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Who achieves what in secondary schooling? A conceptual and empirical analysis

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Executive summary

This study aims to answer a series of questions relating to the currently popular political discourse that one in five students are failing in secondary school. Key questions include:

- What are the benchmarks of success used in various contexts?
- Who reaches these benchmarks, and who does not?
- What are the characteristics of those who do not achieve the benchmarks?
- How have these changed in recent years?
- To what extent do New Zealand schools mitigate the effects of socio-economic disadvantage ?
- How does this compare internationally? And,
- Is it true that one in five students are failing?

This report aims to answer these questions by examining assessment systems, and definitions of success and failure, from multiple perspectives: historically, internationally, through the current NZ assessment model, from the perspective of the OCED's PISA findings (in terms of definitions of success and failure, socio-economic gaps and educational achievement, schools and teachers and policy implications), and in summary.

An historical overview of New Zealand's school assessment policies demonstrate that success and failure are not embodied in individual students, but are an artefact of policies of school provision, access and assessment which vary from time to time. Key findings of this section include:

- In New Zealand, assessment policies and practices have traditionally acted as forms of selection, differentiation and rationing. In particular, prior to NCEA they acted to maintain the existing social order by ensuring that assessment systems valued and rewarded the practice of dominant groups.

- Because school qualifications are valued, all social groups aspire to achieve them. Grade inflation was particularly evident during the early years of schooling in New Zealand, and in the proficiency examination in particular. However, where grade inflation is linked to real increases in performance, this increases skills and knowledge in society.

- New Zealand's school assessment system has changed from norm-based to criterion and standards-based. In the norm-based School Certificate era, pass rates were rigidly controlled, and it is clear, in retrospect, were held down artificially.

- In the NCEA environment, while elements of differentiation remain, for example in the form of grades and endorsements, rationing has, largely,

disappeared. In theory, everyone can 'succeed', with a current political target of 85% at Level 2 of NCEA. Pass rates at NCEA Levels 1, 2 and 3 have steadily increased since their introduction in 2002 - 2004.

- Some elite state and private secondary schools undertake second-tier rationing and finer-grained differentiation, by (a) adopting different assessment systems, such as Cambridge International Examinations, or (b) valuing only particular NCEA outputs.

- The higher the NCEA pass rates, the more the pressure for rationing and differentiation at the top is likely to increase.

Looking internationally, assessment systems are intended to provide useful knowledge and skills for further education, employment and society, and in recent times to provide a means for success for greater numbers of students. There is a wide variety of ways in which schooling systems work to meet those goals.

- The English system of assessment is the subject of strong political debate currently, with a failed attempt in 2012 to shift back to a highly prescriptive norm-referenced system. The argument was that pass rates in the GCSE examination were rising despite no corresponding improvement on international tests of student achievement. The question of whether there will be any major changes to the system is currently unresolved.

- The Australian schooling system is run at the state level, and there are eight different assessment authorities. Nevertheless, the systems are quite similar to one another.

- The Victorian state system is typical. It is a highly flexible, multi-level system offering a very wide range of academic and/or vocational options. Passing at a level involves receiving a 'satisfactory' endorsement. There are no merit grades. Around 77% successfully completed year 12 (final year of schooling) in 2005.

- Around half of indigenous students in Australia complete year 12. PISA figures from 2009 show that indigenous students are concentrated at the lower levels of PISA rankings to a far great extent than New Zealand Māori. Almost 40% of indigenous students performed below level two on the PISA proficiency measure (compared to 25% Māori in NZ).

- Other systems such as the USA, Canada and Finland also adopt broad-ranging routes to school completion, with pass rates ranging from 66-85%.

The current National Certificate of Educational Achievement is discussed. Since inception, the number of students achieving NCEA certificates at every level has increased each year. An increase in the range and scope of subjects, coupled with more effective methods of assessment, have led these changes. However, social, ethnic and gender gaps in achievement remain.

- There is a large gender gap throughout the assessment system. Boys are less likely to attempt and less likely to achieve NCEA assessment. Only a third of boys attempting NCEA1 will achieve NCEA3 two years later, compared to nearly half of all girls.

- Māori and Pasifika students have been catching up ever since the NCEA replaced School Certificate, but a gap of around 20 percentage points continues at NCEA2.

For the government's target of 85% of students to achieve NCEA2 by 2017, all groups, but especially males and Māori/Pasifika students, will require a large increase in success rates.

The following section outlines approaches to defining educational success and failure in the OCED's PISA 2009 study, and their implications for New Zealand.

- Educational performance at school, however defined, is correlated with a range of social and economic indicators across countries and time.

- Many countries have been making efforts to improve the performance of children from low socio-economic backgrounds. This is made more complicated where, as in New Zealand, socio-economic inequality has increased markedly over time.

- Nevertheless, New Zealand's performance on the PISA 2009 exercise was among the best in the world.

- An analysis based on the population divided into quarters by the OECD ESCS index (of socio-economic status) shows that New Zealand's performance was at the very top of the top ESCS quartile of results, and sixth at the bottom quartile.

- There is a reading gap equivalent to approx. 2.5 years between the mean of the top and bottom quartile, which is the eighth highest gap. New Zealand's readers performed well across the socio-economic spectrum.

- A second analytical approach is based on the analysis of variance from the mean, at the 10th, 25th, 50th, 75th and 90th percentiles. This method demonstrates that New Zealand readers have a wider range of PISA reading scores at the bottom than the top of the continuum. Despite these relatively large gaps, New Zealand's performance at the 10th percentile (the bottom measure) is well above the OECD average.

- The difference between the two scales reveals that factors other than socio-economic influence the distribution, the obvious one being the highly skewed gender distribution.
- A third approach is the so-called social gradient approach. This measures the reading score gap generated by a one-point change in the ESCS index of socio-economic status. At 52 points, New Zealand has the highest such gap in the OECD. The gap reflects New Zealand's relatively high level of income inequality, our strong performance at the top of the scale and other factors.

It is clear that socio-economic factors are important indicators of performance at school, both in New Zealand and all other countries. These are considered in three ways: through a 'gap analysis', an investigation of the social characteristics of those performing below level two of the PISA reading scale, and by a brief consideration of the characteristics of our very top achievers on PISA reading in 2009.

- A number of socio-economic indicators are considered in the section that correlate with gaps in reading performance on the PISA test of reading. New Zealand and international indicators are also compared.
- The largest gap is for number of books in the home. The number of books in the home provides possibly the strongest indicator of reading performance.
- Another very high indicator is educational costs, the amount that parents spend on schooling for their children.
- Other factors include parental income, work status, use of home computer, frequency of homework and number of bathrooms in the home. Some of these factors are proxies for socio-economic status.
- 14.3% of students failed to achieve proficiency level 2 on PISA reading. Important differences are observed between this group and the overall sample on the characteristics of household income, ethnicity, gender, books in home, approaches to learning and other factors. Differences are not apparent on ECE attendance, attitude towards schooling and views of teachers.
- Seven students scored on average more than 750 points on the PISA scale. The characteristics of this astonishing group is examined by developing an account of a composite but fictional character, Anna.

Volume four of the 2009 PISA report considers the implications of the findings of the study. By comparing information derived from students, including rankings on performance, from parents and from schools, plus information provided by national organisations on the structure and focus of schooling, the OECD is able to make comments about what constitutes an effective schooling system in practice, based on empirical analysis. The findings of this report are highly interesting and relevant to

New Zealand, but have been subject to no analysis at all by the Ministry of Education. There is a first attempt here, in sections on schools and teachers and policy implications, to consider the implications of the PISA policy analysis for New Zealand schools. Key points are:

- The Ministry and Minister of Education have interpreted recent reports on New Zealand's educational performance to mean that schools and teachers are not serving Māori and other disadvantaged students properly, but the findings of the PISA 2009 report do not support such an interpretation.

- Successful schools according to PISA are those that provide autonomy and the authority for schools to make decisions about curricula and assessments.

- A high level of investment in schools and teachers is also effective.

- Good schools are socially mixed, able to offer opportunities to all and keep children in school, in class and learning.

- New Zealand does well on some of these features but not on others. Some recent programmes have begun to support teachers to work with students with behavioural problems and Māori and Pasifika students.

- Some school systems have students start school at age 6 or 7. Only a minority start at 5. Also, some systems that are effective have shorter school days and a shorter year. There is no one 'rule' or definitive relationship between the amount of time children spend at school and learning outcomes.

- Good assessment policies make a small positive difference to learning, when linked to educational progression. But standardised testing unlinked to progression makes no difference. PISA findings demonstrate that NZ schools are above average in monitoring student progress.

- PISA is not just about ranking countries on educational tasks, but about developing good policies to promote educational achievement.

- Recommended school policies include a strong, collegial, autonomous, diverse school system with good governance and well-paid teachers (as a priority).

- School choice and competition do not systematically produce better results, and put low-performing groups at risk.

- There has been an international shift away from choice and competition as key solutions to schooling, towards a more inclusive and democratic model.

- The key policy agenda in New Zealand is to increase achievement rates at NCEA level 2 to 85% by 2017. This is an ambitious target, and has never been achieved in New Zealand.

- The policy pathways to achieving this target are generally broad and unclear, but some effective programmes are now available in schools.

- New Zealand has a very good schooling system – high performance at moderate cost.

- School funding in New Zealand is remarkably low in international terms, and NZ has funding far lower than its comparator schools. Price per PISA point, at $US92, is only 2/3 of Australia's and half of the UK's.

- PISA recommends social policy agendas be introduced where inequalities are high, which meshes with the child poverty work being undertaken at present in New Zealand.

- The findings of the Expert Panel on Child Poverty should be studied alongside the PISA findings because educational under-achievement is closely related to social and economic factors, in New Zealand and other countries.

- Private schools perform at about the same level as public schools once socio-economic factors are controlled for.

- Age of starting school, length of the school day and year and similar policies should be the subject of debate, and may provide opportunities for different sorts of learning.

- Public/private partnerships offer no systematic improvement that can be observed.

In conclusion, it is found that definitions of success and failure in the schooling system vary enormously over time and across different contexts. In New Zealand, the adoption of the NCEA has provided the opportunity to improve learning outcomes in the senior school. The 2009 PISA results confirm that New Zealand has one of the best schooling systems in the world, and provides certainty that over 85% of students in school at age 16 have the skills to live and work effectively in our society.

Introduction

During 2012, the Minister of Education stated on a number of occasions that one in five students were failing in school. The Post Primary Teachers Association has commissioned this study to examine who is 'failing' in New Zealand schools, with a particular emphasis on New Zealand secondary schooling.

Key questions include:

- What are the benchmarks of success used in various contexts?
- Who reaches these benchmarks, and who does not?
- What are the characteristics of those who do not achieve the benchmarks?
- How have these changed in recent years?
- To what extent do New Zealand schools mitigate the effects of socio-economic disadvantage
- How does this compare internationally? And,
- Is it true that one in five students is failing?

Some of these questions are very easy to answer, but others are far more difficult. The underlying question, "what is failure", is probably the hardest of all.

The study begins, then, by reviewing the history of assessment in New Zealand. Assessment has been used for a range of purposes since the 1870s, including differentiation, to control access to secondary education (and to universities) and, for many years under School Certificate, to regulate pass rates at around 50%.

The second method used to understand assessment is to look at international practice. Systems in England and Australia are considered in depth. England is currently facing what has been termed (politically) a crisis of grade inflation, with new proposals that may significantly reduce pass rates at year 11. Australian States mostly operate standards-based type systems with assessment in the last two years of schooling. Finally, a range of other countries operate graduation-type systems, with students attaining graduation by meeting diverse criteria. These kinds of systems tend to have the highest overall completion rates. However, they tend to require a second-tier testing regime for entry into universities.

The third method was to consider New Zealand's current national system of assessment in the senior school, the National Certificate of Educational Achievement. Since its inception a decade ago, there has been a strong growth in success rates for all groups, including Māori and Pacific learners. There is a consistent gender gap. The government's goal of an 85% success rate at level 2 is discussed.

The fourth method is to examine the findings of the OECD's Programme for International Assessment, or PISA. The PISA study started in 2000 and results are now available for the 2000, 2003, 2006 and 2009 phases. New Zealand's position has not

altered materially during that period, so the decision was made to focus on the rich data from the 2009 round.

Analysis of the PISA data has been divided into four sections. In the first section, New Zealand's results (with a focus on reading, the main area tested in 2009) are shown through the lens of three different methods adopted by PISA: the socio-economic indexing approach (using SES quartiles), the percentile variance approach and finally the 'social gradient' approach.

The second section constitutes a multi-dimensional 'gap' analysis. This looks at the gaps from a number of perspectives, including what they are, how they are demonstrated, how big they are and who is affected. The question of whether schools and teachers enhance or reduce social gaps is examined from the point of view of students' views of schools, as reported in PISA 2009.

The third section examines PISA findings about schools and teachers. Are they part of the problem, or part of the solution? Measures such as school autonomy, teacher efficacy, school competition and the systemic context are considered.

The final section examines education policy through the PISA lens. This part of the PISA reporting remains largely unexplored in New Zealand. The aim of the PISA exercise is not to rank countries but to improve educational outcomes, and significant work has been undertaken by the OECD to provide guidance, based on PISA success factors. Barriers in New Zealand include relatively low funding of education, and the high social gradient.

A brief conclusion restates the main findings.

This research was undertaken between October and December 2012. Sources used included the various OECD PISA 2009 reports, including the New Zealand country report, literature on New Zealand and international education, including reports of other international assessment programmes, and the large PISA database. This research also includes a companion report written by social economic Brian Easton, on the ethnicity gap in PISA.

The authors would like to thank the Ministry of Education for assistance with accessing the PISA database.

Definitions of achievement in New Zealand's schooling history

This section reviews the history of assessment and examinations in New Zealand since their inception. Assessment systems reflect views about human nature and about social and economic need. The history of assessment in New Zealand reveals that in the 19th and 20th centuries our schooling system was highly exclusionary. Assessment rules were used to ration access to further education at various times. For Māori , expectations of success were low, and Māori achievement was relatively poor right up until the abolition of School Certificate. The shift to standards-based assessment with the NCEA constituted a significant change in policy, and a re-conceptualisation of the role of schooling.

Patricia Broadfoot has argued that: "assessment practices reflect and reinforce the often conflicting values embodied in the education system"[1]. This brief historical overview of New Zealand's assessment system will provide examples that support her conclusion. The types of assessment, and definitions of who succeeds and who fails, are highly variable and depend on the purposes of assessment, and political decisions about the distribution of educational and other resources.

There are some universal tensions that arise in assessment systems. The central point is that assessment is a tool of differentiation that has profound social and economic effects. These effects accrue to the individual, in terms of the value of their earned credentials, and shape and order the society. Educational success is highly sought after by all social groups, but access to credentials is socially skewed.

A vignette may be useful to explain this point: What if a new system of assessment inverted the hierarchy of success, with the highest achievement gained by Māori and Pasifika students, and the children of the educated middle class 'failing' at the bottom? There would be a widespread uproar, multiple claims that the system was biased, and major political pressure to change the system. Thus definitions of what constitutes success are closely linked to the prevailing social order. An onlooker might tell a lot about social aspirations by looking at assessment systems.

The beginnings of national schooling

In the post-Treaty society, formal schooling in New Zealand commenced in a sporadic fashion, with each Province developing its own system, and major differences emerging as a result. Only Māori, through the Native Schools Act, had a centralised system, and this was subject to major delays, inefficiencies and a lack of commitment[2]. In 1877, the Education Act was passed, centralising education for pākehā, but still maintaining the separate Native Schools.

At this time, the aim of primary education was to provide basic literacy and numeracy skills to all pākehā children. Assessment was undertaken in every class year by Inspectors until 1899, and after that by teachers, except in Standard 6 where it was still undertaken by Inspectors. Thus students had to pass each 'Standard' before moving on to the next.

The same system was in place for Māori children, with a focus on access to the English language, but the expectation was that most would remain only until the end of Standard Four. For example, the figures for Native School students (most, but not all, of whom were Māori) in 1900 show the following numbers passing in each of the six Standards[3]:

Standard	No. Passing standard
1	411
2	374
3	218
4	152
5	52
6	15
Total students	3109
Māori students	2482*

Table 1. No. passing standard, total and Māori students attending Native Schools, 1900
*A person was counted as Māori if they had half or more Maori 'blood'. In this table, around 80% of those passing any standard were Māori (as defined at the time). However, the table does not break down ethnicity by standard. It is possible that most of those achieving at Standards 5 and 6 were the 'school teacher's children'; relatively advantaged pākehā living alongside Māori .

Three years later the numbers achieving at the higher Standards in native schools had virtually doubled (again, though, ethnicity figures were not provided):

> It may not be altogether out of place here to correct a common impression that the work of the native schools does not extend further than the third or fourth standards. Reference to the Native Schools Code will show that the children may be taught up to the Sixth Standard of public schools, the requirements being practically the same, and… it will be seen that during the past year 36 passed Standard Six, and 83 passed Standard 5[4].

The lack of an external examination at the end of primary schooling (Standard 6) led to many using the Junior Civil Service examination as a proxy. Between 1888 and 1900 the numbers taking that examination trebled, as did the existence of informal 'Standard 7' classes. Shuker notes that this examination "became the first of a series of credentials providing New Zealand's youth with the opportunity to become occupationally and socially mobile"[5].

The Standards regime was subject to change with the development of free secondary education. In 1899 there were only 2723 students receiving secondary education in the endowed schools. Also, around 250 students attended District High Schools, which offered a two-year secondary education within departments of primary schools[6]. There was a strong political pressure, with a growing population and a more wealthy society, to provide secondary education for more children.

The 1902 Act set up what was called the free place scheme, which allowed eligible children to attend endowed or private secondary schools. The demand for free places far exceeded the supply, and in 1903 a new examination, administered by the Department of Education, was set up as a national system to allocate places at secondary schools. This was called the Certificate of Proficiency.

The standards were eventually abolished in 1905, and the Certificate of Proficiency became the predominant examination, undertaken at Standard 6, the final year of schooling for most.

The Certificate of Proficiency

The Certificate of Proficiency tested students in four subjects, each with a set allocation of marks, as shown in Table 2.

Subject	Total marks
English	400
Arithmetic	200
Geography	100
Drawing	100

Table 2. Subjects and total marks available, Certificate of Proficiency, 1903

Initially, students had to achieve at least 50% of the total (400/800) for a pass, and 30% of the marks had to come from English or Arithmetic. As well, Inspectors had to ascertain that candidates had been "sufficiently instructed" in other subjects[7].

When the Act was passed in 1903, the Secretary stated that he expected one third of candidates to pass the Proficiency examination. Already by 1905, the pass rate had reached 56% of those that sat the examination. In response to this, in 1906 the pass mark was raised to 60% of the aggregate, with 40% coming from English and Arithmetic. However, this did not stop the growth in numbers passing Proficiency (and demanding places at secondary schools). In spite of the raised pass mark, in 1907 the pass rate was 59%, in 1908 it was 68%, and it stayed between 70 and 80% until 1931.

The pass rate for Māori was much lower. Only about half of Māori in Native Schools stayed on after Standard Four (in 1909, 455 were in S4 and only 229 in S5, with 121 in S6, a 75% attrition over two years). Only 19 children in Native Schools (including 4

pākehā) gained Proficiency in 1909, and 38 (including 10 pākehā) gained Competency (this is discussed below). However, many Māori attended public schools, although their performance is not recorded separately[8]. It is noted in various places in the official record that Māori achieved better attendance and higher qualifications in Native Schools than public schools[9].

It was recorded that in 1909, 360 Māori were attending secondary schools, and this had not improved markedly a decade later. Some Māori also attended Māori boarding schools (134 in 1920). By 1920, about 30 years after Apirana Ngata became the first Māori to complete a University degree, the Department of Education was able to report that one Māori engineering student was attending Canterbury College on a scholarship[10].

In 1918 the minimum mark for Proficiency in English was raised to 50% required for a pass. While the earlier changes were designed to reduce the numbers passing the examination, the 1918 change was probably more about standards of literacy required for secondary schooling. It may also have affected Māori pass rates in the examination, or at the least have contributed to the continued stagnation of Māori participation in secondary education.

Through its history, the Certificate of Proficiency was used as a form of rationing and differentiation, aiming to hold back the floodgates of demand for secondary education. While this was evident in the continual raising of benchmarks, one set of events provide an excellent example of it.

The backdrop was economic depression, a fear that too many students were taking 'academic' courses and low examination standards. In September 1931, the Minister of Education announced that accrediting options (which has been adopted over a number of years) for the examination would be abolished, and everyone would be required to sit the examination that year.

The pass rate for the examination in that year dropped from 79% to 67%, with 3,500 fewer students passing the examination. This led to an uproar, and claims that unemployed youths were rioting on the streets and coming under the influence of communists! Interestingly, the pass rate dip lasted for only a single year, with the rate back up to 77% in 1932[11].

Assessment for differentiation

In 1904 a Certificate of Competency was also brought in. This was for those who did not reach the standard of Proficiency, and initially required an overall pass rate in the Proficiency examination of 40%. If Proficiency was about providing access to secondary schooling, Competency entitled pupils to a place at the burgeoning technical schools, a second tier facility offering access to trades. But the technical schools also increasingly took the overflow from secondary schools, as the numbers qualifying for free places outran the number of places available.

Pass rates for Competency were very high, ranging from 70% in 1905 to 93% in 1935. In most years the pass rate exceeded 90%, which meant that in practice most people who sat (or were accredited with) the Certificate of Proficiency achieved a qualification of at least Competency level.

