-led services include playgroups, playcentres, Ngā Kohanga Reo and Pacific Language Nests. Within licenced and funded services, 57% are categorised as education and care, 14% are kindergartens, 10% are home-based, 10% are Kōhanga Reo while the remaining 9% includes playcentres, hospital-based and casual education and care. The number of services is increasing, with the most recent data displaying a 1.9% increase between 2018 and 2019.⁹⁸

As such, ECE is a diverse sector with varying internal funding needs, governance, and infrastructure requirements given the range of market-facing options for consumers. For example, day care services typically require sleeping facilities for children whereas facilities offering reduced hours typically only require limited sleeping facilities. Utilisation of infrastructure will also vary across ECE given, for example, kindergartens and playcentres provide services on a reduced hours basis.

3.4.2. Primary and Secondary Education

The provision of education is the primary service provided by schools and is more standardised than ECE and tertiary provision. However, more specialised offerings are available for groups at risk of disengagement, inadequately served by the mainstream system, or with greater support needs, sometimes requiring specialist infrastructure like wheelchair ramps. Schools also have counselling and career services to enhance educational outcomes.

3.4.3. Tertiary Education

The tertiary sector provides broader services than purely education services. It encompasses an array of assessment, pastoral care, research, career and knowledge sharing services that are the cornerstone of holistic student development and a knowledge-based society.^{99 100} Many of these services require specialist facilities – for example, the undertaking of research often requires specialist research equipment and facilities that are highly capital intensive. The small size of New Zealand's economy and the capital-intensive nature of these facilities and equipment means that institutions need to carefully consider what they invest in as there is not available funding to compete at an international level in every field.

⁹⁸ Education Counts, *Summary Report: Results from the Teacher Demand and Supply Planning Tool - November 2020*.

⁹⁹ Tertiary Education Commission, *Annual Report 2019*.

¹⁰⁰ New Zealand Productivity Commission, *New models of tertiary education*.

3.5. Dependencies on Other Infrastructure Systems

MoE has highlighted ICT systems and transport infrastructure as crucial dependencies for the education system. Schools require high-speed internet access through the telecommunications system – as demonstrated through SNUP – and students should also be able to efficiently and safely commute to school using the transport network.

Commuting for students is the responsibility of caregivers. However, MoE provides various school transport services where necessary. School bus procurement is a means of extending transportation options to those that do not otherwise have effective means (due, for example, to geographic location).¹⁰¹

Additionally, schools require effective utility systems (e.g. electricity and water) to function. Other less direct systems, such as health infrastructure, also influence educational outcomes. The interconnectivity between Health and the Education Sector was also apparent during COVID-19 when schools prioritised the on-campus education of learners with caregivers that worked in the healthcare system.

3.6. Wellbeing

3.6.1. Early Childhood Education and Wellbeing

Early childhood is a time of tremendous physical, cognitive, socio-emotional, and language development.¹⁰² ECE assets and services provided in the early years have a causal link with wellbeing outcomes for adults. The OECD has stated that factors such as academic success, labour market performance, and social mobility are all positively linked to effective ECE.¹⁰³

The nature of the learning environment within ECE centres can affect wellbeing outcomes. Physical considerations such as adequate heating and ventilation, sufficient outdoor space and green space can be used to facilitate positive learning experiences and minimise the risk of spreading infectious diseases. Smaller group sizes also contribute positively towards wellbeing, as this helps to maintain a lower stress environment with a controlled noise level for both children and teachers.¹⁰⁴

Given the positive contribution ECE has on well-being outcomes, it will be important to assess whether there are any infrastructure impediments to ECE access, especially for low-income households (for example, transport networks).

3.6.2. Primary and Secondary Education and Wellbeing

High quality schooling (comprising both physical assets and services) is crucial for positive wellbeing outcomes.¹⁰⁵ The 2030 School Property Strategy explored the wellbeing outcomes associated with physical assets. It established that better environments are positively linked to better teaching and learning, which improves educational outcomes. The Tomorrow School 2019 reform means that Boards of Trustees' can focus on improving their educational outcomes as opposed to maintenance burden, and property related administration. Social outcomes are improved through better social services, facility availability, employment opportunities, and the recognition of mana whenua. Environmental outcomes

¹⁰¹ Ministry of Education, "Information for infrastructure suppliers."

¹⁰² Office of Disease Prevention and Health Promotion, "Early and Middle Childhood."

¹⁰³ OECD, *Starting Strong IV - Early Childhood Education and Care, Data Country Note - New Zealand*.

¹⁰⁴ Neuwelt-Kearns and Ritchie. *Investing in children? Privatisation and early childhood education in Aotearoa New Zealand*.

¹⁰⁵ The Ministry of Education, "New Zealand Schools."

are improved through sustainable properties, and economic outcomes are improved through maintenance requirements efficiency, enhanced urban development, and construction industry procurement benefits.¹⁰⁶ Therefore, there is a positive link between the physical school environment and social, environmental and economic outcomes.

3.6.3. Tertiary Education and Wellbeing

On an individual basis, quality tertiary education is associated with higher levels of physical, mental and emotional well-being including the ability for individuals and whānau to participate fully in their communities. Further, education generates a knowledge and skill base that allows for a deeper understanding of the world and greater exposure to opportunities. As such, individuals with tertiary qualifications often experience lower unemployment levels, higher incomes, and increased life satisfaction.^{107, 108}

For wider society, there is a causal link with knowledge advancement, culture, and productivity, which permeates through firms and levels of society as a result of further education.¹⁰⁹ The role of infrastructure in enhancing access to tertiary education given its positive links to wellbeing is therefore an important consideration.

3.6.4. Māori Wellbeing

The education system has underperformed for Māori learners and their whānau over an extended period, resulting in less engagement in the education system and poorer outcomes relative to their Pākehā and Asian counterparts. This in turn has also led to negative social, cultural, health, and economic impacts for Māori and New Zealand as a whole. To address this, Ka Hikitia (The Māori Education Strategy) was established in 2013. The strategy spans several key education agencies to be enacted across all levels of education. It seeks to both support Māori and change systemic inequities¹¹⁰ and infrastructure plays an important role. One of the strategies involves supporting online education through improving access¹¹¹ which involves ensuring ICT systems are sufficient. Ka Hikitia should be read in conjunction with Tau Mai Te Reo, a cross-agency strategy that sets out the goals to achieve and provides a framework for coordinating programmes and services that support Māori language in Māori medium and English medium education. The Ka Hikitia guiding principles are outlined below:¹¹²

- Achieving excellent outcomes
- A strong sense of belonging
- Recognising and building on the strengths of Māori
- Creating strong productive partnerships
- Practically implementing Te Tiriti o Waitangi

¹⁰⁶ The Ministry of Education, *The School Property Strategy 2030*.

¹⁰⁷ New Zealand Productivity Commission, *Educating New Zealand's future workforce*.

¹⁰⁸ New Zealand Productivity Commission, *New models of tertiary education*.

¹⁰⁹ Ibid.

¹¹⁰ Ministry of Education, "Ka Hikitia – Ka Hāpaitia | The Māori Education Strategy."

¹¹¹ Ibid.

¹¹² Ibid.

In general, these stem from the need for Māori to have greater authority and agency, a system responsive to the diversity of Māori and whānau, greater understanding of identity, language, and culture, and freedom from racism, discrimination, and stigma in order to achieve equitable outcomes.¹¹³

¹¹³ The Ministry of Education, *Learning Support Action Plan*.

4. What Shapes the Sector Today?

4.1. Ownership and Governance

The overall governance of the Sector includes MoE and seven other sector agencies (outlined below). Collectively, they design, support, fund, review, and enable the education system.

- The Tertiary Education Commission (TEC)
- The New Zealand Qualifications Authority (NZQA)
- The Education Review Office (ERO)
- Education New Zealand (ENZ)
- The Teaching Council of Aotearoa New Zealand
- Education Payroll Limited (EPL)
- Network for Learning (N4L)

4.1.1. Early Childhood Education

ECE services operate largely independently. Private business or not-for-profits provide services to the sector independently, with limited support and guidance provided by MoE.¹¹⁴ This market-based approach allows providers to operate as they see fit, while adhering to licencing requirements and regulation to operate and maintain funding. Providers are also subject to review by ERO.¹¹⁵

4.1.2. Primary and Secondary

State and state-integrated primary and secondary schools are governed primarily by their respective Boards of Trustees who historically have had significant levels of delegated decision-making power. Boards have been responsible for the control and management of the school, including aspects such as managing staff, curriculum, property, finance, and general administration.¹¹⁶ With the Tomorrow's School Reform, much of the focus has been on supporting schools, including reducing the burden of property management, with the aim of achieving greater attention on teaching and learning.¹¹⁷ The school principal leads the management of each school, while being accountable to their Board.¹¹⁸

MoE has an ownership responsibility for most property, develops policy, and administers numerous services and forms of support to primary and secondary providers alongside funding.¹¹⁹ ERO evaluates educational quality, while the Teaching Council provides teacher certification, regulation, and leadership for teachers.¹²⁰

¹¹⁴ Neuwelt-Kearns and Ritchie, *Investing in children? Privatisation and early childhood education in Aotearoa New Zealand*.

¹¹⁵ The Education Review Office, "About ERO."

¹¹⁶ NZSTA, "School Boards."

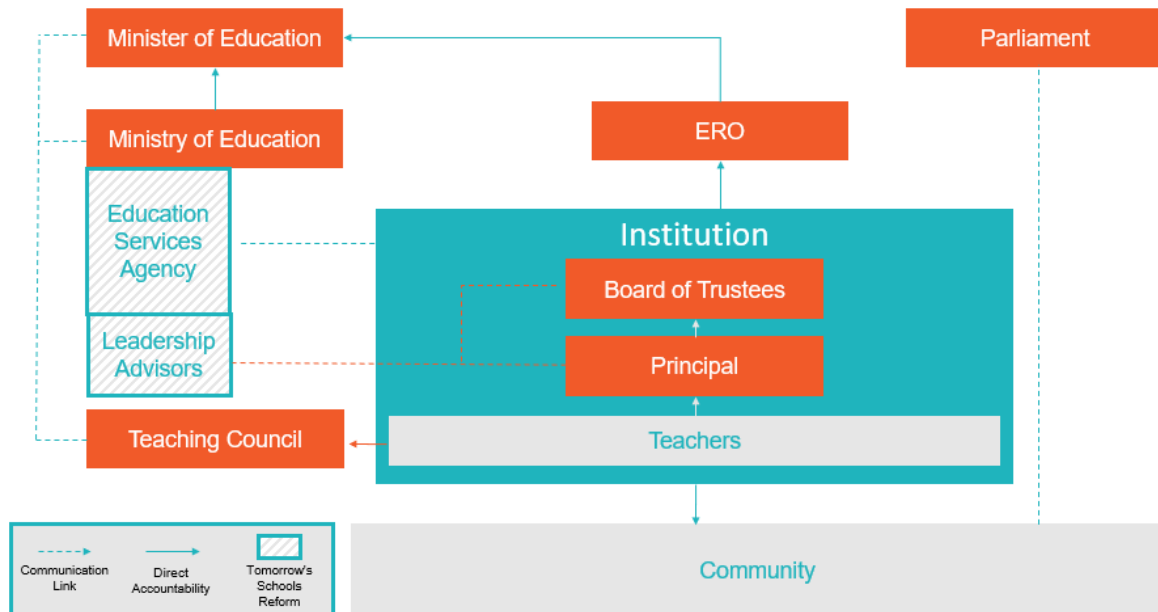
¹¹⁷ Alliston, *The government's changing role in the governance of New Zealand's schools since 1847*.

¹¹⁸ Nusche et al., *OECD Reviews of Evaluation and Assessment in Education*.

¹¹⁹ Ministry of Education, "The role of the Ministry of Education."

¹²⁰ Nusche et al., *OECD Reviews of Evaluation and Assessment in Education*.

Figure 4: Governance Overview for State and State-Integrated Primary and Secondary Institutions



4.1.3. Tertiary

Tertiary providers are largely autonomous. Tertiary education institutions, Te Pūkenga, universities and Wananga are governed by councils with the Vice-Chancellor or CEO managing the institution with accountability to their council.¹²¹

Outside of institutions themselves, TEC monitors, evaluates, and provides funding. Education New Zealand is responsible for marketing and recruiting international students, and NZQA ensures qualification quality and robustness. MoE leads the development of the Tertiary Education Strategy and policy, and the Ministry of Business, Innovation and Employment (MBIE) provides labour market information to inform decision making.¹²²

The Review of Vocational Education includes changes that affect sector governance¹²³ as existing ITPs are consolidated into Te Pūkenga with Workforce Development Councils providing an industry-led perspective.¹²⁴

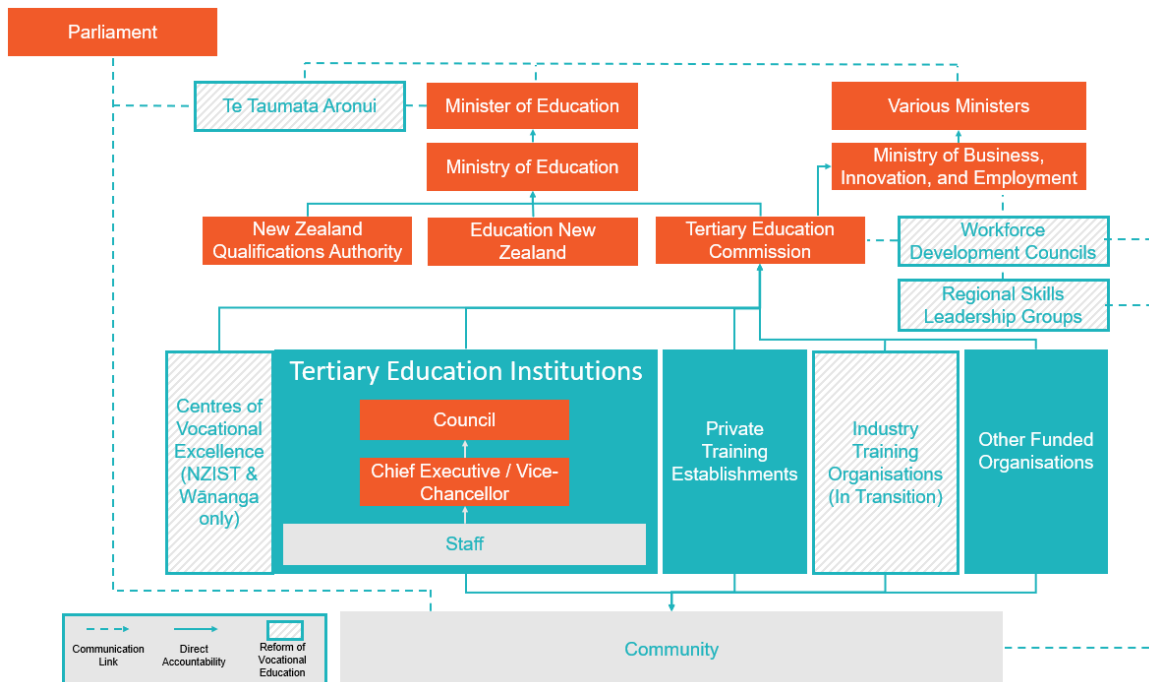
¹²¹ Tertiary Education Commission, *Briefing for the Incoming Minister of Education*.

¹²² New Zealand Productivity Commission, *New models of tertiary education*.

¹²³ Tertiary Education Commission, "Reform of Vocational Education (RoVE)."

¹²⁴ Ibid.

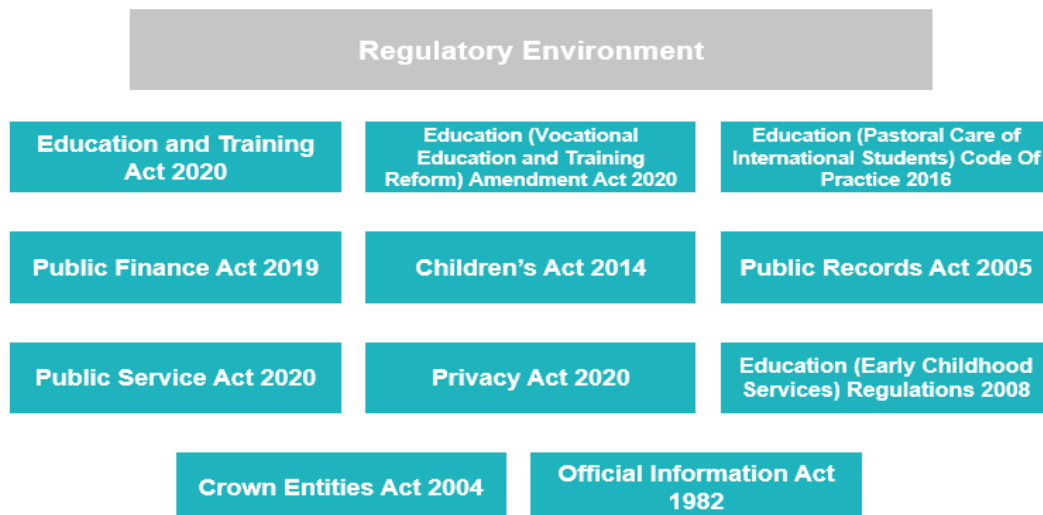
Figure 5: Governance Overview for Publicly Funded Tertiary Institutions



4.2. Regulatory Environment

Key legislation pertaining to the Education Sector is detailed in Figure 6 below.

Figure 6: Key Legislation within the Education Sector in New Zealand



The Education and Training Act 2020 (a replacement of the Education Act 1964 and 1989) now consolidates major legislation on ECE, compulsory schooling and tertiary education into one statute.¹²⁵ This looks to create an improved education system that honours Te Tiriti o Waitangi and supports Māori-Crown relationships. More detail on the key changes in the Education and Training Act 2020 can be found in Appendix F.

The Education (Vocational Education and Training Reform) Amendment Act 2020 works to create a unified and cohesive vocational education and training system with a new regulatory framework and establishment of a single, unified organisation - Te Pūkenga.¹²⁶

The Education (Pastoral Care of International Students) Code of Practice 2016 was developed to ensure international students are well informed, safe and properly cared for when studying in New Zealand.¹²⁷

The Education (Early Childhood Services) Regulations 2008 sets out criteria that ECE providers should comply with in order to be eligible to receive government funding.¹²⁸ Additional requirements have been introduced in the Education and Training Act 2020 to ensure more equitable provision of ECE services across the network. Child protection policies and safety check for children's workers should also be in place as set out in the Children's Act 2014.¹²⁹

The Crown Entities Act 2004 provides a framework for the establishment, governance, and operation of Crown entities, and clarifies accountability relationships.¹³⁰

4.3. Funding

4.3.1. ECE

Although the ECE sector is primarily operated by private providers, the Ministry funds licenced providers primarily with the ECE Funding Subsidy; paying for part of up to six hours per child each day, and up to 30 hours per child each week. 20 Hours ECE is another funding mechanism, but it can fully subsidise the cost for a child up to 20 hours a week, although there are additional requirements for eligible providers. In addition, the Government provides equity funding for specific communities that lack access, as well as a top-up scheme for providers based in isolated areas.¹³¹

Although extensive public funding is provided to the sector, parents pay on average between \$150 and \$350 weekly, as there is often use of services beyond the 20 hours subsidised by the government.¹³²

¹²⁵ Hipkins, "Bill has biggest education changes in decades."

