IS SCHOOL REFORM WORKING?

GEOFF N MASTERS AO
Reforming schools and improving student achievement levels are priorities for governments around the world. In Australia over the past decade, State, Territory and Commonwealth governments put considerable effort into improving the quality and equity of school education. These initiatives included the various National Partnership Programs.

At the same time, international surveys, including the Trends in International Mathematics and Science Study (TIMSS), the Progress in International Reading Literacy Study (PIRLS) and the OECD’s Programme for International Student Assessment (PISA), provided valuable comparative data on the performances of Australian students, as well as information about trends over time and progress in achieving equity goals. The National Assessment Program - Literacy and Numeracy (NAPLAN) provided complementary Australian data from 2008.

The results of international surveys show that, despite reform efforts, there was little improvement in the performances of Australian students over the past decade. The period 2000 to 2012 saw a significant decline in the reading and mathematical literacy levels of Australian 15-year-olds as measured by PISA, and results from TIMSS confirmed a general lack of improvement in mathematics and science. Australia was one of a small number of relatively high-performing countries in which achievement levels in PISA declined over this period.

International efforts to understand differences in countries’ performances are providing insights into national policy settings that can make a difference (either positively or negatively) to levels of educational quality and equity in a country. This paper examines trends in Australian students’ performances – particularly in PISA – over the past decade and considers implications for Australian schools policies. Specifically, the paper asks:

- What can be learnt from international achievement surveys about effective schools policies?
- Will current policy settings in school education arrest the decade-long decline in PISA literacy and numeracy levels at 15 years of age?
- Is Australia on track to see improved levels of performance in future international surveys?
AUSTRALIA’S PERFORMANCE IN INTERNATIONAL SURVEYS

Results from PISA show that the reading and mathematical literacy levels of Australian 15-year-olds have been on a steady decline since at least 2000. Results from PIRLS show that the average reading levels of Australian Year 4 students are well below the average in many other countries. And results from TIMSS show widening gaps between Australia and some East Asian countries in Year 4 and Year 8 mathematics.

Performances of 15-year-olds in Australia, New Zealand and the United Kingdom have followed very similar downward trajectories over the past decade. Figure 1 shows changes in mean reading scores for some selected countries between 2000 and 2012. Australia was one of a number of countries, including the major English-speaking countries, in which reading levels declined significantly over these twelve years. At the same time, there were significant improvements in mean reading levels in some other countries, including Korea, Portugal, Germany and Poland. In Korea, reading levels were similar to Australia’s in 2000, but are now significantly higher.

Figure 2 shows changes in mean mathematics scores for the same countries. A similar pattern of changes is evident, with significant declines occurring in the countries on the left, and significant improvements in countries on the right. The decline in Australia was the result of steady decreases in the mathematical literacy levels of 15-year-olds across five PISA cycles (2000, 2003, 2006, 2009, 2012). The decline in Australia and the improvement in Korea meant that the mathematics achievement gap between Korea and Australia widened by the equivalent of more than a year of school over this twelve-year period.

At the same time, there is little or no evidence from PISA of progress towards national equity goals. Figures 3 and 4 show the average performances of Indigenous and non-Indigenous 15-year-olds in reading and mathematical literacy for the period 2000 to 2012. The performances of Indigenous students declined at essentially the same rate as the performances of non-Indigenous students, meaning that the Indigenous gap was unchanged over this time.

More generally, parallel declines occurred for all identified demographic groups within Australia between 2000 and 2012. For example, the performances of the lowest
Is school reform working?

Figure 1  Difference in PISA reading literacy means, selected OECD countries, 2000 to 2012

Figure 2  Difference in PISA mathematical literacy means, selected OECD countries, 2000 to 2012
Figure 3  Reading literacy mean scores, by Indigenous status, 2000 to 2012

Figure 4  Mathematical literacy mean scores, by Indigenous status, 2000 to 2012

Figure 5  Difference in reading literacy means, by state and territory, 2000 to 2012

Figure 6  Difference in mathematical literacy means, by state and territory, 2000 to 2012
socioeconomic group declined at essentially the same rate as the performances of the highest socioeconomic group.

An interesting exception to this general observation can be seen in Figures 5 and 6. When students are grouped by jurisdiction, the declines in reading and mathematical literacy are seen to be significantly greater in some jurisdictions than in others. The pattern of declines was similar for reading and mathematical literacy, with larger declines in South Australia and Tasmania, and smaller or no declines in Queensland and Victoria (Thomson, De Bortoli & Buckley 2013). The decline in mathematical literacy in Victoria occurred between 2000 and 2003 (when mathematical literacy became the major assessment domain in PISA), with no further decline in that state between 2003 and 2012.

