# Student Outcomes in the ACT

## A High Quality, Low Equity School System

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# Key Points

- The ACT school system faces three key challenges in school education:
  - Increase the proportion of students who receive an adequate education;
  - Reduce the large achievement gap between students from low and high SES families; and
  - Reverse recent declines in student outcomes.

- The ACT has high average school outcomes by international and national standards:
  - The ACT has high average outcomes for international assessments of 15 year olds and Year 4 and Year 8 students and high average outcomes in national benchmark assessments for Years 3, 5 and 7;
  - The ACT has very high retention and completion rates to Year 12.

- However, many students do not achieve an adequate education:
  - About 2900 secondary school students, including 1600 in the government sector, are at the lowest levels of achievement in reading, mathematics and science.
  - About 15 per cent of students enrolled in Year 10 in government schools do not proceed to Year 11 and about 20 per cent of Year 11 students do not complete Year 12.

- There is significant social inequity in student outcomes with a large achievement gap between high and low SES students of about 2½ years of schooling:
  - The difference in outcomes between high and low SES students in the ACT is the highest in Australia, apart from the Northern Territory;
  - There is no evidence that the achievement gap has been reduced since 2000.
  - Low SES students in the ACT are doing no better than low SES students across Australia.

- School outcomes in the ACT have not improved in recent years and have declined significantly in some areas since 2000:
  - Average reading achievement by 15 year-old students has declined by the equivalent of 6 months of schooling;
  - There were significant declines in achievement for 15 year-old students at the top levels in reading and mathematics;
  - There has been no reduction in the proportion of 15 year-old students achieving at the bottom levels in reading and mathematics;
  - There was no improvement in the proportion of students achieving the national benchmarks in reading, writing and numeracy between 2001 and 2007;
  - There has been no improvement in retention and completion rates to Year 12.

- Independent public inquiries should be established to investigate and recommend on how to reduce the achievement gap and to design a school funding system which gives greater emphasis to differences in student learning needs between schools.

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# Summary

## Overview

- The ACT has a high quality, low equity school system. It has made little progress towards meeting the National Goals for Schooling it signed on to in 1998.

- High quality outcomes are evidenced by:
  - High average outcomes in international assessments for 15 year-old, Year 8 and Year 4 students;
  - High proportions of students performing at the most advanced levels in international assessments, except in Year 8;
  - High proportions of students are above national benchmarks for reading, writing and numeracy in Years 3, 5 and 7;
  - Very high retention and completion rates to Year 12.

- Inequity in school outcomes is evidenced by:
  - A significant proportion of 15 year old students are at the lowest levels of achievement in reading and mathematics;
  - A high proportion of students do not complete Year 12;
  - There is a large achievement gap between 15 year-old students from low socio-economic status (SES) families and those from high SES families;
  - The achievement gap has not been reduced over the past six years.

- The level of student learning needs is very low in Years 3, 4 and 5 but increases significantly after Year 5 and through the high school years, especially in literacy.

- There has been no improvement in student outcomes over the last six or more years and results have declined in some areas.

## High average outcomes, with few exceptions

**International studies:**

- Average outcomes for ACT 15 year-old students in reading, mathematics and science in the international PISA study are amongst the highest in the world and in Australia.

- Average outcomes for ACT Year 4 students in mathematics and science in the international TIMS study are amongst the highest in the world and in Australia.

- Average outcomes for ACT Year 8 students in science in the international TIMS study are amongst the highest in the world and in Australia.

- Average outcomes for ACT Year 8 mathematics results are amongst the highest in Australia and the ACT is included in a large group of countries with a middle band of achievement between the highest achieving countries and the international average.

**National assessments:**

- The proportion of ACT students achieving the national benchmarks in reading, writing and numeracy is generally the highest in Australia, but there is little difference between the ACT and several other states when the potential for sampling and measurement error is taken into account. In 2007:
  - 96% of ACT Year 3 students achieved the national reading benchmark, 95% achieved the writing benchmark and 94 % achieved the numeracy benchmark;
  - 95% of Year 5 students achieved the national reading benchmark, 94% achieved the writing benchmark and 92% achieved the numeracy benchmark;
  - 94% of Year 7 students achieved the national reading benchmark, 91% achieved the writing benchmark and 86% achieved the numeracy benchmark.

- Average science literacy results for Year 6 students in 2003 were amongst the highest in Australia, but similar to several other states:
  - 70% of ACT Year 6 students achieved at or above the proficient level in science compared to 58% for Australia; the ACT proportion was higher than in any other area of Australia.

- Average scores for civics and citizenship for Year 6 and Year 10 students in 2004 were amongst the highest in Australia, but similar to several other states:
  - 61% of ACT students achieved at or above the proficiency level for Year 6 compared to 50% for Australia;
  - 48% of Year 10 students achieved or exceeded the proficiency level and this was similar to the average for Australia and most other states.

- Average scores for ICT literacy for Year 6 and Year 10 students in 2005 were amongst the highest in Australia, but similar to several other states:
  - 58% of ACT students achieved at or above the proficiency level for Year 6 compared to 49 per cent for Australia;
  - 66% of Year 10 students achieved or exceeded the proficiency level and this was similar to the average for Australia and most other states.

**Retention and completion to Year 12:**

- The completion rate to Year 12 for all ACT schools is the highest in Australia:
  - In 2006, it was 76% compared to the average for Australia of 67%;
  - However, over 20% of the ACT student-age population who could attend Year 12 each year do not complete Year 12.

- ACT government schools have the highest retention rate to Year 12 in Australia:
  - In 2006, it was 103% compared to the Australian average of 69%;
  - However, approximately 15% of each Year 10 cohort in government schools does not enrol in Year 11 and about 20% of each Year 11 cohort does not complete Year 12. This means that about 1000 students in any cohort do not complete Year 12.

## Strong high level achievement, except for Year 8

(refers to the percentage of students at the most advanced levels of achievement)

**International studies:**

- The ACT has a very high proportion of 15 year-old students achieving at the top reading and mathematics levels:
  - It has the highest proportion (16%) of students achieving at the highest reading level in Australia and is equal to the third highest performing country;
  - It has the highest proportion (23%) of students achieving at the highest mathematics levels in Australia, but is below Taiwan, Korea and Hong Kong;
  - It has the highest proportion (21%) of students at the highest science levels in Australia and is equal highest in the world with Finland.

- The ACT has a high proportion of Year 4 students achieving the advanced benchmarks in mathematics and science:
  - 11% of ACT students achieved the advanced benchmark in mathematics and compared to the international average of 8% and the Australian average of 5%;
  - 15% cent of ACT students achieved the advanced science benchmark compared to the international average of 7% and the Australian average of 9%;

- The ACT is not doing as well at the advanced levels of mathematics and science in Year 8:
  - Only 2 % of ACT Year 8 students achieved advanced level mathematics, compared with the international average of 7%, the Australian average of 5% and 13% in NSW;
  - 8% of ACT Year 8 students achieved the advanced science level compared to the international average of 6%, the Australian average of 9% and 15% in NSW.

**National assessments:**

- Relatively high proportions of ACT students achieved at the highest levels in national assessments of science; civics and citizenship and ICT literacy:
  - 14% of Year 6 ACT students achieved at the highest levels in science literacy in 2003, which was nearly double that for Australia;
  - 12% of Year 6 students achieved at the highest levels in civics and citizenship in 2004, compared to the national average of 8%;
  - 8% of Year 10 students achieved at the highest levels in civics and citizenship in 2004, which was similar to the average for Australia and several states;
  - 13% of Year 6 students achieved at the highest levels in ICT literacy in 2005, which was similar to the national average and several states;
  - 18% of Year 10 students achieved at the highest levels in ICT literacy in 2005 and this was similar to the national average and several other states.

## Low levels of student learning need

(refers to the percentage of students at the lowest levels of achievement)

**International studies:**

- The ACT has a low but significant proportion of 15 year-old students at the lowest PISA reading, mathematics and science levels:
  - 10% of ACT students were at the lowest reading levels compared to the OECD average of 20% and 14% for Australia;
  - 10% of ACT students were at the lowest mathematics levels compared to the OECD average of 22% and 13% for Australia;
  - 11% of ACT students were at the lowest science levels compared to the OECD average of 19% and 13% for Australia;
  - The proportion of ACT students at the lowest levels of achievement is much higher than the highest performing countries, but is similar to several other high performing countries;
  - These figures indicate that about 2900 secondary school students in the ACT, including about 1600 government secondary school students, are at the lowest levels of achievement.

- A small proportion of ACT Year 4 students are below the TIMSS low benchmarks in mathematics and science:
  - 7% of ACT students did not achieve the low mathematics benchmark compared to the international average of 18% and 12% for Australia;
  - 4% of ACT students did not achieve the low mathematics benchmark compared to the international average of 18% and 8% for Australia;
  - The proportion of ACT students not achieving the low benchmarks was larger than the highest achieving country in mathematics and similar to the highest achieving country in science.

- A small proportion of ACT Year 8 students are below the TIMSS low benchmarks in mathematics and science:
  - 6% of students did not achieve the low mathematics benchmark compared to the international average of 26% and 10% for Australia;
  - 2% of students did not achieve the low science benchmark compared to the international average of 21% and 5% for Australia;
  - The ACT has a higher proportion at this level in mathematics than the highest achieving country, but a lower proportion than the highest achieving country in science.

- There is little difference in the level of student learning needs in the ACT between Years 4 and 8 in mathematics and science.

**National assessments:**

- Low proportions of ACT Year 3, 5 and 7 students are below the national benchmarks for reading, writing and numeracy:
  - 4 – 6% of ACT Year 3 students are below the national benchmarks for reading, writing and numeracy compared to 7% for Australia;
  - 5 – 9% of ACT Year 5 students are below the national benchmarks for reading, writing and numeracy compared to 6 – 11% for Australia;

- 6, 9 and 14% of ACT Year 7 students are below the national benchmarks for reading, writing and numeracy respectively compared to 11, 7% and 20% for Australia.

**ACTAP Year 9**

- 14% of ACT Year 9 students were at the lowest writing profile level in 2007;
- A significantly higher proportion of Year 9 students are at the lowest profile literacy profile levels compared to Year 7.

## Student achievement is not improving and has declined in some areas

- Average reading literacy performance amongst ACT 15 year-old students declined between 2000 and 2006, with 80 per cent of the decline occurring between 2003 and 2006:
  - The average reading decline was equal to 6 months of schooling;
  - The declines for the best performers were equal to 6-12 months of schooling.

- There was no significant change in mathematics for 15 year-old students between 2003 and 2006. However, there were significant declines in mathematics scores for students at the top levels:
  - The declines were equal to about 9 months of schooling.

- There has been no reduction in the proportion of 15 year-old students in the ACT achieving below the OECD mean since 2000:
  - About 30 per cent of ACT 15 year-old students achieved at below the average for the OECD in reading, mathematics and science in 2000 and 2006.

- The proportion of ACT 15 year-old students achieving at the top levels in reading and mathematics has declined in recent years:
  - The proportion of students at Level 5 in reading declined from 25% in 2000 to only 16% in 2006;
  - The proportion of students achieving at Levels 5 and 6 in mathematics declined from 27% in 2003 to 23% in 2006 and the proportion achieving at Level 6 declined from 10 to 6%.

- There has been no reduction in the proportion of 15 year-old students achieving at the bottom levels in reading and mathematics:
  - 10% of ACT students were at Level 1 and below in reading in 2006 compared to 11% in 2000;
  - 10% of students were at Level 1 and below in mathematics in 2006 compared to 11% in 2003.

- The proportion of ACT students achieving above the national benchmarks in reading, writing and numeracy did not improve between 2001 and 2007.