¹²⁶ Ministry of Education, "Education (Vocational Education and Training Reform) Amendment Act 2020."

¹²⁷ New Zealand Qualifications Authority, "The Education (Pastoral Care of International Students) Code of Practice 2016 (including Amendments 2019)."

¹²⁸ Ministry of Education, "Starting a centre-based ECE service."

¹²⁹ Ministry of Health, "Children's worker safety checking and child protection policies."

¹³⁰ Parliamentary Counsel Office, "Crown Entities Act 2004."

¹³¹ Ministry of Education, "How the Ministry Funds Services," 1.

¹³² Establish, *Child's Play*.

4.3.2. Primary and Secondary Education

The primary and secondary education levels are funded almost entirely through MoE including teacher salaries, and operational funding based on roll-size, year levels, deciles and how isolated the school is.¹³³ School property, buildings, and other facilities are owned and also largely funded by MoE. See Figure 7 for an overview of the revenue sources for schools and Figure 8 for an overview of the categories of school expenditure.

Boards have discretion over the use of operational-level property maintenance funding, but larger capital upgrades are agreed with the MoE within the parameters of the ten-year property plan. Larger capital upgrades are funded through a five-year agreement provided by MoE. The five-year agreement is used to support capital projects and improvements (over \$5,000) over five years within the ten-year property plan process. Eligible schools receive a minimum of \$45,000 of five-year agreement funding with Boards responsible for how the five-year agreement funding is spent.¹³⁴ Five-year agreement funding will comprise between \$400 to \$500 million of total MoE spending over the next two years and is provided to schools to renew assets and implement flexible learning spaces to meet modern learning requirements.¹³⁵

Extensive capital expenditure such as new schools, rebuilding, redevelopments, building improvements, weathertightness, earthquake strengthening, the Christchurch Schools Rebuild programme, and a growth in student numbers is funded and managed by MoE itself.¹³⁶

Schools also fund some of their own projects, raising cash through donations to sustain additional expenditure for initiatives out of the Ministry's scope.¹³⁷

The decile system as a proxy for socio-economic need has been an increasing point of contention. As such, in 2019 the Government agreed to replace it with the Equity Index – a proxy better targeted to the socio-economic disadvantage of students. The change remains in a phase of stakeholder engagement and co-created design.¹³⁸

¹³³ Nusche et al., *OECD Reviews of Evaluation and Assessment in Education*.

¹³⁴ Ministry of Education, "5 Year Agreement (5YA) funding."

¹³⁵ The Treasury, *Budget 2020 Information Release*.

¹³⁶ Ministry of Education, "Property projects led by schools and by the Ministry."

¹³⁷ Ministry of Education, *Ngā Kura o Aotearoa New Zealand Schools*.

¹³⁸ Ibid.

Figure 7: Total School/Kura Revenue and their Sources (Billions of NZ Dollars), 2018-2019

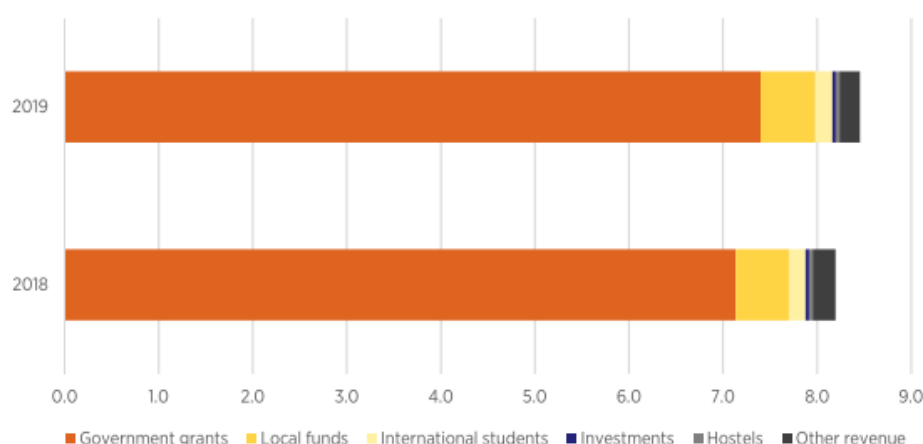
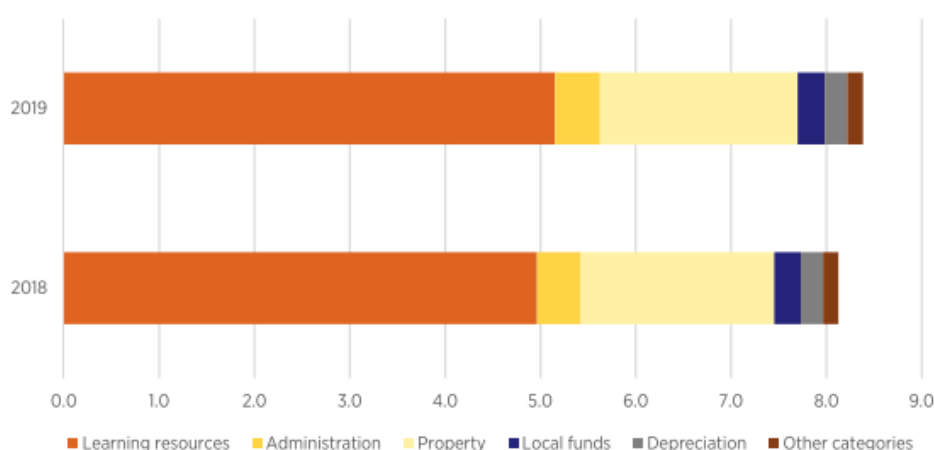


Figure 8: Total School/Kura Expenditure (Billions of NZ Dollars), 2018-2019



Source: *Nga Kura o Aotearoa NZ Schools 2019*¹³⁹

As per Figure 7, in 2019 the majority of the government funding to schools was comprised of three main components; operations funding, staffing and capital expenditure. \$1.568 billion was spent on operational funding including property maintenance, \$4.175 billion on staffing, and a total of \$961 million on capital expenditure.¹⁴⁰

The New Zealand Upgrade Programme (NZUP) included \$400 million worth of funding for most Ministry owned school property. Over 2,000 schools received up to \$400,000 to upgrade their buildings with much needed upgrades now underway.¹⁴¹

4.3.3. Tertiary Education

Although tertiary institutions operate mostly autonomously and usually own their assets, they receive a large sum of public funds in return for strategic alignment with Government priorities. This involves

¹³⁹ The Ministry of Education, *Ngā Kura o Aotearoa New Zealand Schools*.

¹⁴⁰ Ibid.

¹⁴¹ Hipkins, "School infrastructure upgrades ramping up."

preparation of investment plans by institutions for both operational and capital investments. These plans outline why they require funding, and how it aligns with Government policy.^{142 143}

Tertiary institutions are primarily funded for teaching and learning (operational expenditure), and the primary funding mechanism is through publicly subsidised tuition, or Student Achievement Component (SAC) funding. Student Achievement Component Funding is the Government's contribution towards the cost of teaching and learning services for students enrolled at a tertiary education organisation. As such, there is a degree of dependency on an institution's ability to both maintain and grow enrolments in order to reinvest surpluses back into the organisation. Other Government sources of revenue for tertiary organisations include student allowances and scholarships, loans and Performance Based Research Funds.

For universities, Universities NZ states 42% of income is from Government via:

- Tuition grants
- Student Achievement Component (SAC) funding
- Performance Based Research Funds (PBRF)
- 28% from students through tuition fees
- 30% from university research, commercialisation and other revenue¹⁴⁴

This demonstrates the importance of both direct and indirect Government involvement in the financial performance of the tertiary sector.

The Government does not generally provide new capital funding to tertiary institutions, with few exceptions such as after the Canterbury earthquakes. Institutions must present a business case for large capital projects however this is for borrowing money, not funding.¹⁴⁵

TEC - the Government authority responsible for allocation of funding – funded over 700 institutions in 2018/2019 with around \$3 billion allocated to the sector.¹⁴⁶

The Review of Vocational Education plans to develop a 'Unified Funding System' which will redesign the funding for provider-based and work-integrated certificate and diploma qualifications. Funding will be split into three components; learner success, funding category, and strategic. Learner success will target performance relating to under-served groups and support the equitable provision of education. The funding category will tailor funding to the delivery mode, and the strategic component will ensure innovation, responsiveness, and strategic alignment of priorities through targeted funding.¹⁴⁷

4.3.4. Budget 2020

Budget 2020 committed a total of \$813.6 million operating funding and \$115.1 million capital funding to the education sector with a specific focus on addressing inequities across all levels of education. It committed \$375.1 million towards funding mechanisms across all levels to maintain quality standards given increasing cost pressures.

¹⁴² Controller and Auditor-General, Investing in tertiary education assets.

¹⁴³ Tertiary Education Commission, *Briefing for the Incoming Minister of Education*.

¹⁴⁴ Universities New Zealand, "How NZ universities are funded."

¹⁴⁵ Controller and Auditor-General, Investing in tertiary education assets.

¹⁴⁶ The Treasury, "Revenue and expenditure."

¹⁴⁷ Tertiary Education Commission, "Unified Funding System."

Within the total amount mentioned above, \$79.7 million was committed to learning support services, \$119.5 million to operating costs and \$115.4 million capital for public and private partnership schools.¹⁴⁸

An additional \$291.6 million was allocated to ECE providers; addressing low pay issues, qualification gaps, and additional support measures.¹⁴⁹ It was also announced that teacher led ECE services will receive a higher level of funding to support 100% qualified teachers¹⁵⁰.

Notably, due to the impact of COVID-19 on the economy, the Government announced a \$1.6 billion Trades and Apprenticeships Training Package, including free trades training in critical industries and apprenticeship subsidies to mitigate the impact of COVID-19 on New Zealand's crucial skilled workforce-in-training.¹⁵¹

The Budget 2020 website (www.budget.govt.nz) provides further detail on the specific initiatives and new funding mechanisms.

4.4. Current Issues

4.4.1. Inequitable Educational Outcomes

The New Zealand education system is characterised by persistent inequities in educational outcomes. UNICEF's Innocenti Report Card in 2018 ranked New Zealand 33 out of 38 countries in terms of educational equality. The academic performance gap amongst students develops around 10 years old and continues to widen throughout their schooling years.¹⁵²

Poor educational outcomes are especially prevalent among Māori and Pasifika. Lower participation rates in Māori and Pasifika children is evident across all levels of the education system, and they are significantly less likely to leave the education system with a qualification compared to other ethnicities. Around 71% of Maori students stay in school compared to 85% of Pākehā students. Māori and Pasifika children are less likely (68% and 75% respectively) to participate in ECE (compared to 82% of all five-year-olds) and although regular attendance has decreased between 11 and 16 percentage points across all ethnic groups, the biggest decline was amongst Pasifika students.¹⁵³

Lower educational achievement within these ethnic groups is also strikingly clear. A recent PISA survey found that 30% of Māori and 44% of Pasifika students perform below level 2 in mathematics, compared to 22% across all students. Additionally, within the poorest communities, just 64% of students attain NCEA level 2 or higher, compared with 93% in the most affluent communities.¹⁵⁴ Māori and Pasifika students are also much less likely to complete a bachelor's degree, 52% and 49% respectively, compared to 69% for Pākehā.¹⁵⁵ This has flow-on effects with limited employment opportunities and poorer financial outcomes. While Ka Hikitia and Tau Mai Te were introduced to support Māori to succeed, these have not been implemented as intended and there is a lack of engagement between schools and whānau.¹⁵⁶

¹⁴⁸ New Zealand Government, *Wellbeing Budget 2020: Rebuilding together*

¹⁴⁹ New Zealand Government, *Wellbeing Budget 2020: Rebuilding together*, 12.

¹⁵⁰ Ministry of Education, "Budget 2020: 100% funding band restored for early learning."

¹⁵¹ Tertiary Education Commission, "Budget 2020: significant investment in training and education."

¹⁵² Stuff, "NZ's education gap amongst the worst in the developed world."

¹⁵³ Newton, "The attendance freefall in New Zealand's schools."

¹⁵⁴ Teach First NZ, "The need."

¹⁵⁵ Newton, "The attendance freefall in New Zealand's schools."

¹⁵⁶ Ministry of Foreign Affairs and Trade, *New Zealand's progress towards the SDGs – 2019*.

Inequities also exist for students with learning support needs who have been made to feel unwelcome throughout their educational experience with instances of sparse support. This inhibits the provision of education for such groups, resulting in an inequitable systemic disadvantage.¹⁵⁷ MoE responded by employing approximately 600 new dedicated Learning Support Coordinators to work alongside classroom teachers to provide the additional support these students require.¹⁵⁸

The wider Education Work Programme contains various initiatives and strategies to achieve an equitable education system for all and is underpinned by fit for purpose infrastructure. It undertook extensive system reviews across all levels and derived several key changes through the Tomorrow's Schools Reform, Review of Vocational Education, Reform of School Property, and changes to the functioning of NCEA.¹⁵⁹

Its key initiatives include:

- Te Kawa Matakura and Te Ahu o Te Reo Māori – A wānanga based programme to develop knowledge of mātauranga Maori
- The Learning Support Action Plan
- Curriculum, Progress, and Achievement – ensuring ubiquitous quality learning
- Careers Action Plan – developing school-based careers systems
- Ongoing Tertiary Fees Free
- Supporting Research – developing Mātauranga Maori research capabilities

MoE also developed Tapasā as a framework to strengthen teacher engagement with Pacific learners and ensure they become more culturally aware and responsive to the needs of the Pacific community and how to best serve them.

4.4.2. Funding Inequities

Funding structures have perpetuated inequitable educational outcomes across the various levels of the Sector. Recent initiatives and reforms are underway to address these issues.

ECE

Public expenditure in ECE is above the OECD average and has increased over time due to funding policies provided to families. However, increased operational expenditure does not necessarily indicate improved quality or outcomes for children¹⁶⁰ and disparities in funding are still seen in alternative parent-led providers such as Playcentre and Kōhanga Reo.

Inequities exist around the accessibility to ECE across geographic areas. A potential contributor to the inequitable ECE network provision is the decentralised nature of the ECE sector and historic lack of regulation around ECE network provision. Until the introduction of the Education and Training Bill 2019, the Government had no direct involvement in mapping and forecasting of ECE services, and private ECE providers were more likely to open centres in already well-served areas¹⁶¹. Accordingly, children living

¹⁵⁷ Tomorrow's Schools Independent Taskforce, *The 8 Key Issues*.

¹⁵⁸ Ministry of Foreign Affairs and Trade, *New Zealand's progress towards the SDGs – 2019*.

¹⁵⁹ Kōrero Mātauranga, "Let's talk about education."

¹⁶⁰ Neuwelt-Kearns and Ritchie, *Investing in children? Privatisation and early childhood education in Aotearoa New Zealand*, 9.

¹⁶¹ Neuwelt-Kearns and Ritchie, *Investing in children? Privatisation and early childhood education in Aotearoa New Zealand*, 9.

in low-income communities are less likely to receive access to quality early learning¹⁶². MoE aims to address this issue with the 2019-29 Early Learning Action Plan, in which MoE takes a more active approach in mapping out the network of ECE provision and is investigating setting up state-owned facilities and services in areas with insufficient supply.

State Primary and Secondary Schools

The decile system used in New Zealand primary and secondary schools measures the socio-economic position of a school's student community and is used to calculate the amount of operational funding and resources provided to state and state-integrated schools. However, the decile system is commonly associated with the quality of teaching and academic performance, as well as the quality of facilities, with the contention that higher decile schools result in better learning outcomes for students.¹⁶³ It has been noted that the amount of equity funding delivered to New Zealand schools is around half of comparable OECD countries.¹⁶⁴

The Equity Index (anticipated to be rolled out in 2021/22) will estimate the socio-economic factors present within children's lives at the school rather than the location of their homes. Equity index funding (representing 2.9% of total school funding¹⁶⁵) aims to increase funding to support equity in schools, remove the stigma associated with low decile schools and provide better assistance for learners from socio-economically disadvantaged households or communities.¹⁶⁶

4.4.3. Variability in Physical Stock

The quality of physical stock in the education sector varies across levels and within levels depending on the ownership of assets and the extent of devolved decision-making.

State Primary and Secondary Schools

The quality of physical stock across state primary and secondary schools varies due to age and deferred maintenance. Deferred maintenance has an impact on the condition of learning environments and therefore educational outcomes, but it is also fiscally inefficient. Appropriate asset maintenance programmes could potentially extend the useful life of school property and avoid premature or unnecessary expenditure on refurbishment, redevelopment and replacement. The schooling estate has an average age of 40 years with most properties built between the 1950s and 1970s.¹⁶⁷ Mid-life and end-of-life renewal is needed to maintain a suitable condition, alongside upgrades to meet the demands of modern teaching and learning practices with the incorporation of technology in the schooling curriculum. Further, many buildings built between 1994 to 2004 have faced weathertightness problems due to poor designs and quality of materials used in construction.¹⁶⁸ Inconsistent maintenance and prioritisation, and discrepancies in maintenance funding through inflexibility with regards to the differing needs across the portfolio, have also contributed to the variable quality of education infrastructure.¹⁶⁹ As such, there are capital pressures on the school property portfolio with decision making around maintenance or replacement required.

¹⁶² Neuwelt-Kearns and Ritchie, Investing in children? Privatisation and early childhood education in Aotearoa New Zealand, 17.

¹⁶³ Office of the Minister of Education. "Cabinet Paper release: Replacing Education Deciles with the Equity Index".

¹⁶⁴ Tomorrow's Schools Independent Taskforce, *The 8 Key Issues*.

¹⁶⁵ Cooke, "School decile funding system will be scrapped by 2021 or 2022."

¹⁶⁶ Ministry of Education, "Education Funding Review."

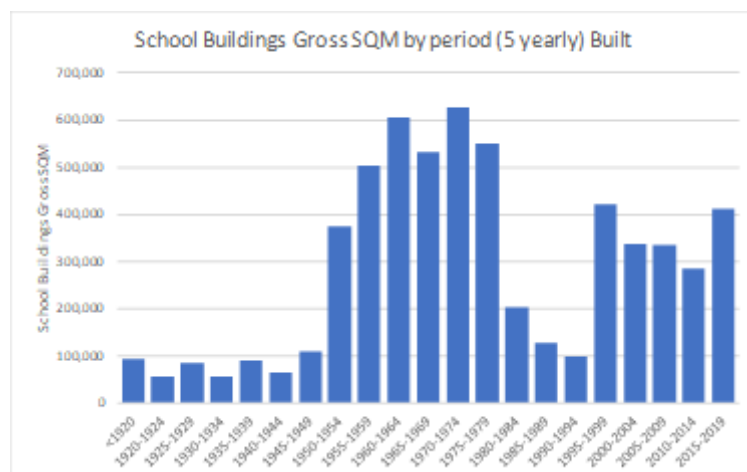
¹⁶⁷ Controller and Auditor-General, "The school property portfolio."