The technical schools were originally set up to provide a very different education than the 'academic' secondary schools, with a focus on manual work and trades. There was a very strong social class element in the differentiation of schooling in the early years of the twentieth century, as this articulation in Parliament made clear:

> Technical education does not mean that every worker shall have the whole of the technical knowledge appertaining to the branch of work in which he is engaged at his finger-ends, or stored away in his brain. It rather means that he should have an appreciation of the absolute necessity for subordination of personal views to the mind of the inventor; that the mechanic should learn the value of co-operation in work, and of strict obedience to the highly intelligent foreman. What is the matter with our colonial people is that they are unwilling to submit themselves to discipline of any kind; and I hold that this necessity for discipline can never be imparted to them till they see that no results worthy of achievement can be gained without it (Dr Grace, PD 1920 v 189 p. 573).

At the time, secondary education was strongly based on the English private school curriculum, with a focus on English, Latin, the Classics and branches of Mathematics. Technical schools were initially about the 'practical handling of tools, construction of models…'and so on, but soon offered a much broader curriculum, including, by 1909, modern languages, English, mathematics and the like.

The rolls in technical education continued to grow, reaching 2926 in 1919. For example, in 1914 students at Palmerston North Technical School could study English, Arithmetic, Chemistry, French, Latin, Mathematics, Geography and Art, in addition to a wide range of technical subjects[12].

There was undoubtedly a social hierarchy associated with secondary versus technical education, which lasted until the abolition of technical schools in the 1960s, despite the fact that the curriculum in the two forms of schooling converged over time. However, Roger Openshaw notes that the liberal progressive ideal of a single secondary education largely won out in post-WW2 New Zealand, with the technical schools increasingly indistinguishable from the others[13]. This was a different direction from that in the United Kingdom, where tripartite schooling (grammar, technical and secondary modern) was instituted post-war.

School Certificate

By the 1930s, the growth in secondary education had continued unchecked, despite the depression-era attempts to ration educational expansion. In 1939, for example,

more than 35,000 students attended secondary schools, with more in the technical and private schools, which had also grown in numbers and size over the period. The abolition of the Certificate of Proficiency in 1936, according to Roy Shuker[14], was the direct result of pressure to expand secondary education.

At the time, the only examination system operating in secondary schools was matriculation, a form of university examination operated by the University of New Zealand. The School Certificate (SC) examination was originally intended to remove the control of the universities over the curriculum via matriculation, and was initiated as an alternative examination. However, in practice most sat SC and matriculation together at the end of three years of secondary schooling. As a result, Shuker notes that SC became the 'poor cousin' examination. The Thomas Commission in 1945 removed the University Entrance examination to the sixth form, and left School Certificate in the fifth form, and by 1948 SC had become the benchmark school leaving examination[15].

While, like its predecessor the Proficiency examination, the numbers taking SC continued to increase, the examination never achieved the pass rates associated with Proficiency. School Certificate was a norm-referenced assessment. This kind of assessment was based on the position that achievement was normally distributed in a 'bell curve' across the population. One way to ensure that examinations were consistent across years and across subjects was to ensure that the distribution of results was similar in any given year to any other year, on the assumption that population characteristics did not change much. McNaughton explains that norm-referencing and the bell curve were based on a series of eugenic assumptions derived from the work of Francis Galton and then built by others into an unassailable edifice, thus reducing ability to "a single figure or scaled score per subject and thereby to distort and simplify information so as to make it useful for ranking students"[16].

The key features of School Certificate assessment were:

- Raw marks were scaled to produce a specific distribution, roughly akin to the bell (normal) curve, in each subject. The core subject (as it was sat by nearly all candidates) was English, which was scaled to (roughly) a pass mark of 50 and a standard deviation of 15.
- It was assumed that some subjects were harder than others. Subjects taken by students at the top of ability groups in English therefore received a much higher scaled pass rate than those with low English passes. The pass rate in 1985 for Latin was 87.7%, while for Woodwork it was 51%. For English in that year, 58.4% of students passed.
- Once scaled, grades were allocated associated with set marks.
- Overall pass rates each year prior to 1968 appeared to be around 60%. (Until 1968, SC was passed by gaining a C or better grade in four subjects including English and Mathematics). From 1968, however, single-subject passes were allowed.

Grades for subjects were allocated as follows on scaled marks:

A	80% - 100%
B	65% - 79%
C	50% - 64%
D	30% - 49%
E	1% - 29%

The systems for standardising and norm-referencing were complex and in practice SC as a system was probably highly biased, especially against girls and Māori. In particular, the system "can be said to have reinforced and even exaggerated a stratified and relatively static view of society"[17].

Increasingly, the norm-referencing of SC results was seen as a source of racial bias. By 1984, it was announced that changes to SC would be made to correct the scaling policy on the grounds that it was unfair to Māori[18]. A commentary from the time notes:

> For more than ten years educators and concerned groups have been drawing attention to the social harm that School Certificate is doing to New Zealand society as a whole and to the aspirations and attainments of young Māori people in particular[19].

Evidence adduced to support this view was that 69% of Māori candidates in 1982 failed the papers they sat, compared with 43% of pākehā, and[20]:

```
In English, 6197 Maoris sat. 1,700 passed - failure rate, 73%.
In Science, 2753 Maoris sat. 953 passed - failure rate 66%.
In Maths 4380 Maoris sat. 1583 passed - failure rate 64%.
```

Two main factors were seen as contributing to these figures. The first was the mono-cultural assumptions of these examinations, and the second was institutional racism.

Despite the move to single subject passes, pass rates for Māori students barely improved between 1969 and 1982. In the latter year, the overall pass rate for Māori was 27% in English, and only 41% in Māori.

The weaknesses of the scaling system were particularly revealed by the positional analysis of Māori students. Whatever the strengths of the system in ensuring consistency between papers and over time, it also became clear that the SC system maintained the existing social hierarchy and would never produce educational success for Māori.

School Certificate was only one part of the assessment system during this period. It was important because it constituted the benchmark leaving qualification (whether achieved or not) for most students. Various examinations in Years 12 and 13, including Sixth Form Certificate, University Entrance and Bursary, were available which focussed on entry to higher level positions and tertiary education. It is

interesting that, ten years since the abolition of SC, the benchmark leaving qualification has become NCEA2, which is essentially a Year 12 assessment.

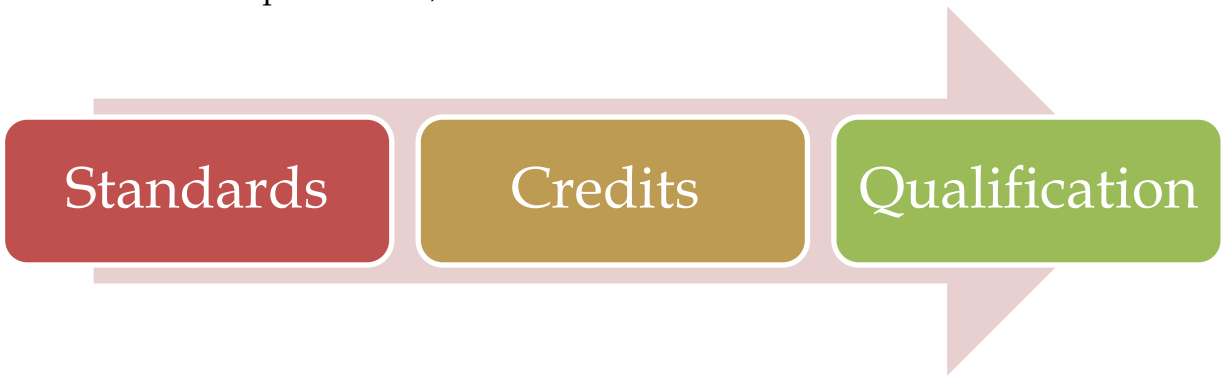
An expansive system

All of the weaknesses described above, plus others, fostered the eventual move from SC, SFC and Bursary to the Qualifications Framework-based National Certificate of Educational Achievement. The shift to NCEA is described on the NZQA website as follows[21]:

> In the past students' performance in a wider range of competencies and skills was often not taken into account. Exam marks were scaled so that only a certain number of students could pass each year and internal assessments results scaled to match external assessment results, even when assessing completely different skills.
>
> The NCEA system provides a more accurate picture of a student's achievement because a student who has gained credits for a particular standard has demonstrated the required skills and knowledge for that standard.

The website also notes that more students are receiving school qualifications under the NCEA system. This is an understatement. The numbers achieving NCEA certificates have grown enormously since the system was introduced, with just under 70 percent of all students in year 12 in 2011 achieving Level 2 Certificates.

Success in NCEA is gained by achieving 'standards', which are worth a number of credits towards a qualification, as shown below.



Once 80 credits at Level 1 or above are achieved, including credits in literacy and numeracy, NCEA level 1 is awarded. To achieve levels 2 and 3, 60 credits at or above the appropriate level must be achieved, with the ability to carry 20 credits forward from the previous level. NCEA is a multi-field qualification, which means that there are diverse routes to achieving the standards and credits towards an NCEA certificate. There are also different modes of assessment depending on the particular standard, i.e. internal assessment of various types and external examinations.

The shift to NCEA was a site of contestation, in particular by those who believed that offering a wider range of courses and more internal assessment would reduce

standards. Initially the struggle was largely around the idea of 'achieve or not achieve' being the only possible outcomes in the original Framework-based qualification which was piloted during the 1990s. This was simply a struggle for differentiation in a new form[22].

At a later stage, 'merit' and 'excellence' endorsements were added to ensure top learners could be differentiated from those who had merely achieved the standard. However, there has still not been the differentiation demanded by a number of high decile state and private schools, which have increasingly chosen to offer, as an addition or increasingly as an alternative, either the Cambridge exams or the International Baccalaureate. Therefore, the attempt to implement a unified qualification system in New Zealand has only been a partial success, as a number of schools (48 are listed on the Cambridge Schools' website[23]) have fully or partially stepped outside New Zealand's assessment system. That such a move was allowed under educational policy demonstrates the amount of autonomy given schools in the current era.

The aim of these schools is to construct the chosen alternative examination systems as being superior to NCEA, otherwise there is no point in taking such a step. In this they are assisted by the interaction between social hierarchies and educational success. In short, the practices that the highest social groups engage in constitute the prestigious practices in education, thus making these alternative qualifications a desirable goal.

The Cambridge exams essentially import an old-fashioned examination-based system into New Zealand. Levering off the Cambridge University name, this franchise has traditionally offered examinations for poorer Commonwealth countries, including Botswana and other African nations that did not have a system of their own.

However, such roots are now well-buried as the examinations are marketed as state-of-the art international qualifications. Interestingly (and ironically), a number of new Cambridge exams have been developed by New Zealand schools to enable them to offer Cambridge qualifications based on the New Zealand curriculum[24]. There is therefore the kernel of a new and alternative New Zealand assessment system being developed through the Cambridge examinations.

Conclusion

This historical overview has examined the systems, assumptions and effects of New Zealand's varying assessment regimes since the commencement of public education. The NCEA regime provides the opportunity of a multi-field and multi-mode assessment system to allow more NZ students than ever to achieve school qualifications. At the same time, the government is stating a range of aspirations that would see the highest ever proportion of New Zealanders gaining a recognised school leaving qualification. While a worthwhile goal, the lack of resources in an under-funded system, and the risks associated with claims of credential inflation and the

relative quality of alternative systems, pose a threat to teachers, learners and the efficacy of the assessment system.

New Zealand now has an examination system that allows most students to gain school leaver qualifications without casting doubt on the quality of the assessment processes. The contrast with the previous School Certificate system, in particular, is stark. But the government's aim to have 85% of 18 year olds holding this qualification may be difficult to achieve, and if achieved may lead to challenges about whether this has been achieved by grade inflation rather than by genuine improvements in learning outcomes. Such a challenge is likely to come from the Cambridge schools, which have invested heavily in an alternative and exclusive examination system.

Appendix 1 provides an overview/summary of the information provided in this section.

International benchmarks of student achievement

Educational success has been defined by a range of different assessment systems in the century and a half since public schooling began in New Zealand. For the first sixty years, success was achieved against standards set by the Department of Education and enforced by inspectors. For the next 70 years, success was defined against norms that were regulated to ensure pass rates of around half of all students, based on the statistical assumption of a normal bell-shaped curve.

In many ways the NCEA system constitutes a liberation from both models. Teachers in schools decide how to teach and assess students in line with the National Curriculum, and the NCEA structure allows multiple routes to subject achievement.

One of the claims of the anti-NCEA lobby was that the NCEA would not meet the standards for university entrance in other countries, a claim that has proven unfounded. On the Cambridge Schools website, for example, it is noted that, as a contrast to the NCEA:

> Cambridge's international A and AS Levels satisfy the entry criteria for every university around the world and are equal in value to UK A and AS Levels. They are recognised by universities in NZ, Australia, Canada, UK (including Oxford and Cambridge) as well as throughout the European Union. In the USA they are accepted by all Ivy League universities (such as Harvard) and can earn students course credits up to one full year of credit.[25]

So how does the NCEA compare with systems in other countries? What trends are evident in the increasingly globalised world of assessment[26]?

The English system

Post-WW2, England instituted a tripartite schooling system: a three tiered system based on grammar schools for high achievers, secondary technical schools for technical skills and secondary modern for the rest. Between 1951 and 1965, the only academic examination option available at Form 5 (Year 11) was the O-level, which was offered to the 'top' 20% of students, mainly at grammar and fee-paying schools. The benchmark pass rate for this examination was 5 subject passes, including English and Mathematics. The exams were controlled by University-led examination boards: Oxford, Cambridge and London, which as a result largely controlled the curriculum of these schools.

The 'O' level examination was based on a single examination at the end of the course, with coursework assessed only in practical subjects such as art and music.

From 1965, the partial breakdown of the tripartite system, and the emergence of comprehensive schools, signalled the need for benchmark examinations for other students. The Certificate of Secondary Education (CSE) exam was introduced in that

year. This examination was intended for the 40% of students below the top tier, and a Grade 1 pass in a CSE subject equalled an 'O' level pass.

Between 1965 and 1987, the assessment system at Year 11 was distributed on average across the population as shown below:

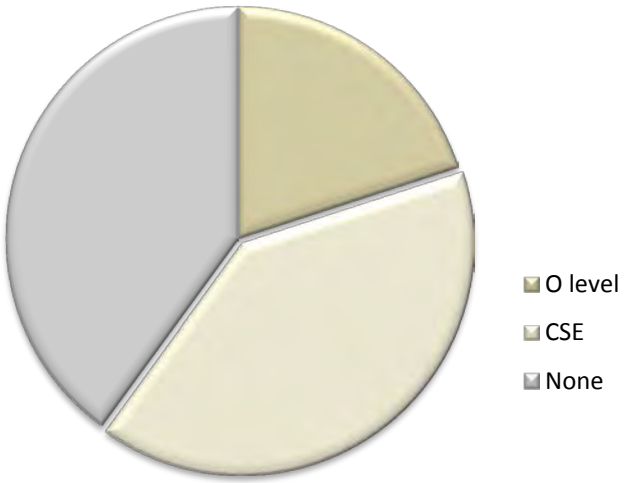


Figure 1. Proportion of Year 11 students by assessment type, 1965-1987.

In 1987, an integrated examination system for Year 11 was introduced across the country (and in Wales). The GCSE offers a mixture of coursework and end-of-year examination. It was designed to be taken by 90% of Year 11 students and was standards-based. Initially, around 40% of students gained the pass mark (A-C grades), but this has now risen to 70%, leading to political claims of grade inflation.

One of the main criticisms of the assessment system is that subjects are divided into 'units', and such units can be taken at different times (for example, in Year 10), and may involve multiple re-sits until the standard is reached.

In 2004, a report by academic Mike Tomlinson suggested replacing the whole examination structure with a new progressive secondary school assessment system. This multi-level standards-based system appeared to get strong support at the time, but was never implemented. Features included an integrated academic/vocational system, specific choices and extra 'stretch' at the top end[27].

However, this movement towards a more open and progressive system became sidelined as a result of a political panic that emerged over the GCSE system. As noted above, the pass rate for the qualification had reached around 70%, largely through (a) the introduction of courses that were said to be 'easy', and (b) the ability of students to re-sit units until they had passed.

While educational expenditure was increasing at a fast rate, and pass rates in GCSE were also rising, it emerged that the UK position on the international PISA benchmarks in reading literacy and maths literacy had notably declined in every

round of testing since 2000. The trends in PISA maths against other indicators are illustrated in Figure 2 below[28].

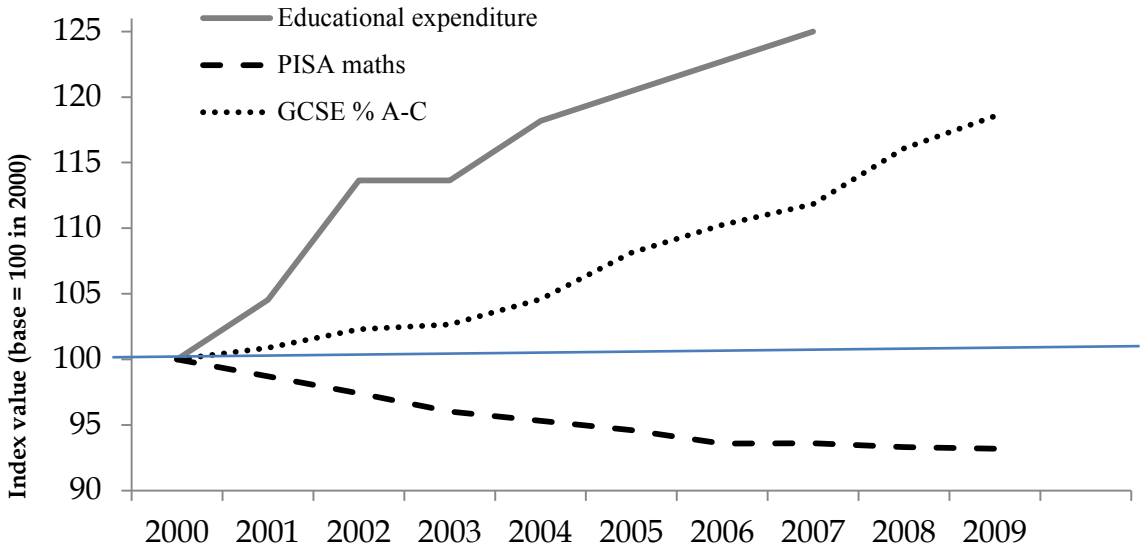


Figure 2. Changes in educational expenditure, GCSE pass rates and relative position on PISA mathematics rankings, England 2000-2009

It should be noted that Figure 2 was reproduced from a paper that questioned the validity of the PISA findings, citing changes to the system, differences with other test (and especially TIMSS), inclusion of Welsh students later (which brought down the average), timing of tests and other factors[29].

In September 2012 the British government proposed sweeping changes to the England/Wales assessment system at Year 11. The changes announced would have moved in the opposite direction to those suggested by Tomlinson, to significantly narrow courses and reduce pass rates from the current 70 percent. The stated reason for this change was as follows:

> If we remove modules and reduce coursework… we can restore faith in our exams and equip children for the challenges of the 21st century[30].

The new examination as announced was to be fully implemented by 2017. It was called the English Baccalaureate, or EBacc, and would have the following characteristics:

- A large reduction in internal assessment and increase in end-of-year examinations
- Passes in English, Maths, a science, a humanities subject and a language would comprise the full EBacc
- Either standards or norm-based – given the concern with credential inflation, a norm-based system was a possibility

- No information on expected pass rates, but said to be across the ability range, with some taking the exams later and some not at all.

One commentator said of the proposals: "Here we have the only government in the developed world determined to drive down the percentage of high achievers"[31].

The proposed EBacc may have ended up being very similar in form to New Zealand's old (pre-1968) School Certificate system, especially if it was to be norm-referenced. Thus, at the same time that New Zealand is aiming to increase achievement in NCEA2 to 85%, the English system, with a pass rate of around 70%, had attempted to apply credentialling brakes very heavily. It should also serve as a warning that ensuring 'success' for ever larger numbers in one era can be seen as standards-slipping or credential inflation in another.

However, within six months of announcing the EBacc, the same Minister retreated from the reforms, which were unpopular because of their potential narrowing of the curriculum, especially in arts, culture, academic and technical subjects, and the high benchmark for success. The Minister stated that instead he will continue to reduce coursework in assessment (a trend already underway), and will look to benchmark the GCSE against international standards[32].

Assessment in Australia

Proposals for an Australian nationwide senior school assessment system appear to have been around for about 20 years, but currently each state administers its own assessments at the end of years 11 and 12 (equivalent of years 12 and 13 in New Zealand). There is no high-stakes assessment at Year 10 in Australia. Despite this, the assessment systems appear quite similar in each state.

The Victorian Certificate of Education (VCE) is a multi-year (students may commence units in Year 10 and continue past year 12) assessment system, and is relatively typical of Australian state senior assessment. This will be reviewed here.