- Retention rates in ACT government schools are lower now than in 2001 and the preceding years, but this is at least partially due to an expansion to Years 11 and 12 by some private schools.

- The number of ACT students who receive a Year 12 certificate as a proportion of the estimated number of students that could attend Year 12 has not improved in recent years:
  - The Year 12 completion rate in the ACT in 2006 was 76% compared to 78% in 1999 and 81% in 2001.

- There has been no improvement in the proportion of ACT students beginning Year 11 who receive a Year 12 Certificate over the last 10 years or more:
  - In 2006, 80% of students enrolled in Year 11 government colleges in the previous year received a Year 12 Certificate compared 81% in 1996;
  - In 2006, 92% of private school students enrolled in Year 11 in February of the previous year were awarded a Certificate compared to 95% in 1996.

## Range of outcomes has narrowed

- There has been a significant narrowing of the range of scores in reading and mathematics in the ACT since the PISA 2003 study.

- The difference between the highest and lowest outcomes in the ACT for 15 year-old students is relatively narrow by national and international standards in reading and mathematics, but it is large for science:
  - The range for reading is amongst the lowest of the top achieving countries;
  - Six high achieving countries have a significantly lower range of mathematics outcomes than the ACT, but the ACT range is narrower than for seven other high achieving countries and is similar to two others;
  - The range in ACT science outcomes is the largest in Australia except for the Northern Territory and the ACT has a larger range of outcomes than all the top 15 achieving countries, except New Zealand and the United Kingdom.

## There is a large achievement gap between low and high SES students

- The ACT has one of the largest achievement gaps in Australia between the average scores of low and high SES 15 year-old students:
  - The ACT had the largest achievement gap in science and mathematics in Australia in 2006, except for the Northern Territory;
  - The achievement gap in reading in the ACT in 2006 was similar to that of Tasmania and larger than for the rest of Australia, except the Northern Territory
  - The gaps are equivalent to about 2½years of schooling.

- There is a large achievement gap of about 40 percentage points between the proportion of low and high SES 15 year-old students in the ACT who achieve below and above the OECD average:
  - Nearly 60% of low SES students were below the OECD average in reading, mathematics and science in 2006 compared to about 20% of high SES students;

- About 40% of low SES students achieved above the OECD average in reading, mathematics and science compared to about 80% of high SES students.

- There are large achievement gaps between the proportion of low and high SES 15 year-old students achieving different proficiency levels in the PISA assessments:
  - In 2006, 55% of low SES students in the ACT achieved at or below Level 2 in reading compared to 15% of high SES students.
  - 48% of low SES students were at or below Level 2 in mathematics compared to 13% of high SES students.

- The achievement gaps between low and high SES students in the ACT do not appear to be declining.

- Low SES 15 year-old students in the ACT are doing no better than low SES students across Australia:
  - The proportion of low SES students achieving below or above the OECD average in science, reading and mathematics is similar to the average for Australia;
  - The proportion of low SES students achieving at Level 2 or below and at Level 3 and above for reading and mathematics is similar to that for Australia.

## Key challenges

- The ACT school system faces three key challenges in the immediate future:
  - Increase the proportion of students who receive an adequate education;
  - Reduce the large achievement gap between students from low and high SES backgrounds; and
  - Reverse the declines in student outcomes in reading and mathematics.

## Independent public inquiries

- An independent public inquiry should be established to investigate and report on what works to improve adequacy and social equity in student outcomes. The inquiry should be required to consider three strategies:
  - improving teaching and learning opportunities for students who have fallen behind;
  - providing a range of student welfare, behavioural and learning support measures; and
  - developing home/school partnerships.

- An independent inquiry should be established to devise a system of funding schools in the ACT which gives greater emphasis to funding to address differences in student learning need between schools.

# 1. Introduction

The most recent report of the Programme for International Student Assessment (PISA) describes the ACT school system as high quality, low equity [Thomson & De Bortoli 2008a: x]. This paper compiles evidence that confirms this description.

The low equity feature has a dual aspect. The first is a significant proportion of students who do not achieve an adequate education to fully participate in modern adult society. The second is a large achievement gap between students from low and high socio-economic status (SES) families. This constitutes social inequity in school outcomes.

Chapter 2 demonstrates that the ACT education system has high average outcomes. Despite these high outcomes, a significant proportion of students do not achieve an adequate education as shown in Chapter 3. Chapter 4 provides evidence that there has been no improvement in school outcomes in recent years and that some outcomes have declined significantly.

Chapter 5 demonstrates that there is significant social inequity in the outcomes of the ACT education system. It takes the form of a large achievement gap between students from high and low SES families in reading, mathematics and science. It is a feature which has changed little since the first PISA study in 2000.

Chapter 6 discusses the implications of the extensive inequity in ACT schooling and some broad policy directions to improve equity.

The paper provides an overview of school outcomes in the ACT drawing on international, national and Territory outcomes data, most of which includes both government and non-government school students. It brings together the available published evidence on the achievement gap in the ACT. The paper is intended to inform public discussion on policy and funding priorities in the ACT government school system.

# 2. High student outcomes

Student outcomes in the ACT are amongst the highest in Australia. This is the case for 15 year olds as assessed in PISA[1], for 4 and 8 year olds assessed in the Trends in Mathematics and Science Study (TIMSS)[2], and for other Year levels assessed for national benchmark reporting. Retention rates to Year 12 and completion rates for Year 12 are also much higher in the Territory than in other regions of Australia.

The PISA and TIMSS assessments have much in common, but they provide different information about levels of student achievement [Masters 2005; Thomson 2005]. PISA looks at 15-year-olds — who in most countries are approaching the end of compulsory schooling—and assesses how well they are able to apply basic understandings and skills in reading, mathematics and science to everyday situations. The goal of PISA is to measure competencies that will equip students to participate productively and adaptively in their life beyond school education. It therefore focuses on young people's ability to apply their knowledge and skills to real-life problems and situations.

TIMSS, on the other hand, looks at how well Year 4 and Year 8 students have mastered the factual and procedural knowledge taught in school mathematics and science curricula. TIMSS begins with a detailed analysis of Year 4 and Year 8 mathematics and science curricula and then tests curriculum content that is common across participating countries.

## 2.1 PISA results[3]

### Average outcomes

Average outcomes for ACT 15 year old students are very high by national and international standards for reading, mathematics and science [Figure 1]. ACT outcomes are amongst the highest in Australia and the world. They are 8-10 per cent above the average for all OECD countries.

The average reading score for the ACT in PISA 2006 is just below that of Korea and Finland, the two highest achieving countries, and is similar to that of Canada, Hong Kong and New Zealand. In mathematics, the ACT average is not significantly different to that of a group of the highest achieving counties - Canada, Finland, Hong Kong, Korea and Taiwan. In science, the ACT is just below Finland, the highest scoring country, and is similar to that of Canada, Hong Kong and Taiwan.

[1] The Programme for International Student Assessment (PISA) 2006 study assessed 15-year old students in 57 countries in reading, mathematics and scientific literacy as well as problem solving. It included all 30 OECD countries and 27 partner countries. It included government and non-government school students. The 2003 study involved 41 countries and the 2000 study 32 countries.

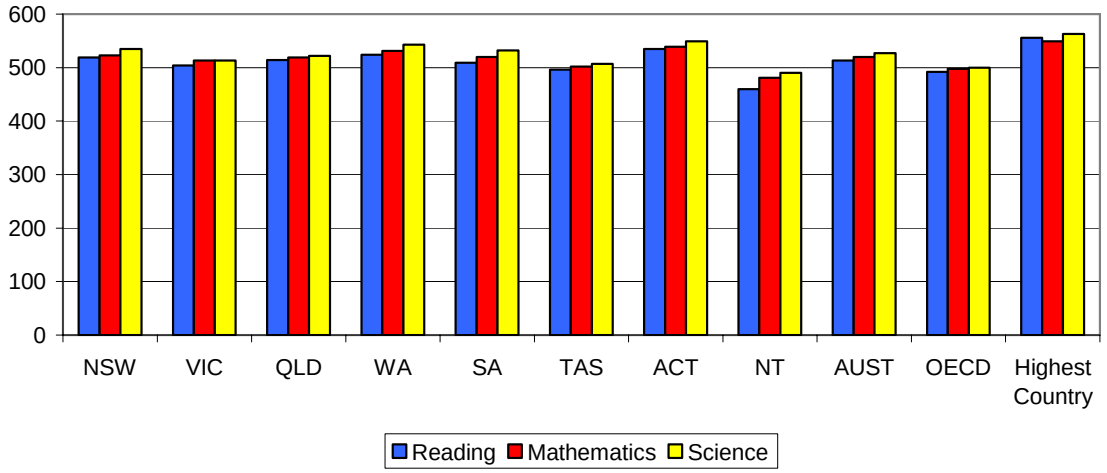
[2] The Trends in International Mathematics and Science Study (TIMSS) 2002-03 study assessed Year 4 and Year 8 students in 46 countries in mathematics and science. It included government and non-government school students.

[3] The PISA 2006 study results for Australia are provided in Thomson & De Bortoli 2008a. A separate report on the performance of ACT students in PISA is also available. See Thomson & De Bortoli 2008b.

Average ACT outcomes are higher than the averages for Australia, but are similar to those of Western Australia when statistical uncertainty is taken into account.[4]

The ACT has a very high proportion of 15 year-old students performing above the OECD average. In 2006, about 70 per cent of students achieved above the OECD average in reading, mathematics and science compared to about 60 per cent across Australia [Thomson & De Bortoli 2008b: 18-20].

**Figure 1: Average Scores for 15 Year Old Students, PISA 2006**




The ACT has a very high proportion of 15 year olds at the top literacy and mathematics levels [Table 1]. It has the highest proportion of students achieving at Level 5 reading in Australia and has one of the highest proportions at this level in the world. Sixteen per cent of ACT students are at Level 5 compared to the Australian average of 11 per cent and the OECD average of 9 per cent. The ACT proportion at this level is substantially below the 22 per for Korea, which is the highest performing country in the proportion of students at Level 5, but it is similar to that of Finland (17 per cent), the second highest performing country, and the same as New Zealand, which is the third highest performing country.

Twenty-three per cent of ACT students are achieving at Levels 5 and 6 in mathematical proficiency. This is the highest of any state or territory in Australia and much higher than the average for the OECD (13%). However, it is much lower than that of Taiwan (32%), the highest performing country, and it is also less than Hong Kong and Korea. It is similar to Finland and Switzerland.

[4] Mean scores for the whole student population of given regions are estimated from the mean scores obtained from a sample of students. Errors can arise in sampling and the measurement of results so that there is a degree of statistical uncertainty associated with mean scores. It is standard practice to report standard errors that give a range of scores within which there is a 95 per cent probability that the mean will occur. Overlapping score ranges mean that the results are not statistically different.

The proportion of ACT students at Levels 5 and 6 in science is 21 per cent, which is much higher than the average for Australia and the same as the highest performing country, Finland.

The ACT also has amongst the lowest proportion of students in the lowest levels of achievement in Australia and the world. The proportion of ACT students in the lowest reading levels is 10 per cent, the same as in Western Australia. This is significantly below the average of 14 per cent for Australia and is half the average for the OECD. However, the ACT proportion is double that of Korea and Finland, the countries with the lowest proportion of students at these levels. The ACT proportion is also higher than that of Hong Kong, but is similar to several other well-performing countries [Thomson & De Bortoli 2008a: 164, Figure 5.4].