¹⁶⁸ Ibid.

¹⁶⁹ The Ministry of Education, *Te Rautaki Rawa Kura The School Property Strategy 2030*.

The Education Infrastructure Service within MoE is starting to undertake a more comprehensive condition assessments on all schooling infrastructure which will enable it to target any “variability of concern”. Currently the Education Infrastructure Service considers the majority of state schooling infrastructure to be in an acceptable condition, and accordingly a minority of state schools to be in an unacceptable condition.

Figure 9: Age distribution of School Buildings in New Zealand (Gross Square Meters by 5-year period)



Source: Ministry of Education (2020)

The education physical stock is also characterised by inconsistent utilisation across the infrastructure network. This is due to demographic drivers changing the demand for schools with increases in enrolment rates concentrated in schools in urban areas (such as Auckland, Christchurch, Hamilton, Tauranga and Western Bay of Plenty, Queenstown and, more recently, New Plymouth and Whangarei) while schools in rural areas are experiencing roll decline.¹⁷⁰

The 2030 School Property Strategy seeks to improve the school property portfolio and its management¹⁷¹ so that “all schools will have quality learning environments as part of a well-managed and sustainable portfolio that helps deliver equitable and excellent outcomes for every child.”

Under the umbrella of the 2030 School Property Strategy, and in addition to the pre-existing 10YPP funding and MoE Capital Works investment, the following initiatives have been undertaken to address the issue of variable quality of state school buildings:

- The National School Redevelopment Programme (NSRP) has identified a pipeline of schools for redevelopment investment.¹⁷²
- Improving classrooms in small or remote schools is a programme to review and improve the quality of teaching spaces across up to 600 schools.¹⁷³
- The School Investment Package (SIP) as part of the NZ Upgrade Programme, aims to support schools to upgrade their property.¹⁷⁴

¹⁷⁰ Ministry of Education, “Cabinet paper: National Education Growth Plan to 2030.”

¹⁷¹ Ministry of Education, *Te Rautaki Rawa Kura The School Property Strategy 2030*.

¹⁷² Ministry of Education, “National School Redevelopment Programme”.

¹⁷³ Ministry of Education, “Improving Classrooms in Small or Remote Schools”.

¹⁷⁴ Ministry of Education “School Investment Package”

Further, the Tomorrow School's Review and Reform recognises the need for a change in the management of school property and is addressing quality discrepancies pertaining to management through:¹⁷⁵

- Reducing the burden on schools by simplifying or removing infrastructure responsibilities.
- Developing a more strategic approach to investment in education infrastructure.

1
Variable quality of state school infrastructure due to age and deferred maintenance.

Policy Implication

The 2030 School Property Strategy looks to ensure all schools will have quality learning environments by 2030. The Government's New Zealand Upgrade Programme (NZUP) also includes investment through the School Investment Package (SIP) to support schools upgrade their physical infrastructure.

State Integrated Schools

The property at State integrated schools is owned by proprietors rather than the Crown. As such the proprietor is responsible for decisions on capital maintenance and upgrading assets.

Private Schools

Private schools tend to have excellent facilities driven by private donations and funding.

Tertiary Sector

The autonomous governance model in the tertiary sector means that some institutions are investing heavily in physical buildings in response to emerging employer demand (for example both Manukau Institute of Technology and Otago Polytechnic have invested \$55 and \$31.7 million respectively into trade training facilities).^{176 177} This investment is supported by Government grants and loans for shovel-ready projects.

Other institutions in the tertiary sector are divesting physical assets as they move towards online learning as a preferred model of delivery. For example, Unitec recently sold 29 hectares of surplus land to the Crown with proceeds from the sale going to support the delivery of teaching and learning programmes to "improve the experiences for students."¹⁷⁸

Kōhanga Reo Schools – Primary, Secondary and Tertiary

The recent \$196 million investment to repair Kōhanga Reo buildings and improve ICT capacity reflects the need to improve the quality of the physical stock at Kōhanga Reo as the poor state of many buildings resulted in a loss of funding under MoE rules. MoE is working with Te Kōhanga Reo National Trust (TKRNT) to assess the extent of the issues associated with Kōhanga buildings¹⁷⁹ and the capital funding that can be provided to upgrade these buildings and avert any major relicensing risks.¹⁸⁰

¹⁷⁵ Ministry of Education, *Supporting all schools to succeed*.

¹⁷⁶ Collins, "Manukau Institute of Technology to build a new \$55 million trade training school."

¹⁷⁷ Stuff, "Otago Polytechnic to build \$31 million trade training centre."

¹⁷⁸ Unitec, "Unitec Hosts Major Land Sale Announcement."

¹⁷⁹ Davis, "Wellbeing Budget recognises the importance of Kōhanga Reo."

¹⁸⁰ Waitangi Tribunal, *The Report on the Kōhanga Reo Claim*.

4.4.4. Governance Issues

The current primary and secondary schooling system is highly devolved as the governance and management of schools is the responsibility of largely autonomous boards of trustees. This can be a barrier to achieving good practice across the education system as many boards lack the capabilities and resources (be it financial or human) to manage effectively property upgrades and the appointment of the principal.¹⁸¹ There is a view this self-governing model has increased unhealthy competition between schools where the focus is placed on achieving higher academic results or increasing the number of enrolments, instead of fostering the collective interest of the network of schools within the wider community. This is particularly detrimental to many Māori, Pacific, and students living in disadvantaged communities and can cause greater divide between different ethnic and socio-economic groups.¹⁸²

The Reform of the Tomorrow's Schools system seeks to address many of these issues by balancing local and national responsibilities for school property management.¹⁸³

Historically devolved governance and planning in primary and secondary schools and the tertiary sector.

Policy Implication

Tomorrow's Schools reform looks to vest responsibility for key infrastructure planning and management to MoE so school Boards can focus on curriculum development and education delivery. RoVE and the establishment of Te Pūkenga will take a national level view of infrastructure needs (including physical buildings and ICT systems) in the vocational education sector. Whilst no reform is currently planned for the university sector, recommendations have been made for more cross-sector collaboration to ensure effective use of collective assets amongst universities.

4.4.5. Inertia in Tertiary Educational Institutions

The Productivity Commission highlighted significant inertia in tertiary institutions as providers are reluctant to be early adopters of new models of tertiary education.¹⁸⁴ This is attributable to regulatory requirements and funding systems as the government holds a high level of central control which inhibits the level of innovation in meeting learner and employer needs.

As universities and Institutes of Technology and Polytechnics are largely dependent on government funding (determined in large part by student numbers), this results in a supply-driven system where tertiary providers are more responsive to government's demands rather than student and employer needs. This confines their ability to innovate and invest in new infrastructure which drives homogeneity in delivery of education. The system is not well-positioned to quickly respond to uncertain future trends and the needs of more diverse learners. It does not equip learners with the skillsets needed to adapt in a rapidly changing world and there are prohibitively high costs to upskill or retrain¹⁸⁵ resulting in a lack of return on investment in education for the learner. This is compounded by high regulatory and cost barriers to entry making it hard for new institutions to enter the market resulting in a lack of diversity in delivery approaches.

¹⁸¹ Tomorrow's Schools Independent Taskforce, *The 8 Key Issues*.

¹⁸² Tomorrow's Schools Independent Taskforce, *The 8 Key Issues*.

¹⁸³ Ministry of Education, *Supporting all schools to succeed*.

¹⁸⁴ New Zealand Productivity Commission, *New models of tertiary education*

¹⁸⁵ Ibid.

The funding model needs to enable tertiary institutions to invest in infrastructure that responds to the growing need and demand for low cost, bite-sized chunks of learning that are focused on transferable skills and capabilities.

4.4.6. Response to Technological Change

The increasing pace of technological change means that digital skills and ICT is becoming increasingly important across all levels of the education system. The Government has introduced a new Digital Technologies curriculum to equip learners from Year 1-10 with technological skills, which is incorporated into each school's curriculum through their school-wide planning and classroom practice.¹⁸⁶ It was found few teachers had adequate digital fluency to teach the new Digital Technology curriculum and delays in establishing a coherent support programme for teachers resulted in an insufficient understanding of the content they are expected to teach. This has resulted in a divide in how the curriculum will be delivered amongst schools and created varying levels of engagement between students depending on students' access to technology and teachers' understanding of the curriculum.¹⁸⁷ A 2019 report by ERO states that "overall, the progress schools have made has been slower than expected. Most schools need to access support to raise understanding, knowledge and skill levels if they are to successfully implement the Digital Technologies curriculum content."¹⁸⁸

COVID-19 has further disrupted traditional ways of learning with a mass transition to remote learning for a short period of time. This highlighted a digital divide among students as, while all schools in New Zealand have access to ultrafast broadband, many school-age children do not have home internet access. In April 2020, it was estimated that around 82,000 Kiwi homes did not have any access to the Internet and/or fit-for-purpose education devices which affected around 145,000 school-age learners in New Zealand.¹⁸⁹ COVID-19 has sped up the transition to digital delivery of education, and there will be benefits from increasing investment in supporting infrastructure.

The dominant university model of having a broad-based teaching and research institution with a large asset base and cumbersome back office is being challenged by digital transformation, with the addition of new ed-tech models such as "on-demand streaming learning, digital courses distributed through apps, AI platforms that support individualised learning, and digital learning passports that accredit higher education courses and work experiences."¹⁹⁰ The uptake in digital platforms means there is less of a need for physical university infrastructure, and these grounds can be repurposed, such as creating education precincts incorporating primary and secondary schools, community precincts with community-oriented services.¹⁹¹

¹⁸⁶ Education Review Office, *It's early days for the new digital technologies' curriculum content*.

¹⁸⁷ Gerritsen, "New NZ digital curriculum set for 2020, are schools ready?"

¹⁸⁸ Education Review Office, *It's early days for the new digital technologies' curriculum content*.

¹⁸⁹ Chumko, "Coronavirus: Ministry connects 18,000 households to internet, but many still without."

¹⁹⁰ EY, *Can the universities of today lead learning for tomorrow?*, 21.

¹⁹¹ EY, *Can the universities of today lead learning for tomorrow?*, 23

3 Economic & technological transformation

Policy Implication

ICT systems need to support the transition to blended and online learning platforms. Increasing digitisation of curriculum may mean there is less demand for physical spaces for learning, and/or physical spaces may need to be repurposed so that they can accommodate new technologies. Within the tertiary sector, some institutions have divested physical assets and are reinvesting in online platforms to support virtual delivery or new teaching programmes. Digital strategies (including ICT systems) can also be harnessed so that they offer tailored and bespoke learning experiences for Māori and other population groups, which can contribute to enhanced educational outcomes.

4.4.7. Qualified Secondary School Teacher Shortages

The quality of teaching is the single most important school-related factor that influences students' achievement. However, a shortage of qualified teachers has persistently affected the secondary school sector. MoE has forecasted that a teacher shortage will continue to impact secondary schools where the supply of secondary teachers is estimated to be 80 teachers short in 2021, 30 teachers short in 2022, and 100 teachers short in 2023.¹⁹²

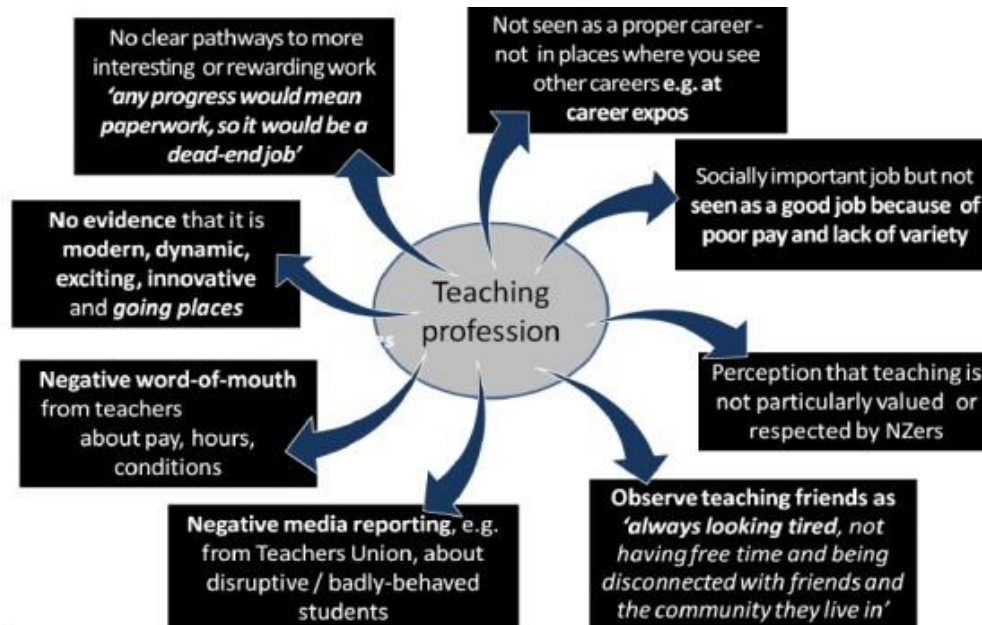
Contributing factors include¹⁹³:

- Burnout from high workload. Deteriorating working conditions has led to higher stress levels among teachers, resulting in a lack of work-life balance negatively affecting their physical and mental wellbeing.
- High attrition rate amongst new secondary teachers.
- Graduates are less willing to enter the teaching profession.

¹⁹² Gerritsen, "Ministry forecasts end to primary teacher shortage, but problems in secondary schools."

¹⁹³ PPTA, "Teacher supply."

Figure 10: Factors Contributing to Shortage in Qualified Teachers¹⁹⁴



The above factors culminate in a shortage in teachers which creates pressure for schools to fill these vacancies. The quality of teachers may be compromised if there is insufficient supply or existing staff members need to pick up additional workload which further exacerbates the burnout issue.

COVID-19 alleviated some of the stresses of the teacher shortage as more qualified teachers have been returning to New Zealand as they perceive a higher level of security and better management of COVID-19 in New Zealand.¹⁹⁵ Retention rates are expected to grow, and the supply of primary teachers will meet demand for at least the next three years. In the secondary sector, supply is projected to rise roughly in line with demand.

A future-focused Education Workforce Strategy 2032 is being developed. This aims to attract, recruit and retain a high-quality and culturally competent education workforce to maximise educational success for learners in the English and Maori Medium stream.¹⁹⁶ Operating pressures such as high workload and burnout seem to be the key driver of attrition in the sector. However, research has shown that incorporating sustainable design in school buildings increases teacher retention rates¹⁹⁷ and it is possible that infrastructure such as ICT could be an enabler of efficiency improvements, potentially alleviating issues related to workload such as burnout.

¹⁹⁴ Ministry of Education, *Secondary Teacher Supply Working Group Report*.

¹⁹⁵ Williams, "High hopes homebound teaches will fill vacancies."

¹⁹⁶ Ministry of Foreign Affairs and Trade, *New Zealand's progress towards the SDGs – 2019*.

¹⁹⁷ New Zealand Green Building Council, *Green Star Schools Handbook*, 3-4.

4.4.8. Private Provision of ECE

The private model of ECE provision in New Zealand has some failings as ECE's emphasis is on maximising profit rather than public good with benefits to the community. Due to the private ECE provider model, MoE do not pay teachers directly, resulting in some of them being paid 49 percent less than other teachers with the same qualifications and experience.¹⁹⁸ This contributes to higher staff turnover and lower ratios of qualified staff in for-profit centres which negatively impacts the quality of children's learning. Budget 2020 helped to address the pay parity issue through a \$151.1 million funding boost to increase the minimum salary for ECE teachers to \$49,862 which is in line with the pay of kindergarten teachers.¹⁹⁹

A further limitation of the ECE model is poor network management, typically leading to an over-supply of services in wealthy urban areas and an under-supply in other rural and low decile areas.²⁰⁰ However, recent changes in the Education and Training Act 2020 give MoE greater powers to decline licence applications where they are not convinced of the need for the proposed service. The NZ Educational Institute (NZEI) has proposed that a staged plan for public provision and funding of ECE be developed and implemented, to amend the current highly privatised market ECE model, centred on child occupancy rates and delivered in a fashion that encourages competition.²⁰¹ NZEI has suggested this could involve the utilisation of an integration model to move ECE services from private to public, ensuring planned provision of a public ECE network that is integrated with schooling where possible, and incentivising this move to a public system by increasing the funding for public ECE centres to be in line with the funding received with 100% qualified teachers.²⁰²

A decentralised ECE sector has resulted in uneven access across regions and populations

Policy Implication

The Education and Training Act 2020 looks to address the limitations of a decentralised ECE sector by regulating the supply of ECE services and incentivising the opening of new centres in areas typically under-served. Further, recent Budget announcements have provided funding to increase teachers' salaries to incentivise high quality teachers to remain in the sector.

¹⁹⁸ Walters, "Minister's stern warning to early learning centres."

¹⁹⁹ Hipkins and Martin, "Pay increases for lowest paid teachers."

²⁰⁰ Office of the Minister of Education. "Cabinet Paper: The Early learning action plan 2019-29"

²⁰¹ New Zealand Educational Institute, *A people-centred recovery: Prioritised social infrastructure for a Just Transition out of the Covid-19 crisis*, 6-7.

²⁰² New Zealand Educational Institute, *A people-centred recovery: Prioritised social infrastructure for a Just Transition out of the Covid-19 crisis*, 7.

5. How the Sector is Performing Today

5.1. Early Childhood Education Performance Measures

ECE is a broad sector, with both formal education centres and at home teaching. However, all ECE providers deliver New Zealand's national early learning curriculum, Te Whāriki. The curriculum is not prescriptive and allows for socio-cultural contexts to influence teaching. ERO completes individual reviews of ECE providers and measures their performance against the following indicators: the learning and their learning; collaborative professional learning and development builds knowledge and capability; evaluation for improvement; leadership fosters collaboration and improvement; and stewardship through effective governance and management.²⁰³

There is variability in ECE provider performance against the above indicators and significant variability in assessment quality across ECE pathways which is likely contributing to difficult transitions to primary level education.²⁰⁴ ERO noted that the Evaluation for Improvement indicator consistently scored poorly across the sector, with ability of an ECE provider to evaluate their own effectiveness key to delivering a better learning service.

MoE also evaluates ECE centres based on participation in ECE. Recently MoE revised participation measures to improve measurement of participation intensity. This was prompted by a general plateau in participation across early learning and the persistent lower attendance rates among Māori, Pacific, and students from lower socioeconomic areas. Table 3 illustrates disparities across ethnic groups and performance against the budgeted standard.