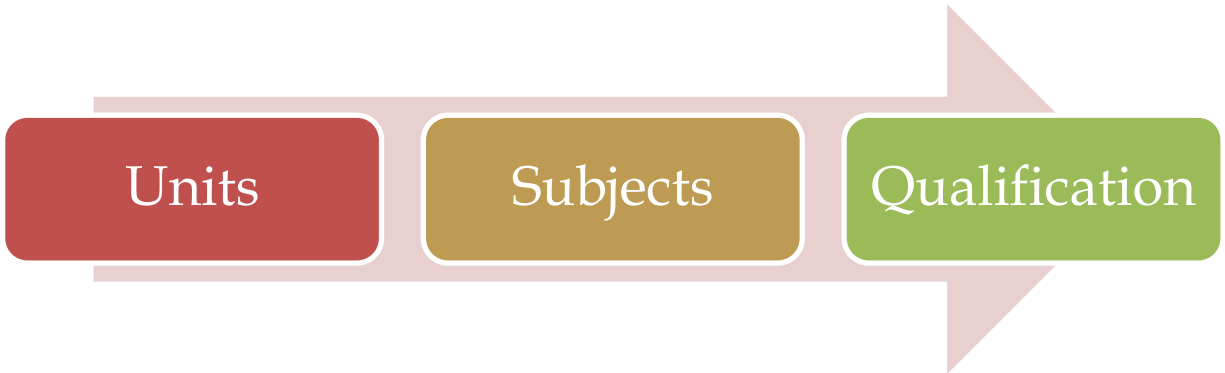


Figure 3. Structure of VCE assessment

Students generally study Units 1 and 2 of each chosen subject (usually 5) in Year 11. These can be offered in any order. There are no external examinations at Year 11, just a range of internal assessments set by the school and externally moderated.

In Year 12 they will generally study Units 3 and 4 of their subjects, although there is no requirement to complete all units of a given subject – students can chop and change. Most of the Year 12 courses have external examinations, and internal work is scaled against these examinations to ensure fairness.

Students can choose from a very wide range of VCE subjects[33], and additionally courses can be imported from a range of vocational options (so-called VCE VET) and university extension, and assessed within the framework. To show the breadth of choice available, there are 44 language options alone listed in the VCE.

On completing any unit, the student receives a 'satisfactory' or 'not satisfactory' grade. Students sitting Units 3 and 4 are eligible for a study score of between 0 and 50, which is used for university entrance purposes. In a system that rations places to university, and where such places are highly sought after, achievement in the VCE (and other states' examinations) is scaled and students are ranked for university entrance, using a system called ATAR, or Australian Tertiary Admissions Rank. Victorian students also sit the GAT, or general achievement test, which assists with ATAR rankings and focuses on writing and other general skills, including general knowledge.

With a segmented system, it is more difficult to establish what proportion of Australian students leave school without qualifications, compared to other systems. One recent study, using cohort data from the Longitudinal Survey of Australian Youth, provides useful figures on completion and non-completion rates, focussed on completion of the Year 12 qualification (New Zealand's year 13), as outlined below:

	1995 cohort		1998 cohort		2003 cohort	
	Count	%	Count	%	Count	%
Early school leavers	2 648	28	2 043	25	1,902	23
Year 12 completers	6 763	72	6 295	75	6,337	77
Total	9 411	100	8 338	100	8 239	100
School year of dropout						
Year 9	65	3	31	2	16	1
Year 10	917	35	617	30	422	22
Year 11	1070	40	946	46	878	46
Year 12	596	23	449	22	586	31
Total	2 648	28	2 043	25	1,902	23

Source: LSAY, 1995, 1998 and 2003 cohorts.

Table 3. Cohort data from LSAY – early school leavers

This data is useful in showing two interesting trends: the falling rates of school non-completion and the numbers and proportion of students who leave early by year. However, this report also shows that around 80% of those who left Australian schools from the 2003 cohort have re-engaged in education (in various forms) within 5 years[34].

The social and ethnicity gap in Australia

Australia was identified as a high quality, low equity nation in PISA 2000, but by 2009 this had been altered to high quality, average equity. These definitions and the social gradients on which they are based will be explored below. In this section, the causes of Australian inequality are briefly examined.

There is significant ethnic-based inequality in Australian schools, which tends to widen the longer a person is in school.

> The proportion of Indigenous students who achieved a Year 12 Certificate has decreased from 51% in 2001 to 49% in 2005 while the proportion of non-Indigenous students who achieved a Year 12 Certificate increased from 80% to 87%[35].

The results relating to indigenous Australians in PISA 2009 demonstrate the gap between Aboriginal and all other Australian students (the Levels referred to are the six-stage PISA proficiency scales), as shown in the following extract:

- Indigenous students scored 82 points lower, on average, than non-Indigenous students in reading literacy. This difference equates to more than one proficiency level or more than two full years of schooling. Indigenous students also performed significantly lower than the OECD average, by 57 score points.
- Indigenous females performed 47 score points higher on average than Indigenous males in reading literacy. In terms of schooling, this places Indigenous males more than one year behind Indigenous females.
- There is a substantial under-representation of Indigenous students at the higher end of the reading literacy proficiency scale and a similarly substantial over-representation of Indigenous students at the lower end. Only two per cent (2.4%) of Indigenous students reached Level 5 and there were even fewer Indigenous students (0.3%) who were placed at Level 6.
- Almost 40 per cent of Indigenous students did not reach Level 2, compared to 19 per cent of students across the OECD and 14 per cent of non-Indigenous students in Australia[36].

The performance of Indigenous Australians against all others, and against the OECD average, is represented in the following figure:

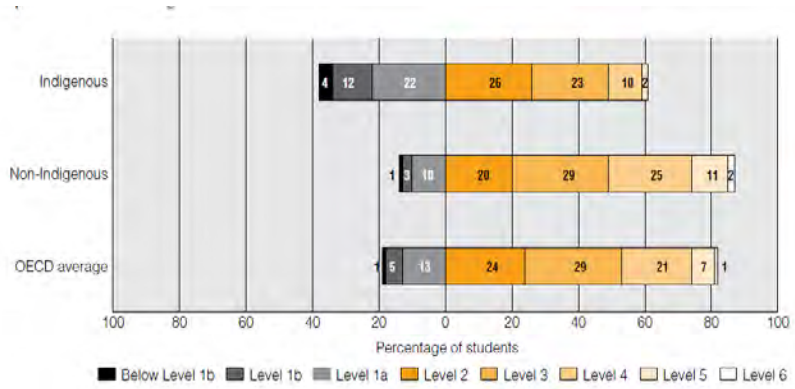


Figure 4. Performance of indigenous Australians against other Australians and the OECD Average, PISA 2009[37].

One question that needs to be answered is whether this learning gap is merely socio-economic in origin, reflecting the relative class and employment status of Indigenous people. Figure 5 shows that the performance of the Indigenous group is worse than that of the lowest socioeconomic quartile (in terms of performance) of the total Australian population:

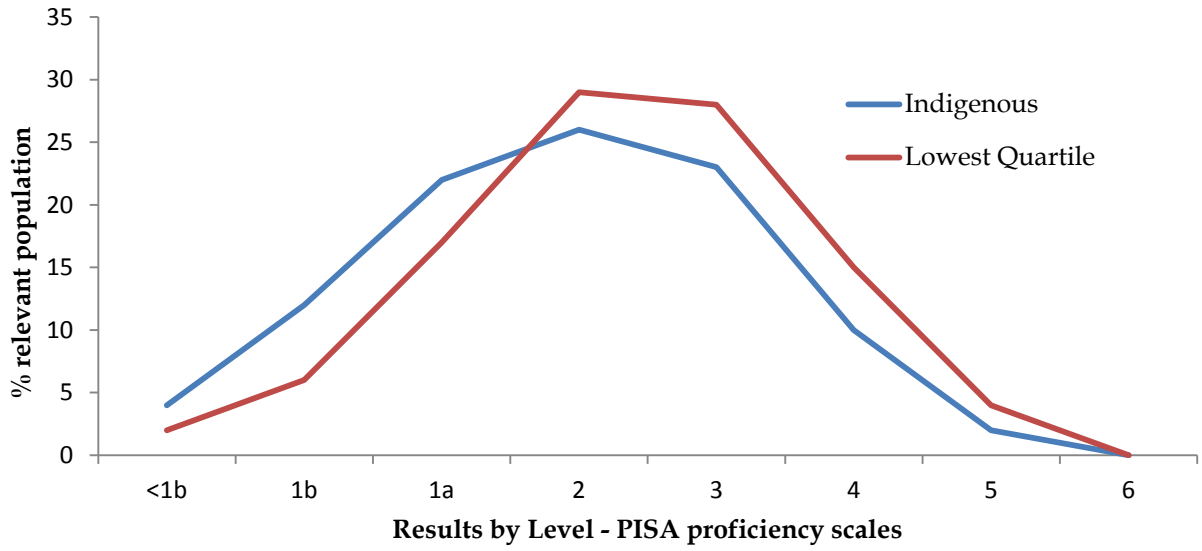


Figure 5. Performance of indigenous Australians against lowest quartile, PISA 2009.

Compared to the indigenous population, the curve of the lowest quartile (LQ) is skewed to the right, with the Indigenous population overrepresented at levels <1b, 1b and 1a, and LQ more likely to score at levels 2, 3, 4 and 5. Neither group was represented in Level 6. But this does not necessarily mean that ethnic or cultural factors per se are causing the difference, although they could be. It may simply mean that Indigenous communities are concentrated into the lower fractions of the lowest socio-economic quartile.

Other countries

Until 2002, New Zealand treated the norm-referenced and rationed achievement systems operated over time in the UK as the proper mode of assessment. Some still adhere to norm-referenced, externally-assessed examinations, hence the growth of schools adopting Cambridge examinations, in the belief that such systems are superior.

Internationally, however, what we might call the 'British Empire' model was and is fairly unusual. A competing system, best known in the United States and Canada, is a 'graduation' model. Essentially, students are expected to achieve a set of requirements, more or less broad, in order to graduate. Usually, these requirements include:

- Academic course completion and specified achievement;
- Some state, provincial or other tests, often with a literacy focus;
- Some community work or options; and
- Some work planning study or work beyond school.

Some systems are far more prescriptive than others. The follow example is from Ontario, Canada:

Students must earn the following compulsory credits to obtain the Ontario Secondary School Diploma:

- 4 credits in English (1 credit per Grade)
- 3 credits in Mathematics (1 credit in Grade 11 or 12)
- 2 credits in Science
- 1 credit in Canadian history
- 1 credit in Canadian geography
- 1 credit in the Arts
- 1 credit in health and physical education
- 1 credit in French as a second language
- 0.5 credit in career studies
- 0.5 credit in Civics

Plus one credit from each of the following groups:

- New **1 additional credit** (group 1): additional credit in English, **or French as a second language,** or a Native language, or a classical or an international language,** or social sciences and the humanities, or Canadian and world studies, **or guidance and career education, or cooperative education*****
- New **1 additional credit** (group 2): additional credit in health and physical education, or the arts, or business studies, **or French as a second language,** or cooperative education*****
- New **1 additional credit** (group 3): additional credit in science (Grade 11 or 12), or technological education, **or French as a second language,** or computer studies, or cooperative education*****

In addition to the compulsory credits, students must complete:

- 12 optional credits†

- 40 hours of community involvement activities
- the provincial literacy requirement

Around 80% of students graduate from high school in Canada, and around 75% in the USA, although there is a great deal of variation between States[38].

The Finnish system splits into two at age 16. There is a vocational track that may (but rarely does) lead to tertiary education, and the academic upper secondary track. The academic schools are selective and places are allocated on the basis of GPA, and sometimes tests and interviews.

Both routes lead to diplomas. Academic students also sit a high-prestige matriculation examination, important for entry into universities. It is not clear what the overall completion rates are, as the system is complex, but around 42% of the population complete the matriculation examination for universities, and others receive academic or technical certificates.

Most other countries use a similar approach. Some, like Germany, still have a highly differentiated high school system, which channels and limits options for the future based on access to examinations. While the goal might be to provide a suitable education for all children, such differentiation inevitably has a rationing effect, especially on access to higher education.

Measuring success and failure in New Zealand

The National Certificate of Educational Achievement (NCEA) constitutes the main measure of school achievement at years 11, 12 and 13 in New Zealand. New Zealand is unusual in having high-stakes assessment over three senior years, and it is not quite clear why this is, except insofar as the NCEA's three levels replaced qualifications at three levels (School Certificate, Sixth Form Certificate/U.E., and Bursary).

Figure 6 and subsequent material excludes information on other qualifications taken by students. There appears to be no published information on numbers achieving Cambridge examinations and other qualifications.

The figure below provides an overall summary of the year 11 cohort in the years 2004 to 2011. Year 11 is the baseline year for senior school examinations. Table 4 shows how many students were enrolled in Year 11 in each year, how many of those were candidates in NCEA1, how many achieved the qualification and how many did not.

There are a number of trends that are evident from this table. First, the number of year 11 students who are not entered for NCEA1 has dropped rapidly, from around 10% in 2004-5 to between 5 and 6% in 2011. Second, the proportion of all students with no qualifications at the end of year 11 has also dropped rapidly, from 35% in 2004 to 27% in 2011. Third, the overall achievement rate of NCEA1 candidates in year 11 has increased from 60% in 2004 to nearly 69% in 2012. As a result of these factors, NCEA1 achievement rates in Year 11 have risen by 7641, or 19%, since 2004, compared to an increase in the number of candidates of 4%.

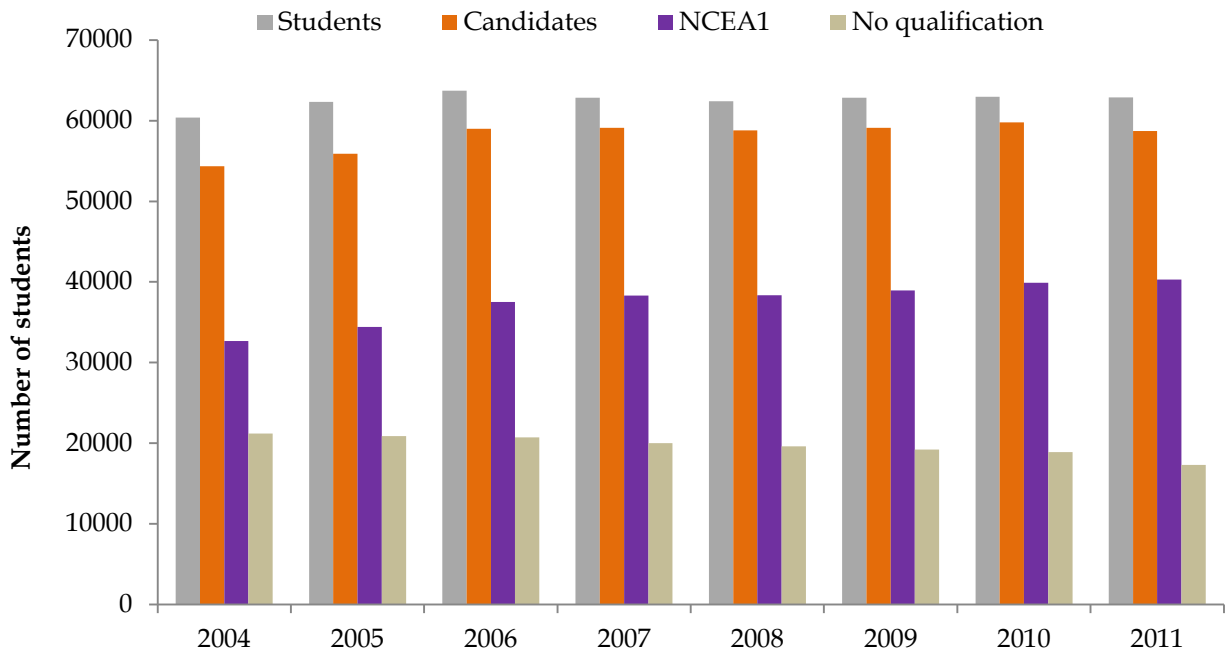


Figure 6. Year 11 and NCEA1 results, 2004-2011[39]

There are a number of different ways of examining the NCEA data, and various approaches are outlined below.

The NCEA cohorts

The number achieving NCEA at each level has increased every year since the qualification's inception. In 2004, 32,663 students achieved NCEA1 in year 11, increasing to 40304 in 2011. As well, around 5,000 additional students in each cohort achieved NCEA1 in years 12 or 13. In the 2008 cohort, for example, a total of 43,583 students eventually (by year 13), eventually achieved NCEA1, or a 74% achievement rate.

In 2004, the student attrition rate (i.e. the proportion of year 11 students continuing to, respectively, year 12 and year 13) was 18% and 26%. By the 2009 cohort, the rates were 12% and 16% respectively. In other words, school retention has increased significantly and incrementally over the five year period. This increase may be driven by rising rates of achievement of NCEA at all levels.

While student retention to year 13 increased by around a third between 2004 and 2011, the number achieving NCEA3 in year 13 has increased by 52% in that period. In 2011, 25273 students achieved level 3 out of 42,860 candidates, a completion rate of 59%.

The government now considers NCEA2 as the benchmark qualification for New Zealand. NCEA2 achievement rates are higher than those for NCEA1, as a significant (but diminishing) number of students leave school after year 11.

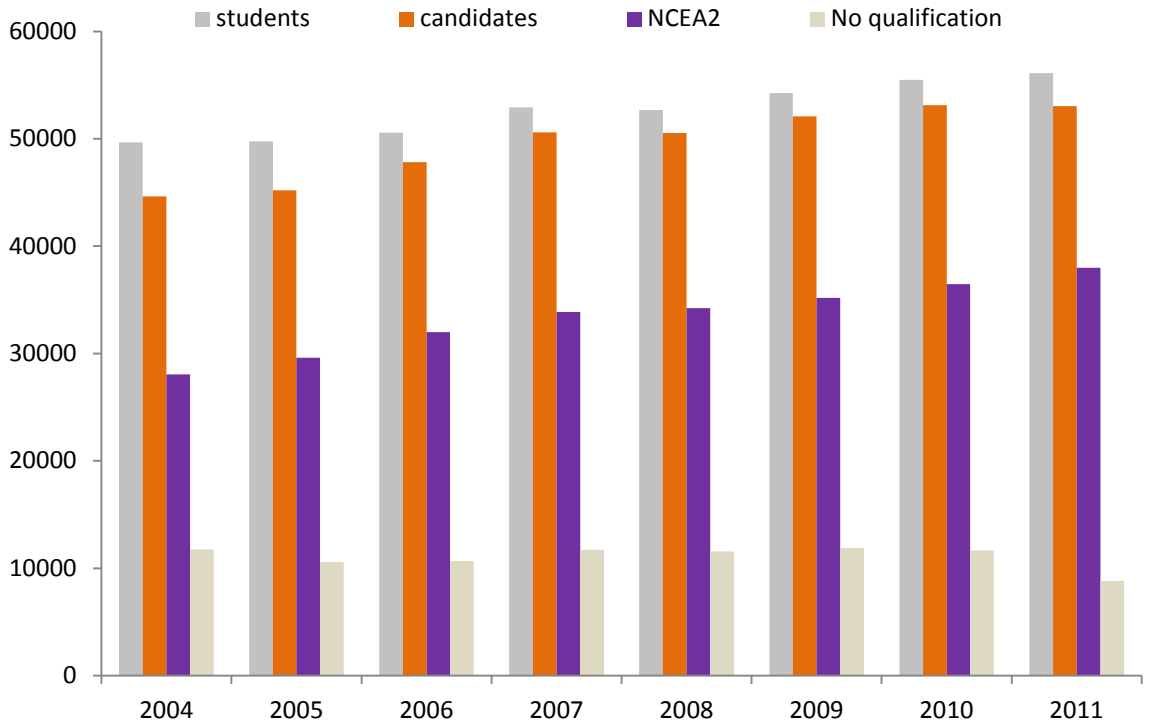


Figure 7. Year 12 and NCEA2 results, 2004-2011[40]

Figure 7 shows a number of trends. The number of students in year 12 rose by just over 10% during the period, driven partly by rising NCEA1 passes (external factors such as job availability and overall student numbers may also have played a part). The number of candidates for NCEA2 rose by over 20%, while the achievement rate increased by 35%. However, the non-achievement numbers also increased over the period in raw numbers, only decreasing in 2011, in what may be an anomalous year.

The actual achievement rate for NCEA2 in Year 12 rose from 62% in 2004 to 71% in 2011. The number of students achieving NCEA2 in year 13 has remained fairly stagnant over the period: 4,600 in 2004 and 4,700 in 2010 (figures for 2011 are anomalous due to other add-ins). An estimate of the overall pass rate in NCEA2, by ethnicity and gender, is provided in the conclusion to this section.

Gender

Comparatively speaking, boys do not fare well in the New Zealand senior school qualifications system. In 2011, 68.6% of girls, but only 59.8% of boys, achieved NCEA1 in year 11. In the same year, 72.2% of female Year 12 candidates achieved NCEA2, compared with 63.3% of male candidates. In the same year, 60.3% of Year 13 female candidates achieved NCEA3, but only 47.3% of boys[41].

The overall Year 12 achievement rates for NCEA2 by gender are shown below. The percentage figures are the percent of candidates in that year by gender.