**Table 1: Proficiency Levels for 15 Year Old Students, PISA 2006 (% of students)**

| Region | Reading | | Mathematics | | Science | |
|---|---|---|---|---|---|---|
| | Level 5 | Level 1 & Below | Levels 5 and 6 | Level 1 & Below | Levels 5 and 6 | Level 1 & Below |
| NSW | 13 | 13 | 18 | 13 | 17 | 11 |
| VIC | 8 | 15 | 14 | 14 | 11 | 16 |
| QLD | 10 | 14 | 15 | 13 | 13 | 14 |
| WA | 12 | 10 | 21 | 11 | 19 | 10 |
| SA | 10 | 12 | 15 | 12 | 15 | 11 |
| TAS | 8 | 19 | 11 | 18 | 11 | 19 |
| ACT | 16 | 10 | 23 | 10 | 21 | 11 |
| NT | 0 | 29 | 11 | 25 | 13 | 25 |
| AUST | 11 | 14 | 16 | 13 | 15 | 13 |
| OECD | 9 | 20 | 13 | 22 | 9 | 19 |
| Highest Country | 22 | 5 | 32 | 12 | 21 | 5 |

**Notes**:

1. The PISA survey classified reading skills in 6 categories, from Level 5 to below Level 1. Level 5 proficiency involves ability to deal with difficult texts and to complete sophisticated reading tasks. Students who do not progress beyond Level 1 are likely to experience problems in some spheres of adult life while students who have not achieved Level 1 proficiency are likely to be seriously disadvantaged in their lives beyond school.
2. Mathematical and science skills are classified in 7 categories, from Level 6 to below Level 1. At Level 6 students can conceptualise, generalize and utilize information based on their investigations and modelling of complex problem situations. Students at or below Level 1are unable to utilize mathematical skills in a given situation.

The proportion of ACT students in the lowest mathematical levels is 10 per cent, which is the lowest in Australia and significantly lower than the average for Australia of 13 per cent. It is less than double that for the OECD (22 per cent), but significantly higher than the 6 per cent in Finland, which is the country with the lowest proportion of students at Level 1 and below. It is also slightly lower than that of Korea but similar to several other well-performing countries [Thomson & De Bortoli 2008a: 200, Figure 6.5].

The proportion in the lowest science levels in the ACT is 11 per cent compared to an average of 13 per cent for Australia and 19 per cent for the OECD. The ACT proportion is slightly higher than that for Western Australia and is the same as in New South Wales and South Australia. It is more than double that of the highest performing country, Finland but it is similar to several other high performing countries [Thomson & De Bortoli 2008a: 66, Figure 3.2].

Students who do not progress beyond Level 1 are likely to experience problems in some spheres of adult life while students who have not achieved Level 1 proficiency are likely to be seriously disadvantaged in their lives beyond school. Students with literacy skills below Level 1 may be at risk not only of difficulties in their initial transition from education to work, but also of failure to benefit from further education and learning opportunities throughout life [Lokan et.al. 2001: 78; Thomson et.al. 2004: 95; OECD 2004: 279].

A proportion of about 10 per cent of ACT 15 year old students in the lowest proficiency levels means that about 500 students are at these levels. However, this proportion could be taken as indicative of proficiency across the secondary school years, in which case it indicates that a total of about 2900 students are at these levels. It also suggests that about 1600 government secondary school students are at these levels.

## Range of outcomes

The PISA 2006 study shows that the difference between the highest and lowest outcomes in the ACT is relatively narrow by national and international standards in reading and mathematics, but large for science [Figure 2]. The ACT range is narrower than the average for Australia and the OECD in reading; similar to the Australian average and narrower than the OECD average in mathematics; and larger than the average for Australia and the OECD in science.

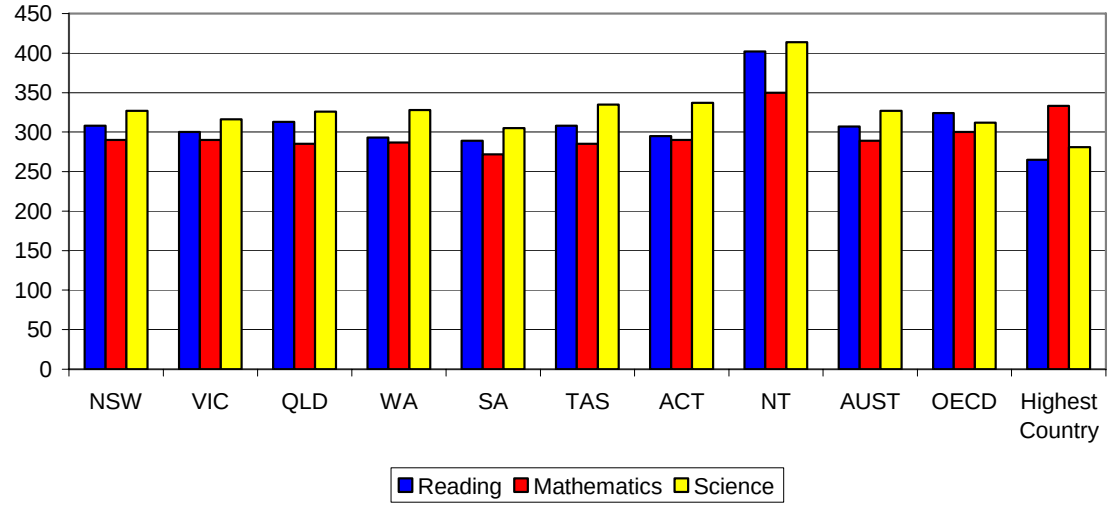
The range of outcomes for ACT 15 year old students in reading is amongst the lowest in Australia and it is lower than the average for Australia. South Australia has the narrowest range of outcomes in Australia in reading. The range for the ACT is amongst the lowest of the top achieving countries and is lower than the average for the OECD countries.

The difference between the highest and lowest mathematics outcomes in the ACT is similar to the Australian average and several other states, but larger than that of South Australia which as the narrowest range. The ACT range of outcomes in mathematics is lower than the average for the OECD. Six high achieving countries have a significantly lower range of mathematics outcomes than the ACT, but the ACT range is narrower than for seven other high achieving countries and is similar to two others.

The range in ACT science outcomes is the largest of all the states and territories except for the Northern Territory, is similar to that of Tasmania and is larger than the Australian average. It is significantly higher than that of South Australia which has the narrowest range. ACT has a larger range of outcomes than all the top 15 achieving countries, except

New Zealand and the United Kingdom. It is also significantly larger than the average for the OECD.

**Figure 2: Score Ranges for 15 Year Old Students, PISA 2006**

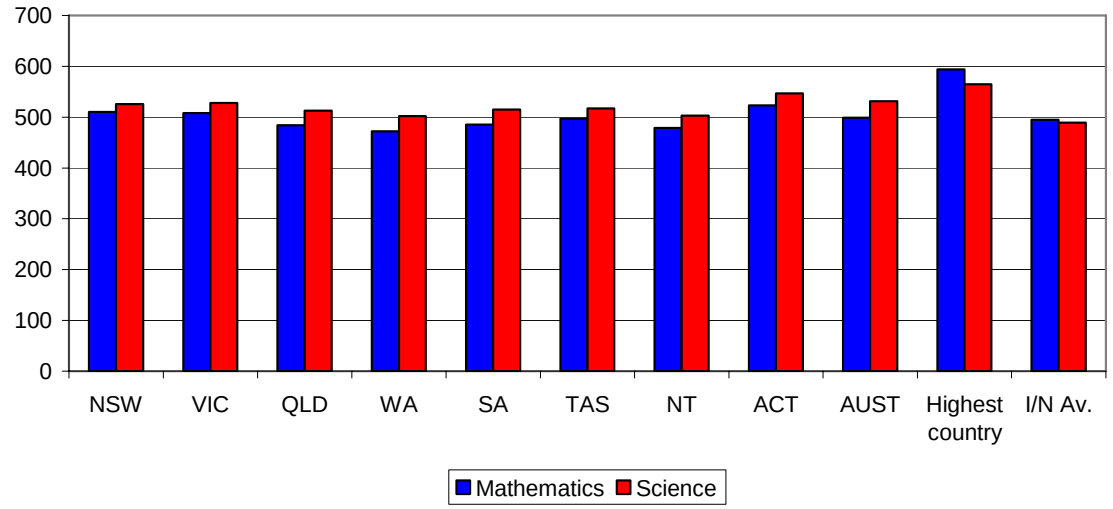



*Note:* The range of scores is approximate for some states and territories. They are estimated from Thomson & Bortoli 2008a: Figure 3.5, p. 70 (science); Figure 5.5, p.165 (reading); Figure 6.6, p. 202 (mathematics).

## 2.2 TIMSS results[5]

Average outcomes in mathematics and science for ACT Year 4 students are high by national and international standards [Figure 3]. ACT mathematics and science outcomes are the highest in Australia, but are broadly similar to several other states when potential measurement error is taken into account.

**Figure 3: Average Scores for Year 4 students, TIMSS 2002**

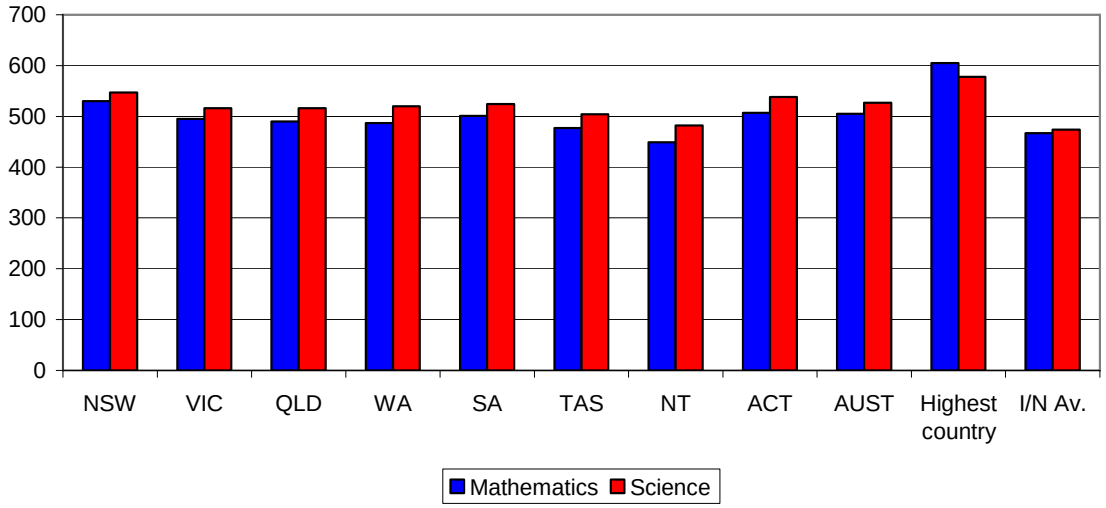



In mathematics, ACT Year 4 outcomes are below a group of eleven high achieving

[5] The TIMSS results are provided in Thomson & Fleming 2004a; 2004b.

countries, but these results were equivalent to the fifth highest achieving country (Belgium), taking account of potential measurement error. The ACT had the third highest ranking internationally in Year 4 science but can be considered as having the equal highest results in the world when potential measurement error is taken into account. ACT outcomes are significantly higher than the international averages.

**Figure 4: Average Scores for Year 8 Students, TIMSS 2002**




ACT outcomes in Year 8 mathematics and science are also high by national and international standards [Figure 4]. The ACT ranked second in Australia in mathematics and science, but there is no significant difference between the ACT and most other states when potential measurement error is taken into account. ACT outcomes are well above the international averages. In mathematics, the ACT is included in a large group of countries with a middle band of achievement between nine high achieving countries and the international average. ACT science outcomes are just below a group of seven high achieving countries, but when potential measurement error is taken into account, the ACT results are similar to the third highest ranking country (Korea).