Of interest from a policy perspective is evidence concerning the variance of students’ PISA results in Australia. First, the range of scores between the lowest performing students (5th percentile) and the highest performing students (95th percentile) is wider than the OECD average in both reading and mathematical literacy (Thomson, De Bortoli & Buckley 2013). Second, the decline in reading literacy in Australia over this period was slightly higher among the highest performing students. Third, the between-school variance in Australia, while below the OECD average, has increased over time (Ainley & Gebhardt, 2014). This is noteworthy because greater between-school differences tend to be associated with lower overall levels of national performance.

A positive result from PISA 2012 is that Australia was one of the few OECD countries where immigrant students achieved at similar levels to native-born students, although the weighting of immigration criteria in recent decades towards educational qualifications and English proficiency is likely to have contributed to this result, coupled with the efforts of school systems to assist immigrant students.

In summary, based on PISA, the reading and mathematical literacy levels of Australian 15-year-olds declined significantly between 2000 and 2012, while gaps between major demographic groups were unchanged. However, not all countries saw a decline in student performance over this period – some witnessed an improvement – and the decline was not uniform across all Australian states and territories, suggesting that education systems’ policy settings may have been differentially effective over this period.
The observation that students in some countries perform at much higher levels than students in other countries has resulted in international efforts to understand why students in some countries perform so well. These studies show that high national performances tend to be the result of a complex set of factors, including the extent to which particular societies value education and high achievement. For this reason, it is often possible to learn more about effective educational policies by studying countries in which there have been improvements in performance over time. Significant improvements tend to be associated with sustained, long-term policies and deliberate national action to lift performance.

For example, Finland, despite a very recent decline in performance, succeeded in transforming itself from an educationally low-performing country to a high-performing country in about five decades. Until the 1960s, the level of educational attainment in Finland was comparable to that of Malaysia or Peru, with only one in ten adult Finns completing more than nine years of basic education. Achieving a university degree was uncommon. Finland’s education achievement levels lagged those of their Scandinavian neighbours Denmark, Norway and Sweden. Today, more than 98 per cent of Finns attend preschool, and by the age of 16, 99 per cent have completed compulsory basic education. Three out of five Finnish students enrol in state-funded higher education after upper secondary school, and 50 per cent complete these studies (Sahlberg, 2011).

Underpinning Finland’s improved educational performance has been a long-term policy to attract and retain a high quality teacher workforce. Finland raised the bar for entry into teaching and so made teaching a highly selective and highly sought-after profession. Teachers complete a masters degree which includes a research-based dissertation, and there is a strong focus on the development of subject-specific teaching expertise. This focus on teaching excellence is accompanied by policies to educate students in a common, comprehensive school system and to set high expectations for every student’s learning. The OECD (2011) describes Finland’s ascent into the top tier of educational performance as ‘the result of a set of policy decisions deliberately taken, implemented thoughtfully, and sustained over a very long period of time’.

Countries in which there has been an improvement in student performance over recent decades appear to have placed a particular priority on building teachers’ capacities (knowledge and skills) to deliver more effective teaching. Some education systems, including Finland and the Shanghai province of China, have trained teachers to undertake systematic research into their own teaching. Through classroom-based research, and with the assistance of diagnostic tools, teachers have been supported to identify and address the learning needs of all students (OECD, 2011).

Another feature of high-performing and rapidly improving school systems is that they have put in place system-wide processes to identify students who are falling behind
and to intervene quickly to put students back on track. Finnish teachers are trained to identify students who are slipping behind in their learning and every Finnish school has a teacher who is responsible for working with such students. In East Asian countries, students who are falling behind in their learning stay back after school for remedial teaching. These countries set high expectations for every student’s learning. All students are expected to make excellent learning progress and are considered capable of meeting high standards given time, motivation and appropriate support. Related to this, school systems with early tracking or streaming of students (for example, into vocational and academic streams), generally have less equitable student outcomes and poorer results overall. Some countries (such as Poland and Germany) have achieved significant recent improvements in student performance in part by delaying the tracking of students (The World Bank, 2010).