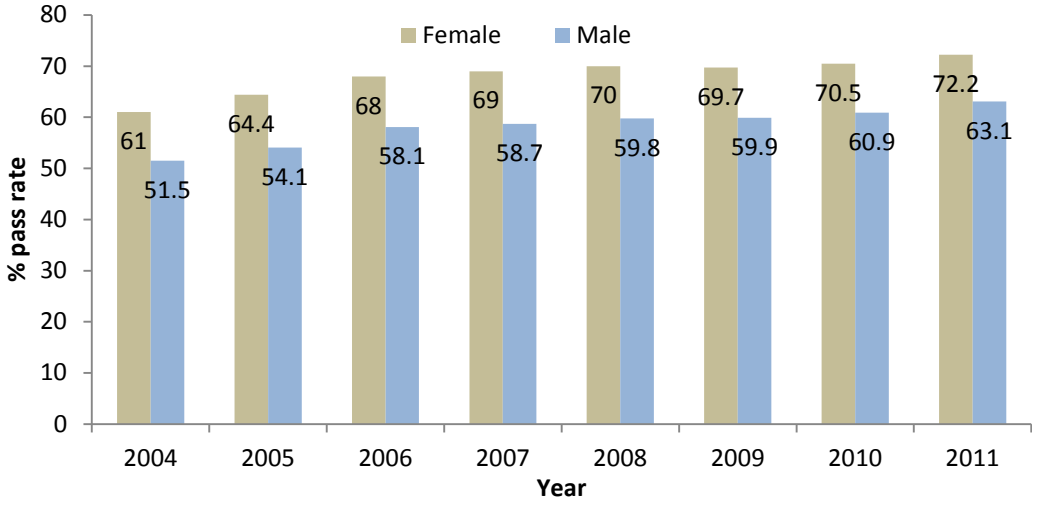


Figure 8. Achievement rates in Year 12 of NCEA level 2, 2004-2011

Two features are evident in Figure 8. The first is that over the eight years shown, there has been a remarkable increase in the numbers achieving the NCEA2 certificate. The second feature is the persistent 9-10 percent gap between male and female achievement rates.

It should be noted that this gender gap plays little part currently in the political discourse around school improvement, which is focused almost entirely on ethnicity and (occasionally) socio-economic status. However, if the government's goal of 85% achievement by age 18 is to be met, it is clear that strategies will be needed to address male under-achievement (see also the table in the conclusion to this section).

Māori and Pasifika students and NCEA

The success rates in Year 11 for Māori students at NCEA1 have continued to rise since the qualification began. Māori student achievement in the prior School Certificate qualification remained at low levels until that qualification was abolished, and Māori students initially 'transitioned' into NCEA with similarly low achievement, but this quickly changed. However, a gender lag is apparent for Maori students, with girls on average 6-7 percentage points ahead of boys at this level.

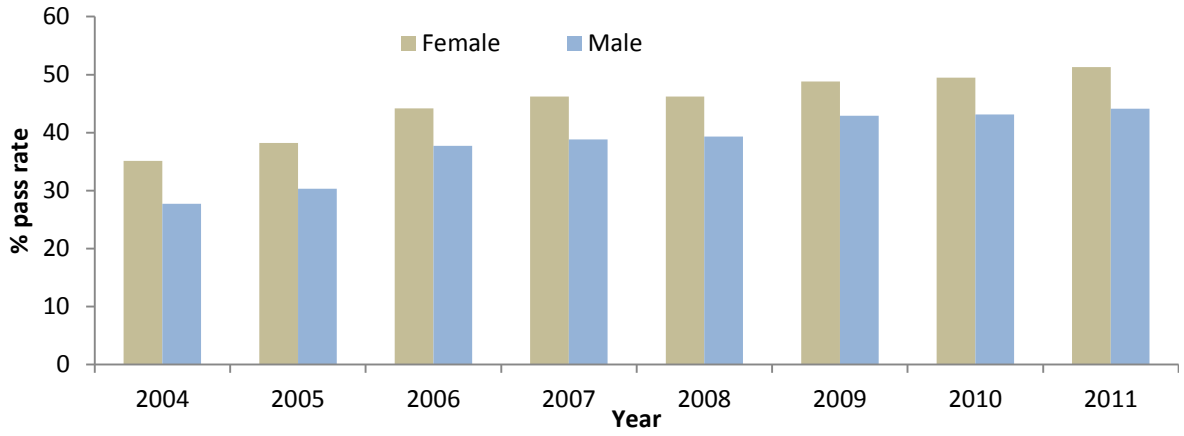


Figure 9. NCEA1 success rates, Māori students by gender and cohort

The trend at NCEA2 is very similar, with a success rate in 2011 of 60% for girls and 53% for boys. The success rates at level 2 are somewhat higher than at level 1.

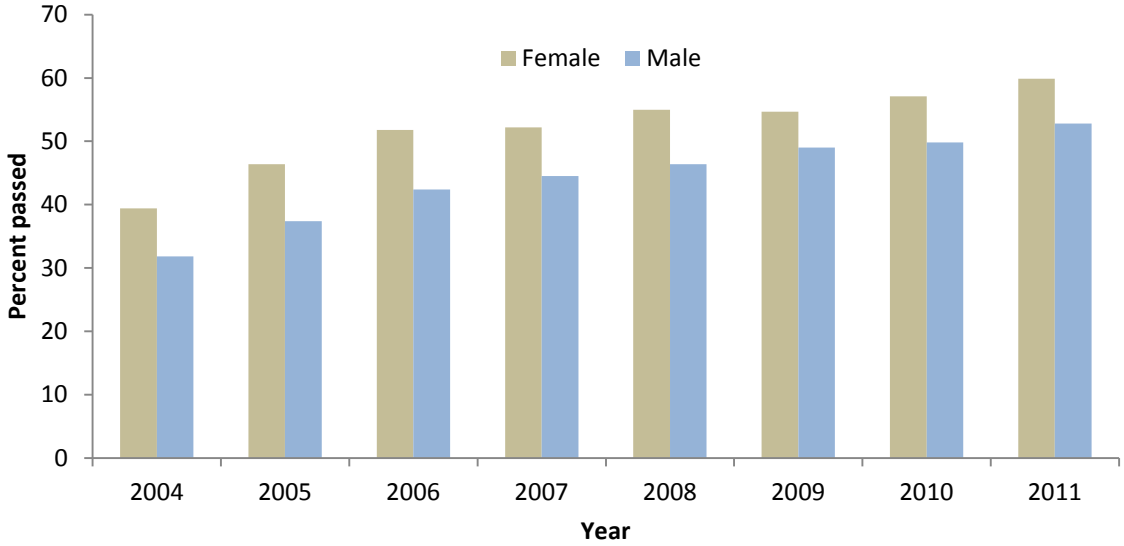


Figure 10. NCEA2 success rates, Māori students by gender and cohort

While achievement for Māori students is often seen as a main focus for educational initiatives, Pasifika achievement has lagged behind Māori over the period, and is only now catching up. As at 2011, the Pasifika achievement rate for NCEA2 in year 12 stands at 55%, compared to 57% for Māori students and 76% for pākehā.

While starting from a low base, Māori and Pacific students are catching up on pākehā learners. Achievement rates in NCEA2 at year 12 are plotted in Figure 11 below. While pākehā achievement rates have changed little since 2006, the achievement rates of the other groups have climbed by around 20%.

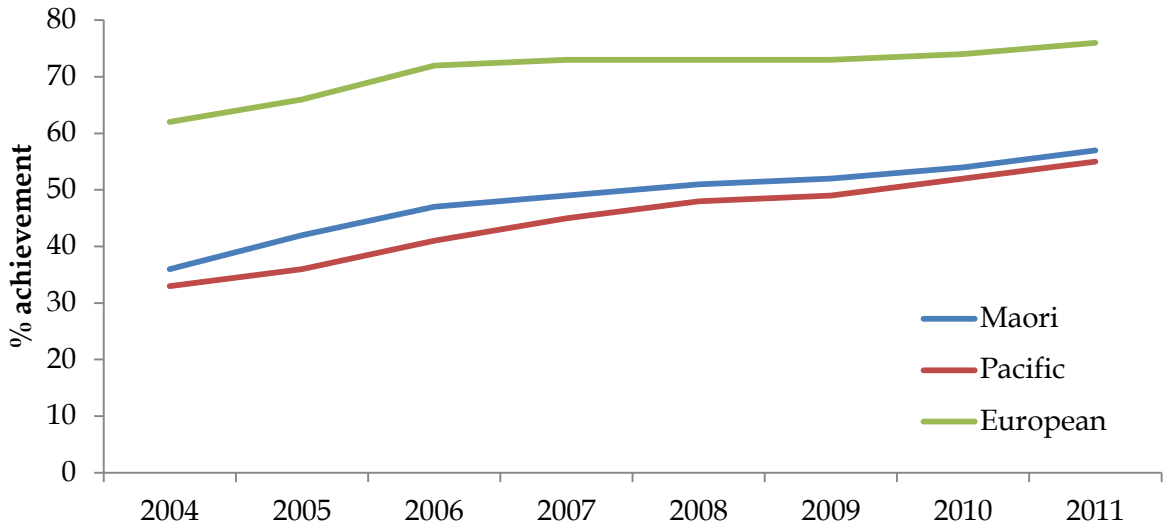


Figure 11. Achievement rates (%) for ethnic groups, NCEA2 in year 12 by year.

The improved completion rates at NCEA2 have driven significant increases in both the number of candidates and the achievement rates at NCEA3 in year 13. With numbers of candidates almost doubling for both Māori and Pacific groups, achievement rates have risen from 24.5% to 40.2% (Māori), and 18.9% to 35.8% (Pasifika) between 2004 and 2011. Pākehā students increased their numbers by one half, and their achievement rates from 53.8% to 62.1% over the same period.

Conclusion

The stated goal of the State Services Commission is for an overall success rate at NCEA2 of 85% at age 18 by 2017. NCEA2 has now become the benchmark for successful education outcomes, when previously the year 11 qualification, School Certificate, was the main benchmark. The 85% rate is far higher than the actual achievement rates recorded in this section, but that is largely because the section has been concerned only with single year figures, while NCEA2 can also be achieved in subsequent years, either year 13 or in other learning environments. The actual figures for NCEA2 success at age 18 have recently been calculated by the Ministry of Education and they are reproduced below as Table 4.

Learner group	2011(%)	Current gap (%)	2017 projection (%)	Remaining gap (%)
All 18 year olds	74.3	10.7	78.9	6.1 (3,650)
Māori	57.1	27.9	66.2	18.8 (2,420)
Pasifika	65.5	19.5	71.6	13.4 (950)
Pākehā	79.3	6.2	84.2	.8 (320)
Male	70.9	14.1	75.3	9.7 (3,000)
Female	77.9	7.1	82.7	2.3 (650)

Table 4. Estimate of 2011 achievement at level 2, NCEA for 18 year olds, plus 2017 projections and gap to SSC targets[42].

In terms of the questions that underpin this study, then, the success rate overall at NCEA2 (by age 18) is around 75%. Using this measurement, about 25% of students, mainly male and Māori, are failing to achieve. While the number is dropping each year, fully 30% of Māori students still leave school between years 11 and 12. Only 12% of Pasifika and pākehā students left at the same point.

NCEA achievement rates have increased significantly since the inception of the qualification. As the standards-based system has matured, the range of subjects, including vocational options, has widened, and far more support is now provided to students to help them achieve the standards. The improving results reflect these trends.

Measuring educational success and failure internationally

This section will mainly examine the findings of the PISA 2009 study, focusing on the reading scores, and examining New Zealand's performance in relation to other countries. There has been little change in New Zealand's performance on PISA since its inception in 2000 and, given the richness of the data (and the huge datasets – there are 4643 NZ students and around 280 individual records associated with each of the student and parent questionnaires, plus school level data), the focus will be solely on the 2009 round.

Across all PISA countries, there is an enduring relationship between socio-economic status and achievement on PISA tests. Essentially, the higher up the social continuum, the higher the level of achievement on PISA tests. If this were a fixed phenomenon, the resulting gradient would reflect exactly the level of socio-economic inequality in a society. But it is not. A range of factors determine the achievement of students in the schooling system. While the socio-economic relationship is both universal and enduring, it is not determinative of individual success.

In 1970, Basil Bernstein made the statement that 'Education cannot compensate for society'[43]. The enduring influence of social factors in PISA test scores across all countries demonstrates that Bernstein was correct. Indeed, the PISA report on equity notes: "Socio-economic disadvantage has many facets and cannot be ameliorated by education policy alone, much less in the short term"[44].

Changing social priorities across the OECD and different educational contexts have ensured that the educational performance of low socio-economic students has improved in recent years. Education, in a variety of forms, is more widely distributed across society, but achievement gaps based on social factors remain. The OECD notes that some schooling systems appear more effective than others in overcoming this social disadvantage[45].

Over the past 25 years New Zealand has become a more economically unequal society. From having one of the most equitable distributions of income in the OECD in the 1970s, New Zealand is now the 10th most unequal economy in the OECD. The measure used to define income inequality is the Gini co-efficient. The Gini scale runs from 0 (completely equal), to 1 (completely unequal), with all OECD countries falling between .2 and .5. Small variations in the scale represent significant real differences within countries. The following figure shows New Zealand's position among OECD countries as at 2009.

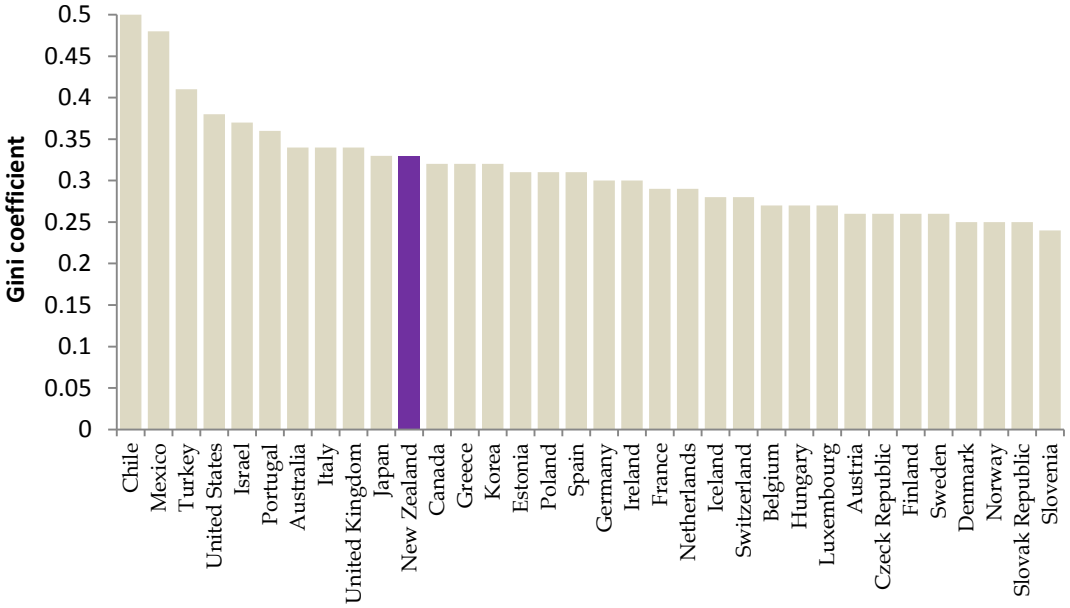


Figure 12. New Zealand and other OECD countries, Gini co-efficient of income inequality

New Zealand's performance, and ability to add value to various groups, needs to be seen in this context. There is clear evidence from the PISA findings that large social inequalities within a country affect educational performance. It is important to examine how different social groups perform, and in particular to what extent the schooling system 'adds value' to different groups.

The ESCS index quartile measure

The OECD uses the ESCS index to measure socio-economic status. Figure 13 shows that New Zealand students in the top quartile (25%) on the ESCS index are unequivocally the best readers in the world, according to the 2009 PISA results.

Figure 13. Mean scores on PISA 2009 reading - top ESCS quartile results.
Green line indicates OECD average

This group received the highest mean scores of comparable groups (top quartile ESCS) in all other participating countries on the reading scale, with an average score for the quartile of 578 points (compared with 562 for Australia, 544 for the UK and 558 for the USA). In contrast, Figure 14 (below) examines our ranking for the bottom ESCS quartile in the context of the other countries.

Figure 14. Mean scores on PISA 2009 reading - bottom quartile ESCS results.
Green line indicates OECD average

New Zealand students in the bottom quartile (25%) ESCS are ranked sixth, with an average score of 475, compared with Australia (471), and the United Kingdom and United States (both on 451).

In looking at the ESCS quartile results, some conclusions can be reached:

- New Zealand has a high quality education system, and is a star performer in educating students to a high level regardless of socio-economic status; and
- Despite New Zealand's relatively high levels of social inequality, the reading performance of the lowest ESCS quartile is among the best in the world.

In the Ministry of Education's annual report for 2012, the Secretary for Education, Lesley Longstone, made the comment that:

> However, the system is still under-performing for Māori learners and Pasifika learners, and learners from communities with significant social and economic challenges. While our education system continues to under-perform for these learners, we are not entitled to call ourselves world-class[46].

Using the quartile figures, this judgement seems overly harsh, and not based on the range of evidence. It is true that within the context of overall high performance, New Zealand's top quartile ESCS students perform comparatively better in reading than students in the lowest quartile. While raw reading scores are high in the bottom ESCS quartile, and this cannot be discounted, the score gap between the top and bottom quartile means puts NZ as having the eighth biggest gap, as shown in Figure 15.

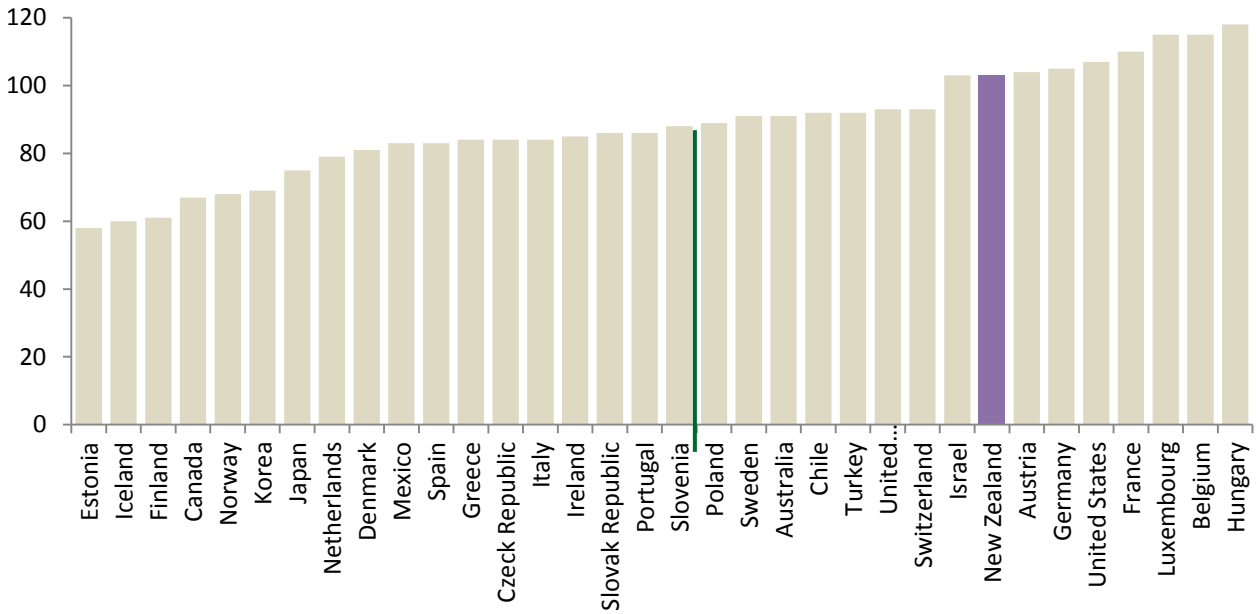


Figure 15. The reading score gap between quartile 1 and quartile 4 ESCS averages, PISA 2009
Green line indicates OECD average

On average, 39 PISA points is equivalent to one school year. Figure 15 therefore needs to be interpreted as showing that New Zealand 15 year olds have a reading gap of around 2.5 years between the means of the top and bottom ESCS quartiles (103 points)[47]. This compares with about a 2.2 year gap for the OECD average, and 2.3 years for Australia and UK. In short, while the gap is slightly wider than the average, there is no sign of a reading gap crisis.

It also needs to be reiterated that despite this gap, the bottom ESCS quartile read better in real terms than the equivalent group in all but five other countries, and better than all other English speaking OECD countries except Canada.

A quartile analysis of New Zealand's performance based on socio-economic factors (the ESCS index) reveals an education 'gap', but one caused as much by the outstanding performance of the top ESCS quartile, as by factors in the bottom quartile which, comparatively, achieves well. This analysis demonstrates a schooling system of world class in terms of reading ability across the socio-economic spectrum but, as with most other OECD countries, significant inequality based on social factors.

The percentile variance method

The ESCS quartile measure is one way of examining New Zealand's performance. Another way is the percentile variance method. Starting from the country's mean score, it measures the performance variation (variance) in each country by looking at the median scores at the 90th, 75th, 50th, 25th and 10th percentile points. It then compares the spread of scores of the above-median and below-median points. For New Zealand, the spread is as follows:

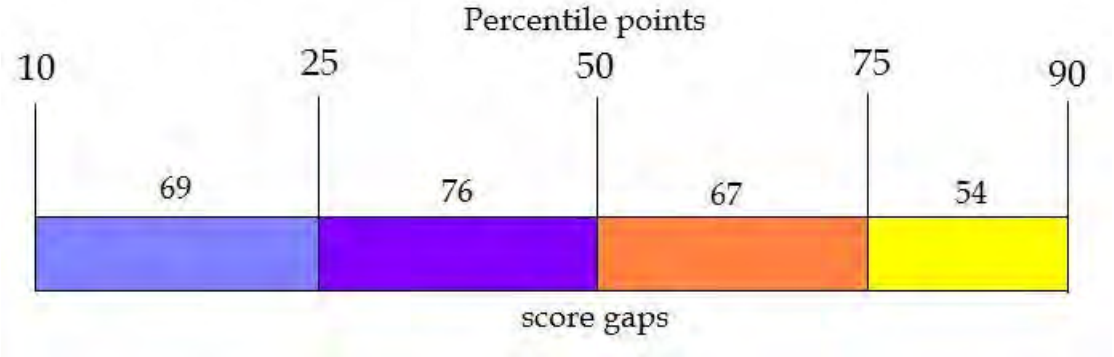


Figure 16. Performance variance between fixed percentile points, New Zealand

There is a 145 score-point gap between the median and the 10th percentile, but a smaller 121 point gap between the median and the 90th percentile. This means that the lower-scoring groups are more dispersed than the higher-scoring groups, leading to an imbalance that could be translated as an inequity.