Nationally, the ACT had the highest proportion of Year 4 students achieving the advanced benchmarks in mathematics and science and the lowest proportion in the low category [Table 2]. Around 11 per cent of ACT students achieved the advanced benchmark in mathematics and 15 per cent achieved the advanced science benchmark compared with an average of 5 and 9 per cent for Australia. The proportion of ACT students at these levels was also much higher than the international average, but much lower than the highest achieving countries.

A low proportion of Year 4 students in the ACT are at the lowest levels of achievement. Only 7 per cent of students did not achieve the low benchmark in mathematics and 4 per cent did not achieve the low science benchmark compared to the average for Australia of 12 and 8 per cent. The proportion of ACT students not achieving the low benchmarks was much smaller than the international average, larger than the highest achieving country in mathematics and similar to the highest achieving country in science.

There is a significant difference between ACT performance at the advanced levels of mathematics and science for Years 4 and 8. While the ACT has a relatively high proportion of students at the advanced levels in Year 4, it has a relatively low proportion at this level in Year 8.

**Table 2: Proficiency Levels for Year 4 Students, TIMSS 2002 (% of students)**

| Region | Mathematics | | Science | |
|---|---|---|---|---|
| | Advanced | Less Than Low | Advanced | Less Than Low |
| NSW | 7 | 8 | 10 | 8 |
| VIC | 6 | 10 | 9 | 8 |
| QLD | 3 | 15 | 7 | 9 |
| WA | 2 | 17 | 5 | 11 |
| SA | 3 | 15 | 7 | 11 |
| TAS | 3 | 15 | 7 | 8 |
| NT | 2 | 19 | 6 | 15 |
| ACT | 11 | 7 | 15 | 4 |
| AUST | 5 | 12 | 9 | 8 |
| I/N Average | 8 | 18 | 7 | 18 |
| Highest Country | 38 | 3 | 25 | 5 |

**Notes**:

1. Four performance levels are set in the TIMSS assessment: advanced, high, intermediate and low. Benchmarks are set for these levels as scores in the scale of achievement.
2. Students at the advanced level of mathematics in Year 4 showed the ability to solve a variety of problems. Students achieving the low benchmark demonstrated only a basic understanding of whole numbers, the properties of basic geometrical shapes and how to read simple bar charts.
3. Students at the advanced level of science in Year 4 showed the ability to apply knowledge and understanding in beginning scientific inquiry while those achieving the low benchmark demonstrated some elementary knowledge of earth, life and physical science.

Only 2 per cent of ACT Year 8 students achieved advanced level mathematics, compared with the Australian average of 7 per cent and an international average of 7 per cent [Table 3]. The ACT was well below NSW where 13 per cent of students achieved advanced level mathematics.

In science, 8 per cent of ACT Year 8 students achieved the advanced level compared to 15 per cent in NSW and an average of 9 per cent for Australia. This was slightly above the international average of 6 per cent, but well below that of the highest achieving country.

The ACT has the smallest proportion of Year 8 students nationally who do not achieve the low benchmark in mathematics and science. Some 6 per cent did not achieve the low mathematics benchmark and 2 per cent did not achieve the low science benchmark, compared with 10 and 5 per cent respectively for Australia. In international terms, the ACT has a much lower proportion of students failing to achieve the low benchmarks than the international averages of 26 and 21 per cent. It has a higher proportion at this level in

mathematics than the highest achieving country, but a lower proportion than the highest achieving country in science.

There is little difference in the proportion of ACT Year 4 and Year 8 students who did not achieve the low benchmark. In mathematics, 7 per cent of ACT Year 4 students did not achieve the low benchmark compared to 6 per cent of Year 8 students. In science, 4 per cent of Year 4 students did not achieve the low benchmark compared to 2 per cent of Year 8 students.

**Table 3: Proficiency Levels for Year 8 Students (% of students)**

| Region | Mathematics | | Science | |
|---|---|---|---|---|
| | Advanced | Less Than Low | Advanced | Less Than Low |
| NSW | 13 | 9 | 15 | 5 |
| VIC | 3 | 9 | 5 | 5 |
| QLD | 3 | 13 | 5 | 6 |
| WA | 2 | 12 | 5 | 6 |
| SA | 6 | 11 | 10 | 5 |
| TAS | 2 | 16 | 5 | 10 |
| ACT | 2 | 6 | 8 | 2 |
| NT | 0 | 21 | 3 | 11 |
| AUST | 7 | 10 | 9 | 5 |
| I/N Average | 7 | 26 | 6 | 21 |
| Highest Country | 44 | 1 | 33 | 5 |

**Notes**:

1. Four performance levels are set in the TIMSS assessment: advanced, high, intermediate and low. Benchmarks are set for these levels as scores in the scale of achievement.
2. Students at the advanced level of mathematics in Year 8 showed the ability to use relatively complex algebraic and geometric concepts. Students achieving the low benchmark demonstrated only basic mathematical knowledge.
3. Students at the advanced level of science in Year 8 demonstrated an understanding of some complex and abstract science concepts. Students achieving the low benchmark were able to recognize some basic facts from the life and physical sciences.

## 2.3 National benchmarks[6]

Student outcomes at other Year levels in the ACT are also amongst the highest in Australia. The proportion of ACT students achieving the national benchmarks in reading, writing and numeracy is generally the highest in Australia.[7] However, there is little difference between the ACT results and those of several other states when the potential for sampling and measurement error is taken into account.

Overall, only 4 to 6 per cent of Territory students are below the national benchmarks for reading, writing and numeracy in Years 3 and 5 compared to 6 to 12 per cent for all of

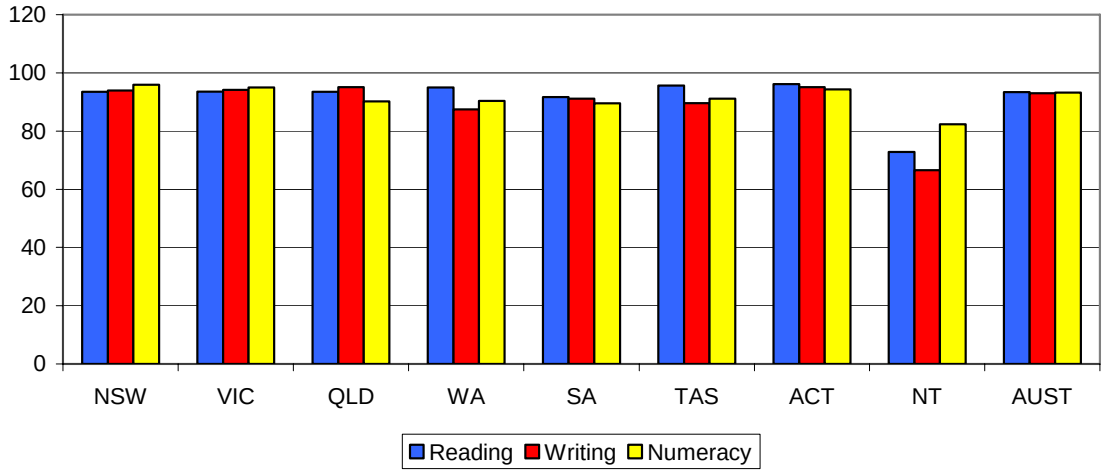
[6] The National Benchmark results are provided in MCEETYA 2008.

[7] The National Benchmark results are reported for all students in both government and non-government schools in Years 3, 5 and 7 for reading, writing and numeracy.

Australia. About 6 to 10 per cent of ACT students are below the benchmarks for Year 7 compared to 8 to 20 per cent for all of Australia.

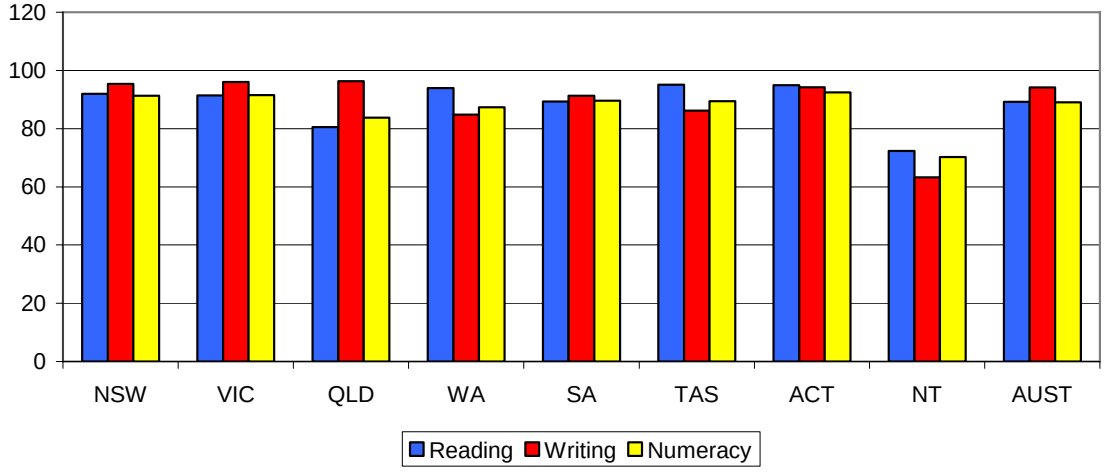
In 2007, 94-96 per cent of Year 3 students achieved the national reading, writing and numeracy benchmarks [Figure 5].

**Figure 5: Proportion of Year 3 Students Achieving National Bencharks, 2007 (%)**



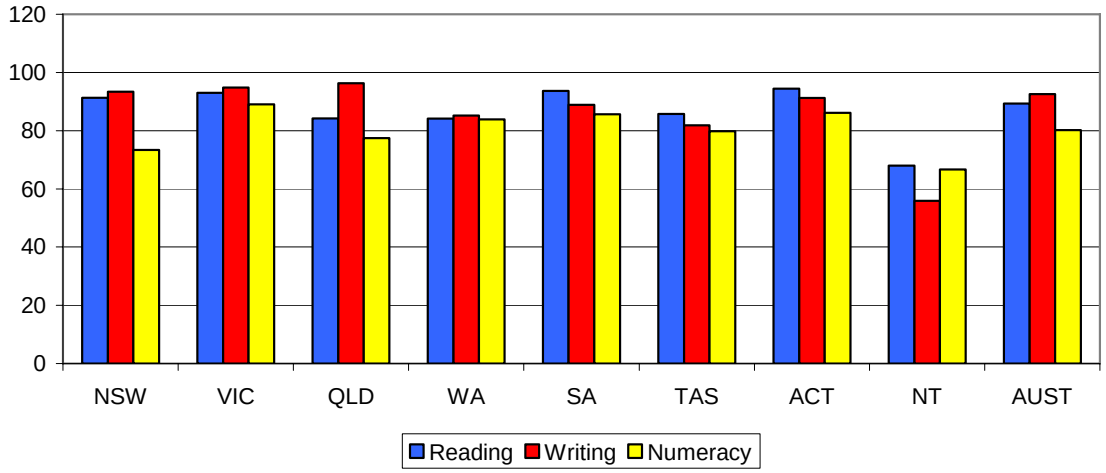

The proportion of Year 3 students in the ACT achieving the national benchmark in reading is the highest in Australia, but statistically similar to Victoria, Western Australia and Tasmania. The ACT has the highest proportion achieving the national writing benchmark, but it is statistically similar to that of NSW, Victoria, Queensland and the Australian average. In numeracy, the ACT is similar to NSW, Victoria and the Australian average.