These countries also appreciate the importance of effective system and school leadership. Leaders are supported to create school cultures in which teachers collaborate around the continual improvement of teaching and learning. They also evaluate and promote high quality teaching throughout the school. Some countries, such as Singapore, have national policies in place to identify, develop and support prospective school leaders of this kind. And in consistently high-performing countries, the ‘central’ administration is oriented towards monitoring school outcomes, intervening where necessary and ensuring that schools have the resources they need. Finally, a key lesson from countries in which educational performance has improved over recent decades is the importance of ensuring that performance improves across the entire education system. OECD analyses suggest that equitable resource allocations based on student needs is related not only to levels of national equity, but also to the performance of school systems as a whole (Schleicher, 2014). High-performing school systems work to ensure that resources (money; high quality teachers and leaders) are equitably distributed across all schools. They also work to align and focus all levels of the system on supporting and enhancing the quality of on-the-ground, day-to-day practice.

In summary, deliberate and sustained public policies have made measurable differences to the quality and equity of school education in a number of countries. Factors underpinning improved performance include the development of a high quality teacher workforce; collaboration to promote effective teaching practices; effective instructional leadership of schools; high expectations for every student’s learning; the creation of strong school improvement cultures; and policies to ensure that these practices are distributed across all classrooms in all schools.

Some countries have achieved significant recent improvements.
IDENTIFYING THE RIGHT DRIVERS

By the turn of the century, the observation had been made in many countries that substantial increases in expenditure on schools had failed to deliver measurable improvements in student performance. International studies showed total national spending on schools, average class sizes, formal teacher qualifications and teachers’ years of experience were poor predictors of national performance in key areas of the school curriculum. This led some economists of the time to conclude that ‘input-based’ policies such as providing more money to schools, reducing class sizes and improving teacher qualifications had ‘failed’, and that improvements in schools now depended on giving teachers and schools direct incentives to raise student performance.

Over the past fifteen years, this simple idea has had a far-reaching influence on the education policies of many countries, especially in the English-speaking world. Initiatives to provide incentives for improved performance have included the creation of stronger performance cultures in schools, with teachers and school leaders being held personally accountable for improving student results. This, in turn, has required better measures of student performance and, in particular, measures that can be compared reliably across classrooms and schools. A number of countries have used test scores to allocate financial rewards for school improvement, performance pay for teachers, and to identify and intervene in schools that fail to meet annual improvement targets.

And some countries have identified another incentive for schools to improve – the risk of losing students to a better performing school. To promote this incentive, they have ensured the public transparency of schools’ test results, encouraged greater parental choice of schools, and freed schools to operate as independent competitors in the marketplace for students.

But there are good reasons to question the effectiveness of accountability regimes and incentive programs as strategies for school improvement. First, the countries that have been pursuing these strategies tend to be the countries that have experienced the greatest declines in student performance over the past decade. Major English-speaking countries saw significant declines in reading levels, and similar declines in mathematics. Although it is not possible to attribute these declines to any specific education policy, it is also difficult to conclude that incentive schemes and school accountability arrangements in these countries had a positive impact on student performance.

Second, research is raising doubts about the theoretical underpinnings of incentive schemes. A review published by the US National Research Council concluded that the international evidence was ‘not encouraging about the ability of incentive programs to reliably produce meaningful increases in student achievement’ (Hout and Elliott, 2011). Research by RAND Education reached a similar conclusion: ‘paying teachers to improve student performance did not lead to increases in student achievement and did not change what teachers did in their classrooms’. And as well as being of questionable effectiveness, incentive schemes often result in unintended and undesirable behaviours on the part of teachers and schools, ranging from the
narrowing of the school curriculum, to withholding less able students from testing, to providing inappropriate assistance to students during tests.

Third, although incentives are popular in the world of business, there is growing evidence that financial rewards are not particularly effective there either – except, perhaps, in relatively low-skilled occupations. In professional and creative work, financial rewards are sometimes counter-productive. In fact, there is evidence from psychology that paying people for what they would have done anyway can lead to poorer performance. Author Daniel Pink argues that what motivates most people at work is not so much money as the opportunity to self-direct, to master increasingly challenging work, and to pursue a purpose and make a difference in the world.

In summary, there have been important differences in the primary focus of countries’ school reform efforts over the past decade. In some countries, reform efforts tend to have been focused first on building the capacity of school leaders and classroom teachers to deliver high quality teaching and learning, and on ensuring that excellent teaching and leadership are distributed throughout the school system. In other countries, including a number of English-speaking countries, greater reliance has been placed on using systems of accountability and incentives to drive improvement. These two approaches (see Table 1) are not mutually exclusive. However, as Michael Fullan (2011) has observed, some strategies appear to be more effective than others in leading school reform efforts.

