

Treasury's Advice on Lifting Student Achievement in New Zealand: Evidence Brief

March 2012

Treasury's [2011 Briefing to the Incoming Minister of Finance](#) (BIM) summarised Treasury's current advice on education policy:

New Zealand's compulsory education system produces good outcomes for most students, as evidenced by our strong performance in international tests. However, despite large funding increases, achievement levels remain unacceptably low for some groups. Student achievement can be raised by improving the quality of teaching, which the evidence shows is the largest in-school influence on student outcomes. Increasing student/teacher ratios, and consolidation of the school network, can free up funding that could be used to support initiatives to enhance the quality of teaching, such as more systemic use of value-add data and a more professionalised workforce.

This note provides a short summary of the evidence base that underpins this advice.

A significant proportion of New Zealand students are achieving poorly

On average, New Zealand performs well in international surveys of student achievement such as PISA¹, and many students achieve at a very high level. There are however, some areas that suggest cause for concern about the performance of New Zealand's education system.

Firstly, performance in PISA and other international surveys of student achievement has remained relatively static over the past decade, while government expenditure on schooling per student increased by about 20% in real terms (i.e. over and above inflation).

Secondly, New Zealand has a wide distribution of educational achievement and more low performing students compared to other countries with a similarly high average score in international tests (OECD, 2010). As a result of this wide distribution, a McKinsey and Company report on high performing schooling systems classifies New Zealand's schooling system as 'fair to good', similar to countries such as Malaysia, Armenia and Portugal (Mourshed et al, 2010). The end result is that three in ten students - and five in ten Māori students - leave school without achieving NCEA 2.

¹ The OECD's Programme for International Student Assessment, which looks at the achievement of 15 year olds in reading, mathematics and science.

There is general agreement that NCEA 2 is the level of the qualification needed to succeed in the modern economy.

Thirdly, the socio-economic background of New Zealand students exerts a much larger influence on their achievement than in most other OECD countries². In other words, New Zealand's education system does not appear to be very good at enabling students to succeed, regardless of their background.

Finally, amongst all OECD countries, New Zealand has the largest variation in student achievement *within* schools (OECD, 2010). Both PISA and school leaver data show that low attainment is not confined to just a few schools, or to schools serving the most disadvantaged communities, but is widely distributed across schools (although Māori, Pasifika and low socio-economic background students are most at risk of low attainment). This suggests that all schools could do better at lifting the achievement of their lowest performing students.

The potential growth impact of lifting student achievement is significant. Treasury's analysis, drawing on Hanushek and Wößman (2009), suggests that if overall student achievement could be lifted by 25 PISA points (putting New Zealand with the top performers in the OECD), GDP would be expected to be higher than it otherwise would be by 3-15% by 2070. This is a large growth impact from a single contributing factor.

Within schools, teachers have the greatest influence on student learning

Research on student learning consistently shows that the largest source of variation in student learning is attributable to differences in what students bring to school – their abilities and attitudes, and family and community background – factors that difficult for policy makers to influence, at least in the short-run.

Of those variables which are potentially open to influence in educational settings, factors to do with teachers and teaching are the most important influences on student learning (Alton-Lee, 2003; Hattie 2009). For example, research suggests that teachers at the top of the quality distribution can get up to a year's worth of additional learning from students, compared to those who are at the bottom of the quality distribution (Hanushek and Rivkin, 2006). Chetty et al (2011) find that students assigned to high quality teachers (determined by test score-based value-add measures) are more likely to attend college and earn higher salaries, and are less likely to have children as teenagers, suggesting policies to raise the quality of teaching are likely to have substantial economic and social benefits in the long run.

² A one unit increase in socio-economic status (using OECD measures) is associated with a 52 point gain in PISA reading score (equivalent to more than 1 year of schooling) – the highest in the OECD. In New Zealand, 16.6% of the variance in student performance in PISA is explained by student socio-economic background, compared to 14% on average across the OECD.