**Figure 6: Proportion of Year 5 Student Achieving National Benchmarks, 2007 (%)**



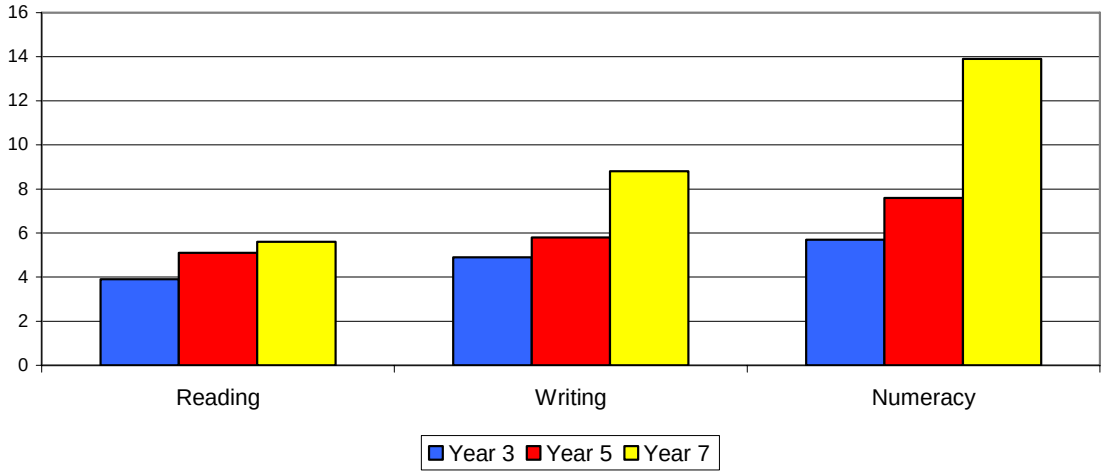
In 2007, 95 per cent of Year 5 students achieved the national reading benchmark, 94 per cent achieved the writing benchmark and 92 per cent achieved the numeracy benchmark [Figure 6]. The ACT proportion for reading is the highest in Australia, being significantly above the Australian average, but statistically similar to that of Tasmania and Western Australia. In writing, the ACT proportion is statistically similar to that of three other states and the Australian average. In numeracy, the ACT is the highest in Australia together with New South Wales and Victoria.

**Figure 7: Proportion of Year 7 Students Achieving National Benchmarks, 2007 (%)**




In 2007, 94 per cent of ACT Year 7 students achieved the national reading benchmark, 93 per cent achieved the writing benchmark and 86 per cent achieved the numeracy benchmark [Figure 7]. The proportion of Year 7 students in the ACT achieving the national reading benchmark was the highest in Australia, but statistically similar to Victoria and South Australia.

**Figure 8: Proportion of ACT Students Not Achieving National Benchmarks, 2007 (%)**




The ACT proportion for writing is below that of Victoria and Queensland and statistically

similar to New South Wales and the Australian average. For numeracy, the ACT proportion was below Victoria, similar to South Australia and well above the Australian average.

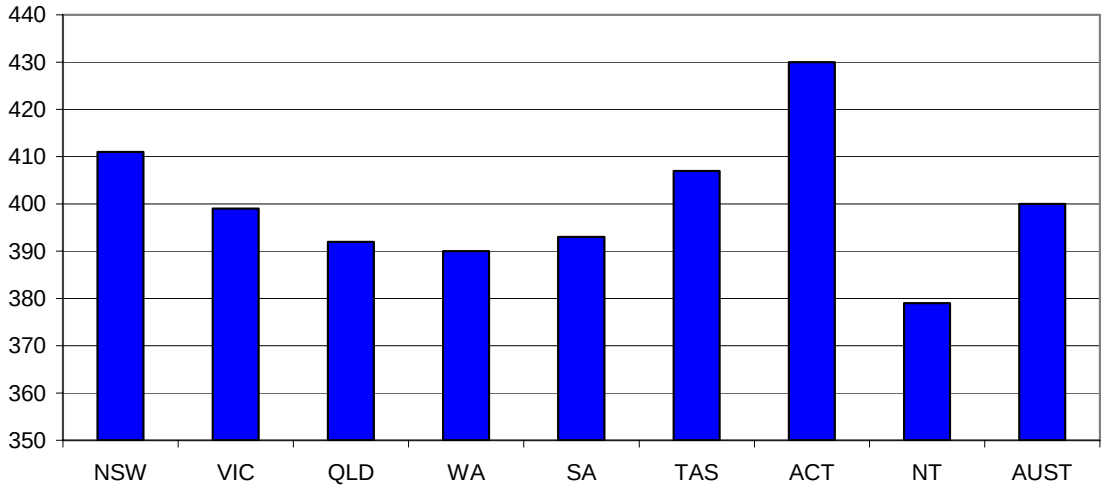
Overall, a higher proportion of Year 7 students in the ACT did not achieve the national benchmarks compared to Year 3 and Year 5 students [Figure 8]. Some 4 to 8 per cent of primary school students in the ACT did not achieve the benchmarks in 2007 compared to 6 to 14 per cent of Year 7 students. The main differences are in writing and numeracy.

## 2.4 Other national assessment outcomes

In addition to the annual national assessments of literacy and numeracy, sample assessments are conducted nationally on a three-year cycle in science, civics and citizenship and information and communications literacy.[8]

Science literacy results for Year 6 students are only published for 2003 [MCEETYA 2005].[9] ACT students achieved significantly above the mean for Australia [Figure 9]. The ACT mean was significantly above other states, but it was similar to that of NSW and Tasmania when statistical uncertainty is taken into account.

**Figure 9: Average Science Scores for Year 6 Students, 2003**




Seventy per cent of ACT students were at or above the proficient level compared to 58 per cent for Australia. This proportion was higher than in any other area of Australia. The proportion of ACT students achieving at the highest levels was 13.5 per cent, which was nearly double that for Australia (7.6 per cent). While the proportion of students achieving

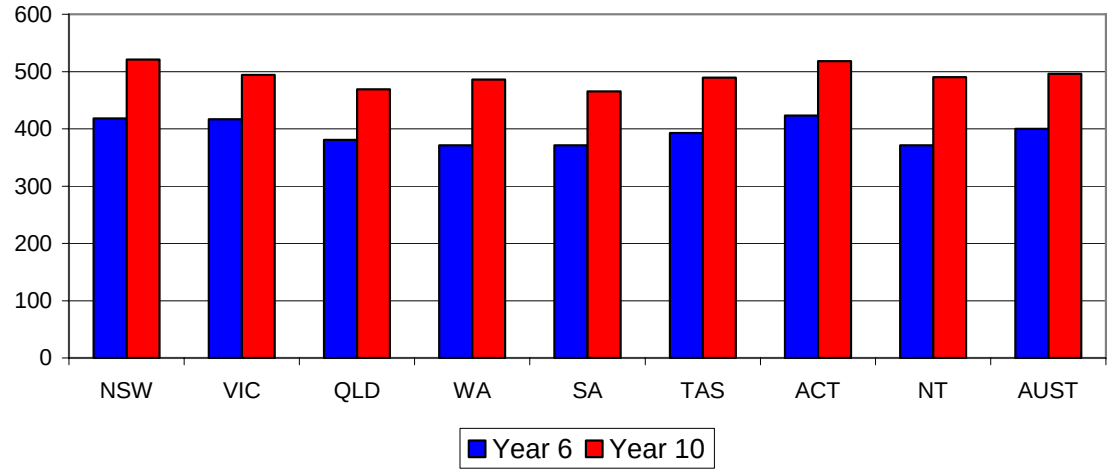
[8] Sample assessments for information and communications technologies were conducted in 2005 but the results have not been published to date.

[9] The first sample assessment for science was conducted in 2003 and another in 2006. Student performance is determined as the proportion of the sampled students achieving at or above the proficient standard, which is set at 3.2 (of levels 1 – 4 or above). This standard is different from that applied in the national benchmark assessments, where the focus is on identifying minimum skill and knowledge levels required to progress to the next level of schooling.

at these levels in the ACT was the highest in Australia, it was statistically similar to that of NSW and Tasmania.

National assessment results for civics and citizenship for Year 6 and 10 students are available for 2004 [MCEETYA 2006].[10] The mean scores for the ACT were significantly above those for Australia, but statistically similar NSW and Victoria for Year 6 and to all other states except Queensland and South Australia for Year 10 [Figure 10].

**Figure 10: Civics and Citizenship Mean Scores, Year 6 and 10 Students, 2004**




Sixty-one per cent of ACT students achieved at or above the proficiency level for Year 6 compared to 50 per cent for Australia. The ACT proportion was statistically similar to that for NSW and Victoria. The proportion of ACT students achieving at the highest levels was 12 per cent compared to the national average of 8 per cent. The ACT proportion was statistically similar to that of NSW, Victoria and Tasmania.

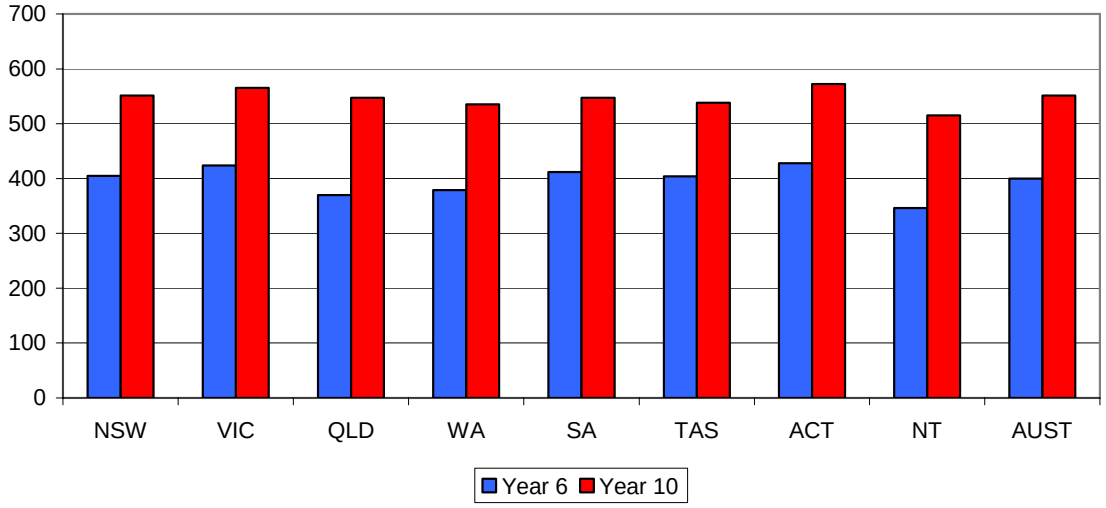
Forty-eight per cent of Year 10 ACT students achieved or exceeded the proficiency level and this was statistically indistinguishable from the average for Australia and most other states once statistical uncertainty about the results was taken into account. The proportion of ACT students achieving at the highest levels was 8 per cent, but this was also statistically indistinguishable from the average for Australia and that for several states.

National assessments for ICT literacy for Years 6 and 10 students are available for 2005 [MCEETYA 2007].[11] The mean scores for the ACT at both Year levels are higher than the Australian average, but statistically similar to several other states [Figure 11].

[10] Student performance in civics and citizenship is determined as the proportion of sampled students achieving at or above the proficient standard, which is set at proficiency level 2 for Year 6 and at level 3 for Year 10 on a continuum of levels 1 to 5.

[11] Student performance in ICT literacy is determined as the proportion of sampled students achieving at or above the proficient standard, which is set at proficiency level 3 for Year 6 and at level 4 for Year 10 on a continuum of levels 1 to 5.

**Figure 11: ICT Literacy Mean Scores, Year 6 and 10 Students, 2005**




Fifty-eight per cent of ACT students achieved at or above the proficiency level for Year 6 compared to 49 per cent for Australia. The ACT proportion was statistically similar to that the national average and for several states. The proportion of ACT students achieving at the highest levels was 13 per cent compared to the national average of 8 per cent. The ACT proportion was statistically similar to the national average and several states.