Table 3: Participation in Early Learning 2019/20²⁰⁵

Target student groups	Budget Standard	Actual Results (2019 / 20)
All	98%	97.1%
Māori	98%	95.4%
Pacific	98%	93.4%
Decile 1-3	98%	94.5%

From 2020/21, MoE measures the percentage of children (ages three and four) attending early learning for 10 or more hours a week.

²⁰³ Education Review Office, *Te Ara Poutama indicators of quality for early childhood education: what matters most*, 16-17.

²⁰⁴ Education Review Office, *Early Learning Curriculum: What's important and what works*, 3.

²⁰⁵ Education Counts, "Participation in early childhood education".

5.2. Primary and Secondary Performance Measures

5.2.1. Access

Evaluation of access to education across the sector tends to focus on student achievement within their cohort level, progression and achievement of courses, and the level of support and information students and their families receive. MoE is also progressively working to increase the physical accessibility of New Zealand schools. New school buildings are being modified and designed to support the highest level of inclusivity and meet or exceed the access and mobility requirements outlined in the Building Code Access Standard (NZS4121). In 2019/20, MoE spent \$54.3 million on property modifications to improve over 600 schools.²⁰⁶

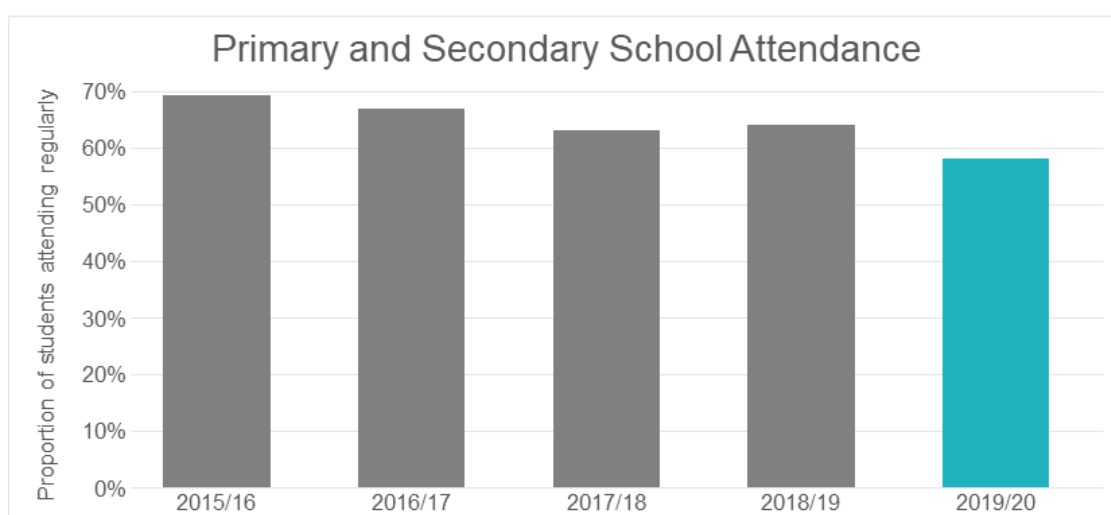
5.2.2. Quality

Performance measures related to quality of education are based on the quality of teaching, buildings, and ICT infrastructure. Several measures are related to ICT infrastructure and network connectivity which also serves to reflect the importance of digital connectivity in education.

5.2.3. Participation

This measure is intended to guide the sector to achieving equitable participation and increased engagement in education. Regular attendance rates have been declining since 2015 (see Figure 11) and continued to fall in 2019 with lower attendance rates consistently seen in Maori, Pacific, and lower socioeconomic areas. MoE is working to support schools and other agencies on initiatives (e.g. the School Lunch Programme, parent support programmes, and wellbeing initiatives) to improve attendance and participation across the sector. Regional staff are prioritising attendance and engagement plans as part of the COVID-19 response and recovery.

Figure 11: Primary and Secondary School Attendance between 2015 and 2020²⁰⁷



²⁰⁶ Ministry of Education, *Annual Report 2020*, 15.

²⁰⁷ Ministry of Education, *Annual Report 2020*, 14.

5.2.4. School Property Portfolio Management

For primary and secondary schools, MoE also monitors school property portfolios. This includes evaluation of the purchase and construction of new property, upgrades made to existing property, disposal of surplus property, management of teacher/caretaker housing and other services provided by MoE in its stewardship of the land, buildings, and facilities that comprise the State property portfolio. This works to create a school sector property portfolio that is managed efficiently, sustainably, and supports achievement of educational outcomes.

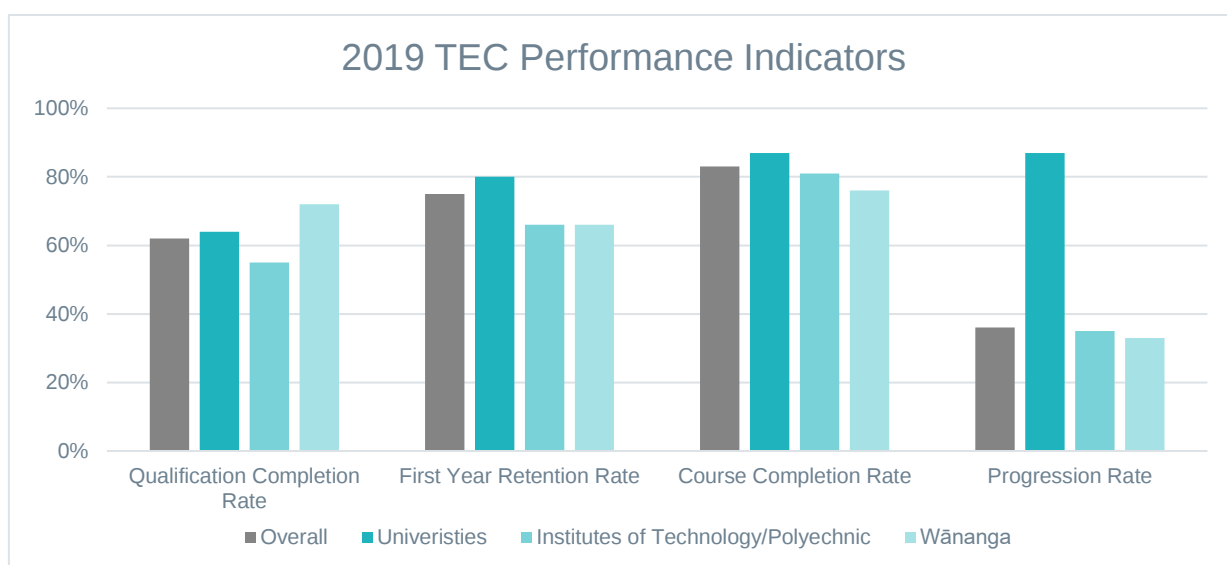
Monitoring of ICT infrastructure is also included in this assessment and measures the provision of computer hardware and software to enable core business functions within schools. In terms of the ICT infrastructure, 100% of state, integrated and partnership schools that have an ultra-fast broadband (UFB) connection available are connected to the managed network provided by Network for Learning (N4L) directly.

Based on the Asset Management maturity index for the school property portfolio established by the Treasury, MoE is seen as a high-quality property manager and was ranked at 77% compared to the budgeted 75-80%.

5.3. Tertiary Performance Measures

TEC leads the Government's relationship with the tertiary education sector, and monitors and reports on Tertiary Education Organisation performance and financial viability. TEC has identified four key annual performance measures for tertiary institutions.²⁰⁸ These are cohort-based qualification rate, first year retention rate, course completion rate and progression rate. Figure 12 illustrates Tertiary Education Organisation performance against these indicators for 2019. Slight increases were seen in the overall Qualification Completion and First Year Retention rates from 2018 increasing from 60% and 74%, respectively. Course Completion and Progression rates (which measures the proportion of students that continue studying at a higher level after completing a qualification at levels 1-4) remained consistent.

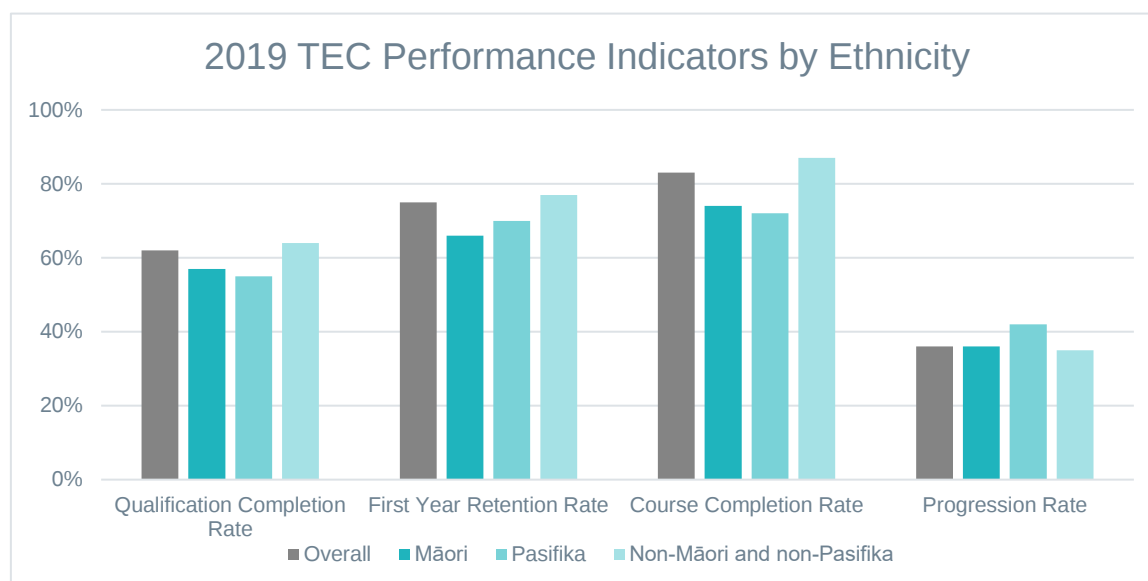
Figure 12: 2019 Performance Against TEC Indicators



²⁰⁸ Tertiary Education Commission, "View educational performance using interactive charts."

Disparities between ethnic groups is also apparent in the tertiary sector. As demonstrated in Figure 15, Māori and Pasifika students tend to have lower completion and retention rates when compared against other students. School performance is a significant contributor to ethnic gaps in higher education, suggesting interventions at the early learning, primary, and secondary levels are critical to correcting the disparities seen in further education participation rates.²⁰⁹

Figure 13: Participation in Further Education by Ethnicity²¹⁰



5.4. Comparison with International Peers

MoE's 'Education at a Glance' outlines internationally comparable outcomes and opportunity indicators. These are used to develop policies to increase social and economic prospects and create greater efficiency in schooling. The indicators were developed to compare New Zealand schooling data with OECD averages and include expenditure; educational attainment; progression and completion.

In 2017, New Zealand spent 6.3% of GDP on the Education Sector – the second highest amongst other OECD countries.²¹¹ Of this, 4.6% of GDP was spent on primary, secondary, and post-secondary non-tertiary education. The remaining 1.7% of GDP was spent on tertiary education. For primary and secondary services, spending was predominantly on instructional services, whereas research and development, and other ancillary services accounted for a large part of the spend in the tertiary sector.

²¹²

In 2019, New Zealand performed slightly above the OECD average for educational attainment between 25 to 34-year olds and was ranked 16th overall out of all OECD countries.

²⁰⁹ Meehan, Pacheco and Pushon, *Explaining ethnic disparities in bachelor's qualifications: participation, retention and completion in NZ*, 33.

²¹⁰ Tertiary Education Commission, "View educational performance using interactive charts."

²¹¹ Ministry of Education, *How does New Zealand's education system compare?*, 2.

²¹² OECD, "How much is spent per student on educational institutions?"

The OECD also measures participation in ECE settings where New Zealand performs particularly well. Overall, New Zealand has a high percentage of children aged 3 to 5 enrolled in ECE services and spends a high proportion of GDP on this sector compared to other OECD countries. It also has some of the lowest ratios of teachers to children within the OECD, at 6.5 compared to the OECD average of 14.3 for children aged three to five years (2018).

See Appendix G for graphs of OECD comparisons on expenditure, educational attainment; completion and progression; and children to ECE teaching staff ratio.

5.4.1. Students' Achievement

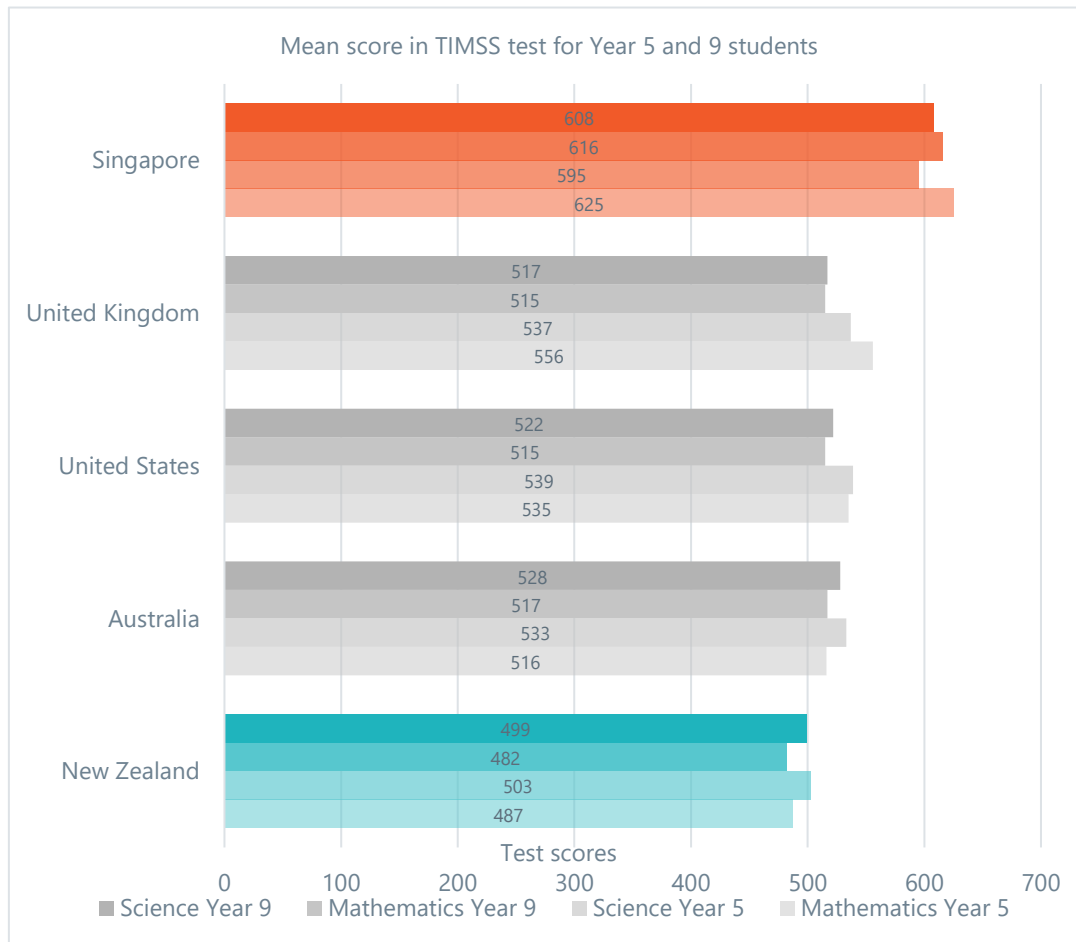
According to the findings in Trends in International Mathematics and Science Study (TIMSS), the maths and science test scores of New Zealand students has fallen by the largest margins in 2018/19.²¹³ This under-achievement is especially highlighted amongst 13 year olds where the lowest scores were recorded – 482 for maths and 499 for science. This is lower than other OECD countries like Australia and England, and a significant gap is seen with the best-performing nation, Singapore.²¹⁴ In response to this, the Royal Society has been commissioned to investigate how to best teach these subjects and improve results.²¹⁵

²¹³ RNZ, "NZ students record worst results in maths and science."

²¹⁴ Gerritsen, "Results in maths and science 'a worrying trend'."

²¹⁵ Cardwell, "Science educators raise concerns while Ministry of Education focuses on maths results."

Figure 14: Mean Mathematics and Science Achievement of Year 5 and 9 Students (2018/19)



6. How the Sector is Responding to What Might Come Next

6.1. Economic and Technological Transformation

The future of work is changing, driven by the machine economy where robotics and machine learning replace repetitive and programmable human tasks and artificial intelligence augments human roles.²¹⁶ What it takes for a graduate to be work-ready is evolving. Graduates are increasingly expected to step into more complex roles than in the past, as lower order jobs will be done by artificial intelligence.²¹⁷ An EY survey of more than 3000 students and employers and more than 50 university leaders and policy makers in Australia concluded that nearly half of existing degrees could be obsolete within a decade if they are not drastically overhauled. There are also reports that existing degrees are overly theoretical and have insufficient work-integrated learning.²¹⁸ Further, the increasing pace of technological change creates the need for upskilling in new areas, and more often throughout an individual's career.

Our education system and supporting infrastructure should ensure students are trained and developed in a way that prepares them for this changing world.²¹⁹ It is imperative that institutions are flexible and responsive to this change. Employer demand is changing and there needs to be a subsequent shift in the provision of education and training. With an increased pace of technological change, there is likely to be a trend towards un-bundling of lengthy degrees and qualifications with bite-sized chunks of learning and "nano-degrees" delivered flexibly and online. This will be essential to meet the needs of the in-work learner who will need to constantly up-skill throughout their career. Transferable skills that are relevant across sectors and technologies will also be increasingly important and a way for employees to signal to employers that they have the requisite skills in a rapidly changing job market.

²¹⁶ EY, *Can the universities of today lead learning for tomorrow?* 7.

²¹⁷ Ibid.

²¹⁸ EY, *Can the universities of today lead learning for tomorrow?* 4.

²¹⁹ New Zealand Productivity Commission, *New models of tertiary education*, 22.

Economic and technological transformation will mean that the capability and capacity of virtual learning technologies and the provision of flexible physical infrastructure that can accommodate new technologies and models of delivery will become increasingly important. Digital platforms that are shared across providers may allow for economies of scale. Education institutions should be prepared to evolve from faculty-centred to learner-centric institutions²²⁰ with COVID-19 speeding up the move to digital and online learning. The integration of technology and digitisation of content can help to improve the student experience as this can improve the ability to translate learnings, engage with others and interact with their teachers.²²¹

Universities will need to consider unbundling their degree programs as online courses have the potential to either completely or partially replace face-to-face lectures. Commoditised parts of the curriculum (those that require little personalisation) could be recorded and made available online for students to view at their convenience and at a cheaper cost. Resources can be re-allocated towards research-based teaching, which may require in-person facilitation. This blended delivery model could look to make education a more affordable option for students.²²² While this provides increased flexibility and accessibility, there is a shift in thinking and knowledge required as to how to provide quality learning experiences that meet learning outcomes through a web-based medium.²²³

The trend towards digital delivery presents both an opportunity and risk as providers need to attract students while staying on top of a disrupted medium.²²⁴ The shift to online delivery also means that it is less relevant where you reside but access to telecommunications infrastructure such as broadband and digital literacy is essential.