Class size influences achievement, but not always, and not for all students

Overall, the evidence suggests that the effect of class size on academic outcomes varies depending on the characteristics of students (e.g. age, prior attainment, socio-economic disadvantage). For example, a consistent finding from the research is that smaller class size has a positive impact on the achievement of students in the initial years of schooling, and that some students - particularly lower achieving and disadvantaged students - benefit more than others. The evidence for the effect of class size on achievement is limited beyond these first few years, and little is known about the effects of class size on secondary age students (Blatchford and Lai, 2010).

The research also identifies large differences in the extent to which the potential benefits of smaller class sizes are realised. For example, one of the most well-known studies of class size effects – Project Star in the US – found a small positive effect on student achievement in about half the classes where student numbers were reduced, while in the other half, smaller class size had no effect on student achievement (Hanushek and Rivkin, 2006). One reason for these different effects is that some teachers adapt their teaching to take advantage of smaller class size, while others do not.

The research provides little guidance on the optimal class size, or the lower or upper thresholds at which class size starts to have a positive or negative impact on educational outcomes. For example, some US studies suggest that classes of 20 or fewer students are necessary to have an effect on achievement, while English research has suggested that a class size of 25 or fewer is important (Blatchford and Lai, 2010).

Reducing class size is expensive³ - it requires more teachers and more classrooms. Policy makers need to know not only that it works, but that it is the most cost-effective approach to lifting student achievement. Studies that provide comparative cost-benefit analyses of different interventions to lifting student achievement are not readily available, but other evidence suggests a focus on teaching quality over class size. For example, research suggests that the impact on student learning of moving from a class with an average teacher to one with a high performing teacher is roughly equivalent to the effect of a ten student decrease in class size (Rivkin, Hanushek and Kain, 2005). Hattie (2005) notes that the typical effect size of smaller classes could be considered 'small' or even 'tiny' relative to other educational interventions. Further, the OECD has identified that high-income countries which prioritise the quality of teachers over smaller classes tend to show better performance (OECD, 2012).

³ The cost of reducing average teacher:pupil ratios by 1 student would require a 4 percent increase in the number of teachers, at a cost of about \$100 million per annum.

The key to improving student outcomes is to ensure consistently high quality teaching for all students, in all schools

Treasury's position is not that class size doesn't matter. Our concern is to ensure that resources are directed to where they will have the greatest impact on student achievement. In our view, this is best done through a focus on ensuring effective teaching across the system. Although we have almost no information about the quality of teaching⁴ in New Zealand, there is no reason why we would not have the wide variation in teaching quality that is observed in other countries. The strong impact of teachers on student learning, the large within-school variance in student achievement, low equity, and relatively high proportion of low achievers, all suggest that New Zealand should turn its attention to ensuring there is consistently high quality teaching practice in all schools.

The OECD's work suggests that a high quality teaching workforce is a result of deliberate policy choices, carefully implemented over time (Schleicher, 2011). It suggests that making teaching an attractive and effective profession requires support for continuous learning, career structures that give new roles to teachers, engagement of teachers as active agents in school reform, and fair and effective teacher evaluation systems. A recent report by Australia's Grattan Institute highlights how four East Asian countries have achieved significant improvements in the performance and equity of their schooling systems by building teacher capacity. They have done so via a focus on high quality initial teacher education, improved feedback and mentoring, and career structures that value good teaching (Jensen, 2012).

A recently released OECD report on evaluation and assessment in New Zealand education highlighted issues across a number of these areas, including: variable teacher appraisal; poor linkages between appraisal, professional development and school development; and an apparent lack of a formalised career path for effective teachers (Nusche et al, 2012). The OECD made recommendations to address these issues, in order to strengthen the quality of teaching in New Zealand.

Finally, a growing body of evidence has highlighted the importance of using data to inform teaching practice and decision-making in schools (Faubert, 2012). This includes gathering and analysing data to assess individual student progress and identify who is falling behind. It also includes aggregating data and using it to inform school and teacher self-review processes, help allocate resources, and facilitate conversations about effective teaching strategies and possible development needs. The OECD has recommended that New Zealand needs to do more to ensure teachers and schools have the skills to collect, analyse and interpret data, in order to support improved outcomes for learners (Nushe et al, 2012).