Using this measure, New Zealand's reading 'gap' is not the highest among all countries, but it is the highest of the high-performing group. Even so, New Zealand's performance at the bottom measure – the tenth percentile – is still within the top group and well above the OECD average. The results of the percentile gap measure for all countries are shown in Figure 17.

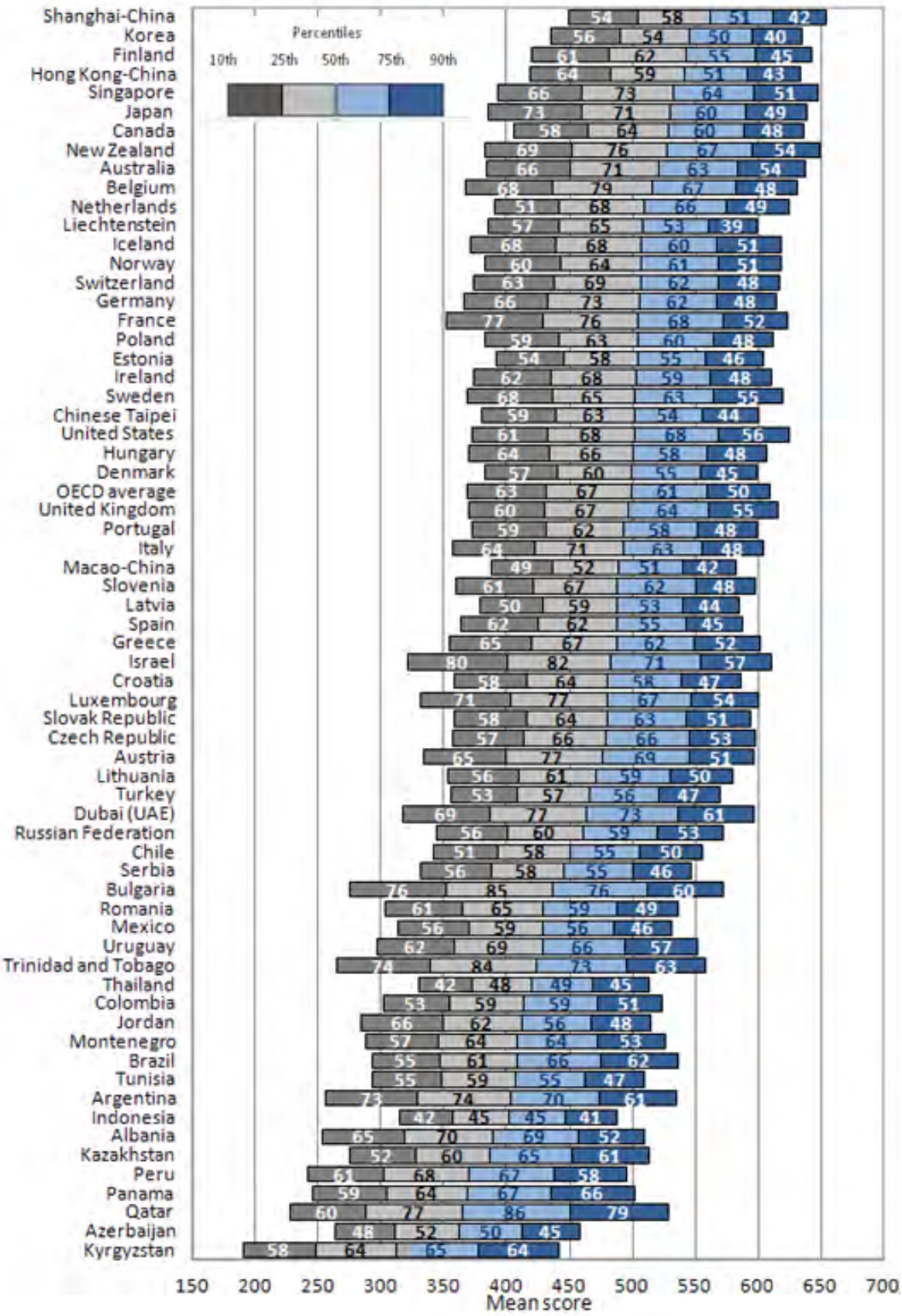


Figure 17. Variation of reading performance within countries.

A variance approach is useful in examining the spread of achievement in reading along a continuum. But it should be noted that the variance on the percentile model is significantly wider than the gap based on the ESCS index. This means that factors other than socio-economic status are causing the big gaps at the bottom of the hierarchy. One obvious influence is gender. Examined on a quartile basis of overall PISA scores in reading, there is a strong inverse relationship (p. -1.00) between the results for boys and for girls in New Zealand. In Figure 18, Q1 represents the top 25% of reading scores, Q2 the second 25%, and so on:

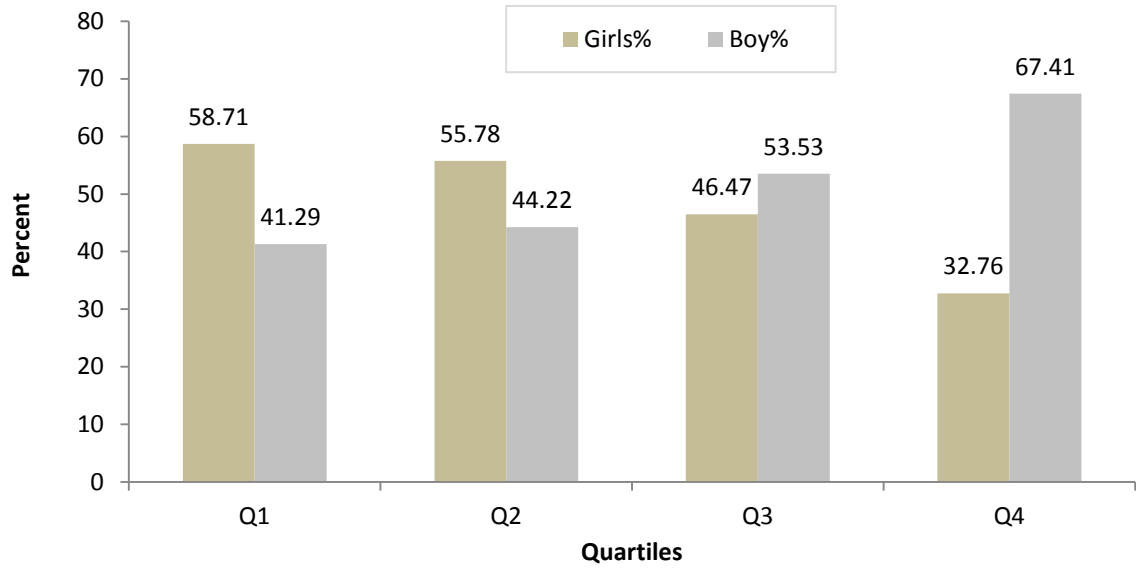


Figure 18. PISA 2009 reading scores ranked by results and in quartiles, by gender, NZ.

This means that, relatively independent of class and ethnic factors, there is a gender achievement gap across the whole spectrum of student learning in New Zealand.

The social gradient

The PISA report also uses a third method that interprets reading scores in the context of the level of social (in)equality in the various countries.

PISA (Volume 2) notes that New Zealand is a country of relative social advantage but medium-high social inequality. It also has, relatively speaking, a strong relationship between performance on reading and socio-economic background. In short, despite overall high performance, the 'gradient' of New Zealand's reading performance reflects the social inequality of the wider society.[48]

Yet another measure is used by the PISA reports to describe what is called the 'social gradient'. While the quartile measurements and the 10-90% percentile measures outlined above give a good picture of the distribution of marks over the achievement range, they are unable to describe with accuracy what is happening at the top and bottom of the distribution. The social gradient approach considers the whole

continuum, and examines how much students' performance changes with a change of one unit on the index of socio-economic status.

Lesley Longstone, the former Secretary for Education, was reported in 2012 as saying that New Zealand schools were "65th out of 65 countries at mitigating the impact of socio-economic background through its education system". In stating this, she was referring specifically to the social gradient figures, which show that a one-point change in socio-economic status in New Zealand is equal to 52 PISA points, compared to the OECD average of 38 points. This figure is the highest in the OECD (with France close behind at 51 points), with comparator countries scoring as follows:

Australia	46
Canada	32
United Kingdom	44
United States	42

The construction of the social gradient relies on the correlation of two different sets of measures: the PISA index of social, cultural and economic status (SCES[49]) and educational performance. Both are complex and correlation does not imply causation.

The last section of this report, on policy implications, notes that the OECD considers that social rather than educational interventions may prove more effective in making a difference, in countries such as New Zealand with higher levels of income inequality.

Implications of various indicators

New Zealand's readers are the best, or among the best, in the world on most of the measures used by PISA. The sole exception is measurement on the social gradient, where New Zealand performs relatively poorly at the lower levels. The social and educational contributors to this outcome are examined in the next section, which specifically focuses on the nature, size and implications of the 'gaps'.

Socio-economic gaps and educational performance

The previous section has established that New Zealand is a high achieving country in reading on a range of measures. The single measure in which this country came out 'worst' was on the relationship between socio-economic factors and school performance, the 'social gradient'. It can be summarised thus: While New Zealand performs strongly at all levels, and in top and bottom ESCS quartiles is at or near the top in reading performance, there is nevertheless a gap in achievement between top and bottom performers, which appears to be strongly related to the social and economic characteristics of the learners (see Brian Easton's companion report).

This section will examine these gaps from a variety of perspectives. The aim is to examine both the social factors and school factors that impinge on student performance in reading. Performance on mathematics and science tests is also available for analysis, but reading is chosen as a precursor to so much further learning. However, it should be noted that New Zealand's performance on these other subject areas was also well above the OECD average, and especially high in science[50].

The following table lists a series of indicators (some among many) measured by the PISA 2009 study and then examines the size of the 'gap'. The gap is constituted by examining the average reading score of the top and bottom group in the category.

For example, in the books category, the difference ('gap') is the average reading score of those participants who report 500+ books in their home, minus the average score of participants who report 0-10 books in their home.

The key feature of this table is that many of the elements act as proxies to describe other relationships, both economic and social. Many, of course, are both. Also, none of the factors listed exist in isolation, but in combinations that reflect relative advantage or disadvantage. In the table, the heading 'Rating' refers to the research team's assessment of the relative size of the gap, while 'Gap NZ' is compared to 'Gap all", the average size of the gap across all OECD countries.

Category	Rating	Gap NZ	Gap all	Comments
Number of books	Very High	132	116	Ranging in six steps from 0-500+, there is a direct and strong correlation between number of books in the home and performance on PISA.
Educated mother	Very High	123	102	
Educated father	Very High	121	98	

Educational costs	Very High	118	68	A strong relationship between amounts paid by households for education and performance on PISA.
Homework frequency	High	95	35	This specifically related to homework completed on a home computer
Use of home computer	High	85	66	This is a strong proxy indicator for in-home resources
Number of bathrooms	High	79	97	A direct relationship between number of bathrooms and performance on PISA reading - the gap is between 0 and 3+ baths.
Family income	High	72	81	Family income is an indicator of a large performance gap in reading across all countries - slightly smaller in NZ than average
Classic literature	High	58	57	28% of readers – many of them high performers- have classic books in their home
A desk at home for study	High	56	49	Around 85% of students have access to a desk at home for study purposes.
Student progress monitored	High	56	30	Parental reporting of whether student progress is monitored by the school
Gender	Medium	45	39	Girls outperform boys across all countries in reading.
Dishwasher	Medium	37	17	72% of families have a dishwasher. The 28% without average 37 fewer performance points
Working father	Medium	31	18	Father working fulltime is worth nearly a year to PISA reading score.
Choice: High academics	Medium	27	33	Importance to family of choosing a school with high academic outcomes.

Working mother	Medium	21	36	The gap shown is between full time work and no work. Mother working part time indicates the best performance - 24 points
Classrooms observed	Low	-20	-6	Small *inverse* relationship between performance in schools where classroom performance is never monitored, compared to always monitored.

Table 5. Learning gaps observed in a range of socio-economic conditions

What can be made of these indicators? Basically any factor listed with a high or very high rating indicates that the factor is present at a high level in high performers, and either absent or present at a very low level in low performers. In short, that element has strong predictive value for success at school, even though the element is unlikely to 'cause' that success.

Books

The number of books in a home has long been recognised as an important indicator of educational success among children. The late Roy Nash[51], for example, argued that counting the number of books in a home provided an excellent proxy for predicting educational outcomes for the children. He believed that 300 books constituted the benchmark for a guarantee of achievement, other factors being equal.

Figure 19 demonstrates the very strong linear relationship between number of books in the home and PISA scores on reading, mathematics and science tests in New Zealand:

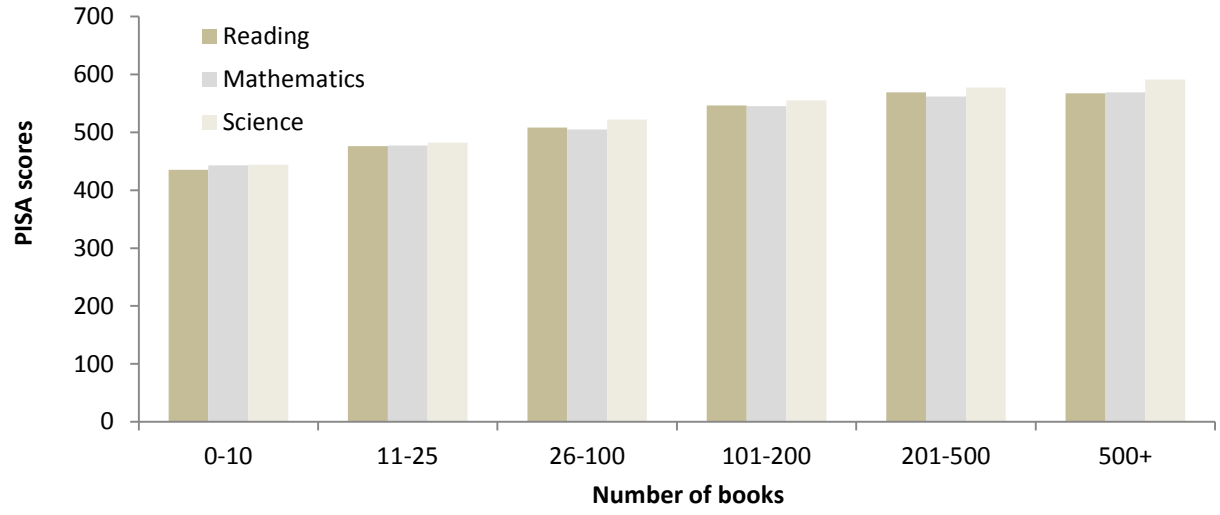


Figure 19. Number of books in students' homes by PISA scores, 2009.

Of course, book reading *per se* is beneficial to student achievement, and more so in New Zealand than other places:

> Parents' engagement with their children's reading life has a positive impact on their children's reading performance. Students whose parents reported that they had read a book with their child "every day or almost every day" or "once or twice a week" during the first year of primary school performed higher in PISA 2009 than students whose parents reported that they had done this "never or almost never" or "once or twice a month". On average across the 14 countries that had collected information on this question, the difference is 25 score points, but it ranges from 4 score points in the partner country Lithuania to 63 score points in New Zealand[52].

The linearity of the distribution is strong across all three subject areas. However, once the 200-book benchmark is passed the advantage largely disappears, except in science where having more than 500 books in the home is worth an additional 14 points over the 200+ category (the overall books gap for science is large at 147 points, equalling around four years of learning).

The number of books in the home is a powerful indicator of children's performance in reading at school, both in New Zealand and across countries. It demonstrates that there are enduring and strong relationships between those factors in the home that foster educational success: income, resources, cultural dispositions towards education and the valuing of reading, knowledge and accessing a varied experience, and learning outcomes.

The PISA data notes that together these are unassailable: no country in the world, whether having less or more income and social inequality, has been able to eradicate this relationship, although schooling reduces the impact of negative family dispositions and enhances good ones. New Zealand's overall high rankings, even in the bottom ESCS quartile, provide evidence that schools here are good at both tasks.

Family expenditure on education

A second area of interest to be examined here is the relationship between spending on education and PISA results. Parents of participants were asked how much they have spent on educational services over the past twelve months, excluding costs such as school uniforms and other non-service costs and add-ons, but including fees and voluntary activity fees.

Results are listed in Table 6 below:

Amount spent	PISA mean results	% total
Nothing	466	2.7
More than $0 but less than $200	508	49.1
$201 or more but less than $500	549	17.2
$501 or more but less than $1000	561	17.7
$1001 or more but less than $2000	546	3.3
$2001 or more but less than $5000	578	7.2
$5001 or more but less than $10,000	537	0.34
$10,001 or more	538	2.2

Table 6. Amount spent by parents on schooling, linked to PISA reading scores and % of schools, in US$

This finding is interesting because it must be assumed that parents who pay more for education are doing so in the hope of getting a better education for their children, or at least having them mix with a more successful educational cohort, and are also able to afford to pay more. The results show that up to expenditure of between $500 and $1000, the score relationship is linear, but after that becomes somewhat variable. In particular, the participants whose parents spent $5,000, or $10,000 or more on their children's education scored lower on average than those of parents who spent $201-$500.

The average reading score on PISA in New Zealand for private schools is 59 points higher than the state school average, at 586 points, which appears to be reflected in the $2-5000 category but not the higher categories.

The main finding that can clearly be sustained is that those who pay $200 or more per annum in school servicing costs constitute just under half of all participants, and average above the PISA NZ reading score. Those paying less than $200 average below the PISA NZ average reading score. It is likely that the gap is due to socio-economic factors rather than school factors per se.[53]

The PISA data provides the opportunity to undertake school-level analyses on this and most other indicators. There is a clear opportunity to undertake further analysis of this, and similar, data.

Failing to reach PISA proficiency level 2

> "The underlying assumption is that every child could be successful" (Hon Hekia Parata)[54].

The PISA report works on a scale of six levels of proficiency, averaging 73 score points. Proficiency Level 2 is considered a useful benchmark by the OECD for identifying students who risk failure in education or beyond in the globalised labour market. If there is a group in the PISA study who are deemed to have failed in reading, it is this group.

Proficiency Level 2 has a baseline score of 407 score points, and:

> …is judged the baseline level at which students begin to demonstrate the reading literacy competencies that will enable them to participate effectively and productively in life. Students proficient at Level 2 are capable of tasks such as locating information that meets several criteria, comparing or contrasting against a single feature in the text, working out what a well-defined part of a text means, even when the information is not prominent and making connections between the text and personal experience[55].

Cathy Wylie notes that:

> In 2009 New Zealand had 14.3% of its 15 year old students below level 2; in 2000 it was 13.7%, not a statistically significant difference. Looking at other English-speaking countries, we can be spurred on only by Canada, which in 2009 had 10.3% at this low level. Australia has much the same level as we do (14.2%, an increase from 12.5% in 2000), and the United Kingdom and the United States have more, with around 18%[56].

The OECD average is also at 18%. This section will examine the characteristics of the students who constituted the bottom 14.3% of 2009 PISA reading scores in New Zealand. The actual average scores gained by these students ranged from a low of 164 to 413. The bottom eight marks were outliers: only 8 students scored below 200 points.

The household income characteristics of the bottom 14.3% differed significantly (p =.06) from the overall sample, as shown in Figure 20:

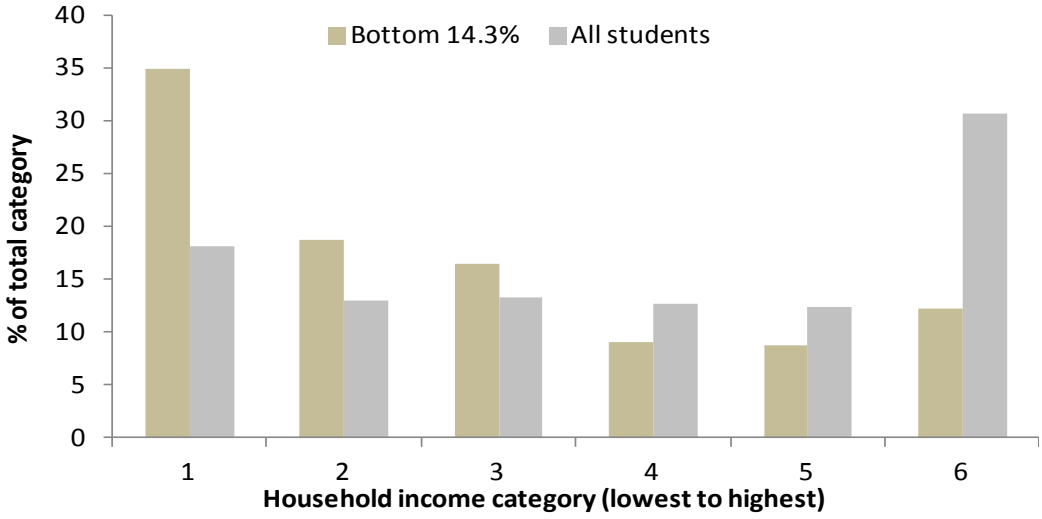


Figure 20.Comparison of reported household income, bottom 14.3% against total

The total family income of participants in this bottom group is far more likely to be in income categories 1-3 (household income from $0 - $70,000), than in the higher

categories ($70,001+). As well, the social characteristics of the 14.3% below the Level 2 benchmark differ greatly from those of the overall sample. There is a high gender bias, with 74% of the group being male (21% of all male participants are in this category).