The Productivity Commission highlights the link between the demand for skills and the need for the education and training system to respond accordingly (see Figure 15). However, there is difficulty planning for the future given the uncertainties around the nature and speed of technological disruption that is likely to occur. The solution lies in creating a flexible system that can adapt to change effectively, which is a goal of the current reforms to the tertiary sector.

²²⁰ EY, *Can the universities of today lead learning for tomorrow?* 5.

²²¹ EY, *Can the universities of today lead learning for tomorrow?* 9.

²²² Govindarajan and Srivastava, "What the shift to virtual learning could mean for the future of higher education."

²²³ Whittaker, *Quality Online Teaching? Who's asking?* 19.

²²⁴ Education and Science Committee, *Briefing on the New Zealand Productivity Commission report: new models of tertiary education*, 3.

Figure 15: Demand and Supply for Education and Training



Source: The New Zealand Productivity Commission²²⁵

6.2. Shifting Demographics

New Zealand's demography – ethnicity, population size, age and place of residence – is changing. Ethnicities experiencing significant demographic change include Asian and Pacific communities. Statistics New Zealand predicts that by 2023 there will be more Asian people in New Zealand than Māori and by 2038, 22% of our population will be Asian.²²⁶ Pacific New Zealanders are becoming a bigger proportion of our workforce. Pacific peoples make up 7.4 percent of our population now and this is expected to rise to 10 percent by 2026 as currently one out of four new-born babies are of Pacific descent.²²⁷

This changing ethnic composition means that it will be important for our education system to address inequities of access across ethnic groups as these ethnic groups will become increasingly vital for the economic and social success of the country. Culturally sensitive education delivery and a system that supports and understands different cultures, knowledge bases, and languages is also critical as our nation becomes increasingly diverse. MoE recognises this and has numerous initiatives to foster success in diversity. These include various strategies and initiatives under the Education Work Programme²²⁸ as well as curriculum implementations²²⁹.

The New Zealand population is growing fast. Statistics NZ estimates that by 2030 there is a 90 percent probability of the population increasing to between 5.19 – 5.94 million and by 2048 to between 5.34 – 7.13 million (up from 5.09 million people as at 2020).²³⁰ This will likely result in pressure on our schooling system; capacity for an additional 100,000 students is expected in high-growth areas by 2030.²³¹

²²⁵ New Zealand Productivity Commission, *Training New Zealand's workforce*, 4.

²²⁶ The Treasury, *Human Capital and the Living Standards Framework*, 9.

²²⁷ Ibid.

²²⁸ Kōrero Mataurangi, "Education Work Programme Overview."

²²⁹ Te Kete Ipurangi (TKI), "Cultural diversity principle."

²³⁰ Stats NZ, "National population projections: 2020 (base) – 2073."

²³¹ Ministry of Education, "National Education Growth Plan."

Increased urbanisation will result in demand and supply imbalances with some schools strained, and others with excess capacity. Investment shifts will be required to address changing demand and supply moving forward. With that in mind, MoE is planning various school expansions, new schools, and redevelopments as part of the National Education Growth Plan – a \$1.2 billion investment in school property.^{232 233 234} Table 4 and Table 5 illustrate expected student population growth and the number of new schools, expansions, enrolment schemes and redevelopments required to meet the demands by the increase in student population.

Table 4: National Education Growth Plans (excluding Auckland)

	Student Places			New Schools	School Expansions	Potential Enrolment Schemes	New Redevelopments
	Low	High	Expected	Total	Total	Total	Total
To 2030	30,590	48,040	40,000	31	10	38	7

Table 5: Auckland Education Growth Plans

	Student Places			New Schools	School Expansions	Potential Enrolment Schemes	New Redevelopments
	Low	High	Expected	Total	Total	Total	Total
To 2030	17,255	63,866	60,000	30	21	103	2

Source: The Ministry of Education²³⁵

The \$1.2 billion investment in school property means that construction market capacity is a serious consideration as there are over 500 projects in the national infrastructure pipeline in the short-to-medium term totalling an estimated \$21.2 billion.²³⁶ This will place pressure on the construction sector and the ability to deliver all planned projects. Advanced planning and pipeline certainty will help ensure the market has capacity to deliver all projects and the centralisation of some asset management responsibilities away from individual Boards of Trustees to MoE will further increase the ability to deliver.

6.3. Internationalisation of the Tertiary Sector

6.3.1. International Education Sector

With all New Zealand universities ranking in the top 3% worldwide,²³⁷ New Zealand has been a popular destination for international students. In 2020 13% of tertiary learners (58,000 students) in New Zealand

²³² Ministry of Education, *National Education Growth Plan Auckland and Te Tai Tokerau*, 5.

²³³ National Infrastructure Unit, *Infrastructure Evidence Base 2015 Refresh*, 3.

²³⁴ Ministry of Education, "National Education Growth Plan."

²³⁵ Ministry of Education, *National Education Growth Plan Auckland and Te Tai Tokerau*.

²³⁶ New Zealand Government, "Budget Policy Statement".

²³⁷ Top Universities, "Worldwide university rankings, guides and events."

were international students.²³⁸ The significant proportion of international students is reflected in our export revenue statistics – international education was the fifth largest source of export revenue in New Zealand and contributed \$5.0 billion to the New Zealand economy in 2019 (around \$1.1 billion came from student fees).²³⁹

COVID-19 has heavily affected the international education sector given periodic closures of our campuses in response to lockdown measures, border restrictions and as students grow wary of studying abroad. It has disrupted the “continuity of learning and delivery of course material, the safety and legal status of international students in their host countries, and students’ perception of the value of their degree”.²⁴⁰ The financial implications of COVID-19 have been significant with estimates that education providers have missed out on around \$600 million in fees in 2020.²⁴¹ A significant decrease in student volumes and international revenue is likely to continue if borders remain closed.

As well as financial implications, there will be social effects if borders are to remain closed as New Zealand has relied on international student migration to facilitate innovation and research. Further, international student mobility is important for “generating jobs, growing the local economy, attracting skilled talent to New Zealand, enriching and supporting the domestic education system, providing educational opportunities for New Zealanders, supporting New Zealand’s diplomatic outreach and increasing the cultural competency of New Zealanders.”²⁴²

The future net impacts of COVID-19 are uncertain. Moving forward, students may be more hesitant to cross borders and invest in an international education. External competition will continue to increase as more universities compete for international students. However, New Zealand may prove to be an attractive destination for international students as we are positioned to have a quicker rate of recovery from the pandemic.²⁴³ With increasing digitisation of education delivery, New Zealand has the opportunity to provide online offerings to international students. Further, providers may need to shift the strategic focus of international education from a “revenue generating export industry focused on attracting high volumes of students, to one that focuses on the quality of education, higher value students and markets, incorporates domestic students and global competencies, and contributes to economic, social, and cultural benefits for New Zealand.”²⁴⁴

6.3.2. International Market for Education

The digitisation of education and shift to online learning platforms – accelerated by COVID-19 – means that individuals can increasingly study anywhere in the world. Ivy-league universities are increasingly providing learning offerings that are accessible to remote learners regardless of where they reside. The rise of Udacity and Singularity University in the US – one of which offers “nanodegrees powered by leaders in industry” and the other focused on scientific progress and exponential technologies – signals the impending disruption to the education market.²⁴⁵ This disruption to the education system gives New Zealand education providers the opportunity to review their current business models and find ways to supply more responsive and flexible offerings that deliver high quality learning experiences for students so that they can compete in an increasingly international education market. Our tertiary providers including universities will need to expand into new markets and services and foster closer links

²³⁸ Tertiary Education Commission, *Annual Report 2020*, 60.

²³⁹ Office of the Minister of Education, *Cabinet Paper release: A strategic recovery plan for the international education sector*, 1.

²⁴⁰ OECD, *The impact of COVID-19 on education: Insights from education at a glance 2020*, 9.

²⁴¹ Office of the Minister of Education, *Cabinet Paper release: A strategic recovery plan for the international education sector*, 1.

²⁴² Office of the Minister of Education, *Cabinet Paper release: A strategic recovery plan for the international education sector*, 5.

²⁴³ Gerritsen, “NZ international student sector: More focus on quality education than work rights – Cabinet papers.”

²⁴⁴ Office of the Minister of Education, *Cabinet Paper release: A strategic recovery plan for the international education sector*, 3.

²⁴⁵ EY, *Can the universities of today lead learning for tomorrow?* page 4.

with industry to compete against a range of local and global education service providers. Te Pūkenga has been established, in part, as a response to the future of work and is tasked with accelerating the development of new, innovative ways of delivering learning more suited to a post-COVID environment (such as micro-credentials). The shift to online learning and an international qualification market will also require New Zealand to understand the needs of an international student population that may be less willing to cross borders for the sole purpose of study²⁴⁶ and position its offerings accordingly. Further, in an international education market, where the country in which you reside becomes less important, New Zealand will need to consider how it will attract suitably qualified staff especially in highly specialised skills areas.

Internationalisation of the tertiary sector.

Policy Implication

With the digitisation of education, tertiary education is increasingly becoming an international market. A policy and regulatory setting that enables the digitisation of education, re-bundling of traditional degree programmes and other new models of delivery (such as micro-credentials, nano-degrees, online delivery and inter-disciplinary learning) will be important.

6.4. Sustainability and Flexibility of Physical Assets

6.4.1. Sustainability

The sustainability of our physical assets in the Education Sector will become increasingly important as New Zealand transitions to a carbon neutral, climate resilient world. Students (and teachers) find themselves spending time in schools “that are too often unhealthy, restrict their ability to learn, require unsustainable amounts of resources to construct and maintain, and contribute substantially to environmental problems such as pollution and climate change.”²⁴⁷ Further, by constructing schools that are more energy efficient and environmentally conscious, the buildings can become interactive learning resources for students.

In response to climate change, MoE has encouraged all new schools to follow the New Zealand Green Building Council’s Green Star Education 5-Star Standard with schools expected to incorporate environmentally sustainable principles in the design and construction phase. The Green Star – Education v3 Design and Built rating tool is used by MoE to allocate funding as well as measure the sustainability credentials and energy efficiency of the new buildings. Environmental factors such as energy and water use, materials, indoor environment quality, land use and ecology, emissions, transport, and building management are considered when schools are either being built or refurbished.²⁴⁸

Research suggests that incorporating sustainable design in school buildings increases students’ achievement and the retention rates of teachers.²⁴⁹ Students are more engaged with their education and perform more highly in green schools, which have been purpose built for today’s learning and teaching model. Teachers also become more satisfied when they can work in a healthier environment provided by green schools. Further, it has been shown that green schools on average consume 32 percent less water and 33 percent less energy than conventionally designed schools due to increased operational efficiency.²⁵⁰

²⁴⁶ OECD, *The impact of COVID-19 on education: Insights from education at a glance 2020*, 11.

²⁴⁷ Center for Ecoliteracy, “Green School Design: Better for Health and Education... and more cost-effective.”

²⁴⁸ Education Central, “Sustainable schools, but at what cost?”

²⁴⁹ New Zealand Green Building Council, *Green Star Schools Handbook*, 3-4.

²⁵⁰ New Zealand Green Building Council, *Green Star Schools Handbook*, 4.

Case study: Kimi Ora School in Wellington, New Zealand

Kimi Ora School in Wellington is a specialist school catering for students aged between 5 to 21 years with high-needs and physical disabilities. It is the first education building in Wellington to obtain a 5 Green Star – Education Design and Built certified rating in New Zealand. Green policies were implemented throughout the building process resulting in an energy-efficient building. A key standout feature was the school's numerous building attributes that worked as learning resources for its students.²⁵¹

7 Sustainability of design.

Policy Implication

The MoE incorporates environmentally sustainable principles into the design and construction of state school infrastructure and provides support for schools to be environmentally sustainable in the operation of schools with the intention of reducing energy consumption and minimising waste.

6.4.2. Flexibility

Future-proofing Buildings for the Accessibility of all Learners

The physical environment in schooling buildings should be innovative and inclusive where all students are supported so they can meet their individual needs both socially and educationally.

Most learners with learning support needs (such as those with physical/sensory/cognitive disabilities) currently attend regular schools instead of one of the 28 specialist schools in New Zealand. Since impairments can vary in duration, severity and impact, the support learners require can range from minimal to highly intensive. It is therefore important that, through the school property reform, the design and functionality of properties is maintained to minimise any potential accessibility issues for students with higher needs.²⁵² The availability of assistive technology (specialised computers, classroom hearing or vision tools) can also allow for students' greater participation in education.

Accessibility to education cannot be provided solely by a school's physical infrastructure but should be complemented by accessible teaching methods and classroom practices.

Figure 16: Accessibility for all Learners



Importance of Flexible Learning Spaces

More schools are embracing the use of flexible learning spaces (either by purpose building them or remodelling existing buildings) to support a wider range of teaching strategies. This also helps to facilitate collaborative teaching, leading to improved student achievement outcomes.²⁵³ When new projects are planned, MoE works with respective schools to ensure designs are able to support their

²⁵¹ Maycroft Construction + Management, "Kimi Ora School, NaeNae."

²⁵² Office of the Minister of Education, "Cabinet Paper release: Towards a Comprehensive Reform of School Property."

²⁵³ Ministry of Education, *Designing schools in New Zealand*, 33.

vision for teaching and learning and it is sufficiently flexible for future repurposing. This acknowledges the diverse range of students' needs and gives them more control over their learning as they are able to choose where they work and what furniture and resources they require instead of conforming to the traditional methods of learning.²⁵⁴ This encourages independence among learners and the curriculum becomes more student driven which supports holistic development.

Flexibility of physical capital is a highly important factor when considering education infrastructure design because physical capital cannot flex easily with demographic shifts (for example, from rural to urban). Flexible learning spaces such as modular classrooms are one solution to this issue enabling new learning spaces to be operational in as little as 6 months from project initiation.²⁵⁵

Flexible learning spaces also have the added benefit of being able to be reconfigured, to allocate the space differently. This can enable schools to respond to current needs and adapt to future needs including the sustainability challenges outlined in Section 6.4.1.

Case study: Ngatea Primary School

At Ngatea Primary School, flexible learning spaces (FLS) were implemented for Years 7 and 8 alongside personalised timetables, a learner-led curriculum and physical barriers between classrooms removed to create a mix of single-cell classrooms and collaborative spaces. Different spaces such as quiet zones, zones for teacher-led activities and zones to allow groups to collaborate were created. This gives students control over learning to use a FLS in different ways depending on their needs and helps to improve student behaviour.²⁵⁶

8 Flexibility of physical assets

Policy Implication

Designing/repurposing of learning spaces so that they are flexible and accessible to create a supportive and collaborative learning environment for all learners is an investment in supporting pedagogy.

²⁵⁴ Education Review Office, *Leading Innovative Learning in New Zealand Schools*, 15.

²⁵⁵ Ministry of Education, "Modular buildings for new spaces at schools".

²⁵⁶ Education Review Office, *Leading Innovative Learning in New Zealand Schools*, 32-33.

7. Conclusions

The Education Sector is on the cusp of significant economic and technological disruption. Given the Sector's contribution to future economic prosperity and overall well-being of New Zealanders, it is critical that the New Zealand education system responds in a way that exploits these emerging opportunities and prepares New Zealand for the future of work.

Infrastructure – our buildings, classrooms, laboratories, technologies and equipment– has a clear role in contributing to the quality of our education services and enabling a strategic response to these emerging trends. New Zealand needs high quality, flexible, fit for purpose infrastructure if it is to have a high performing education system that is responsive to the needs of its learners and their employers.

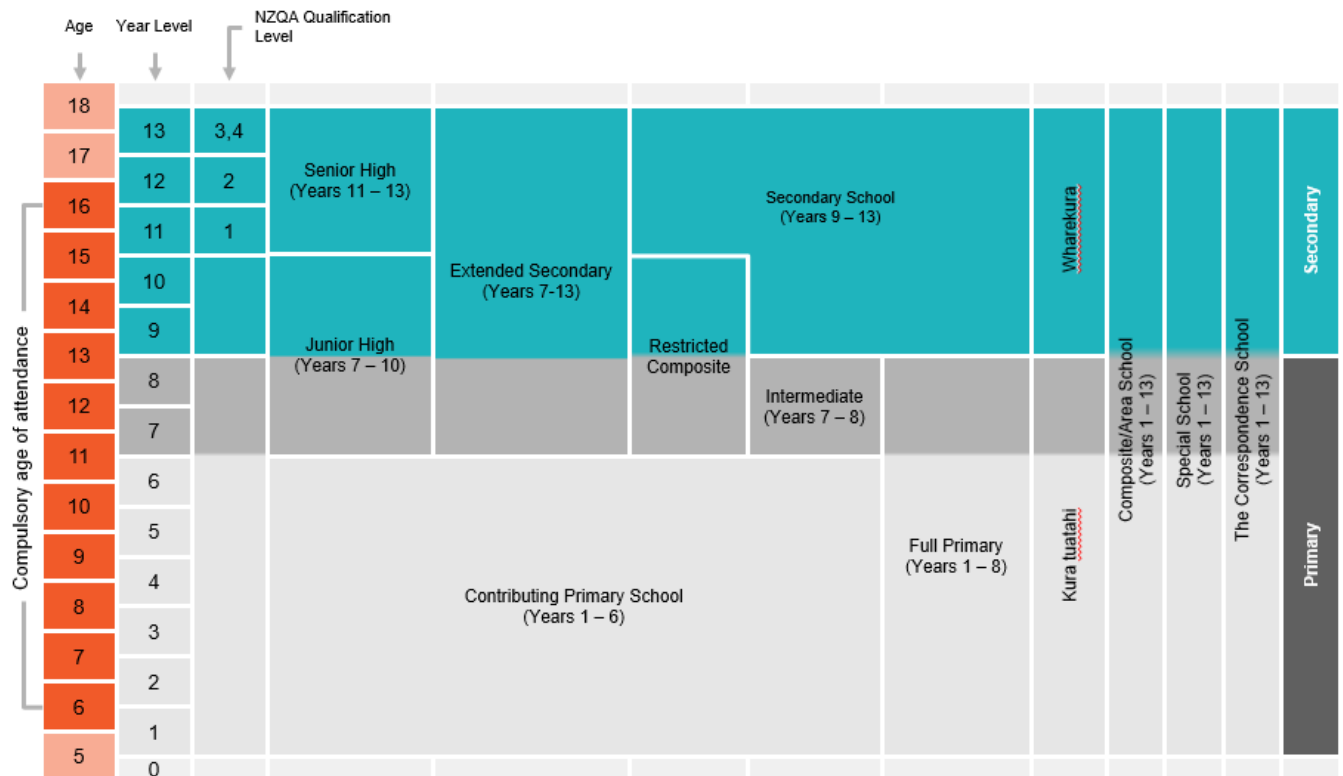
While New Zealand historically has performed well on many educational outcome indicators, there have been notable recent declines in achievement (especially within mathematics and science areas) and we continue to have significant and persistent disparities in attainment and education outcomes for certain groups such as Māori, Pasifika and learners with disabilities. New Zealand cannot afford to leave these learners behind as they are expected to become an increasing proportion of the workforce. Our education sector, and its supporting infrastructure, needs to adapt to reflect an increasingly diverse population and honour the principles of the Te Tiriti o Waitangi. Recent Government initiatives and reforms (including the Reset of Tomorrow's Schools reform in late 2019 and the Review of Vocational Education) are steps towards an education system that gives effect to Te Tiriti o Waitangi, caters for increasingly diverse needs and responds to looming trends such as the digitisation of education delivery. These reforms are underpinned by a shift towards a national, system wide approach to infrastructure investment.