### Table 1 Two general approaches to school reform

<table>
<thead>
<tr>
<th>BELIEF</th>
<th>STRATEGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement will occur if schools are given incentives to improve (rewards, sanctions, having to compete for students).</td>
<td>stronger performance cultures &lt;br&gt;better measures of outcomes &lt;br&gt;personal accountability for improvement &lt;br&gt;performance pay linked to test scores &lt;br&gt;greater public transparency &lt;br&gt;financial rewards for school improvement &lt;br&gt;sanctions for failure to improve &lt;br&gt;increased competition for students &lt;br&gt;greater autonomy to compete &lt;br&gt;more parental choice</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BELIEF</th>
<th>STRATEGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement will occur by building the capacity of teachers and school leaders and by ensuring high quality practice throughout the system.</td>
<td>attract more able people into teaching &lt;br&gt;train approximately the number of teachers required &lt;br&gt;place a high priority on building teachers’ content and pedagogical content knowledge &lt;br&gt;develop school leaders’ capacities to build and lead cultures of continual improvement in teaching and learning &lt;br&gt;ensure that high-quality teaching and leadership are equitably distributed across all schools</td>
</tr>
</tbody>
</table>
IMPLEMENTING ‘MICRO’ REFORM

A feature of accountability regimes and incentive programs is that they tend to assume that school leaders and classroom teachers know what to do to achieve improved student outcomes and simply need to be ‘incentivised’ to make a greater effort. However, as Barber & Mourshed (2007) have observed, many reform strategies fail to deliver improvement because they fail to change day-to-day practice in schools. There has been growing recognition that more effective than setting ambitious targets for improved student performance, or attaching money or other consequences to student test results, is to work directly on developing the teaching and leadership practices that result in improved student outcomes.

In contrast to top-down reform levers, the promotion of evidence-based school practices might be described as ‘micro’ reform.

Research into high performing and improving schools highlights the essential role that outstanding school leadership plays in creating the conditions for improved performance. Schools are turned around by exceptional leaders who create cultures of improvement. These leaders understand that improved student outcomes depend fundamentally on improved classroom teaching. They take responsibility for creating an environment of high expectations and a school-wide commitment to change. They promote a culture of ongoing monitoring, evidence-based decision making and regular feedback. Importantly, they transform the school into an effective professional learning community focused on making continual improvements in teaching practices, including by learning from research into best practice and by networking and learning from colleagues in other schools.

Systematic studies of what school leaders do to achieve whole-school improvement reveal a high degree of consistency in the priorities set by leaders of turn-around schools. These priorities are summarised in the National School
Improvement Tool (Masters, 2012) and can be thought of as a set of micro-strategies for whole-school reform. They include:

- setting an explicit school improvement agenda;
- systematically monitoring progress in achieving desired improvements;
- establishing and sustaining a culture of support and high expectations;
- targeting the use of school resources to address student needs;
- encouraging teachers to work as a team to improve teaching and learning;
- establishing a coherent, sequenced, shared school curriculum;
- sustaining a strong focus on addressing individual learning needs;
- implementing effective pedagogical practices including diagnostic practices; and
- using local community resources to better meet student needs.

Research into classroom teaching also reveals a high degree of consistency in what highly effective teachers do. Although there is no single best teaching method, and what works for some students in some circumstances may not be effective for all students, there appear to be general principles that underpin highly effective teaching. These principles and the high-impact teaching strategies that follow from them include:

- **establishing where individuals are in their learning**

  Effective teaching and successful learning depend on an understanding of where individual learners are in their learning. This understanding is required to ensure that learning opportunities are appropriate and maximally effective. Highly effective teachers go to the trouble of understanding learners’ existing levels of knowledge, understanding and skill and use this to guide starting points for teaching. They do not assume that students of the same age or year level are at similar stages in their learning or that the same learning experiences will be appropriate for all
students. Understanding where students are in their learning may include developing an appreciation of individuals’ interests and motivations, the errors they are making, and the specific misunderstandings that they have developed.

**tailoring teaching to the progress and needs of individual learners**

Highly effective teachers then use this information to provide differentiated teaching and learning opportunities as appropriate. They expect every student to make excellent progress in their learning and set learning goals that stretch and challenge all students – including already high-achieving students. Such teachers appreciate that, within any given year of school, students’ levels of achievement can vary by up to five or six years of school, meaning that some students will require additional, remedial support, and others will not be challenged and extended by grade-based expectations.

