



25 January 2009

The Hon Anna Bligh  
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Dear Premier Bligh

**RE: Preliminary Advice**

I am pleased to submit the attached preliminary advice as part of my review of the literacy, numeracy and science performances of Queensland primary students.

As we discussed last Friday, I am proposing that last year's NAPLAN test materials be made available for classroom use by teachers of Year 3, 5 and 7 students early in the new school year. The purpose is to provide students with an opportunity to familiarise themselves with the NAPLAN testing materials and process, and to provide teachers with additional information about students' levels of literacy and numeracy skill early in the school year.

I am viewing this proposed use of last year's NAPLAN materials not as a one-off exercise but as part of a broader strategy that I expect to be recommending in April to increase the focus of schools and teachers on literacy, numeracy and science performance data.

Yours sincerely

Professor Geoff N Masters  
**CHIEF EXECUTIVE OFFICER**

**Improving Literacy, Numeracy and Science Learning  
in Queensland Primary Schools**

**PRELIMINARY ADVICE**

Geoff N Masters

Australian Council for Educational Research

January 2009



This document provides preliminary advice to the Queensland Government and forms part of my review of levels of literacy, numeracy and science achievement in Queensland primary schools.

### **Performances of Queensland Students in NAPLAN and TIMSS**

During January 2009, work was commenced to review available evidence concerning levels of achievement in Queensland primary schools. This work will continue over the next three months. The focus of the early data analyses has been on students' performances in the 2008 National Assessment Program - Literacy and Numeracy (NAPLAN) and state-wide literacy and numeracy tests prior to the introduction of NAPLAN, and on students' performances in the 2007 Trends in International Mathematics and Science Study (TIMSS) and in earlier studies conducted by the International Association for the Evaluation of Educational Achievement (IEA).

Following the release of NAPLAN and TIMSS results late in 2008, concerns were expressed about the performances of Queensland primary students in comparison with students in other states and territories. For this reason, our initial data analyses have focused on the *relative* performances of Queensland students and trends in these relative performances over time. Some preliminary conclusions are summarised below. More detailed analyses will be undertaken in the period February to April.

- *In 2007 and 2008, Queensland Year 3, 4 and 5 students were ranked below students in all states and territories other than the Northern Territory in tests of literacy, numeracy and science. The average performance of Queensland students in these year levels usually was significantly lower than the average performance in other states<sup>1</sup>.*

There are several possible explanations for these lower performances. An obvious explanation is that students in Queensland, on average, have been in school for a shorter period of time than students in some other states and territories. This is likely to have a particular influence in these early years of school. It should be noted, however, that in Finland – one of the highest performing countries internationally – the fact that students have had fewer years in school is not an impediment to a world-class performance<sup>2</sup>. The large number of small and remote schools in Queensland also may be part of the explanation for lower achievement levels.

- *There is some evidence that the Reading and Numeracy achievements of Queensland Year 3, 5 and 7 students relative to students in other states and territories declined between 2004 and 2008.*

This observation is based on a comparison of the percentages of students in the Australian states and territories achieving the relevant Reading and Numeracy

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<sup>1</sup> Based on Year 3 and 5 NAPLAN results and Year 4 TIMSS results. Differences between states are considered statistically significant if the 95% confidence intervals around the means do not overlap.

<sup>2</sup> Students in Finland start school at age seven and attend school for four or five hours each day during their first two years. At age 15, students in Finland outperform students in other countries in reading literacy, mathematical literacy and scientific literacy.

‘benchmarks’. There is some evidence to suggest a decline in the relative performance of Queensland students over the past five years, particularly at Year 3.

- *There is evidence of a long-term decline in the mathematics and science achievements of Queensland students since the 1970s, both in relation to students in other states and in absolute terms.*

This conclusion is based on Queensland’s participation in international mathematics and science studies since 1964. One study of the mathematics performances of lower secondary students in the period 1964 to 1995 concluded that the decline in Queensland during this period was greater than in any other state and represented more than two years of learning<sup>3</sup>.

#### **RECOMMENDATION 1**

That the Queensland Government establish a goal to have Queensland primary students performing at the level of students in the highest-performing Australian states in literacy, numeracy and science within the next three years.