Māori and Pasifika are strongly over-represented in the bottom 14%, while pākehā are significantly under-represented. Another way to illustrate this is as follows:

25% of all Māori are in the bottom 14.3%
35% of all Pasifika are in the bottom 14.3%
8.6% of all pākehā are in the bottom 14.3%

The following figure goes further, breaking down the composition of this group by ethnicity and gender. A new column, 'total Māori' is added, which examines the total of all students who indicate a part-Māori ethnicity. As Figure 21 is based on raw numbers rather than proportions, it can be seen that there are as many Māori in the 14.3% group as there are pākehā.

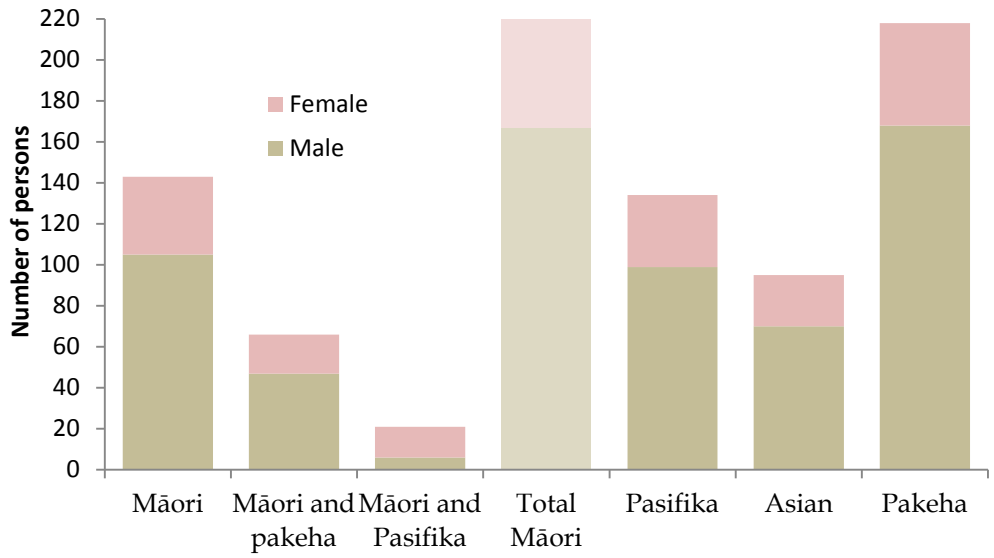


Figure 21. Breakdown of bottom 14.3% by ethnicity and gender.

The gender and ethnic breakdown can clearly be seen in Figure 21. The two most important features are the male dominance at this low level, and the high number of Māori once multi-ethnicity is taken into account. Multi-ethnic differences are explored further in Brian Easton's companion report.

Most of the students in this category live with their mother and father. Participants were asked to select from a list of options to describe people they lived with, and many selected more than one option.

407 lived with Mother and Father
87 lived with Mother and other

137 lived with Mother alone
35 lived with Father alone
96 lived with Grandmother, with or without a parent
13 lived only with an 'other'.

It is difficult to get accurate data from this group on the educational qualifications of parents. In the raw data, there are many missing values and some differences between student-report and parent-report of qualifications.

There is little difference between the early childhood (ECE) attendance of this group and the whole sample: 62% have attended more than one year of ECE compared with 69% for the overall New Zealand sample. The overall picture is shown in Figure 22.

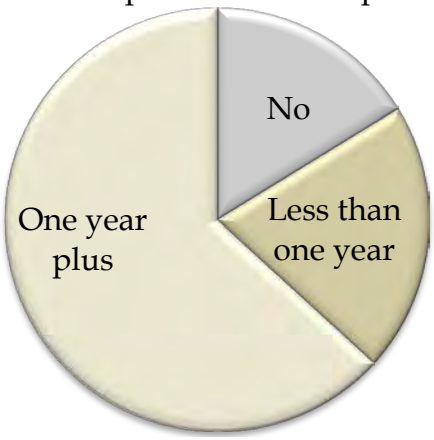


Figure 22. Did the student attend early childhood education, and for how long?

Of those who attended no ECE, there is a split between Māori (26%), Pasifika (29%), Asian (18%) and Pākehā (24%). There is no evidence in the sub-sample, or the whole sample, that Māori and Pasifika students are much less likely to attend early childhood education than others.

On the gap indicator outlined above, the number of books in the home scored the highest among a range of factors that affected performance on reading. As expected, there was a significant relationship between the distribution of results for the 14.3% bottom group, and for the participants as a whole, as Table 7 illustrates.

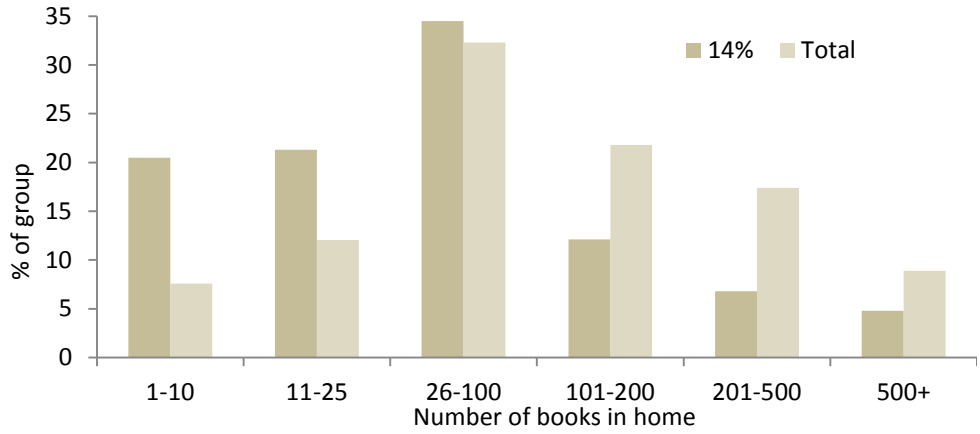


Table 7. Comparison between the bottom 14.3% and total participants, NZ, number of books in home (reading)

As the 'gap' analysis above indicates, children at the bottom of the reading scale fall behind on most social indicators, such as household resources and parental work and income measures. However, the 14.3% remains relatively socially diverse except for the ethnic and gender indicators mentioned above.

Twenty-one percent of the participants in the 14.3% group are the children of immigrants, of whom 70% do not speak English in the home. Over half of these children came to New Zealand at age 10 or above, and many more recently, so it is possible their relatively poor performance reflects their status. These factors are seen as relatively weak indicators by the OECD, but they may be a factor in some cases.

Differential approaches to learning or study habits may also help to explain students' failure to reach proficiency level 2. In terms of approaches to learning, once again the differences exist across all indicators, and show systematically poorer skills by the bottom 14.3%.

However, the differences are of degree rather than kind. One 'study habit', the relating of new information to prior knowledge, has been chosen to demonstrate this.

Question: When I study, I try to relate new information to prior knowledge acquired in other subjects.

	Bottom 14.3%	All
Never	14%	11%
Sometimes	43%	38%
Often	29%	36%
Always	7%	14%
N/A	7%	1%

Table 8. Comparison of bottom 14.3% against all students on study habits.

This reveals that the bottom group have quite similar study habits to all other students.
However, according to the PISA study, those failing to achieve proficiency level 2 in reading are unlikely to be able to "participate effectively and productively in life". These students are unlikely to read well enough to engage effectively with the secondary curriculum. This group is at risk of poor outcomes at school and beyond. Boys are more likely to disengage from school, especially from literacy learning, to exhibit poor behaviours and/or to drop out of school early[57]. This group is also that which the government expects will continue to fail, if 85% of students achieve NCEA Level 2 by 2017.

If disengagement from school was a cause or effect of poor student achievement, it would be expected that the poorest performers would exhibit attitudes that indicate rejection of schooling and/or of teachers.

One PISA question used four statements to test attitudes of the participants about the usefulness of school. The results are discussed more fully in the next section on schools and teachers. Figure 23 compares the responses of the 14.3% group with all participants, and comes up with some interesting findings.

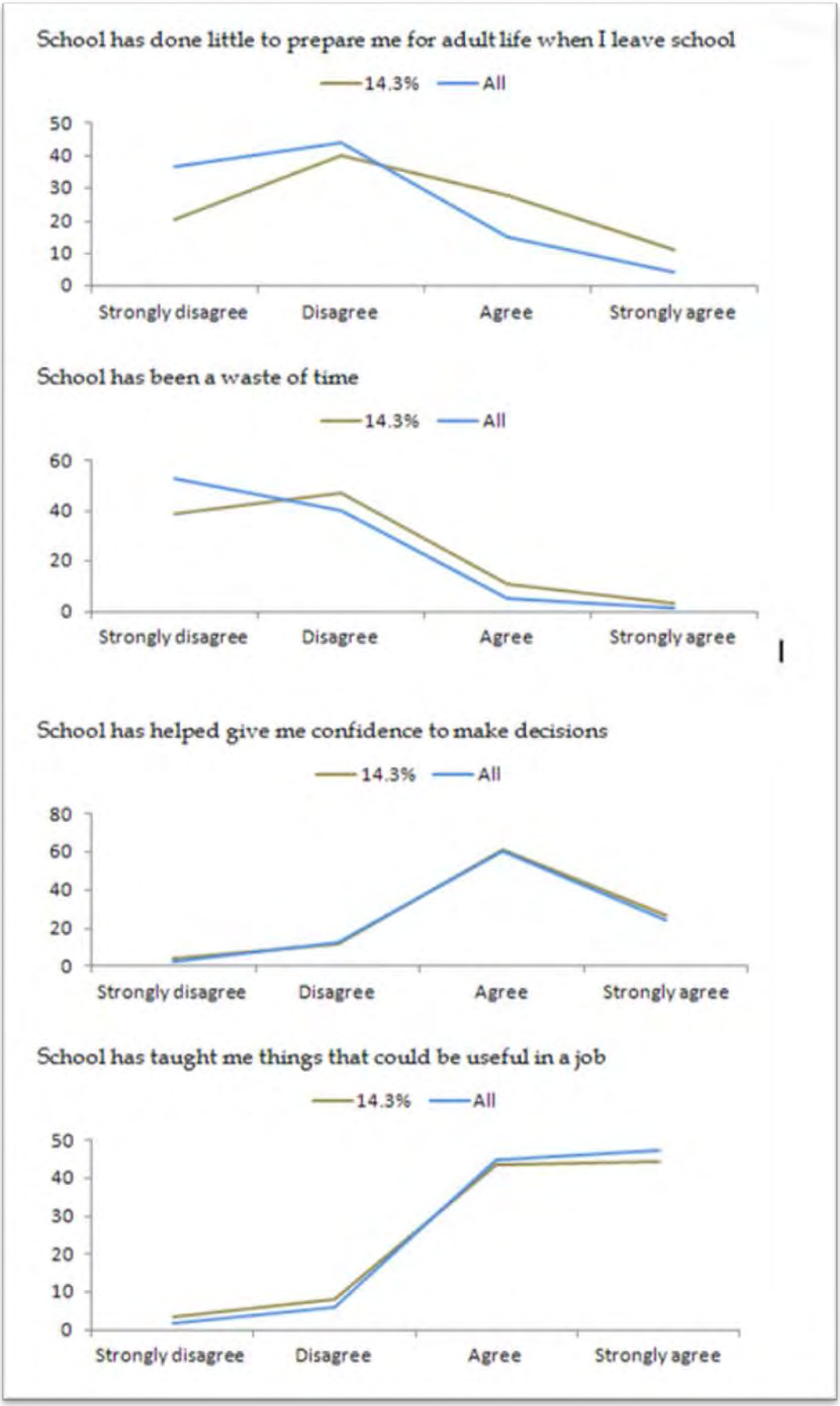


Figure 23. Comparison graphs of questions relating to school effectiveness, 14.3% at bottom against all participants

In only the first statement, about preparation for adult life, is there any clear difference between the bottom group and all participants. The overall group are more likely to disagree that schools have done little to prepare them for adult life, and less likely to agree with that statement. This statement was also the one most negatively answered.

In terms of the other three statements, not only were the two groups very similar in their responses, but both were also highly laudatory of their schooling. Schools are NOT a waste of time, they DO give students confidence to make decisions and they DO teach useful job skills.

This is important because the Minister of Education has stated that schools and teachers fail to address the needs of poor learners. In her speech notes for an August 2012 conference of primary school principals, she noted:

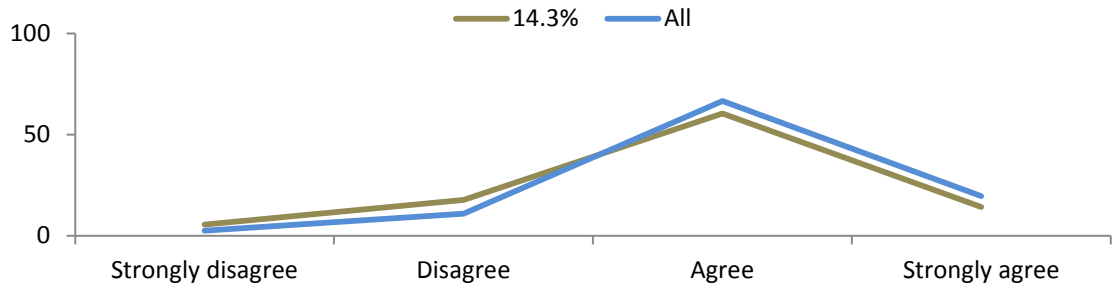
> If we want to lift achievement for our priority learners, we need to provide them with culturally responsive environments, where they feel more secure and valued[58].

But it is evident that the bottom group, despite low academic skills, do value schools and, presumably, feel that schools value them too. In that context, these figures are significant, and are notably missing from the New Zealand country report on the PISA findings.

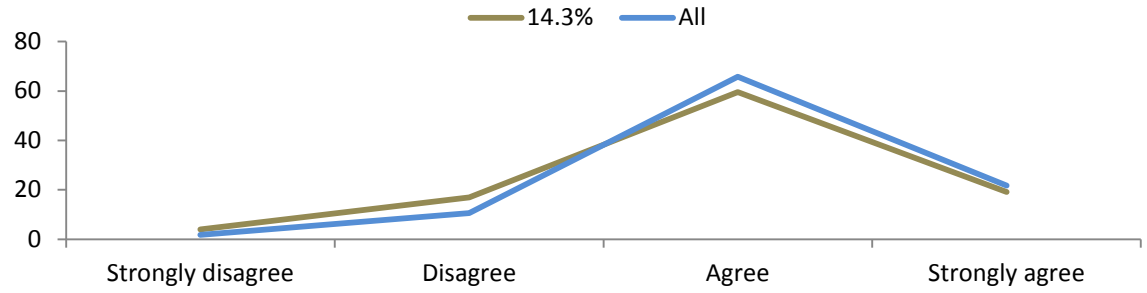
The New Zealand report also does not discuss the findings relating to participants' perceptions of their teachers. One question asks participants to respond to five statements about their teachers. Using the format in Figure 23, the responses have been graphed (below) to compare the responses of the bottom group with all students.

If the 'failing' students are disaffected and detached from schooling, it would be expected that their relationships with teachers would be less positive than those of other students. In practice, however, there is little difference between the mean responses of the two groups, beyond a slight but consistent tendency across all questions for the bottom group to be more negative. Figure 24 demonstrates an overall positive view of teachers by their students, with little disaffection evident.

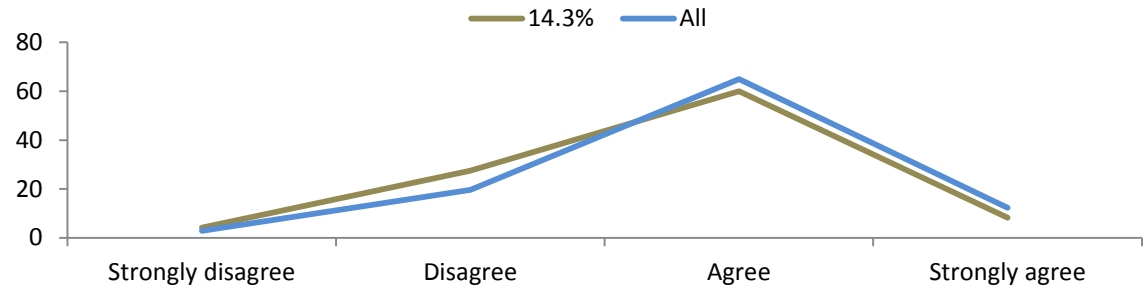
Most of my teachers treat me fairly



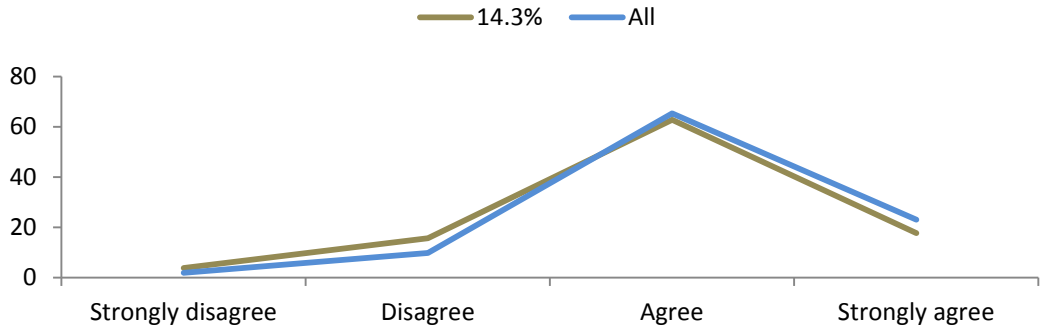
If I need extra help, I will receive it from my teachers



Most of my teachers are interested in my wellbeing



I get along well with most of my teachers



Most of my teachers really listen to what I have to say

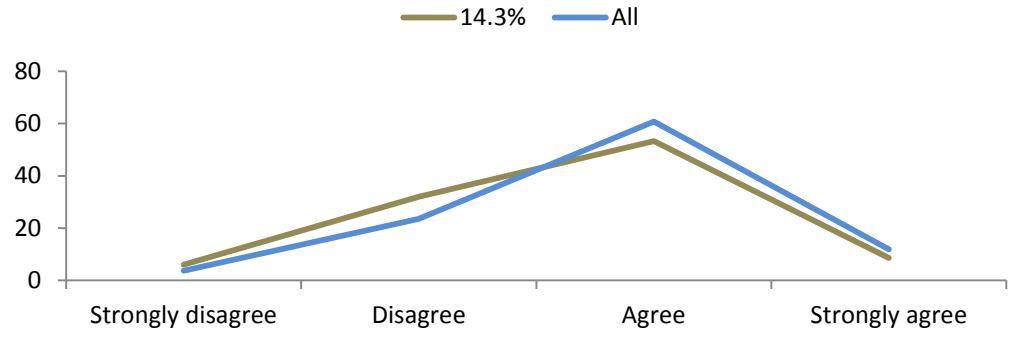


Figure 24. Views by students of aspects of teacher responsiveness, 14.3% and total groups

In summary, the social, economic, gender and ethnic characteristics of the bottom 14.3% differentiate markedly from the overall sample. The bottom group are poorer, more likely to be non-European, to be male and to have fewer household resources than the overall sample. Nevertheless, the students in the bottom group were nearly as positive about schooling as the total group (except on the one dimension of preparation for adult life, where the bottom group were more negative). Also, the bottom group were nearly identical to the total group in their estimation of the value and support of teachers.

A common claim by policy makers in 2012 is that schools have failed these children, and that radically different policy options are required. The PISA data raises doubts about this interpretation. There is little evidence that schools have low expectations of the lowest performing students as a whole, or give them a bad deal in the classroom. From the perspective of the students, a picture emerges of a teaching profession that does not distinguish between high and low achievers.

Seven stellar students at 750 plus

Seven students averaged more than 750 points over the PISA reading tests. As noted above, a one-year gain at school equals about 39 points, and the average NZ student scores 521 points. These students have a reading level around six years above the average fifteen year old. Most people will never have the reading analytic ability that the seven top students demonstrate. What are the social characteristics of these students? The following account is based on the median characteristics of the seven top students, and describes a mythical but typical top student.

Anna is a female pākehā. She lives with her mother and father, and may have a brother and/ or a sister. She attended early childhood education for more than one year. Her mother finished high school and has a degree-equivalent qualification, and works full time. Her father also has a post-school qualification, probably not a degree, and also has a full time job. Anna was born in New Zealand. Her house is well-resourced. She has her own desk for quiet study, her own bedroom and there are two or more bathrooms in her house. There is a broadband connection in her house and three or more computers. There are also three or more cellphones, two TVs and two cars.

There are more than 500 books in her house, and she can find classics, poetry, technical and reference books on the shelves. She reads for pleasure, on average, for over one hour per day. She also spends quite a bit of time on the computer, getting and answering emails, looking things up and working.

Anna goes to a New Zealand state school, and is equally likely to attend a single sex or co-educational school. Anna has not changed schools except to move from one level to the next. She expects to get a university degree or equivalent but not a post-graduate qualification.