Sixty-six per cent of Year 10 ACT students achieved or exceeded the proficiency level compared to 61 per cent for Australia. This was statistically indistinguishable from the national average most other states once statistical uncertainty about the results was taken into account. The proportion of ACT students achieving at the highest levels was 18 per cent, but this was also statistically indistinguishable from the average for Australia and that for several states.

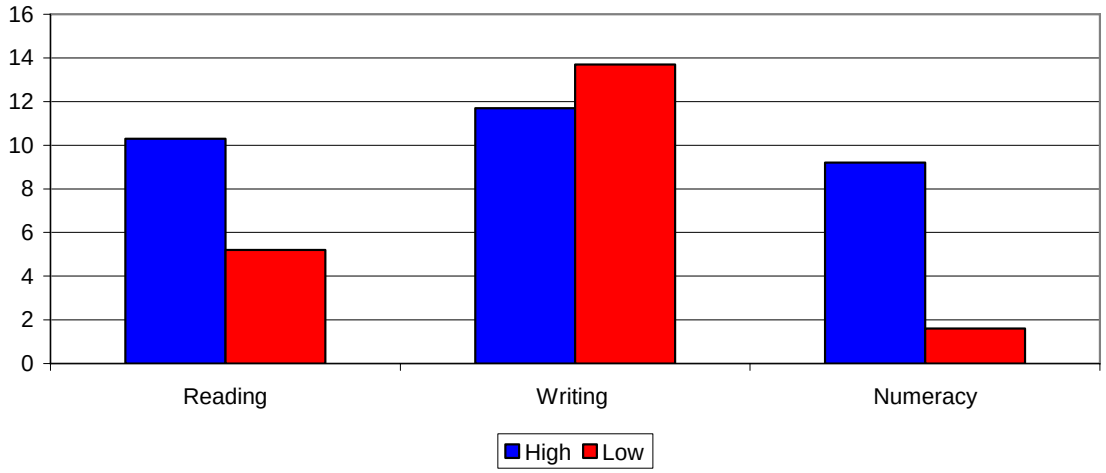
## 2.5 ACTAP Year 9 literacy and numeracy outcomes

National benchmark results for Year 9 are not available, but an indication of outcomes for this Year can be obtained from the ACT Assessment Program (ACTAP). The ACTAP results are reported as proportions of students achieving at different curriculum profile levels. There are four profile levels for each Year. Students at the lowest profile level can be considered as seriously 'at risk' of not achieving the expected rate of development and not achieving an adequate education. These students are eighteen months or more behind their peers. By way of comparison with the national benchmark results, it should be noted that in Years 3, 5 and 7 the national benchmark levels fall within the second lowest profile level for each Year. This suggests that the proportion of students at the lowest profile level is an underestimate of the extent of students 'at risk' in their learning.

In 2007, 10 per cent of Year 9 students were at the highest reading profile level, 12 per cent were at the highest writing level and 9 per cent were at the highest numeracy level [Figure 12]. There was little change in these proportions since 2002. In 2002, 8 per cent

were at the highest reading level, 15 per cent were at the highest writing level and 7 per cent were at the highest numeracy level.

**Figure 12: Proportion of ACT Year 9 Students at Highest and Lowest Profile Levels, 2007 (%)**



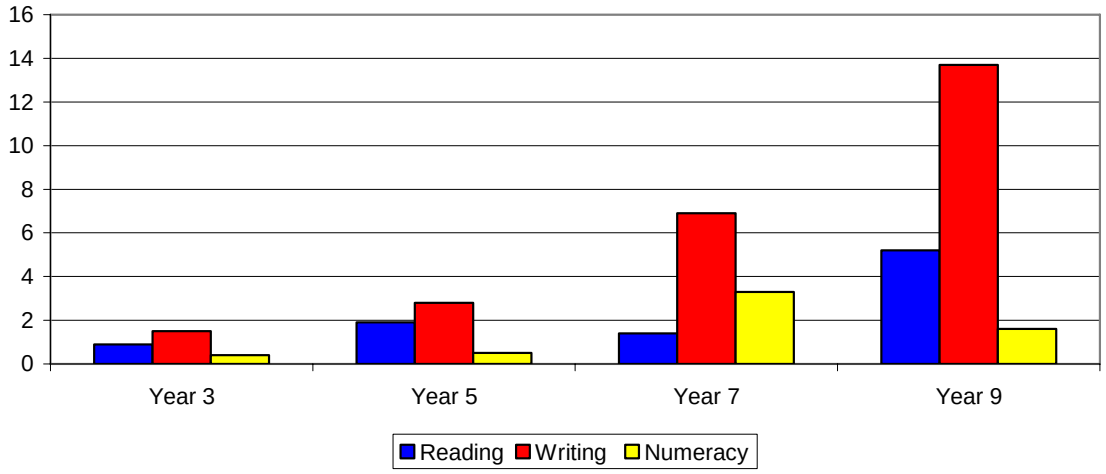

*Source:* ACT Department of Education and Training

In 2007, 5 per cent of Year 9 students were at the lowest reading profile level, 14 per cent were at the lowest writing level and 2 per cent were at the lowest numeracy level. These results represent a considerable improvement over recent years. In 2002, 22 per cent of Year 9 students were at the lowest reading and writing levels and 5 per cent were at the lowest numeracy level.

Overall, a higher proportion of high school students in the ACT are at the lowest profile levels than primary school students. About 1 to 3 per cent of primary school students were at these levels in 2007 compared to 1 to 7 per cent of Year 7 students and 2 to 14 per cent of Year 9 students [Figure 13]. The difference is most apparent in literacy, and especially writing.

A comparison of the results shown in Figures 8 and 13 suggests that significant proportions of Year 9 students are likely to below expected standards for this Year level. The difference between the proportion of ACT students below the national benchmarks for Years 3, 5 and 7 and the proportion at the lowest ACTAP profile levels of these Years suggests that some 10 – 15 per cent of Year 9 students could be below expected levels of achievement.

**Figure 13: Proportion of ACT Students at Lowest Profile Levels, 2007 (%)**




*Source:* ACT Department of Education and Training

## 2.6 Retention rates and Year 12 completion rates

Retention rates to Year 12 and completion rates for Year 12 are also important measures of student outcomes.[12] Completion of Year 12, or an equivalent qualification, is widely seen as a minimum education requirement for effective participation in modern society. Students who do stay on to Year 12 are significantly disadvantaged in terms of further education and employment opportunities available to them. Even those students who find employment before completing Year 12 are not assured of secure and meaningful long-term employment.

Recent research published by the Productivity Commission shows that labour force participation rates are considerably lower for people who do not complete Year 12 compared to those that have completed the final year of school [Lattimore 2007]. For example, in 2001, about 25 – 30 per cent of males between the ages of 25 and 50 who did not complete Year 10 were not in the workforce compared to 10 – 15 per cent of those who completed Year 12 [Lattimore 2007: 188, Table 9.1].

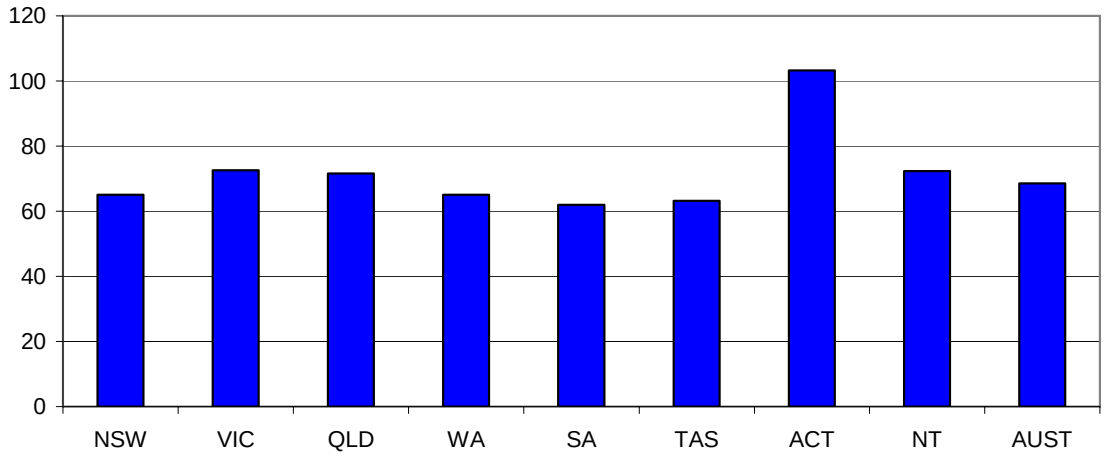
Unemployment is generally higher for those who have not completed secondary education. In Australia, the incidence of unemployment among those without Year 12 or its equivalent is more than twice that among those who have completed upper secondary education [Sweet 2006].

Males with low attainment rates face more prolonged periods of unemployment. For example, about one in five males with no schooling beyond year 9 experience

[12] The retention rate to Year 12 used here measures the proportion of students who continued to Year 12 from the respective cohort group at the commencement of secondary school. Completion rates measure the number of students who receive a Year 12 certificate as a proportion of the estimated number of students that could attend Year 12 in the year. Retention rate data is reported separately for government and private schools while completion rate data is only available for students from all schools.

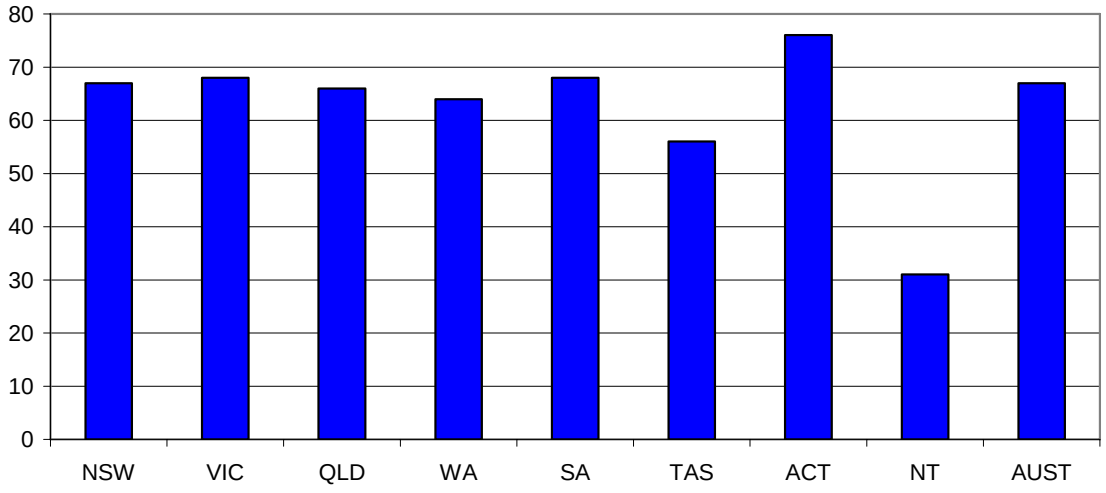
unemployment for 4 or more years of first 7 post-school years, about three times the rate of those who have completed year 12 [Lamb & McKenzie: 2001: 48ff]. These higher unemployment rates of young, poorly educated males appear to lead to higher labour force inactivity rates at mature and older ages [Lattimore 2007: 202].

**Figure 14: Retention Rates to Year 12, Government Schools, 2006 (%)**




*Source:* Report on Government Services 2008: Table 4A.116

**Figure 15: Completion Rates for Year 12 (%)**




*Source:* Report on Government Services 2008: Table 4A.121

The ACT has the highest retention rate to Year 12 in government schools in Australia. In 2006, it was 103 per cent compared to the Australian average of 68.5 [Figure 14]. Apart from the influence of socio-economic and other background factors on this high rate, the government college sector attracts students previously enrolled in non-government schools, some of which do not have Years 11 and 12, and from surrounding areas of NSW.