I view this as an aspirational goal, consistent with the stretch targets set by the Queensland Government in its 2020 vision statement. (Under the Government’s ambition to deliver world-class education and training, 2020 targets have been set to provide all children with access to a quality early childhood education so they are ready for school, and to provide three out of four Queenslanders with trade, training or tertiary qualifications. No 2020 targets have been set for improving results in the school sector.) In practice, the goal could be to have Queensland primary students performing at the level of students in Victoria and New South Wales in most aspects of literacy, numeracy and science learning by 2012.

The setting of such a goal would make clear what level of improvement was being sought for the state as a whole and could be followed and supported by targets for improvement within school sectors and individual schools.

A clear and realistic timeline for the achievement of this goal is important. International research shows that targeted interventions to improve the quality of classroom teaching can have a dramatic impact on student outcomes in a relatively short period of time. In England, new national training programs to promote best-practice teaching saw the number of students meeting literacy targets increase from 63 per cent to 75 per cent in three years. Similar initiatives in Boston saw the number of students meeting its mathematics standards increase from 25 per cent to 74 per cent, and the number of students meeting its English standards increase from 43 per cent to 77 per cent, in six years<sup>4</sup>.

<sup>3</sup> Afrassa, TM & Keeves, JP (1999). Changes in students’ mathematics achievement in Australian lower secondary schools over time. *International Education Journal*, 1 (1), 1-21.

<sup>4</sup> Barber, M & Mourshed, M (2007). *How the world’s best-performing school systems come out on top*. McKinsey & Co.

**RECOMMENDATION 2**

That progress towards the achievement of this goal be monitored using NAPLAN Year 3, 5 and 7 tests in 2009, 2010, 2011, 2012 and TIMSS Year 4 tests in mathematics and science in 2011.

NAPLAN and TIMSS assessments should not be the only basis for monitoring progress in raising levels of literacy, numeracy and science achievement in primary schools. However, these two assessment programs provide independent measures of how Queensland students perform in relation to other states and territories and – in the case of TIMSS – other countries. Annual NAPLAN data will allow state and school performances to be monitored and compared from one year to the next, and trends over time to be established. TIMSS results will be released in 2012.

**Improving Achievement: Research Evidence**

The mere setting of a goal to improve achievement levels in primary schools will not in itself lead to improvement. Achievement levels will improve only if changes are made to current practices. With this in mind, during January a review was undertaken of international research evidence that might inform efforts to raise achievement levels in Queensland primary schools.

This research review concluded that the most effective way to increase achievement in literacy, numeracy and science is to increase the effectiveness of classroom teaching practices. A great deal is known from international research about the practices of highly effective teachers. In particular, research shows that highly effective teachers:

- *set high expectations for student learning*
- *have deep knowledge of the subjects they teach and of how students learn<sup>5</sup>*
- *target teaching to individuals' levels of readiness and need*
- *continually monitor student learning and provide feedback to guide learning*

A great deal also is known about what high-performing schools and education systems do to promote more effective teaching. Findings from international research may provide a useful frame of reference for reflecting on current practices and for identifying strategies and initiatives to raise achievement levels.

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<sup>5</sup> In contrast, in the 2007 TIMSS study, fewer than half of Australian Year 4 teachers said that they felt well prepared to teach Year 4 science.

**RECOMMENDATION 3**

That the Queensland Government put in place a range of initiatives to achieve its goal of increasing levels of literacy, numeracy and science achievement in primary schools over the next three years. These initiatives will be informed by the recommendations of the current review (to report at the end of April). At this stage I expect the review to make recommendations in a number of areas, including strategies for:

- building teachers' knowledge and skills in literacy, numeracy and science teaching;
- enhancing the capacity of school leaders to drive improvement in schools;
- diagnosing student learning difficulties and monitoring individual progress; and
- creating a state-wide culture of continuous improvement that includes targets and systems for monitoring school performance and improvement.

The final review recommendations will be informed by detailed analyses of available performance data, an analysis of current practices in Queensland primary schools, and consultations with a range of stakeholders in the period February to April 2009. A general strategy should be to ensure that all teachers and all schools are doing what the best Queensland teachers and schools already are doing.

**Identifying Students' Literacy and Numeracy Learning Needs**

The research evidence on effective teaching suggests that levels of student achievement improve when teachers identify and understand individuals' current levels of attainment, diagnose learning difficulties and misunderstandings, and target teaching on student needs and readiness. When teachers work in this way, they use assessments to identify starting points for their teaching and to identify students who require special assistance or support.