⁴ The one New Zealand study to look at this issue (Schereens, Vermeulen and Pelgrum, 1989, cited Alton-Lee, 2003) identified a between-teacher variance of 42% for Year 9 students.

References

- Alton-Lee, Adrienne (2003) *Quality teaching for diverse students in schooling: Best evidence Synthesis*. Ministry of Education, June 2003.
<http://www.educationcounts.govt.nz/publications/series/2515/5959>
- Blatchford, P and K C Lai,(2010) Class size - arguments and evidence. In: *International Encyclopedia of Education, Third Edition* (Editors-in-Chief: Penelope Peterson, Eva Baker and Barry McGaw), pp 200-2006.
<http://www.sciencedirect.com/science/article/pii/B9780080448947010812>
- Chetty, Raj, John N. Friedman and Jonah E. Rockoff (2011) The long-term impacts of teachers: teacher value-added and student outcomes in adulthood. *NBER Working Paper 17699*. <http://www.nber.org/papers/w17699>
- Faubert, Brenton (2012) A literature review of school practices to overcome school failure. *OECD Education Working Papers*, No. 68. OECD Publishing.
- Hanushek, Eric and Steven Rivkin (2006) Teacher quality. *Handbook of the Economics of Education, Volume 2* (Eds: Eric Hanushek, Finis Welch).
<http://www.sciencedirect.com/science/article/pii/S1574069206020186>
- Hanushek, Eric and Ludger Wößman, (2009) Do better schools lead to more growth? Cognitive skills, economic outcomes and causation. *NBER Working Paper No. 14633*, <http://www.nber.org/papers/w14633>
- Hattie, John (2005) The paradox of reducing class size and improving learning outcomes. *International Journal of Educational Research*, Vol 43, pp 387-425.
<http://www.sciencedirect.com/science/article/pii/S0883035506000607>
- Hattie, John (2009) Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge, UK.
- Jensen, Ben (2012) *Catching Up: Learning from the best school systems in East Asia*. Grattan Institute. February 2012.
http://www.grattan.edu.au/pub_page/129_report_learning_from_the_best.html
- Mourshed, Mona, Chinezi Chijioke and Michael Barber (2010) *How the world's most improved school systems keep getting better*. McKinsey and Company.
<http://mckinseyonsociety.com/how-the-worlds-most-improved-school-systems-keep-getting-better/>
- Nusche, Deborah, Dany Laveault, John MacBeath and Paul Santiago (2012) *OECD Reviews of Evaluation and Assessment in Education: New Zealand 2011*. OECD Publishing.
http://www.oecd.org/document/48/0,3746,en_2649_39263231_44567984_1_1_1_1,00.html#New Zealand
- Nye, Barbara, Spyros Konstantopoulos and Larry Hedges (2004) How large are teacher effects? *Educational Evaluation and Policy Analysis*, Vol. 26, No. 3, pp 237-257. <http://epa.sagepub.com/content/26/3/237.abstract>

OECD (2010), PISA 2009 Results: Overcoming Social Background – Equity in Learning Opportunities and Outcomes (Volume II).

<http://dx.doi.org/10.1787/9789264091504-en>

OECD (2012) Does money buy strong performance in PISA? *PISA in Focus* 13 (February 2012) http://www.oecd-ilibrary.org/education/does-money-buy-strong-performance-in-pisa_5k9fhmfzc4xx-en

Rivkin, Steven, Eric Hanushek and John F Kain (2005). Teachers schools and academic achievement. *Econometrica*, Vol. 73, No. 2, pp 417–458. www.econ.ucsb.edu/~jon/Econ230C/HanushekRivkin.pdf

Schleicher, A. (2011), *Building a high-quality teaching profession: lessons from around the world*. OECD Publishing. <http://dx.doi.org/10.1787/9789264113046-en>