Completion rates to Year 12 are also very high in the ACT compared to other states and the Northern Territory. In 2006, the ACT rate was 76 per cent compared to the average for Australia of 67 per cent [Figure 15].

Retention and completion rates to Year 12 are influenced by a range of factors including the socio-economic composition of the population. A consistent finding in research on schooling is that completion of school is strongly related to social background. The ACT has a much higher SES composition of the population than other states and territories and this is likely to contribute significantly to the higher retention and completion rates in the ACT compared to the rest of Australia.

A recent study has attempted to analyse the impact of SES differences between the states and territories on retention rates to Year 12 [Lamb et.al. 2004: 112, 114]. It estimated an adjusted retention rate for each state and territory after holding SES composition constant across each region. The largest impact of SES is on the rates in the ACT. It estimated that the higher SES (and more homogeneous) composition of the population in the ACT added approximately 8.8 per cent to the apparent retention rate. After adjusting differences in SES composition the ACT retention rate dropped below that of Victoria and Queensland.

Further modelling undertaken by the study to remove a range of population and other related factors greatly compressed interstate differences in retention rates to the extent that the ACT adjusted retention rate was lower than that for Victoria, Queensland and Western Australia [Lamb et.al. 2004: 123, Table 8.1].

## 2.7 Government and private schools

International and national assessment data does not provide separate results for government and private schools. However, private schools only fully participated in the national benchmark assessments some time after they were introduced. This lag in participation provides an opportunity to assess for any prima facie evidence of significant differences in outcomes between the two sectors.

Less than 20 per cent of private school students participated in the assessments for Years 3 and 5 in 2000, reflecting less than 10 per cent of all students tested in the ACT. Private schools fully participated in the 2001 assessments, and accounted for about one-third of all students tested. There was no increase in proportion of ACT students achieving the national reading and numeracy benchmarks associated with the full participation of private schools in the Year 3 and 5 assessments in 2001, although there was an increase in writing.

National benchmark assessments for Year 7 were introduced in 2001 but only 53 per cent of Year 7 students in private schools participated, accounting for about 34 per cent of all students tested. Private schools fully participated in the assessments in 2002 and comprised nearly 50 per cent of all ACT students tested. There was no increase in the proportion of ACT students achieving the national reading, writing and numeracy benchmarks associated with the full participation of private schools.

All this suggests there is little difference in student outcomes between the two sectors in the ACT.

This suggestion is supported by a comparison of Year 12 results. For example, in 2007 there was little difference between the government and private school sectors in the mean aggregate scores for students receiving a Tertiary Education Statement. The mean score for government colleges was 550.9 and 563.7 for private schools [BSSS 2008].

However, a much larger proportion of students in private schools achieve a Year 12 Certificate than in government colleges. For example, in 2004, 93 per cent of students starting Year 11 in private schools achieved a Year 12 Certificate compared to 79 per cent of Year 11 students in government colleges [Atelier 2005: 28, 144].

## 2.8 Summary

The ACT has very high average student outcomes by international and national standards. It has relatively high proportions of students achieving at the top levels and relatively low proportions of students at the lowest proficiency levels. It has very high retention and completion rates to Year 12.

Average outcomes for ACT 15 year old students in reading, mathematics and science are amongst the highest in the world and in Australia. The ACT has a very high proportion of 15 year olds at the top reading, mathematics science proficiency levels. It also has amongst the smallest proportion of students at the lowest proficiency levels.

Only about 10 per cent of ACT 15 year olds are achieving at the lowest PISA proficiency levels in reading, mathematics and science. However, even this small proportion translates to about 2900 students across the secondary school years in the ACT, including 1600 government school students, who are not likely to achieve an adequate education standard.

The range of outcomes in the ACT is relatively narrow by national and international standards in reading and mathematics, but large for science. There has been a significant narrowing of the range of scores in reading and mathematics in the ACT since the PISA 2003 study when the ACT had a relatively large range of scores compared to the highest achieving countries and the other high achieving Australian states.

Average outcomes in mathematics and science for ACT Year 4 students are equal to the best in the world, taking into account potential measurement error. In Year 8 mathematics, the ACT is included in a large group of countries with a middle band of achievement between nine high achieving countries and the international average while its Year 8 science outcomes are equal to the best in the world.

Nationally, the ACT had the highest proportion of Year 4 students achieving the TIMSS advanced benchmarks in mathematics and science and the lowest proportion in the low category. However, it is not as well performed at both levels as the highest achieving

countries. Only 7 per cent of ACT Year 4 students did not achieve the low benchmark in mathematics and 4 per cent did not achieve the low science benchmark

There is a significant difference between ACT performance at the advanced levels of mathematics and science for Years 4 and 8. It has a relatively low proportion of students at this level in Year 8 in comparison with national and international results.

However, the proportion ACT Year 8 students not achieving the low benchmarks in mathematics and science are relatively small. Only 6 per cent of did not achieve the low mathematics benchmark and 2 per cent did not achieve the low science benchmark

Student outcomes at other Year levels in the ACT are also amongst the highest in Australia. The proportion of ACT students achieving the national benchmarks in reading, writing and numeracy in Years 3, 5 and 7 is generally the highest in Australia, although there is little difference between the ACT results and those of several other states when the potential for sampling and measurement error is taken into account.

Only 4 to 8 per cent of ACT students are below the national benchmarks for reading, writing and numeracy in Years 3 and 5 compared to 6 to 11 per cent for all of Australia. About 6 to 14 per cent of ACT Year 7 students are below the benchmarks compared to 7 to 20 per cent for all of Australia.

ACT students also perform very well in other national assessments in science, civics and citizenship and ICT literacy. Average scores for Year 6 students are significantly above the Australian average, although statistically similar to several other states, and high proportions achieved the proficiency standard. The ACT has a high proportion of Year 6 students at the highest proficiency levels in science, civics and citizenship and ICT literacy. Year 10 students achieved a similar level of proficiency in civics and citizenship and ICT literacy as the average for Australia.

Overall, a higher proportion of high school students in the ACT are at the lowest profile levels than primary school students. About 1 to 3 per cent of primary school students were at these levels in 2007 compared to 1 to 7 per cent of Year 7 students and 2 to 14 per cent of Year 9 students The difference in the proportion of students in primary and high schools at the lowest profile levels is most apparent in literacy, and especially writing.

There appears to be some significant deterioration of high school outcomes between Years 7 and 9. The difference between the proportion of ACT students below the national benchmarks for Years 3, 5 and 7 and the proportion at the lowest ACTAP profile levels of these Years suggests that some 10 – 15 per cent of Year 9 students could be below expected levels of achievement.

# 3. Many students do not receive an adequate education

While a higher proportion of students stay on to Year 12 in the ACT than in any other State or Territory, this success conceals a significant 'drop-out' rate between Years 10 and 12 because a significant percentage of students fail to complete Year 12. Completion rate data indicates that approximately 20 per cent of ACT students do not receive a Year 12 Certificate.

Completion rates are not separately available for government schools, but upper estimates of the 'drop-out' rate can be obtained by comparing retention rates in government schools between different years. For example, the retention rate between Years 7 and 11 may be compared with the rate for Years 7 and 12.

Retention rates do not provide an accurate measure of the 'drop-out' rate from schools because they measure only the net outcome of students leaving and entering the government school system in the intervening years. For example, a retention rate from Year 7 to Year 12 of 98 per cent in a given year indicates a net loss of two per cent of those enrolled in Year 7, say 100 students. However, the net loss may be the result of 200 students leaving the system and another 100 students transferring in from other systems or from interstate. Therefore, retention rates may disguise the actual extent of the loss of students from the government school system and the extent to which students leave school before completing Year 12.

On the other hand, not all students who leave the government school system actually leave school or 'drop-out'. Students may continue their education by transfer to another school system, transfer to a school interstate or overseas and by entering training for employment. In addition, some students may also leave school before the end of Year 12 to take up employment. Nevertheless, failure to gain a Year 12 Certificate may not provide an adequate foundation for secure employment in the future.

There are three distinct periods in which students may leave school early. Some students fail to complete Year 10. A further group of students do not enrol in Year 11 and another group who enrol in Year 11 but fail to complete Year 12.

The retention rate to Year 10 indicates that only a very small proportion of students leave the government school system before Year 10 in ACT government schools. In 2006, the retention rate to Year 10 was 99 per cent, but in several of the preceding five years it was 100 per cent.[13]

Some students who complete Year 10 do not enrol in Year 11. This number cannot be determined from a comparison of retention rates for Years 7 to 10 and for Years 7 to 12 because a large number of students enter the government school system from non-

[13] Steering Committee for the Review of Commonwealth/State Service Provision, *Report on Government Services 2008,* Table 4A.118.

government schools and from across the border at the beginning of Year 11. However, ACT Budget Papers indicate that about 15 per cent of government school students who complete Year 10 do not enrol in Year 11.[14]

In terms of Year 12 completion in 2006, the relevant Year 10 cohort for comparisons of drop out rates is for 2004. The Year 10 enrolment in August 2004 was 2569.[15] On the basis that 15 per cent of Year 10 students did not proceed to Year 11 in a government school college, it is estimated that 385 students did not proceed in 2005.

An estimate of the number of students who enrol in Year 11 but leave school before completing Year 12 can be obtained by comparing the retention rate from Year 7 to Year 11 for a given year to the rate from Year 7 to Year 12 in the following year.[16]

The government school retention rate from Year 7 to Year 11 in 2005 was 119.7 and the rate to Year 12 in 2006 was 103.2.[17] This disparity of 16.5 percentage points shows that a significant number of students enrolled in 2005 did not complete Year 12 in the following year. The actual difference between enrolments in Years 11 and 12 in August 2005 and August 2006 was 447 students, or 14.8 per cent of those enrolled in Year 11 in 2005.[18]

However, comparison of these retention rates does not provide a complete measure of drop-out rates because published retention rates are estimated in August each year. Consequently, they do not account for students who enter or leave secondary college between enrolment in Year 11 as recorded in the February census and the August census of the same year. A comparison of the 2005 February and August censuses shows that 19 Year 11 students left school before August.

Thus, 466 students, or 15.4 per cent, of those who enrolled in Year 11 in February 2005 left school before August 2006. It is assumed that none of these students received a Year 12 Certificate.

In addition to these, a small number of students enrolled in Year 12 in August of each year do not actually receive a Year 12 Certificate. Of the students enrolled in Year 12 in February 2006, 381 failed to gain a Year 12 Certificate.[19] Of these, 260 had left the school system by August that year. Thus, 121 students, or about 5 per cent of those enrolled in Year 12 in August of 2006, failed to achieve a Year 12 Certificate.

Thus, a total of 587 students, or about 20 per cent, of those enrolled in Year 11 in February 2005 did not achieve a Year 12 Certificate in 2006. This estimate is supported

[14] ACT 2004-05 Budget Paper No. 4: 354; 2005-06 Budget Paper No. 4: 392; 2006-07 Budget Paper No. 4: 385; 2007-08 Budget Paper No. 4: 370.
[15] ACT Department of Education and Training, Government School Bulletin, August 2005 Census.
[16] Retention rates are estimated from enrolments as of August of each year.
[17] Steering Committee for the Review of Commonwealth/State Service Provision, *Report on Government Services 2006*, Table 3A.117; *2007*, Table A4.116.
[18] Total Year 11 enrolments in August, 2005 was 3030 and total Year 12 enrolments in August, 2006 was 2583. These figures are obtained from the August Census.
[19] Estimated from figures supplied in ACT Department of Education, *Annual Report 2006-07*: 10.

by findings of recent internal and external reviews of colleges that about 20 per cent of each Year 11 cohort does not complete Year 12 [DET 2004; Atelier 2005: 28, 144].