The best teachers, when beginning work with a new class, do not assume that all students in the room will be equally ready for the same learning experiences. They do not teach to the middle of the class, but instead spend time establishing where students are up to in their learning and then differentiate their teaching accordingly. This is essential because, in a typical classroom, the highest-achieving children in reading and numeracy may be five or more years ahead of some other children in the room.

**RECOMMENDATION 4**

That last year's NAPLAN assessment materials – including test booklets, administration manual, marking guides, and details of the performances of last year's cohort on each test question – be made available to all Year 3, 5 and 7 teachers at the start of the 2009 school year for use in establishing students' current levels of literacy and numeracy development and to assist in identifying individual learning needs. To ensure the best outcomes at a classroom level, there should be no central marking or collection of students' test responses. This will be undertaken through the NAPLAN tests to be administered on 12-14 May 2009.

I am proposing that last year's NAPLAN materials be made available as a *resource* that teachers can use early in the 2009 school year to assist them in establishing students' commencing literacy and numeracy skills, to identify areas of strength and weakness, and to plan their teaching. These materials also may provide students with some useful test taking experience. Under this recommendation, there would be no central collection of students' test responses: the materials simply would be made available for classroom use.<sup>6</sup>

I am proposing that teachers be provided with all of the 2008 materials (administration manual, test booklets, marking guides, etc) together with an item-by-item commentary on how last year's students performed on these materials. An advantage of having teachers mark their own students' work is that this should provide them with a better appreciation of the current literacy and numeracy levels of individual students – information that should assist them in their literacy and numeracy teaching in the first three months of the school year, prior to the 2009 testing<sup>7</sup>. It also may draw attention to gaps in aspects of the school curriculum.

I envisage the materials being made available for downloading and printing from the Queensland Studies Authority (QSA) website. Schools would then print sufficient copies for students in each of the relevant year levels.

This proposed use of NAPLAN materials as a classroom resource is very different from the way in which NAPLAN tests are used as part of the annual national assessment program. To achieve national comparability, students' test responses in the national assessment program are collected and marked centrally. Classroom teachers do not see the written responses of their own students and they do not see the national marking guides that are used to evaluate students' responses. In contrast to what is being proposed here, no opportunities are provided in the annual national assessment program for in-school discussions of students' responses to NAPLAN materials.

The value of making last year's assessment materials available to schools will depend on how widely they are used. An important opportunity will be lost if the materials are simply added to a range of other assessment materials available for teacher use on the QSA website and are not widely used in schools. I believe that the use of past NAPLAN materials by teachers could provide a useful basis for conversations with parents about their children's levels of literacy and numeracy development early in the 2009 school year.

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<sup>6</sup> Students in Years 3, 5, 7 and 9 will sit the nationally administered 2009 NAPLAN tests on 12-14 May.

<sup>7</sup> A similar strategy is used by some schools in Victoria. For example, schools in the Northern Metropolitan Region administer that state's previous literacy and numeracy tests at the start of each school year. These tests are available online to all Victorian schools and are known as *AIM On Demand* ([www.aimonline.vic.edu.au](http://www.aimonline.vic.edu.au)).



**RECOMMENDATION 5**

That parents of students entering Years 3, 5 and 7 be informed about the availability of these assessment materials to schools and encouraged to talk with teachers about their children's performances on them. Consideration also should be given to making the materials available for online access by parents following their use by teachers.

The intention in making last year's NAPLAN materials available to schools is for teachers to use individual and class performances on these materials to inform and guide their teaching. Many teachers will be better able to do this if they also are provided with assistance in interpreting students' NAPLAN performances and given advice on teaching strategies that could be used to address student needs.

**RECOMMENDATION 6**

That teachers be provided with online advice on teaching strategies to address identified learning needs.

This online advice might take the form of general advice already provided to schools (for example, by the Government or Catholic education systems). Consideration also might be given to using advice developed by other states or territories directly linked to students' performances on NAPLAN assessments (for example, advice developed in NSW and incorporated into that state's SMART software).<sup>8</sup>

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<sup>8</sup> The School Measurement, Assessment and Reporting Toolkit (SMART) facilitates student, class, school and system analyses of NAPLAN data.