Appendix A. Glossary

Acronym	Definition
10YPP	10 Year Property Plan
5YA	5 Year Agreement funding
CPAG	Child Poverty Action Group
ECE	Early Childhood Education
EIS	Education Infrastructure Service
ERO	The Education Review Office
FLS	Flexible learning spaces
GDP	Gross Domestic Product
ICT	Information and Communication Technology
ITO	Industry Training Organisation
ITP	Institutes of Technology and Polytechnics
LSF	Living Standards Framework
MBIE	Ministry of Business, Innovation and Employment
MoE	Ministry of Education
N4L	Network for Learning
NZQA	New Zealand Qualifications Authority
NZUP	New Zealand Upgrade Programme
OECD	Organisation for Economic Co-operation and Development
PLD	Professional Learning and Development
PTE	Private Training Establishment
RoVE	Reform of Vocational Education
SNUP	School Network Upgrade Project
TEC	Tertiary Education Commission
TEO	Tertiary Education Organisations
TIMSS	Trends in International Mathematics and Science Study
TITO	Transitional Industry Training Organisation
UFB	Ultra-fast Broadband
UNICEF	United Nations International Children's Emergency Fund

Appendix B. Overview of the New Zealand School System

Figure 17: Overview of the School System for Young People of Compulsory School/Kura Attendance Age²⁵⁷



²⁵⁷ Education Counts, Summary Report: Results from the Teacher Demand and Supply Planning Tool - November 2020.

Appendix C. New Zealand Cognitive Skills and Educational Attainment Over Time

Figure 18: Assessment of Cognitive Skills at Age 15 using Programme for International Student Assessment (PISA) Scores

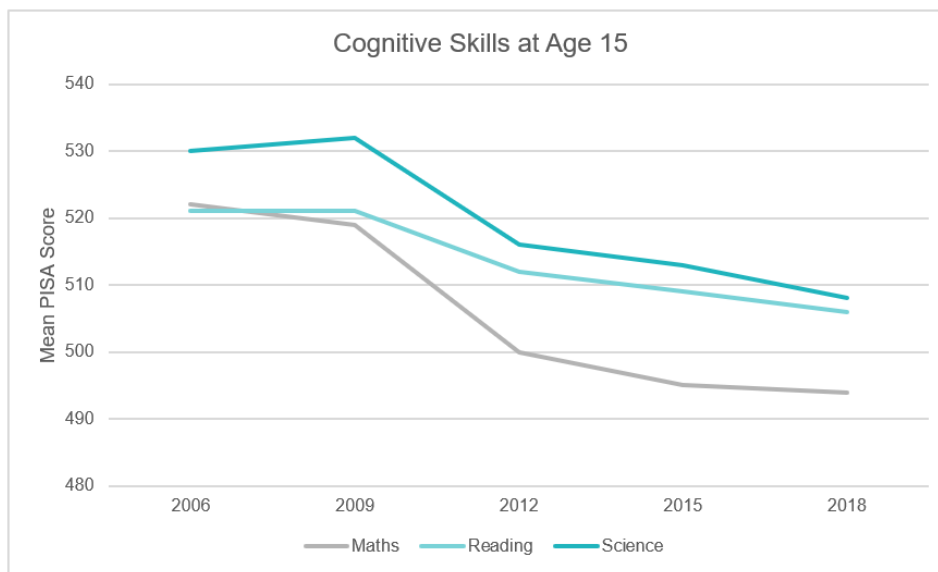
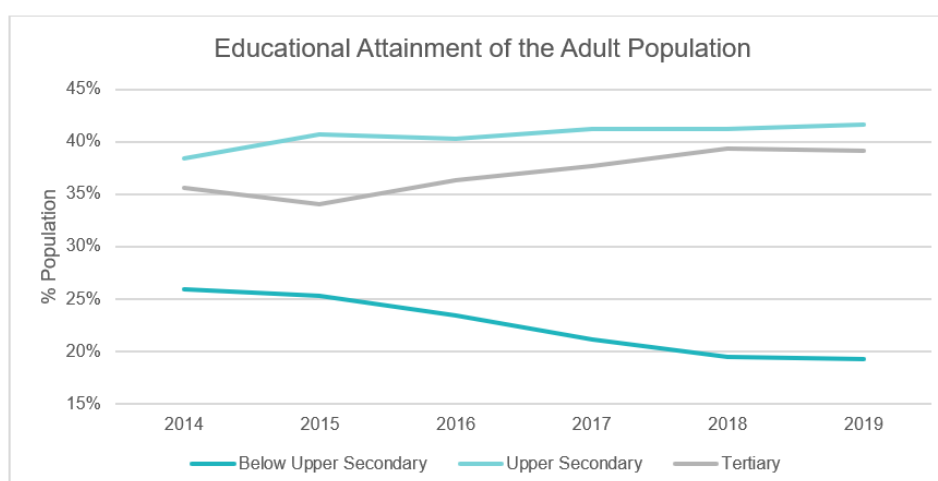


Figure 19: Upper Secondary (NCEA Level 2 equivalent) and Tertiary (Bachelor's Degree) Attainment for Adults Aged 25 – 64 years²⁵⁸



²⁵⁸ OECD, "Adult education level."

Appendix D. OECD Comparisons – Educational Attainment and Cognitive Skills

Figure 20: Cognitive Skills at Age 15

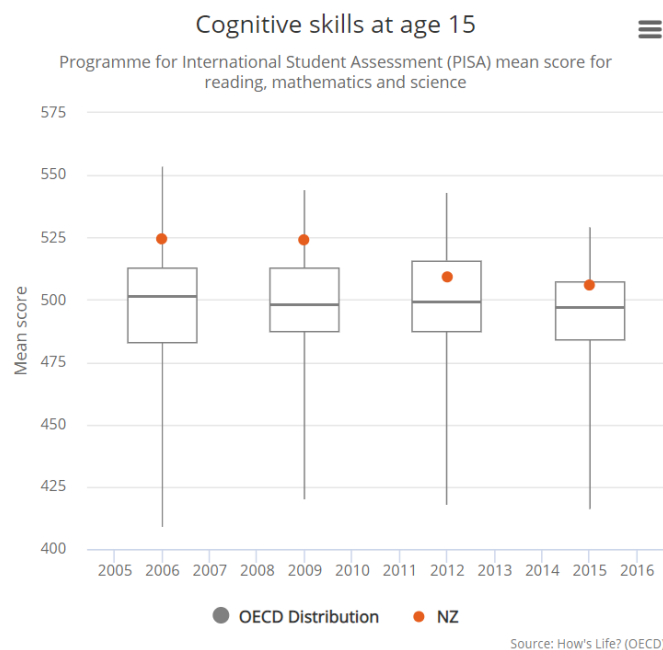
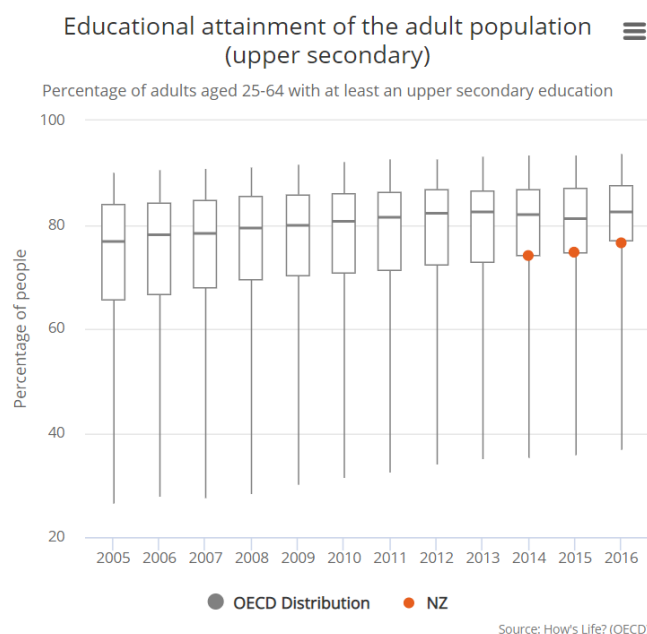
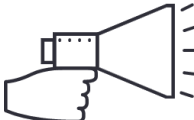


Figure 21: Educational Attainment of the Adult Population (Upper Secondary)



Appendix E. LSF Wellbeing Domains and Indicators

Domain	Description	Indicators
Civic Engagement & Governance 	Aims to measure people's engagement with governance, how "good" New Zealand's governance is perceived to be, and the procedural fairness of our society.	• Perceived corruption • Trust in government institutions • Voter turnout
Cultural Identity 	Aims to measure whether people have a strong sense of identity, belonging and ability to be oneself, and the value of cultural taonga.	• Ability to express identity • Te Reo Māori speakers
Environment 	Aims to measure how the natural and physical environment impacts on people's current levels of wellbeing.	• Access to the natural environment • Air quality • Perceived environmental • Water quality (swim ability)
Health 	Aims to measure indicators of both mental and physical health.	• Health status • Healthy life expectancy • Mental health • Suicide rate
Housing 	Aims to measure the quality, sustainability, and affordability of the homes we live in.	• Household crowding • Housing cost • Housing quality
Income and Consumption 	Aims to measure disposable income, how much people spend, and how many material possessions they have.	• Child poverty - material hardship • Consumption • Disposable income • Financial wellbeing • Household net worth
Jobs and Earnings 	Aims to measure the quality of people's jobs, work environment, ease of finding suitable employment and freedom from underemployment.	• Employment rate • Hourly earnings • Unemployment rate • Youth NEET rate

Domain	Description	Indicators
Knowledge and Skills 	Aims to measure indicators of educational performance and qualifications.	• Cognitive skills at age 15 • Educational attainment of the adult population (tertiary) • Educational attainment of the adult population (upper secondary)
Safety 	Aims to measure indicators of people's safety and security (real and perceived) from domestic, other violent crime, and safety in the workplace.	• Domestic violence • Feeling safe • Intentional homicide rate • Workplace accident rate
Social Connections 	Aims to measure indicators around positive social contacts and support networks.	• Discrimination • Loneliness • Māori connection to marae • Social network support
Subjective Wellbeing 	Aims to measure overall life satisfaction and sense of meaning and self.	• Family wellbeing • General life satisfaction • Sense of purpose in one's life
Time Use 	Aims to measure the quality and quantity of people's leisure and recreation time.	• Leisure and personal care • Paid work • Satisfaction with work-life balance • Unpaid work

Appendix F. Key changes in the Education and Training Act 2020

ECE sector	→	Additional requirements to be met before establishing services	ERO can require providers to present their governance and management practices
		All adults that live in a home where ECE service is provided must undergo police vetting	ERO can enter a home where home-based early learning is being provided
Compulsory schooling	→	All enrolled students have the right to attend school when it is open, including those with learning support needs and disabilities	Appoint a staff member to be a representative on the Board of Te Kura (the Correspondence School)
		Establishment of local complaint and dispute resolution panels	Transfer responsibility of developing enrolment schemes from school boards to MoE
		Set eligibility criteria for principal appointments and regulate teaching profession	School boards to give effect to Te Tiriti o Waitangi through policies and local curriculum
ECE sector	→	Additional requirements to be met before establishing services	ERO can require providers to present their governance and management practices
		All adults that live in a home where ECE service is provided must undergo police vetting	ERO can enter a home where home-based early learning is being provided
Compulsory schooling	→	All enrolled students have the right to attend school when it is open, including those with learning support needs and disabilities	Appoint a staff member to be a representative on the Board of Te Kura (the Correspondence School)
		Establishment of local complaint and dispute resolution panels	Transfer responsibility of developing enrolment schemes from school boards to MoE
		Set eligibility criteria for principal appointments and regulate teaching profession	School boards to give effect to Te Tiriti o Waitangi through policies and local curriculum

Appendix G. OECD comparisons on expenditure, educational attainment and progression and completion

Figure 22: Investment in Education as a Percentage of GDP (2017)

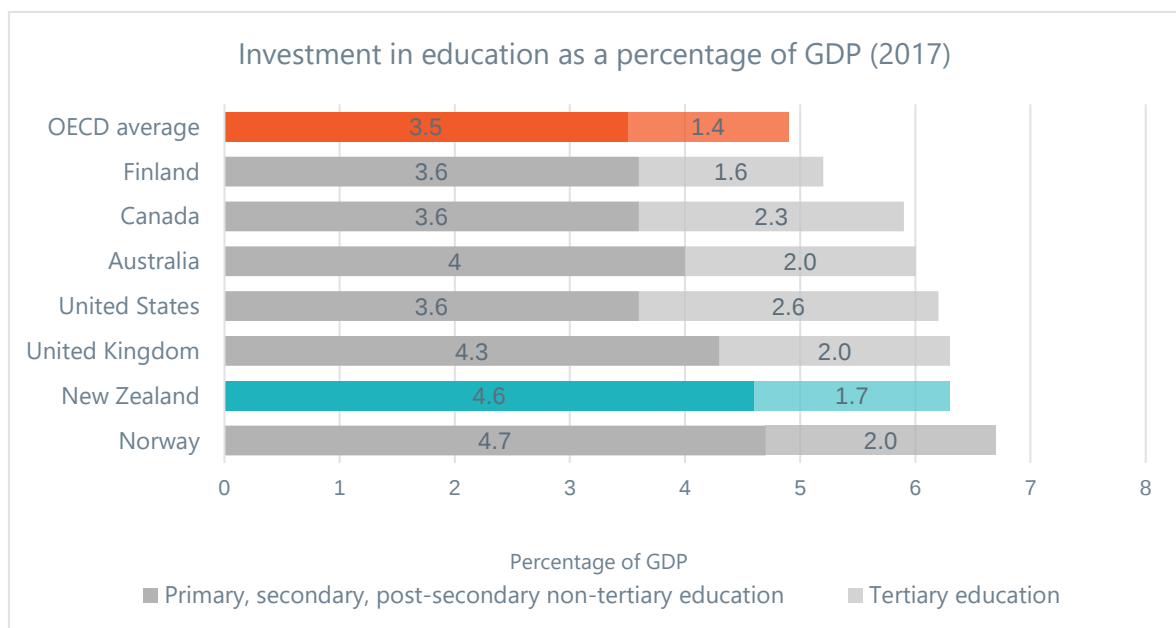


Figure 23: Educational Attainment of 25-34-year-olds (2019)