---

**Improvements in national student achievement levels depend on continual improvements in the quality of what happens inside every school and every classroom.**
► providing personalised feedback that guides action
Ongoing learning depends on regular feedback. Highly effective teachers provide feedback that goes beyond a judgement of how well a student has performed (for example, a mark, grade or comment), and provides specific guidance on what individuals need to do next to make further progress in their learning. Feedback is most effective when it is ongoing, detailed, and provided in a form that encourages effort and a belief that further success is possible.

► assisting learners to see and appreciate the progress they are making
One of the most effective ways to build students’ beliefs in their ability to learn successfully is to assist them to see the progress they make in their learning over time. Many common approaches to assessing and reporting student achievement judge students against expectations for their age/grade, with the result that less advanced students may be judged to be performing poorly year after year – despite the good personal learning progress they may be making. More advanced students sometimes are judged to be performing well against age/grade expectations despite making limited annual progress in their learning. Highly effective teachers find ways to set appropriate personal learning goals and to help students appreciate the long-term progress they are making.

In summary, improvements in national student achievement levels depend on continual improvements in the quality of what happens inside every school and every classroom. There is an emerging evidence base on highly effective school leadership and classroom teaching practices. A policy challenge is to develop teachers’ and leaders’ understandings of effective, evidence-based practices and to promote the use of these practices in all schools and all classrooms.
PROMISING SIGNS?

Although Australia has witnessed a steady decline in the reading and mathematical literacy levels of 15-year-olds over the past decade, there are promising signs of recent improvements in primary reading levels. Figures 7 and 8 show changes in mean reading levels at Year 3 and Year 5 in NAPLAN between 2008 and 2013. Jurisdictions in which there were statistically significant changes over this 5-year period are starred. There were no parallel improvements in reading in Years 7 or 9, and numeracy levels were largely unchanged over this period.

**Figure 7** Differences in Year 3 NAPLAN Reading means, 2008 to 2013 (Jurisdictions in which there were statistically significant changes over this 5-year period are starred.)

**Figure 8** Differences in Year 5 NAPLAN Reading means, 2008 to 2013 (Jurisdictions in which there were statistically significant changes over this 5-year period are starred.)
It is not possible to infer from NAPLAN alone the reasons for improvements in primary reading levels. However, these improvements follow significant efforts on the part of State, Territory and Commonwealth governments to identify children who experience reading difficulties in the early years of school and to intervene before difficulties become entrenched. As an example, the NSW government’s 5-year Literacy and Numeracy Plan has promoted evidence-based school and classroom practices in communities with high levels of aggregated disadvantage. These practices are consistent with research into the kinds of micro-strategies required for sustained improvement. They include:

- providing teachers with continuing professional development in the teaching of literacy and numeracy under the guidance of experienced teachers;
- diagnosing and monitoring student progress against specified benchmarks of achievement;
- providing teaching that is differentiated and tailored to the progress and learning needs of individual students; and
- implementing intervention programs for children who are falling behind or who require additional challenge through an accelerated program of learning.

Although Year 3 and Year 5 reading levels did not improve significantly in NSW between 2008 and 2013, significant improvements in reading levels are being reported in schools currently participating in that state’s Literacy and Numeracy Plan (Boston, 2014).

In summary, as a nation we face a challenge in addressing long-term declines in the performances of Australian students in the key curriculum areas of reading, mathematics and science. Research and international experience make clear that there are more and less effective approaches to school reform and to achieving improved student performance. The challenge is to ensure that we learn from this experience and put our educational efforts into the kinds of reform strategies that are most likely to make a difference. Recent improvements in primary reading levels across Australia suggest that this is now beginning to occur.
REFERENCES


Organisation for Economic Cooperation and Development (OECD) (2011). Building a high quality teaching profession: Lessons from around the world, Background report for the international summit on the teaching profession, OECD, Paris


An initiative of the Centre for Education Policy and Practice
The Centre for Education Policy and Practice promotes the interconnection between research, policy and practice. The Centre investigates the impact of policy and practice in terms of research evidence of what works to meet learners’ needs and improve learning outcomes, but also examines ways in which research can be informed by a thorough understanding of the perspectives of policy makers and practitioners. The work of the Centre, addressing all levels of education and training, is organised around three themes: effecting teaching; effective institutional leadership; and effective system leadership.

www.acer.edu.au/epp