When studying reading, she begins by figuring out what she needs to learn, she checks her understandings, spends time figuring out concepts and aims to remember the most important points. She will look for additional information.

At school her classes last for 55 minutes, and she has four or five classes a week in English, Maths and Science. She does not attend any enrichment classes at school, and does not take any curriculum subjects after school.

She is reasonably positive about school. She disagrees strongly that school is a waste of time, and believes school has helped give her confidence and prepare her for jobs. She is positive about her teachers' skills, and generally finds classrooms quiet and orderly. Her teachers challenge the class to gain a better understanding.

She uses libraries. They are a place where she can work, and she borrows books for fun but rarely for study. Her school has a library.

Anna's parental income is in or near the top category of $100,000 or more, and they spend around $1000 on average for educational services for Anna each year. They are happy or very happy with the services they get from the teachers and school.

A note on single parenthood

New Zealand has a relatively high rate of single parenthood compared to similar countries. In an OECD report[59], New Zealand was ranked third highest in the OECD after the United States and Ireland, with a single parent rate of 24% of all families with children. The OECD average was 14.8%, nearly half of the NZ figure. According to Perry (2012), single-parent households with dependent children have the highest income poverty rates of all household types, measured at 58% in 2011. More children than adults live below the poverty benchmark. In numerical terms, around 175,000 children, or 16% of the total, live in poverty[60].

Given the extent of single parenthood and its link to child and family poverty, it is worthwhile asking what effect these factors may have on educational performance, and whether they contribute to low achievement. In the PISA NZ sample, 20% of children reported living with only one parent, slightly lower than the 24% estimated in the Better Families report.

The average difference in performance in 2009 between the children of single parent families and those of other family types was 30 points, or three quarters of a year's progress in education. Other nations with a high reported level of single parenthood and large effect size include the United States, Trinidad and Tobago, Bulgaria, Panama and Argentina.

However, in the case of New Zealand the effect of single parenthood on educational performance may be more social than about household formation. Once corrected for socio-economic background, the PISA reading performance difference in 2009 fell from 30 points to only 4 points – a negligible effect size. This means that the large

performance gap is likely to be related to socio-economic factors and poverty issues rather than parenting.

The Māori and Pasifika achievement gap

On average, Māori and Pasifika students perform poorly across all measures of educational achievement. As noted in the first section of this report, in the early years of state schooling Māori students were not expected to go beyond Standard Four, then not expected to go to secondary school, then not expected to gain School Certificate, then not expected to enter tertiary education[61]. The parents and grandparents of Māori children, in many cases, had few opportunities to achieve well at school.

However, the rise of Māori aspirations for Tino Rangatiratanga (self-determination) and cultural revival has brought with it a re-definition of what constitutes learning, especially with bilingual and immersion schooling. This coupled with the shift from School Certificate to a more inclusive NCEA has generated improved opportunities for Māori in the education system.

The ministry's official position appears to be that the Māori achievement gap is a cultural phenomenon, not a socio-economic one. This appears to mean that it is caused by a cultural clash between the school and the Māori student. This view is clearly summarised in the following extract from a Ministry of Education briefing paper to the minister:

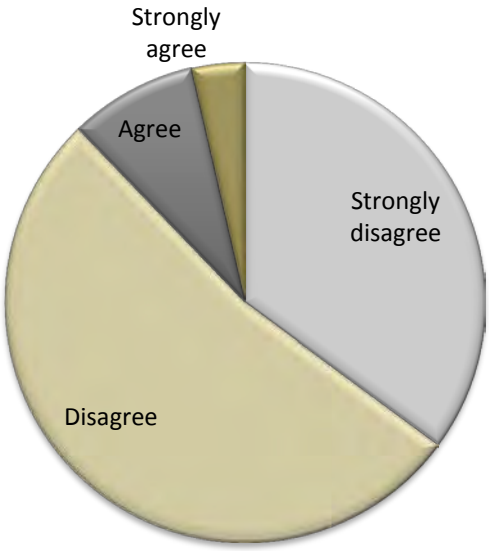
> By age 10, 18 out of every 100 Māori learners will not have achieved basic literacy and numeracy skills, compared to 4 out of every 100 pākehā learners. This is an unacceptable level of disparity. *Māori learners have inherent capability that can be realised with high expectations and quality teaching* (my emphasis). The education system must take better account of who Māori learners are, how they see the world, and what is important to them in education[62].

The companion statistical analysis by Brian Easton considers this and surrounding issues in more depth. Easton concludes that, when controlled for socio-economic differences, Māori perform at the international PISA average.

How poorly do Māori students perform? In the 2009 PISA study, Māori constituted only 8.1% of the top quartile in reading, but 30% of the bottom quartile. Comparative figures for Pasifika students were 3.1% and 21%. The NZ report on PISA notes:

> Those students identifying as Māori (19%) and Pasifika (10%) scored [on average] 478 score points and 448 score points, respectively.

The rich PISA data provides a range of evidence about the factors influencing Māori and Pasifika achievement. Very little of that has to do with the relationship between students and schooling. Māori students are as likely as all other students to value their teachers and find them useful, even those in the fourth quartile, as the following two figures, derived from Māori/fourth quartile data, displays:



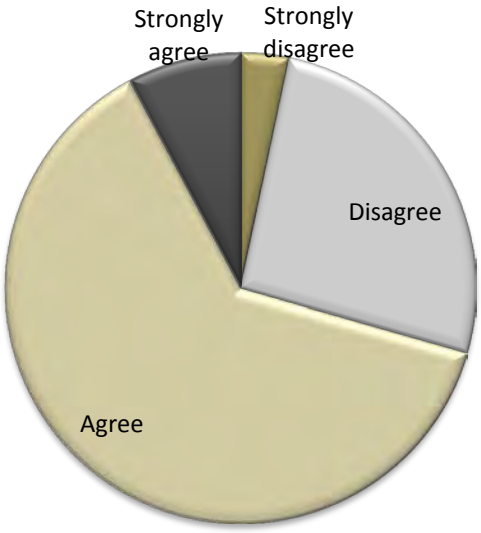


Figure 25. "School is a waste of time".
Figure 26. "Most of my teachers are interested in my well-being"

One area where Māori and Pasifika show more disengagement, by omission in this case, is completion by parents of the parent questionnaire for PISA. Overall, 76% of parents completed the questionnaire, compared to 65% of parents of Māori students. But in the bottom quartile, 45% of Māori whānau, 50% of Pasifika and 35% of pākehā parents did not complete and return the questionnaire.

Conclusion: Failing students?

New Zealand is a modern OECD country with an excellent schooling system. In terms of PISA 2009, New Zealand students perform well above the average on reading, science and mathematics, and are particularly strong on the first two of these.

Like all other countries, there are two variables that are systematically linked to school performance: socio-economic position and gender. Due to a range of factors, New Zealand has a so-called 'steep socio-economic gradient', with a large performance gap between each step of the ESCS index.

However, this is not caused only by poor performance at the bottom. As the NZ PISA report notes:

> Although New Zealand continues to show a wide range of scores in reading, not all this difference can be attributed to low performing students. The success of the highest performing students also increased the size of the spread [63].

It is essentially the size of the gap that has led to the arguments by the Ministry and Minister that "our system is continuing to fail these young people"[64]. It has led to the setting up of the Ministerial Cross-Sector Forum on Raising Achievement, an educational forum tasked with "raising achievement across the board, for every learner"[65].

This section has laid out what the gaps are, and the extent to which they are linked to a range of factors inside and outside of schools. To summarise the findings of what constitutes a failing student:

Fourteen percent of New Zealand students did not achieve Level 2 reading literacy. This is the same proportion as Australia (14%) and Japan (14%)[66]. In that bottom group, which is considered not to have the skills needed for full participation in work and society, are 25% of all Māori students and 35% of Pasifika students. That bottom group is also 74% male.

Factors identified as significant in that group include the absence of key social and economic resources, and an apparent lack of family or whānau engagement. In terms of student engagement with school, students rated schools and teachers nearly as positively as high achievers: New Zealand students appear to find schools useful and teachers responsive.

The NZ PISA report notes[67]:

> The proportion of students not reaching Level 2 in the two other large English-speaking countries − the United Kingdom (18%) and the United States (18%) − was larger than in New Zealand, Australia or Canada.
>
> At the lowest end of the proficiency scale, PISA 2009 Level 1b or below, Japan (5%), New Zealand (4%) Australia (4%) and Singapore (3%) all showed slightly larger proportions than the five other top- or high performing countries or economies.

This section has identified a number of factors that are associated with students becoming good readers:

- Family income and education levels – for all ethnic groups, highly educated, working parents with good incomes foster good readers.
- Family spending on education – spending more than $200 per year on a child's schooling is a strong indicator of good reading, although this is probably a socio-economic rather than an educational indicator.
- Gender – being a female boosts everyone's chances of being a good reader.

- Good family resources – number of books, type of books, a desk, a room of one's own and a range of other factors contribute to good reading.
- Good personal reading habits – use libraries, read for pleasure, do homework on a home computer.
- Attendance at a school with high academic outcomes – although this is probably as much a socio-economic as educational factor.

The next section investigates a small number of factors relating to schools and teachers.

Success from the PISA perspective

PISA essentially defines the minimum acceptable educational performance as the achievement of Proficiency level 2. This is the benchmark which enables readers to participate effectively and productively in life. As noted above, 14.3% of 15 year olds in NZ fell below that benchmark in the reading scales in 2009, compared to an OECD average of 18.1%. The figure for Mathematics was 15% (OECD average 22%) and for Science it was 13% (OECD average 18%). As noted above, Māori, Pasifika and boys (except in Mathematics) were more likely to fail to reach the benchmark.

The difference in New Zealand student performance levels between the PISA benchmark for success, Proficiency Level 2, and success rates in the NCEA need to be explained. If only 15% of NZ students at age 15 do not have the skills needed to participate effectively in society (PISA), why is it that NCEA success rates are different? More generally, should the school system be able, through assessment and accreditation policies, to acknowledge the skills of those who are above PISA Proficiency level 1 (who are deemed to have the knowledge to function effectively in society) but unable to achieve NCEA level 1?

And should not some serious remedial schooling be available for that bottom 15%, to ensure they end up able to live and work in NZ society, and not be at risk of social or justice problems?

These matters should be open for widespread debate and discussion, but are not. Nevertheless, there are important opportunities in this data to develop further research programmes for policy and good practice.

Schools and teachers

In her Nelson speech to the NZEI Principals in August 2012[68], the Minister of Education, Hekia Parata, made a number of implied criticisms of schools and teachers, based on the 2009 PISA results. Quoted comments include:

> New Zealand's education system is world-leading, but its performance has plateaued and it needs a system-wide lift.
>
> Standing still is slipping behind.
>
> Principals and teachers need to take advantage of the permissiveness of the curriculum to design a programme that suited their students.

The speech was derived largely from a set of speech notes produced by the Ministry of Education, although the term 'plateau' does not appear in the notes.

The speech notes prepared by the Ministry, and the Minister's speech, share a similar analysis. Roughly translated the political discourse is as follows:

> *Schools and teachers are doing well with the easy to teach students, but are failing to properly educate others, especially Māori and Pasifika students. We have set targets that require schools and teachers to do much better, and it will be their fault if the targets are not met. They need to have better skills and higher expectations to ensure that the low-achieving groups are effectively educated. Failure is not an option.*

This is a peculiarly disembodied discourse. By its close-in focus, it ignores the social context in which teaching and learning take place and which, as this report has shown, so strongly influences learning. It is also generic. It can be repeated when New Zealand does well on international assessments, and when it performs more poorly.

New Zealand research evidence acknowledges that the social context is important to educational achievement. Snook and O'Neill note:

> It is clear that home background is the major determinant of educational achievement. Study after study has shown that the social class from which students come has a major influence on school achievement. Estimates of the effect on individual variance vary from 86% (Hirsch, 2007 p. 1) downwards but the key point is that when considered together, social class and home background effects are always much more significant than any school or teacher effects[69].

It is also not true that our lowest-achieving students are not being catered for. New Zealand's lowest ESCS index quartile averaged a PISA reading score that put them at sixth place in the world for the bottom quartile, ahead of Australia, the UK and the

USA among others. This is despite New Zealand's relatively high levels of income inequality.

The argument also ignores a range of systemic contextual issues, including the low funding of New Zealand schools and the effects of other system factors such as the requirements of self-management and competition, and the effects of school choice.

As noted in the previous section, the PISA data confirms the influence of socio-economic resource factors on schooling: every country has a social gap that translates into an educational gap. But since the development of the NCEA, the measured achievement levels of students have improved significantly.

This section will briefly examine what the PISA report (volume 4) has to say about school and teacher success.

What makes a successful school system?

The PISA report defines a successful school system as one with above-average performance and below-average impact from socio-economic status. New Zealand qualifies on the first criterion but not the second. New Zealand's education policy settings demonstrate some, but not all, of the features identified by PISA as constituting a good system.

Certain administrative settings support high performing school systems:

> … those school systems that grant individual schools authority to make decisions about curricula and assessments while limiting school competition are more likely to be performing above the OECD average and show below-average socio-economic inequalities. Many school systems with high average performance but comparatively large socio-economic inequalities tend to allow higher levels of school competition[70].

New Zealand has a system with high levels of autonomy and opportunity for the curriculum to be offered in different ways, the school to be controlled and managed locally and parents to be involved in the education of their children. Such features are highly recommended by the OECD. However, the same system has also allowed high levels of competition between schools to develop, especially at the secondary level.

The PISA report also notes that strong investment in teachers, with higher teacher salaries, links to better performance at school[71]. New Zealand's system is built, to a large extent, around putting well-trained and relatively well-paid teachers in front of classrooms.

On other factors, New Zealand does not do so well. According to the report, features of good school systems include:

- Opportunities are offered to all students regardless of their background;

- Socio-economically advantaged and disadvantaged students attend the same schools; and

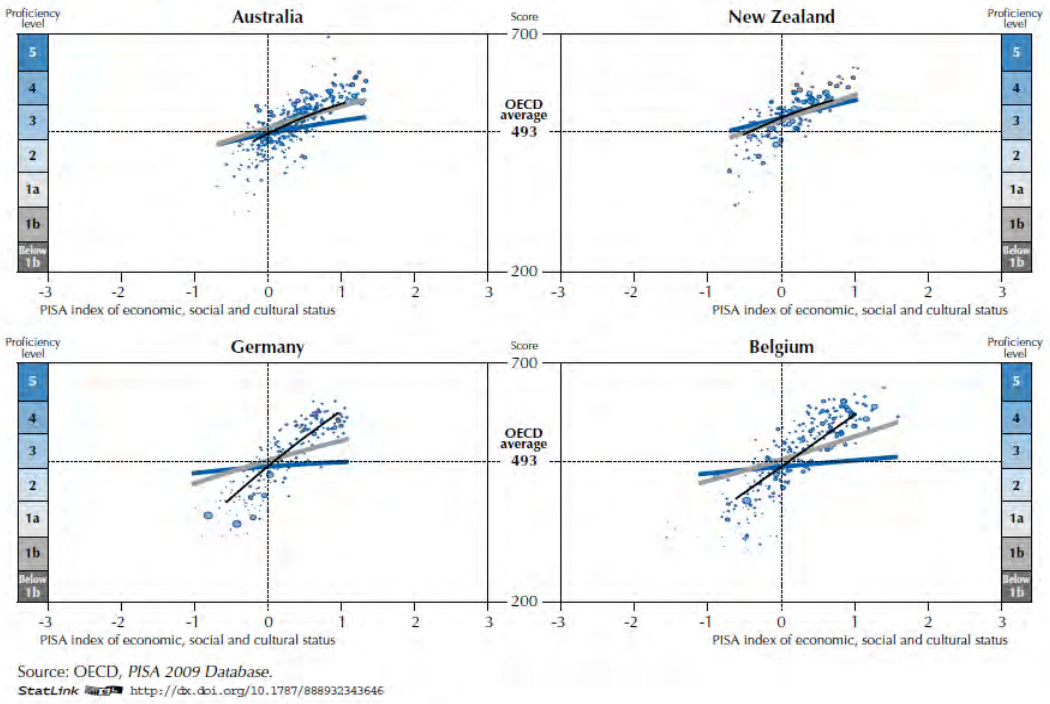
- Students rarely have to repeat grades or get transferred out of schools because of behavioural problems, low academic achievement or special needs[72].

New Zealand schools would generally meet the first criterion, but there is significant socio-economic differentiation in our schooling system (and schools receive differential funding on the basis of the SES decile). In recent years, the Ministry of Education has developed a number of new programmes aimed at addressing behavioural problems (Positive Behaviour for Learning), although these are patchy in their implementation and funding. So New Zealand has a mixed score-card on these factors, although individual schools may do an excellent job with hard-to-teach students.

The PISA report (vol. 4) notes that the level of social differentiation between schools is not related to average performance, but does impinge on socio-economic inequalities. This latter point refers to systems of academic/vocational selection and other forms of between-school selectivity, and also to selective programmes in schools.

Figure II.H

Relationship between school performance and schools' socio-economic background in Australia, New Zealand, Germany and Belgium



Source: OECD, *PISA 2009 Database*.

StatLink http://dx.doi.org/10.1787/888932343646

Figure 27. Gradients of in-school and between school variance by socio-economic background, comparison of four countries.

Figure 27 demonstrates that New Zealand's level of between-school differentiation is quite closely aligned with its within-school differentiation, demonstrating inequalities throughout the system that impinge on student success. A range of factors, many related to socio-economic mix, cause these differences.

New Zealand's schools have many of the features of high performing systems, but fall down on a lack of features to overcome the inequalities facing low socio-economic children in a competitive system and a highly unequal society[73]. The problem is not an artefact of the schools, but of the policies that have shaped the current system.

How long should children spend at school?

In New Zealand, students tend to start school on their fifth birthday. Only Ireland, the UK, the USA and Canada have similar practices. In most systems, the actual age of starting school is six years or, in the case of Finland and a number of other OECD countries, seven years. There appears to be little relationship between successful education and age of commencement, although other factors, such as participation in early childhood education, may also be important.

A number of schooling systems, especially in Northern Europe, and notably Finland, also have a much shorter school day and school year. In Finland, for example, students have only about 2.5 hours per week of instruction in their native language, compared to 4 or 5 hours in New Zealand and similar countries.

Factors other than relative achievement govern age and hours of school attendance. The New Zealand model supports part-time day work for custodial parents, which a shorter school day may not. Also, teachers report that it is difficult to fit the curriculum into the existing hours, and would most likely not support a reduction in hours.

Assessment and the monitoring of performance

Assessment policies in various nations are linked to small but significant changes in school performance in the PISA data[74]. The most effective assessment is standards-based approaches with an external examination component, with promotion dependent on performance in such assessments and low levels of repeated work. New Zealand's NCEA system meets most criteria for an effective assessment system.

On the other hand, other forms of assessment, notably standardised tests that are not linked to progression at school, were found to be unrelated to school performance. For that reason, the National Standards system now implemented in New Zealand schools is unlikely to lead to an improvement in student performance[75]. In her speech to the Nelson primary principals, the Minister of Education strongly defended the

National Standards policy: "it's about raising achievement". From the perspective of the PISA studies, such a policy is unlikely to be effective in meeting this goal.

In New Zealand, parents are relatively satisfied that schools are adequately monitoring student progress, as outlined in Table 9. Nearly 85% of parents are satisfied with the way schools monitor performance, a rate higher than the OECD mean. Notably, the higher their children's average score on the three assessed areas, the higher the reported parental satisfaction.

Country	Category	%	Reading Mean	Mathematics Mean	Science Mean
New Zealand	Strongly agree	21.59	550	545	557
New Zealand	Agree	62.48	540	536	551
New Zealand	Disagree	11.81	513	514	532
New Zealand	Strongly disagree	1.47	492	487	510
OECD Average	Strongly agree	18.53	506	505	512
OECD Average	Agree	59.35	505	504	511
OECD Average	Disagree	17.28	503	500	510
OECD Average	Strongly disagree	2.23	486	481	495

Table 9. Parents' satisfaction with school monitoring of student performance

Conclusion: A good schooling system

In an article in the NZ Herald, writing about the PISA 2009 results, Warwick Elley stated:

> Why isn't it front-page news? Why don't we celebrate the achievement of our schools in producing so many bright students, with so little per capita expenditure? At this time, when schools are completing their academic year, and plaudits are being handed out to our top sports teams, business leaders and media stars, we should be congratulating our rank and file teachers for drawing the best out of thousands of children, and showing the world that we still have a great education system.

The 2012 Ministry of Education Annual Report contained a comment by the former Secretary for Education, Lesley Longstone, that New Zealand cannot claim to be world class because Maori and Pasifika children and children from poor communities are under-performing. Is this the proper message to take from the PISA studies? Taken with the various statements coming from the Minister, it appears that a quite politicised approach, based on a strong critique of the work of teachers and schools, has been taken by the national leaders.

This is a pity, because there are pointers arising from careful analysis of PISA 2009 and its policy recommendations that could be used to further improve learning outcomes

in this country. Requests under the Official Information Act have failed to find any work that the Ministry has undertaken on Volume IV of the 2009 PISA.

Following on from PISA, there is a lot more that can be said and done about raising achievement in New Zealand schools. A new agenda is needed, and the PISA findings provide some impetus towards new policies and practices for raising achievement. These are considered in the next section.