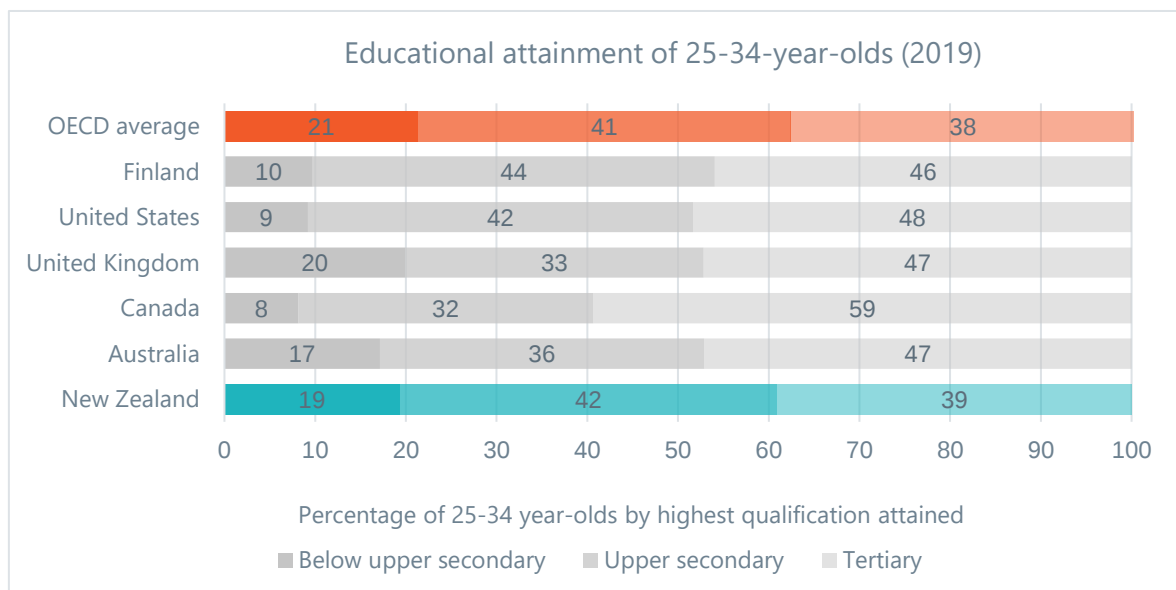


Figure 24: Proportion of Children Enrolled in Formal ECE Settings

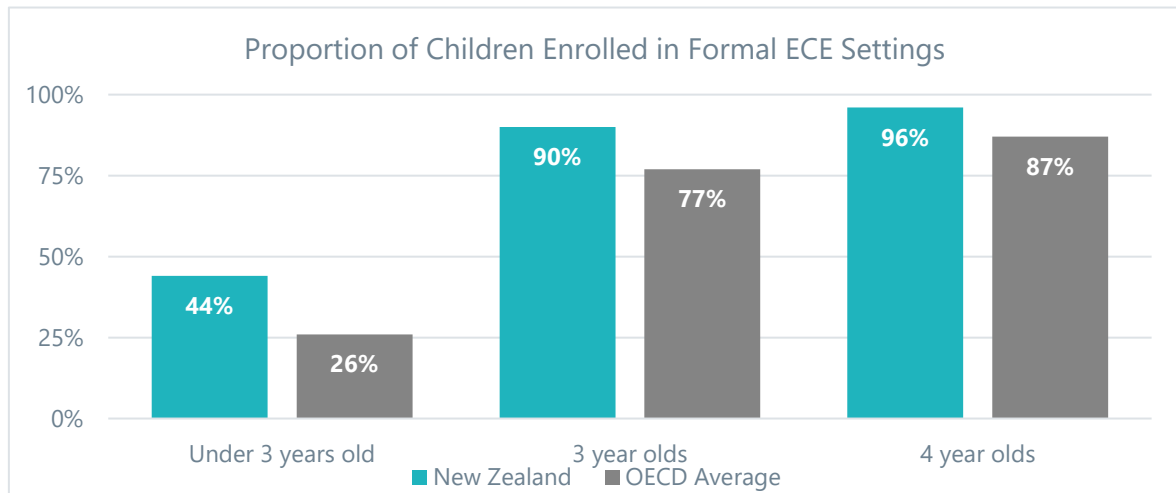
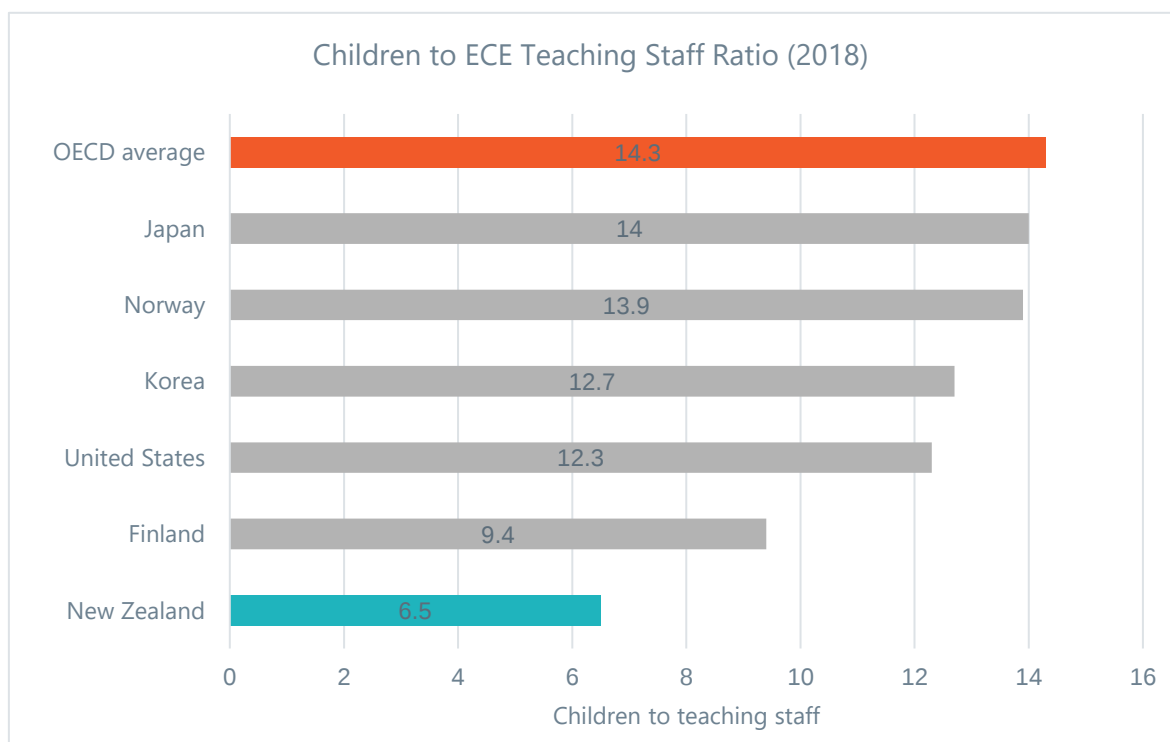


Figure 25: Children to ECE Teaching Staff Ratio (2018)



Appendix H. Process, Assumptions and Limitations

H. 1. Our Process

This State of Play was developed between December 2020 and March 2021 drawing on publicly available information. Key data sources included:

- Ministry of Education
- Tertiary Education Commission
- New Zealand Productivity Commission
- Te Rautaki Rawa Kura - The School Property Strategy 2030
- Reform of the Tomorrow's Schools system
- Learning Support Action Plan 2019-2025
- CPAG: Privatisation and early childhood education in Aotearoa New Zealand (2020)
- OECD Education at a Glance (key indicators).

A full list of all literature cited can be found in the reference list (Appendix I).

On completion of the initial draft, we also met with individuals from a range of organisations across the sector to get their views on a high-level summary of our findings, and to understand their thoughts on current challenges. A draft of the complete report was peer reviewed by Te Waihanga's Board and by a sector expert.

H. 2. Limitations

While every effort is made to ensure the accuracy of the information contained herein, Te Waihanga, its officers, employees and agents accept no liability for any errors or omissions or any opinion expressed, and no responsibility is accepted with respect to the standing of any firms, companies or individuals mentioned. Te Waihanga reserves the right to reuse any general market information contained in its reports.

Appendix I. Bibliography

- Alliston, Louise. *The government's changing role in the governance of New Zealand's schools since 1847*. Wellington: Parliamentary Service, 2019. <https://www.parliament.nz/media/6157/school-administration-research-paper.pdf>
- BERL, Waikato-Tainui, The Southern Initiative and Tokona te Taki, *He Awa Ara Rau: A Journey of Many Paths*. BERL, Waikato-Tainui, The Southern Initiative and Tokona te Taki, He Awa Ara Rau. <http://www.maorifutures.co.nz/wp-content/uploads/2020/08/He-Awa-Ara-Rau-A-Journey-of-Many-Paths-Nov-2019.pdf>
- Cardwell, Hamish. "Science educators raise concerns while Ministry of Education focuses on maths results." *RNZ*, February 3, 2021. <https://www.rnz.co.nz/news/national/435703/science-educators-raise-concerns-while-ministry-of-education-focuses-on-maths-results>
- Centre for Ecoliteracy. "Green School Design: Better for Health and Education... and more cost-effective." Accessed February 11, 2021. <https://www.ecoliteracy.org/article/green-school-design-better-health-and-educationand-more-cost-effective>
- Child Poverty Action Group, *Investing in children? Privatisation and early childhood education in Aotearoa New Zealand*. Auckland: Child Poverty Action Group, 2020. <https://www.cpag.org.nz/assets/Backgrounders/CPAG%20Backgrounder%20-%20Privatisation%20and%20early%20childhood%20education%20in%20Aotearoa%20New%20Zealand%20.pdf>
- Chumko, Andre. "Coronavirus: Ministry connects 18,000 households to internet, but many still without" *Stuff*, May 8, 2020. <https://www.stuff.co.nz/national/health/coronavirus/121459835/coronavirus-ministry-connects-18000-households-to-internet-but-many-still-without>
- Controller and Auditor-General. *Investing in tertiary education assets*. Wellington: Office of the Auditor-General, 2017. <https://oag.parliament.nz/2017/tei-assets/docs/tei-assets.pdf>
- Controller and Auditor-General. "The school property portfolio." Accessed February 11, 2021. <https://oag.parliament.nz/2017/school-property/part2.htm>
- Collins, Simons. "Manukau Institute of Technology to build a new \$55m trade training school." *NZ Herald*, April 5, 2019. <https://www.nzherald.co.nz/nz/manukau-institute-of-technology-to-build-new-55m-trade-training-school/HEXPCQ6WZ7LCSJGUPNRCJITRLU/>
- Cooke, Henry. "School decile funding system will be scrapped by 2021 or 2022." *Stuff*, September 24, 2019. <https://www.stuff.co.nz/national/politics/116049946/school-decile-funding-system-will-be-scrapped-by-2021-or-2022>

- Davis, Kelvin Hons. "Wellbeing Budget recognises the importance of Kōhanga Reo." Accessed February 11, 2021. <https://www.beehive.govt.nz/release/wellbeing-budget-recognises-importance-k%C5%8Dhanga-reo>
- Education Central. "Opinion: Susan Bates - our kids are not getting enough space in childcare." Education Central. Accessed February 11, 2021. <https://educationcentral.co.nz/susan-bates-our-kids-are-not-getting-enough-space-in-childcare/>
- Education and Science Committee. *Briefing on the New Zealand Productivity Commission report: new models of tertiary education*. Wellington: New Zealand Parliament, 2017. https://www.parliament.nz/resource/en-NZ/SCR_74394/1a63f69695b7a6bc1446649dfc0ecb9196e96684
- Education Central. "How our teacher shortage affects everyone." Accessed February 11, 2021. <https://educationcentral.co.nz/how-our-teacher-shortage-affects-everyone/>
- Education Central. "Sustainable schools, but at what cost?" Accessed February 11, 2021. <https://educationcentral.co.nz/sustainable-schools-but-at-what-cost/>
- Education Counts. "Participation in Early Childhood Education". Ministry of Education. Accessed February 11, 2021. <https://www.educationcounts.govt.nz/indicators/main/student-engagement-participation/1923>
- Education Counts. *Summary Report: Results from the Teacher Demand and Supply Planning Tool - November 2020*. Ministry of Education: Wellington, 2020. https://www.educationcounts.govt.nz/data/assets/pdf_file/0005/203675/Summary-report-TDS-November-2020.pdf
- Education Review Office. "About ERO." Education Review Office. Accessed February 11, 2021. <https://www.ero.govt.nz/footer-upper/about-ero/>
- Education Review Office. *Early Learning Curriculum: What's important and what works*. Education Review Office: Wellington, 2016. <https://www.ero.govt.nz/assets/Uploads/ERO-Early-Learning-Curriculum-WEB.pdf>
- Education Review Office. *It's early days for the new digital technologies curriculum content*. Wellington: New Zealand Government, 2019. <https://www.ero.govt.nz/assets/Uploads/Its-early-days-for-the-new-digital-technologies-curriculum-content.pdf>

- Education Review Office. *Leading Innovative Learning in New Zealand Schools*. Wellington: Education Review Office, 2018. <https://www.ero.govt.nz/assets/Uploads/Leading-Innovative-Learning-in-Schools.pdf>
- Education Review Office. *Te Ara Poutama indicators of quality for early childhood education: what matters most*. Education Review Office: Wellington, 2020. <https://moeshared.cwp.govt.nz/assets/Uploads/Te-Ara-Poutama-Indicators-of-quality-full-document.pdf>
- Establish. *Child's Play*. New Zealand: Establish, n.d. https://establish.co.nz/assets/file_5a1b7c11ba760-1.pdf
- EY. *Can the universities of today lead learning for tomorrow?*. Australia: EY, 2020. <https://inventorium.com.au/wp-content/uploads/2020/06/EY-university-of-the-future-2030-1.pdf>
- Gerritsen, John. "Ministry forecasts end to primary teacher shortage, but problems in secondary schools." *RNZ*, November 12, 2020. <https://www.rnz.co.nz/news/national/430438/ministry-forecasts-end-to-primary-teacher-shortage-but-problems-in-secondary-schools#:~:text=It%20said%20latest%20figures%20indicated,an%20improvement%20on%20previous%20forecasts>.
- Gerritsen, John. "New NZ digital curriculum set for 2020, are schools ready?" *RNZ*, August 5, 2019. <https://www.rnz.co.nz/news/national/395986/new-nz-digital-curriculum-set-for-2020-are-schools-ready>
- Gerritsen, John. "NZ international student sector: More focus on quality education than work rights - Cabinet papers." *RNZ*, August 4, 2020. <https://www.rnz.co.nz/news/national/422694/nz-international-student-sector-more-focus-on-quality-education-than-work-rights-cabinet-papers>
- Gerritsen, John. "Poor results for Māori, Pasifika lead to funding cuts for education providers." *RNZ*, August 13, 2019. <https://www.rnz.co.nz/news/national/396560/poor-results-for-maori-pasifika-lead-to-funding-cuts-for-education-providers>
- Gerritsen, John. "Results in maths and science 'a worrying trend'." *RNZ*, December 9, 2020. <https://www.rnz.co.nz/news/national/432516/results-in-maths-and-science-a-worrying-trend>
- Gerritsen, John. "Tertiary institutions miss Māori and Pasifika targets." *RNZ*, February 21, 2017. <https://www.rnz.co.nz/news/national/325026/tertiary-institutions-miss-maori-and-pasifika-targets>
- Goldin, C. "Human Capital." *Handbook of Cliometrics*, (2016): 55-86. doi: 10.1007/978-3-642-40406-1_23

- Govindarajan, Vijay and Anup Srivastava. "What the shift to virtual learning could mean for the future of higher education." *Harvard Business Review*, March 31, 2020. <https://hbr.org/2020/03/what-the-shift-to-virtual-learning-could-mean-for-the-future-of-higher-ed>
- Hillmarè Schulze, "The future Māori workforce – Part three." BERL, October 19, 2021. <https://berl.co.nz/our-mahi/future-maori-workforce-part-three>
- Hipkins, Chris Hons. "Bill has biggest education changes in decades." Accessed February 11, 2021. <https://www.beehive.govt.nz/release/bill-has-biggest-education-changes-decades>
- Hipkins, Chris Hons. "School infrastructure upgrades ramping up." Accessed February 11, 2021. <https://www.beehive.govt.nz/release/school-infrastructure-upgrades-ramping>
- Hipkins, Chris Hon. "More support for schools to reduce energy consumption and environmental impact." Beehive.govt.nz. Accessed February 11, 2021. <https://www.beehive.govt.nz/release/more-support-schools-reduce-energy-consumption-and-environmental-impact>
- Hipkins, Chris Hon and Hon Tracey Martin. "Pay increases for lowest paid teachers." Accessed February 11, 2021. <https://www.beehive.govt.nz/release/pay-increases-lowest-paid-teachers>
- Hurihanganui, Te Aniwha. "Budget funding increase for kōhanga reo to help retain staff, kaiako says." *NZ Herald*, May 15, 2020. <https://www.rnz.co.nz/news/te-manu-korihi/416696/budget-funding-increase-for-kohanga-reo-to-help-retain-staff-kaiako-says>
- Immigration New Zealand. "Preschool care and education." New Zealand Now. Accessed February 11, 2021. <https://www.newzealandnow.govt.nz/living-in-nz/education/childcare-preschool>
- Immigration New Zealand. "The school system." New Zealand Now. Accessed February 11, 2021. <https://www.newzealandnow.govt.nz/living-in-nz/education/school-system>
- Independent Schools of New Zealand. "Government funding realities." Independent Schools of New Zealand. Accessed February 11, 2021. <https://www.isnz.org.nz/about-us/debunking-the-myths/government-funding-misconceptions/>
- Karippon, Katharina, Dylan P. Cliff, Sarah J. Lancaster, Anthony D. Okley, Anne-Maree Parrish. "Flexible learning spaces facilitate interaction, collaboration and behavioural engagement in secondary school." *PLOS ONE* 14, no. 10 (2019): [page range](https://doi.org/10.1371/journal.pone.0223607). <https://doi.org/10.1371/journal.pone.0223607>
- Kaye, Nikki. "School Network Upgrade Project completed." Beehive.govt.nz. Accessed February 11, 2021. <https://www.beehive.govt.nz/release/school-network-upgrade-project-completed>

Kōrero Mātauranga. "Early learning action plan 2019-2029." Accessed February 11, 2021.
https://conversation-space.s3-ap-southeast-2.amazonaws.com/SES_0342_ELS_10YP_Final+Report_Web.pdf

Kōrero Mataurangi, "Education Work Programme Overview." Accessed February 11, 2021.
<https://conversation.education.govt.nz/about/>

Kōrero Mātauranga. "Let's talk about education". Accessed February 11, 2021.
<https://conversation.education.govt.nz/>

Makhlouf, Gabriel. "Social Capital and the Living Standards Framework." Speech presented at University of Auckland, March 27, 2018. <https://www.treasury.govt.nz/sites/default/files/2018-03/sp-social-capital-lsf-27mar18.pdf>

Maycroft Construction + Management. "Kimi Ora School, NaeNae." Accessed February 11, 2021.
<https://www.maycroft.co.nz/projects/kimi-ora-school-naenae/>

Meehan, Lisa., Gail Pacheco and Zoe Pushon. *Explaining ethnic disparities in bachelor's qualifications: participation, retention and completion in NZ*. New Zealand Productivity Commission and AUT University: Auckland, 2017. https://workresearch.aut.ac.nz/_data/assets/pdf_file/0006/65733/Ethnic-disparities-in-bach-quals.pdf

Ministry of Education. *Annual Report 2020*. Ministry of Education: Wellington, 2020.
<https://www.education.govt.nz/assets/Documents/Ministry/Publications/Annual-Reports/2020/2020-MOE-Annual-Report-with-Erratum-FINAL-WEB.pdf>

Ministry of Education. "Budget 2020: 100% funding band restored for early learning." Accessed February 11, 2021. <https://www.education.govt.nz/news/budget-2020-100-funding-band-restored/>

Ministry of Education. "Cabinet paper: National Education Growth Plan to 2030." Accessed April, 4 2021.
<https://www.education.govt.nz/assets/Documents/Ministry/Budgets/Budget2019/NEGP/NEGPCabPaper.pdf>

Ministry of Education. "Capital works - state schools." Ministry of Education. Accessed February 11, 2021.
<https://www.education.govt.nz/school/funding-and-financials/school-finances/capital-works-state-schools/>

Ministry of Education. "Capital works - state-integrated schools." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/school/funding-and-financials/school-finances/capital-works-state-integrated-schools/>

Ministry of Education. *Designing schools in New Zealand*. Wellington: The Ministry of Education, 2015.
<https://www.education.govt.nz/assets/Documents/Primary-Secondary/Property/Design/Design-guidance/DSNZ-version-1-0-20151014.pdf>

- Ministry of Education. "ECE Funding Handbook." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/early-childhood/funding-and-data/funding-handbooks/ece-funding-handbook/>
- Ministry of Education. "Education Funding Review." v Accessed February 11, 2021. <https://education.govt.nz/our-work/consultations/recent-consultations/education-funding-system-review/>
- Ministry of Education. "Education in New Zealand." Ministry of Education. Accessed April 4, 2021. <https://www.education.govt.nz/our-work/our-role-and-our-people/education-in-nz/>
- Ministry of Education. "Enrolments, school property and facilities." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/new-zealands-network-of-schools/about/enrolments-school-property-and-facilities/#sp>
- Ministry of Education. "Homepage." Accessed February 11, 2021. <https://www.education.govt.nz/>
- Ministry of Education. *How does New Zealand's education system compare?* Wellington: Ministry of Education, 2020. https://www.educationcounts.govt.nz/data/assets/pdf_file/0005/200696/NZ-Summary-Report-EAG-2020.pdf
- Ministry of Education. "How the Ministry Funds Services." In *ECE Funding Handbook*, 1-15. Wellington: Ministry of Education, 2020. <https://www.education.govt.nz/assets/Documents/Early-Childhood/ECE-Funding-handbook/Early-Childhood-Funding-Handbook-Chapter-2-How-the-Ministry-Funds-Services.pdf>
- Ministry of Education. "Improving Classrooms in Small or Remote Schools". Accessed 21 April, 2021. <https://www.education.govt.nz/our-work/changes-in-education/improving-classrooms-in-small-or-remote-schools/>
- Ministry of Education. "Information for infrastructure suppliers." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/school/property-and-transport/suppliers/>
- Ministry of Education. "Ka Hikitia – Ka Hāpaitia | The Māori Education Strategy." Updated January 19, 2021. Accessed February 11, 2021. <https://www.education.govt.nz/our-work/overall-strategies-and-policies/ka-hikitia-ka-hapaitia/ka-hikitia-ka-hapaitia-the-maori-education-strategy/>
- Ministry of Education. *Learning Support Action Plan*. Wellington: Ministry of Education, 2019. <https://conversation.education.govt.nz/assets/DLSAP/Learning-Support-Action-Plan-2019-to-2025-English-V2.pdf>

- Ministry of Education. "Modular buildings for new spaces at schools." Accessed March 15, 2021. <https://www.education.govt.nz/school/property-and-transport/school-facilities/modular-buildings/>
- Ministry of Education. *New Zealand Schools. A report on the compulsory schools sector in New Zealand*. Wellington: Ministry of Education, 2019. https://www.educationcounts.govt.nz/_data/assets/pdf_file/0016/201661/Nga-Kura-o-Aotearoa-NZ-Schools-2019.pdf
- Ministry of Education. "National Education Growth Plan". Accessed February 11, 2021. <https://www.education.govt.nz/our-work/publications/budget-2019/negp/>
- Ministry of Education. "National School Redevelopment Programme". Accessed 21 April, 2021. <https://www.education.govt.nz/our-work/changes-in-education/national-school-redevelopment-programme/>
- Ministry of Education. *National Education Growth Plan Auckland and Te Tai Tokerau*. Wellington: Ministry of Education, 2019. <https://www.education.govt.nz/assets/Uploads/AucklandTaiTokerauplans2.pdf>
- Ministry of Education. *Ngā Kura o Aotearoa New Zealand Schools*. Wellington: Ministry of Education, 2019. https://www.educationcounts.govt.nz/_data/assets/pdf_file/0016/201661/Nga-Kura-o-Aotearoa-NZ-Schools-2019.pdf
- Ministry of Education. "Operational funding components." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/school/funding-and-financials/resourcing/operational-funding/operational-funding-components/>
- Ministry of Education. "Property and school transport." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/our-work/our-role-and-our-people/what-we-do/>
- Ministry of Education. "Property projects led by schools and the Ministry." Accessed February 11, 2021. <https://www.education.govt.nz/school/property-and-transport/suppliers/property-projects/>
- Ministry of Education. *Reform of Vocational Education - Consultation discussion document*. Wellington: Ministry of Education, 2019. https://www.educationcounts.govt.nz/_data/assets/pdf_file/0016/201661/Nga-Kura-o-Aotearoa-NZ-Schools-2019.pdf
- Ministry of Education. *Secondary Teacher Supply Working Group Report*. Ministry of Education: Wellington, 2016. <https://www.education.govt.nz/assets/Uploads/Secondary-Teacher-Supply-Working-Group-Report-9-August-2016.pdf>

- Ministry of Education. "School Investment Package" Accessed 21 April, 2021.
<https://www.education.govt.nz/school/funding-and-financials/funding/school-investment-package/>
- Ministry of Education. "Starting a centre-based ECE service." Accessed February 11, 2021.
<https://www.education.govt.nz/early-childhood/running-a-service/starting-a-service/starting-a-centre-based-ece-service/early-childhood-education-and-care-regulations/>
- Ministry of Education. *Te Rautaki Rawa Kura The School Property Strategy 2030*. Wellington: The Ministry of Education, 2020. <https://www.education.govt.nz/assets/Documents/Ministry/Strategies-and-policies/MOE-Te-Rautaki-Rawa-Kura-The-School-Property-Strategy-2030.pdf>
- Ministry of Education. *Technology in Schools - Information and Communications Technology (ICT) Switching Infrastructure: Policy and Standards for Schools*. Wellington: The Ministry of Education, 2015. <https://www.education.govt.nz/assets/Documents/School/Running-a-school/Technology-in-schools/technical-info/MoE-ICT-Switching-Policy-and-Standards-v1-70-June-2015.pdf>
- Ministry of Education. *The impact of physical design on student outcomes*. Wellington: The Ministry of Education, 2016. <https://www.education.govt.nz/assets/Documents/Primary-Secondary/Property/Design/Flexible-learning-spaces/FLS-The-impact-of-physical-design-on-student-outcomes.pdf>
- Ministry of Education. "The role of the Ministry of Education." Ministry of Education. Accessed February 11, 2021. <https://www.education.govt.nz/our-work/our-role-and-our-people/what-we-do/>
- Ministry of Education. *The School Property Strategy 2030*. Wellington: Ministry of Education, 2019. <https://www.education.govt.nz/assets/Documents/Ministry/Strategies-and-policies/MOE-Te-Rautaki-Rawa-Kura-The-School-Property-Strategy-2030.pdf>
- Ministry of Education. "5 Year Agreement (5YA) funding." Accessed February 11, 2021.
<https://www.education.govt.nz/school/funding-and-financials/funding/5-year-agreement-funding/>
- Ministry of Foreign Affairs and Trade. *New Zealand's progress towards the SDGs - 2019*. Wellington: Ministry of Foreign Affairs and Trade, 2019. <https://www.mfat.govt.nz/assets/Peace-Rights-and-Security/Our-work-with-the-UN/Sustainable-Development-Goals/New-Zealand-Voluntary-National-Review-2019-Final.pdf>
- Ministry of Health, "Children's worker safety checking and child protection policies." Accessed February 11, 2021. <https://www.health.govt.nz/our-work/health-workforce/childrens-worker-safety-checking-and-child-protection-policies>
- National Infrastructure Unit. *Infrastructure Evidence Base 2015 Refresh*. Wellington: National Infrastructure Unit, 2015. https://www.treasury.govt.nz/sites/default/files/2019-10/3142326_1%202015%20Evidence%20Base%20Social%20Sector.pdf

- Neuwelt-Kearns, Caitlin and Dr Jenny Ritchie. *Investing in children? Privatisation and early childhood education in Aotearoa New Zealand*. Auckland: Child Poverty Action Group, 2020.
<https://www.cpag.org.nz/assets/Backgrounders/CPAG%20Backgrounder%20-%20Privatisation%20and%20early%20childhood%20education%20in%20Aotearoa%20New%20Zealand%20.pdf>
- New Zealand Educational Institute. *A people-centred recovery: Prioritising social infrastructure for a Just Transition out of the Covid-19 crisis*. Wellington: New Zealand Educational Institute, 2020.
<https://campaigns.nzei.org.nz/wp-content/uploads/2020/05/NZEI-Te-Riu-Roa-Social-Infrastructure-discussion-paper-April-2020.pdf>
- New Zealand Educational Institute. *Turning the tide away from a privatised, profit-focused education system*. New Zealand Educational Institute: Wellington, 2019. <https://campaigns.nzei.org.nz/wp-content/uploads/2019/01/Turning-the-Tide-FINAL-20190109.pdf>
- New Zealand Government. "Budget Policy Statement". The Treasury. Accessed February 11, 2021.
<https://budget.govt.nz/budget/2020/bps/delivering-for-nz-education.htm>
- New Zealand Government. *Wellbeing Budget 2020: Rebuilding together*. The Treasury: Wellington, 2020.
<https://budget.govt.nz/budget/pdfs/wellbeing-budget/b20-wellbeing-budget.pdf>
- New Zealand Government. *The Thirty Year New Zealand infrastructure plan 2015*. Wellington: Treasury, 2015. <https://www.treasury.govt.nz/sites/default/files/2018-03/nip-aug15.pdf>
- New Zealand Green Building Council. *Green Star Schools Handbook*. Auckland: New Zealand Green Building Council & Ministry of Education, 2014.
https://www.nzgbc.org.nz/Attachment?Action=Download&Attachment_id=1762
- New Zealand Qualifications Authority. *Briefing to the Incoming Minister*. Wellington: New Zealand Qualifications Authority, 2020. <https://www.nzqa.govt.nz/assets/About-us/Publications/Strategic-publications/BIM/NZQA-BIM-Final-web-version-2020.pdf>
- New Zealand Qualifications Authority. "Our role." New Zealand Qualifications Authority. Accessed February 11, 2021. <https://www.nzqa.govt.nz/about-us/our-role/>
- New Zealand Qualifications Authority. "The Education (Pastoral Care of International Students) Code of Practice 2016 (including Amendments 2019)." Accessed February 11, 2021.
<https://www.nzqa.govt.nz/providers-partners/education-code-of-practice/>
- New Zealand Productivity Commission. *Educating New Zealand's future workforce*. Wellington: New Zealand Productivity Commission, 2020.
https://www.productivity.govt.nz/assets/Documents/4771bd784d/Draft-report-4_Educating-NZs-future-workforce-v2.pdf

- New Zealand Productivity Commission. *New models of tertiary education*. Wellington: New Zealand Productivity Commission, 2017. <https://www.productivity.govt.nz/assets/Documents/2d561fce14/Final-report-Tertiary-Education.pdf>
- New Zealand Productivity Commission. *Training New Zealand's workforce*. Wellington: NZ Productivity Commission, 2019. https://www.productivity.govt.nz/assets/Documents/da611be657/Draft-report-3_Training-New-Zealands-workforce-v2.pdf
- Newton, Kate. "The attendance freefall in New Zealand's schools." *Stuff*, November 28, 2020. <https://www.stuff.co.nz/national/education/123514144/marked-absent-the-attendance-freefall-in-new-zealands-schools>
- Nusche, Deborah, Dany Laveault, John MacBeath and Paulo Santiago. *OECD Reviews of Evaluation and Assessment in Education*. OECD Publishing: New Zealand, 2012. <https://www.oecd.org/newzealand/49681441.pdf>
- NZSTA. "School Boards." Accessed February 11, 2021. <https://nzsta.org.nz/trustee-elections-and-appendix-2/board-of-trustees/>
- OECD. *Adult education level*. France: OECD, 2019. <https://data.oecd.org/eduatt/adult-education-level.htm>
- OECD. *OECD Insights: Human Capital*. France: OECD Publishing, 2007. <https://www.oecd.org/insights/37966934.pdf>
- OECD. "How much is spent per student on educational institutions?" In *Education at a Glance 2020: OECD Indicators*. OECD Publishing: France, 2020. https://www.oecd-ilibrary.org/education/education-at-a-glance-2020_5e4ecc25-enjsessionid=Uz9XCQcU9ygubVLAfGlNTKJc.ip-10-240-5-92
- OECD. *OECD Reviews of Evaluation and Assessment in Education: New Zealand*. France: OECD Publishing, 2012. <https://www.oecd.org/newzealand/49681441.pdf>
- OECD. *Reading Performance (PISA) indicator*. France: OECD, 2018. <https://data.oecd.org/pisa/reading-performance-pisa.htm#indicator-chart>
- OECD. *School education during COVID-19 - Were teachers and students ready?*. France: OECD Publishing, 2020. <http://www.oecd.org/education/New-Zealand-coronavirus-education-country-note.pdf>
- OECD. *Starting Strong IV - Early Childhood Education and Care, Data Country Note - New Zealand*. France: OECD Publishing, 2016. <http://www.oecd.org/education/school/ECECDN->

[NewZealand.pdf?bcsi_scan_01d939382f6c0b14=Mwxpk90v13sEmkoxg5wGFSPYS/5MAAAAZ1qaDQ=&bcsi_scan_filename=ECECDCN-NewZealand.pdf](#)

OECD. *The impact of COVID-19 on education: Insights from education at a glance 2020*. France: OECD Publishing, 2020. <https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance-2020.pdf>

Office of Disease Prevention and Health Promotion. "Early and Middle Childhood." HealthyPeople.gov. Accessed February 11, 2021. <https://www.healthypeople.gov/2020/topics-objectives/topic/early-and-middlechildhood#:~:text=Early%20childhood%2C%20middle%20childhood%2C%20and,%20Demotional%2C%20and%20language%20development>

Office of the Minister of Education. *Cabinet Paper release: A strategic recovery plan for the international education sector*. Wellington: Office of the Minister of Education, 2020. <https://www.education.govt.nz/assets/Uploads/R-285-288-Cabinet-Paper-Pack-International-Education-Recovery-Redacted2.pdf>

Office of the Minister of Education. "Cabinet Paper release: Towards a Comprehensive Reform of School Property." Accessed February 11, 2021. <https://www.education.govt.nz/assets/Documents/Ministry/Information-releases/2018-releases/R-10-Cabinet-Paper-Towards-a-Comprehensive-Reform-of-School-Propert..-.pdf>

Office of the Minister of Education. "Cabinet Paper release: Replacing Education Deciles with the Equity Index". Accessed April 4, 2021. <https://www.education.govt.nz/assets/Documents/Ministry/Information-releases/2019-releases/R-131-133-Redacted.pdf>

Office of the Minister of Education. "Cabinet Paper: The Early learning action plan 2019-29". Accessed 22 April, 2021. <https://conversation.education.govt.nz/assets/ELSP/ELAP/R-170-Paper..-Redacted.pdf>
Parliamentary Counsel Office. "Crown Entities Act 2004." Accessed February 11, 2021. <https://www.legislation.govt.nz/act/public/2004/0115/latest/DLM329637.html>

PPTA, "A Hierarchy of Inequality - The Decile Divide". Accessed February 11, 2021. <https://www.ppta.org.nz/publication-library/document/338>

PPTA. "Teacher supply." Accessed February 11, 2021. <https://www.ppta.org.nz/advice-and-issues/teacher-supply/>

RNZ, "NZ students record worst results in maths and science." *RNZ*, December 9, 2020. <https://www.rnz.co.nz/news/national/432451/nz-students-record-worst-results-in-maths-and-science>

- Stats NZ. "National population projections: 2020(base)- 2073." Accessed February 11 2021. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073#:~:text=annual%20population%20growth%20has%20a,5.19%E2%80%935.94%20million%20in%202030.>
- Stuff. "NZ's education gap amongst the worst in the developed world." Stuff, October 20, 2018. <https://www.stuff.co.nz/national/education/108204490/nzs-education-gap-is-among-the-worst-in-the-developed-world-and-poverty-makes-it-worse>
- Stuff. "Otago Polytechnic to build \$31 million trade training centre." Stuff, July 24, 2020. <https://www.stuff.co.nz/business/innovation/122237700/otago-polytechnic-to-build-31-million-trade-training-centre>
- Teach First NZ. "The need." Accessed February 11, 2021. <https://teachfirstnz.org/the-need>
- Te Kete Ipurangi (TKI). "Cultural diversity principle." Accessed February 11, 2021. <https://nzcurriculum.tki.org.nz/Principles/Cultural-diversity-principle>
- Tertiary Education Commission. "About us." careers.govt.nz. Accessed February 11, 2021. <https://www.careers.govt.nz/about-careers-nz/about-us/>
- Tertiary Education Commission. *Annual Report 2019*. Wellington: The Tertiary Education Commission, 2019. <https://www.tec.govt.nz/assets/Reports/TEC-Annual-Report-2018-2019.pdf>
- Tertiary Education Commission. *Annual Report 2020*. Wellington: The Tertiary Education Commission, 2020. <https://www.tec.govt.nz/assets/Reports/TEC Annual Report 2020.pdf>
- Tertiary Education Commission. *Briefing for the Incoming Minister of Education*. Wellington: Tertiary Education Commission, 2017. <https://www.tec.govt.nz/assets/Reports/3cf112d979/TEC-Briefing-for-the-Incoming-Minister-2017-Hon-Chris-Hipkins.pdf>
- Tertiary Education Commission. "Budget 2020: significant investment in training and education." Accessed February 11, 2021. <https://tec.govt.nz/news-and-consultations/budget-2020-significant-investment-in-training-and-education/>
- Tertiary Education Commission. "Our role." Tertiary Education Commission. Accessed February 11, 2021. <https://www.tec.govt.nz/about-us/what/our-role/>
- Tertiary Education Commission. *Plan Guidance*. Wellington: The Tertiary Education Commission, 2020. <https://www.tec.govt.nz/assets/Forms-templates-and-guides/Plan-Guidance-for-Investment-from-2022.pdf>

- Tertiary Education Commission. "Reform of Vocational Education (RoVE)." Tertiary Education Commission. Accessed February 11, 2021. <https://www.tec.govt.nz/rove/reform-of-vocational-education/>
- Tertiary Education Commission. "Step 2: Business case development." Accessed February 11, 2021. <https://www.tec.govt.nz/teo/working-with-teos/tei/business-case-guidance-and-templates-for-tertiary-education-institutions/development/>
- Tertiary Education Commission. "Unified Funding System." Accessed February 11, 2021. <https://www.tec.govt.nz/rove/unified-funding-system/>
- Tertiary Education Commission. "View educational performance using interactive charts." Accessed February 11, 2021. <https://www.tec.govt.nz/funding/funding-and-performance/performance/teo/epi-reports/interactive-charts/#!/>
- The Teaching Council of Aotearoa New Zealand. "What we do." The Teaching Council of Aotearoa New Zealand. Accessed February 11, 2021. <https://teachingcouncil.nz/about-us/what-we-do/>
- The Treasury. *Budget 2020 Information Release*. Wellington: The Treasury, 2020. <https://www.treasury.govt.nz/sites/default/files/2020-07/b20-t2019-3192-4183937.pdf>
- The Treasury. *Human Capital and the Living Standards Framework*. Wellington: Treasury, 2018. <https://www.treasury.govt.nz/sites/default/files/2018-06/sp-human-capital-lsf-21jun18.pdf>
- The Treasury. *Living Standards Framework*. Wellington: The Treasury, 2017. <https://www.treasury.govt.nz/sites/default/files/2017-12/lsf-pres-13dec17.pdf>
- The Treasury. "Revenue and expenditure." Accessed February 11, 2021. <https://www.treasury.govt.nz/information-and-services/financial-management-and-advice/revenue-and-expenditure>
- Tomorrow's Schools Independent Taskforce, *The 8 Key Issues*. Kōrero Mātauranga. <https://conversation.education.govt.nz/assets/TSR/Tomorrows-Schools-Report-Summary-of-8-Key-Issues.pdf>
- Top Universities. "Worldwide university rankings, guides and events." Accessed February 11, 2021. <https://www.topuniversities.com/>
- Unitec. "Unitec Hosts Major Land Sale Announcement." Accessed February 11, 2021. <https://www.unitec.ac.nz/about-us/unitec-hosts-major-land-sale-announcement>

Universities New Zealand. "About the university sector." Universities New Zealand. Accessed February 11, 2021. <https://www.universitiesnz.ac.nz/about-university-sector>

Universities New Zealand. "How NZ universities are funded." Accessed February 11, 2021. <https://www.universitiesnz.ac.nz/about-university-sector/how-nz-universities-are-funded>

Waitangi Tribunal. *The Report on the Kōhanga Reo Claim*. Lower Hutt: Waitangi Tribunal, 2013. https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68775144/Matua%20Rautia%20W.pdf

Walters, Amy. "Minister's stern warning to early learning centres." *Newsroom*, July 2, 2020. <https://www.newsroom.co.nz/minister-issues-stern-warning-to-early-learning-centres>

Williams, Amy. "High hopes homebound teachers will fill vacancies." RNZ, October 20, 2020. <https://www.rnz.co.nz/news/national/428739/high-hopes-homebound-teachers-will-fill-vacancies>

Whittaker, Julie. *Quality Online Teaching? Who's asking?*. Auckland: He Kupu, 2007. <https://www.hekupu.ac.nz/sites/default/files/2017-11/Quality%20Online%20Teaching%20Who%E2%80%99s%20asking.pdf>