Policy settings

Volume 4 of the PISA 2009 study focuses on the ability of high quality transnational research to improve schooling, through sharing and testing ideas across nations:

> The results from the PISA 2009 assessment reveal wide differences in educational outcomes, both within and across countries. The education systems that have been able to secure strong and equitable learning outcomes, and to mobilise rapid improvements, show others what is possible to achieve. Naturally, GDP per capita influences educational success, but this only explains 6% of the differences in average student performance. The other 94% reflect the potential for public policy to make a difference[76].

While the PISA study receives publicity primarily as a 'league table' of student performance across countries, its main goal is to lead change across nations. In the past, New Zealand has had good reason to be wary of such ambitions emanating from the OECD and other international organisations. This kind of study has, in the past, been used as a vehicle to promote what has become known as the Global Education Reform Movement (or GERM) – more choice and competition, higher fees, use of flexible labour and so on. The OECD has not, in the past, been immune from this.

Led, in particular, by the effective Finland[77], the OECD now appears to be promoting a more evidence-led approach to policy development arising from the PISA studies. This section reviews current school policies in New Zealand and an agenda for action that could emerge by adopting approaches recommended by PISA.

Current policies aimed at improving achievement in schools

At the present time (December 2012), a stated aim of the government is to increase the achievement of New Zealand students in school and beyond to the following target:

- 85% of 18 year olds will have achieved NCEA level 2 or an equivalent qualification in 2017.

In the 1920s and 1930s, the Proficiency exam at Standard 6 (age 14) achieved pass rates averaging around 80% *of those that sat the examination*, but only around half of students did so (rising to around 75% towards the end of the period for non-Māori). An 85% achievement rate for assessment at age 18, over the whole age group, is by far the most ambitious target ever established in New Zealand schooling (indeed, it is the first time that a population target has been set at all).

While the proportion of students achieving NCEA2 has increased substantially, the trajectory needed to achieve the government's aim is very steep, particularly for Māori and Pasifika students. Table 10 below outlines the achievement rates for 18 year olds in 2006 and 2010.

Ethnicity	2006 (%)	2010 (%)
Pākehā	69	73
Māori	34	50
Pasifika	40	57
Total	59	67

Table 10. Achievement rates at age 18, NCEA level 2 for 2006 and 2010[78]

The State Services Commission website that outlines the 85% target lists a number of ways it will be achieved. Of the two methods given that are relevant to secondary schools, one focuses on relevance and the other is solely about community engagement:

- Ensuring young people in schools achieve NCEA level 2 or equivalent by strengthening the relevance of learning for young people through the implementation of vocational pathways, skills-based learning and stronger linkages and networks between schools, other providers and employers, and
- Identifying and engaging learners at risk of leaving education, or who have already left education, and working with schools and communities to re-engage these learners in education.[79]

A variety of policies and programmes have been put in place in New Zealand in recent years to attempt to mitigate the social/educational gaps. After years where government policy has required little intervention in 'autonomous' schools, the Ministry of Education has in recent years undertaken a range of programmes to lift achievement in low decile schools. There have been two main foci:

- improving Māori education through initiatives such as immersion and bi-lingual learning, Te Kotahitanga and similar programmes; and

- improving behaviour in schools in order to improve learning opportunities, the PB4L programme, healthy schools, RTLBs and similar programmes.

Such programmes, and planning documents like Ka Hikitia, have focussed on increased learning engagement with at-risk students. Restorative practices in schools, where effectively implemented, can lead to significant school changes that appear to affect learning outcomes[80].

But are these policies enough? Should the government be looking to more structural change, such as that suggested in Cathy Wylie's recent book[81] - a move back to strong regional Ministry of Education offices that can support schools and teachers more effectively?

The funding of schools[82]

New Zealand spends below its comparator countries on education as a whole, and schooling in particular. Figure 28 on the next page demonstrates graphically that our cumulative annual spending in US dollars on schooling between the ages of 6 and 15 is well below the OECD average, and about equal to the amount spent in Greece. Only Korea, of the high-performing countries, is anywhere near NZ on the table, and that country spends around $13,000 more than NZ per student over the compulsory school attendance period.

The PISA data allows further examination of the funding issue. How much does a country spend on education to raise the reading score of a student by one point? Of course, the question is moot, as children gain reading skills in a range of ways including home and school. However, the table is still highly illustrative of how far behind New Zealand's school expenditure is compared to similar countries. The results are outlined in Table 11 below.

Country	Expenditure	PISA average	$/PISA point
USA	105752	500	211.50
UK	84899	494	171.86
Australia	72386	515	140.56
Canada	80451	524	153.53
Finland	71385	536	133.18
Korea	61104	539	113.37
New Zealand	48422	521	92.94

Table 11. Total est. expenditure per student, and calculation of cost of a PISA reading point, selected countries

The PISA policy report notes that expenditure is not by itself a key influence on achievement above a certain level, but it would assist in the purchase of resources to help overcome social and educational inequalities, including highly qualified, well-paid teachers.

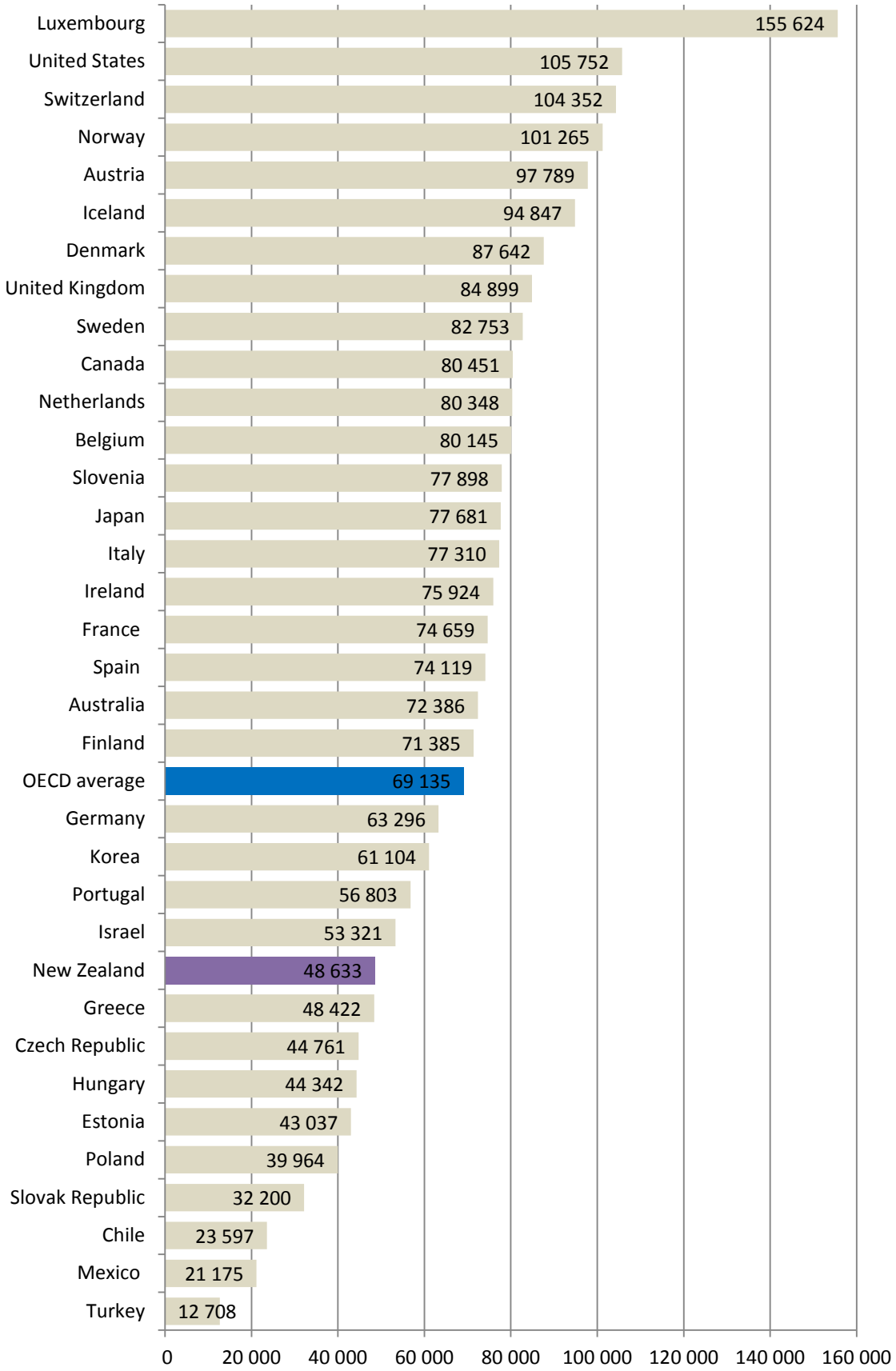


Figure 28. Cumulative expenditure by educational institutions per student aged 6 to 15, by OECD nation and in $US[83].

Policy approaches recommended from PISA study

In some cases, PISA recommends policies beyond the educational domain. It is difficult to achieve better educational outcomes in highly unequal countries:

> Countries where the [socio-economic] gradient is steep will find that socio-economically-targeted policies are more likely to reach the students who most need help. Socio-economically targeted interventions are of particular relevance in countries that show steep socio-economic gradients and an above-average strength of the relationship between socio-economic background and learning outcomes[84].

New Zealand has the steepest gradient (52 PISA points) but an average link between socio-economic status and outcomes. As such, it does not quite fall into the category described above. However, other studies (see below) have suggested that, with high child poverty rates, socio-economic interventions would be the most effective way to raise school achievement. In-school social policies, such as free school lunches and social workers in schools, may also be effective.

In schools, a strong socio-economic mix (rather than differentiation), highly qualified and well-paid teachers, relative school autonomy, good local governance and management and approaches that foster community rather than hierarchy are supported. Behaviour management methods should be aimed to keep students in school and learning. Highly qualified and well-paid teachers are seen as a priority by the OECD.

In terms of the system, school choice is not related positively to improved achievement for low SES groups where additional costs (such as transport costs and school uniforms) are incurred in making the choice. Also:

> The degree of competition among schools is one way to measure school choice. Competition among schools is intended to provide incentives for schools to innovate and create more effective learning environments. *However, cross-country correlations of PISA do not show a relationship between the degree of competition and student performance.* Among school systems in the OECD countries, the proportion of schools that compete with other schools for student enrolment seems unrelated to the school system's overall student performance, with or without accounting for socio-economic background[85] [my emphasis].

In summary: "Countries that create a more competitive environment in which many schools compete for students do not systematically produce better results"[86].

Policies that privilege private schools do not make educational sense: "Private schools average 25 points advantage over state schools in reading across all countries. However, once socio-economic advantage is controlled, the gap falls to 3.4 points and is not statistically significant"[87].

The PISA policy report notes that shorter or longer classes or school engagement time appears to make little difference, with several high-achieving countries starting school at age 7 and having shorter school days and fewer lessons. While an increase in the school starting age would be socially unpopular, especially with caregivers, and it would be difficult to change the school day for similar reasons, these findings do raise the possibility that classroom learning could be reduced to make way for additional alternative activities, such as sport, culture, club activities and the like, especially if financial provision was made to ensure equity of access.

It would be interesting to do some research with teachers on whether they think we over-teach students in New Zealand.

The policy guidance provided by PISA is aimed at assisting OECD nations to improve schooling. It should be noted that the report written by the New Zealand team for New Zealand schools and the public merely reported the subject results, and has not considered or written on the contents of the volumes on overcoming inequality and making policy changes.

Generally speaking, the OECD policies move in the direction of a more inclusive and comprehensive system of education, with schools catering to a wide social and ability range, good curricula, good teachers and some autonomy in decision-making.

Child poverty and education: an opportunity

The Expert Advisory Group (EAG) on Solutions to Child Poverty released its final report and recommendations in December 2012[88]. There have been a string of reports on the effects of child poverty in New Zealand over the past 40 years, but this is the largest, most comprehensive and most prestigious, sponsored by the Office of the Children's Commissioner.

It is evident from the PISA 2009 findings that reducing poverty and inequality would help foster better learning at schools. While schools can (and do) work to help poor children learn, much more could be done if the economic and social context were improved.

It is not appropriate here to go through the socio-economic findings of the EAG report, but it is probably useful to note the recommendations in relation to education. They are in line with the general approach of the PISA policy, if not the specifics[89]:

- We recommend that the government take additional action to reduce poverty and mitigate its effects for Māori children and young people so that they are on a par with other children in New Zealand, and report annually on progress.

- We recommend that the government scale up successful Māori education initiatives.

- We recommend that the government incentivise inclusive quality ECE and prioritise the provision of compulsory education, and tertiary education/ training for children and young people with disabilities who are living in poverty.

- We recommend that the government design and implement a collaborative food-in schools programme, commencing with decile 1 to 4 primary and intermediate schools.

- We recommend that the government continue and expand the Positive Behaviour for Learning school-wide intervention and other evidence-based targeted behavioural support interventions for parents and teachers.

The key message from the OECD policy report is that the twin spectres of socio-economic inequalities and educational failure need to be dealt with together, and in a way that supports the professional, autonomous work of schools and teachers.

Concluding comments

Throughout the twentieth century, achievement in New Zealand schools was rationed by a series of scaled examinations which limited and channelled educational success. As in other countries, patterns of achievement were strongly linked to socio-economic and ethnic status. With the abolition of School Certificate, Sixth Form Certificate and University Entrance examinations in 2002, and their replacement with the three-tiered National Certificate of Educational Achievement, the door was opened for a more expansive and success-oriented system.

Over the decade since the introduction of NCEA, there has been an enormous change in achievement rates across all social groups. This was an intended outcome of the shift to NCEA, and further improvements have been targeted by the government. It is notable that:

- All groups are staying on longer at school;
- All groups have increased their achievement at all levels of NCEA; and
- There has been some closing of the educational 'gaps', especially for Māori and Pasifika but less so for boys.

The change to NCEA has provided the basis for New Zealand to bring itself into line with achievement rates in other countries, currently in the range of 70-80%.

Two sources of achievement were mainly used in this document: NCEA results and the results of the very detailed PISA 2009 study undertaken by the OECD. Towards the end of this research, the 2012 TIMSS and PIRLS data was released, and painted a less positive picture of New Zealand achievement, but that data was not used here.

Success rates under NCEA

Success rates at all levels of NCEA are changing rapidly. In the early days of NCEA, 6,000 students enrolled in year 11 did not commence NCEA study. By 2011 that number had dropped to 3,000, despite an overall increase in student numbers. The overall proportion of students with no qualifications at the end of year 11 has dropped from 35% to 27%, and about a third of these will achieve NCEA1 in year 12 or 13.

In 2004, nearly 11,000 students left between year 11 and year 12. By 2011, that number had reduced to around 6,000. Most (95%) of these are enrolled at NCEA1 or 2. In 2011, 67.7% achieved NCEA2 in year 12, an increase of over 11 percentage points since 2004. A further 10%, on average, will complete NCEA2 in year 13, with an expected success rate for 18-year olds in that cohort of around 75%.

Another way of viewing this is that 62,000 students entered year 11 in 2009, and 41,500 ended up with NCEA2 after three school years, and over 25,000 had also gained NCEA3 in that time.

However, achievement rates for Māori and Pasifika are still significantly lower than for pākehā, even though these groups are catching up. Across all ethnicities, the male achievement gap lags, on average, 7 percentage points behind female rates. The Ministry of Education has recently estimated that, over and above ongoing improvements, a further 3,650 students, 2,420 of whom are Māori, and 3,000 of whom are male, will need to achieve NCEA2 by 2017 to meet the government's 85% target.

If NCEA2 is considered as the current benchmark for school success, then only 68% of students who entered year 11 in 2009 are currently successful by year 13. According to the Ministry of Education, this increases to 74% for all 18 year olds. This rate is likely to continue increasing over the next few years, but additional initiatives to support Māori learners and boys would provide the best means to achieve the 85% target by 2017. With such initiatives, it appears to be achievable (pākehā females probably achieved that rate in 2012).

PISA study

The PISA findings echo the NCEA results in terms of the segmented nature of student learning in the senior school. Comparatively speaking, New Zealand does well at both ends of the socio-economic spectrum, but has a higher than average reading gap between the mean of the top and bottom quartiles, of about 2.5 years. This reflects medium-high levels of social inequality. Even so, performance at the 10th percentile is well above the OECD average.

A gap analysis revealed the factors that correlate with (but are not, in themselves, causative of) level of achievement. The four very high factors (more than three years difference from the top group to the bottom group) were number of books in the home, mother's education, father's education and the amount spent by the families on education.

Factors other than socio-economic status influence student achievement, the most pervasive being gender. Girls predominate in the top half of achievers and boys in the bottom half.

The only benchmark of achievement recognised by PISA is Proficiency Level 2 on its own scale. This is considered to be the benchmark at which students can achieve at school or in the labour market. Across the OECD, 18% of students scored below that level. In New Zealand the figure was lower, at 14.3%. Given the government's goal of an 85% success rate at NCEA2, this group constitutes those that would still fail to achieve under that regime. A detailed analysis was undertaken of the characteristics of the group.

Seventy percent of the 14.3% group had family incomes in the bottom half of the distribution. Seventy four percent were male. A quarter were Māori and 35% Pasifika.

Schools and teachers are often blamed for the failure of students in the bottom group to achieve. The PISA study asked students their views on the skill and helpfulness of their teachers. In general, the bottom 14.3% did not score their teachers differently than the overall sample, indicating that disengagement is unlikely to be the cause of failure among the bottom group. More research on this group is needed.

In summary, the PISA study found that 85.7% of New Zealand students achieved adequately on the 2009 reading scale. The study supports the analysis of NCEA data that Māori and male students tend to be in the bottom group, and also that Pasifika students are over-represented at the bottom.

Final word

The PISA study makes it clear that, with good policies and practices, and with a focus on both school and non-school factors that lead to poor outcomes, student achievement can increase further. Liberated from the constraints of scaling, New Zealand's school outcomes have already improved dramatically over the past eight years, in both outcomes and diversity of qualifications. While the 2017 target of 85% achieving NCEA2 by age 18 seems ambitious, it can probably be achieved with adequate support for schools and teachers. This would align our NCEA2 results with PISA proficiency level 2.

There are external factors, notably high child poverty, that act as constraints in achieving this ambitious target. In meeting it, also, further issues should be raised about what it would take to provide a more successful schooling experience for the 15% who do not achieve NCEA2. That group, mainly male, Māori and Pasifika, remain severely at risk of poor outcomes, such as joblessness or even imprisonment, that could be overcome by educational engagement and success.

It is evident from this report that New Zealand schools and teachers (not to mention students) have embraced the National Certificate of Educational Achievement, with all its possibilities to offer a diverse and successful educational experience for senior students in New Zealand schools. The transformation in outcomes from a decade ago, especially for Māori and Pasifika learners, is nothing short of startling. The high achievement on PISA scales should provide confidence that the education being provided is of high quality.

Appendix 1. Summary of information on NZ examinations

Date	Form of assessment	Type of assessment	Outcome of assessment	Expected pass rates	Other	Māori
1877-1902	Assessment at each standard	Standards-based	Promotion to next standard	No information	Initially assessed by Inspectors at each level, then by teachers	Most left after Standard 4.
1902-1936	Certificate of Proficiency	Standards-based	Access to free secondary education under free places scheme	1903 Secondary Schools Act - a third of candidates expected to pass, but 1907 the pass rate was 59%, in 1908 it was 68%, and in 1912 it rose to 77.1%.	50% of aggregate required to pass, minimum of 30% in English/arithmetic, inspectors satisfied that candidates were "sufficiently instructed" in other subjects.1906 - pass for Proficiency raised to 60% with 40% in arithmetic and English. 1918 - minimum English raised to 50%.	Very small numbers of Māori initially passed, and numbers increased very slowly over time
1904- 1936	Certificate of Competency	Standards-based (based on lower standards than Proficiency)	Failed Proficiency but 'fulfilled requirements of some standard of education'. Entitled to place at Technical school.	No information, but note increase in Proficiency pass rates above	40% of the Proficiency aggregate, later - with 50% in reading and composition and 30% in arithmetic. In 1916 endorsements were introduced to record special merit in handwork or elementary science.	Very small numbers of Māori initially passed, and numbers increased very slowly over time
1936-2002	School Certificate	Norm-referenced, scaled, initially based on four passes but from 1968 there were single-subject passes	Became, by 1948, the school leaving certificate for those not entering higher education	Was unable to find exact figures. Probably 50-60% of those that sat the examination. However, many left school at 15 without sitting.	Until 1968 had to pass in four subjects to gain SC, after that single-subject passes were allowed. Pass rate varied enormously between subjects.	School Certificate not offered in the Native District High Schools until 1945. Pass rates for Māori remained low, leading in later years to claims of racial bias in the exam.
2002-	NCEA	Standards-based and moderated	Levels 1, 2 and 3. Can do multi-level study.	Level 2: Currently around 70%. Goal: 85% by 2017.	Many ways to earn standards to gain credits to pass the levels. Highly expansive system.	Currently around 50% at Level 2, 57% for Pasifika

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	Students	Candidates	NCEA1	No qualification
2004	60378	54366	32663	21195
2005	62324	55888	34401	20892
2006	63726	59009	37518	20740
2007	62832	59097	38318	20000
2008	62394	58789	38336	19624
2009	62832	59107	38950	19227
2010	62980	59802	39888	18897
2011	62878	58728	40304	17309

[40]

	students	candidates	NCEA2	No qualification
2004	49679	44648	28054	11744
2005	49750	45189	29604	10585
2006	50567	47833	31986	10662
2007	52911	50608	33858	11721
2008	52675	50541	34243	11579
2009	54257	52101	35185	11885
2010	55482	53125	36458	11662
2011	56107	53038	37979	8814

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