In addition, based on the above assumption of 15 per cent of Year 10 students not proceeding to Year 11, about 385 students in the Year 10 cohort of 2004 did not complete Year 12.

Together, these give an overall estimate of 972 students not achieving a Year 12 Certificate in 2006. This amounts to 32 per cent of those who enrolled in Year 11 in 2005. Thus, a very significant proportion of students in ACT government schools not achieving a goal that has been set as a Territory and national objective.

Strictly speaking, these two figures should not be added together because they are derived from different bases, one based on government high school enrolments and the other on college enrolments that include students previously not enrolled in ACT government schools. However, expressing the total as a percentage of, say, the Year 11 cohort of any one year, does provide an approximate upper estimate of the drop-out rate in from Year 10 through to the end of Year 12 in government schools. Most of these students can be considered 'at risk', although many may continue their education elsewhere, in school or in training institutions.

This upper estimate of about 30 per cent of students in any Year 11 cohort who do not achieve a Year 12 Certificate is approximate to the estimate that can be derived from the ACT Budget Papers. The Budget Papers report that 15 per cent of Year 10 students in government schools do not proceed to a government secondary college and that a further 15 per cent of Year 12 students in government secondary colleges do not achieve a Year 12 Certificate.[20] As noted above, recent reviews of colleges have found that about 20 per cent of each Year 11 cohort does not complete Year 12.

As stated in an internal Department of Education review of government secondary colleges in 2004, it is clear that the actual rate for non-continuing students is considerably higher than previously understood [DET 2004]. The review said that the extent of the drop out rate is disturbing and that it cannot be explained away. While some of these students transfer to other school systems or find employment, many do not achieve the standard of education required today for a successful employment career and adult life.

In summary, the ACT has the highest retention rates to Year 12 and the highest completion rates for Year 12 in Australia. However, these high rates disguise a significant drop-out rate between the end of Year 10 and Year 12 in government schools. About 1000 students in any high school Year cohort do not achieve a Year 12 Certificate. This figure amounts to about 30 per cent of the Year 11 cohort in government schools, but it includes students who move to other school systems or gain employment.

[20] ACT 2007-08 Budget Paper No. 4: 370.

# 4. No improvement and some declines in outcomes

While the ACT is achieving very high average outcomes by international and national standards, its results are not improving and, in some cases, show a significant decline in recent years.

## 4.1 PISA results

The results from the three PISA studies conducted in 2000, 2003 and 2006 indicate that the performance levels of ACT students are generally not improving. Average reading literacy performance declined between 2000 and 2003 while there was no significant change in mathematics results.[21] In addition, the proportion of students achieving the top levels of performance has declined and there has been no reduction in the proportions achieving at the bottom levels.

There was a significant decline in performance in reading literacy in the ACT since PISA 2000 [Thomson & De Bortoli 2008a: 175-176]. The overall reading literacy average for the ACT declined significantly by 17 score points, from 552 to 535 score points from PISA 2000 to PISA 2006. Over 80 per cent of the decline appears to have occurred between 2003 and 2006.

The decline in the ACT was slightly larger than that of Australia (15 points) but significantly larger than the overall decline in the OECD average of six score points. The decline in the ACT was less than that in NSW, South Australia and the Northern Territory. The decline in the ACT is equivalent to about six months of schooling.[22]

This decline appears to be the result of a decline in performance at the top levels of achievement. There were significant declines in reading performance of ACT students in the 75$^{th}$, 90$^{th}$ and 95$^{th}$ percentiles between 2000 and 2006 [Thomson & De Bortoli 2008b: 8]. There was a 23 score point decline in the 75$^{th}$ percentile, 29 points in the 90$^{th}$ percentile and 37 points in the 95$^{th}$ percentile. These are quite large declines in performance, being the equivalent of 6-12 months of schooling. In addition, the proportion of students achieving at the top level has declined since 2000 (see below). The evidence for Australia also points to a decline in the performance of students at the upper end of performance levels [Thomson & De Bortoli 2008a: 176].

There was no significant difference between the average ACT score in mathematics in 2003 and 2006. Significant declines were recorded only in South Australia and Western Australia. However, there were significant declines in mathematics performance of students at the top levels between 2003 and 2006 [Thomson & De Bortoli 2008b: 10]. There was a decline of 23 score points for students in the 90$^{th}$ percentile and a decline of 24 points for students in the 95$^{th}$ percentile.

[21] Valid comparisons of PISA results are available for reading from 2000 to 2006 and for mathematics from 2003 to 2006. Valid comparisons are not available for science.

[22] A gain or loss of 34 points represents about one year of schooling. See Thomson & De Bortoli 2008a: 62, 175.

There has been no reduction in the proportion of 15 year-old students in the ACT achieving below the OECD mean since 2000 [Thomson & De Bortoli 2008b: 18-20]. The proportion has remained at about 30 per cent in reading, mathematics and science.

There has been a significant decline in the proportion of ACT students achieving at the top levels in reading since 2000. In 2000, 25 per cent of students were at Level 5 in reading compared to only 16 per cent in 2006. The proportion of students achieving at Levels 5 and 6 in mathematics declined from 27 per cent in 2003 to 23 per in 2006. The proportion achieving at Level 6 declined from 10 to 6 per cent.

There has been no improvement in the proportion of students achieving at the bottom levels in reading and mathematics. In 2000, 11 per cent of ACT students were at Level 1 and below in reading compared to 10 per cent in 2006. In 2003, 11 per cent of students were at Level 1 and below in mathematics compared to 10 per cent in 2006.

There has been a significant narrowing of the range of scores in reading and mathematics in the ACT since the PISA 2003 study. In 2003, the ACT had a relatively large range of scores in all areas assessed compared to the highest achieving countries and the other high achieving Australian states. The range was broadly similar to the average for Australia and the OECD.

The range for reading in the ACT is 30 points lower than it was in the PISA 2000 study and 25 points lower than in the PISA 2003 study when the ACT had amongst the largest range of outcomes amongst the high achieving states and countries. The range for mathematics is 36 points lower than it was in the PISA 2003 study when the ACT also had amongst the largest range of outcomes amongst the high achieving states and countries. The range for science is 13 points lower than it was in 2003, but this is unlikely to be a statistically significant difference.

## 4.2 National benchmark results

In general, the national benchmark results show no improvement in reading, writing and numeracy between 2001 and 2007.[23]

There was no improvement in the proportion of Year 3 students achieving the national benchmarks in reading and writing after allowing for measurement error. However, the proportion achieving the numeracy benchmark declined from 97 to 94 per cent. The proportion of Year 5 students achieving the reading, writing and numeracy benchmarks did not improve. No improvement was recorded in the proportion of Year 7 students achieving the reading, writing and numeracy benchmarks, after allowing for statistical error.

[23] National benchmark results for 2001 are provided in MCEETYA 2003a, 2003b.

## 4.3 Retention and completion rates

Retention rates in ACT government schools are lower now than in 2001 and the preceding years while retention rates for Australia have increased slightly [Figure 16]. In 2006, the ACT retention rate was 103 per cent compared to 110 per cent in 1999. Over the same period, retention rates for Australia increased from 66 to 68 per cent. At least part of the decline in the ACT is due to several private schools extending to Years 11 and 12.

**Figure 16: Retention Rates in Government Schools, Year 7 to 12, 1999-2006 (%)**

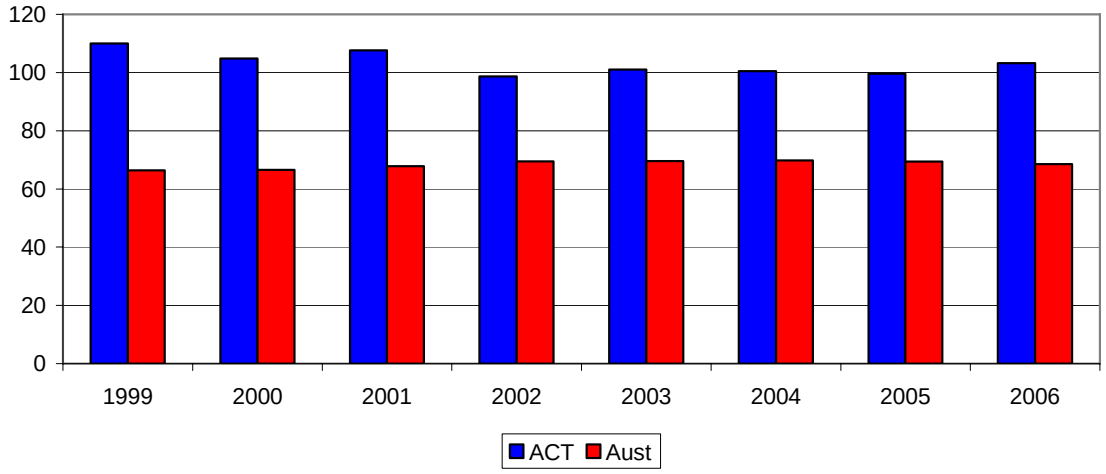
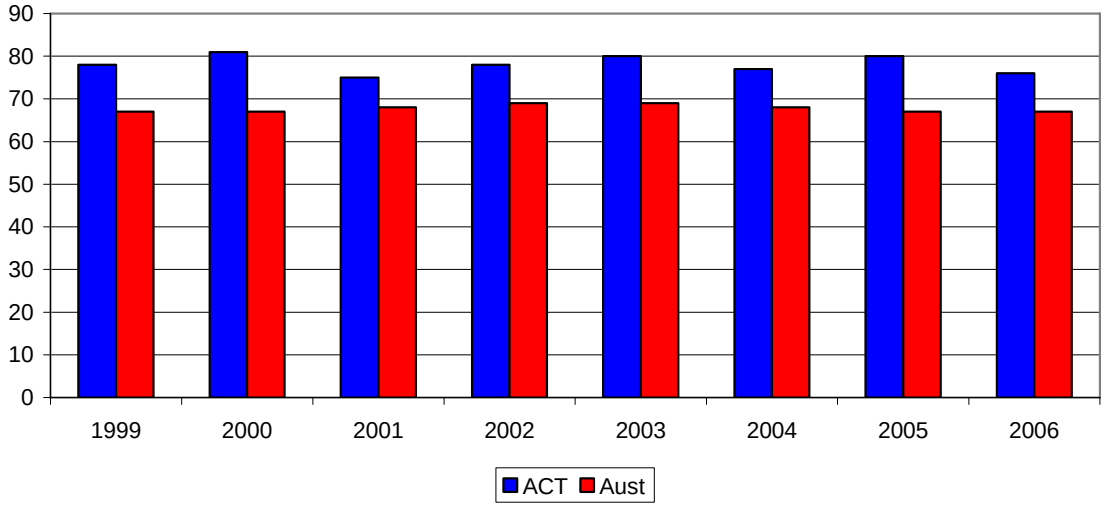



**Figure 17: Completion of Year 12 in ACT Schools, 1999-2006 (%)**




The number of ACT students who receive a Year 12 certificate as a proportion of the estimated number of students that could attend Year 12 has not improved in recent years [Figure 17]. In 2006, the Year 12 completion rate in the ACT was 76 per cent compared to 78 per cent in 1999 and 81 per cent in 2001. Since 1999, ACT completion rates have

varied between 75 and 80 per cent. Completion rates for Australia have not increased over the same period.

There has been no improvement in the proportion of ACT students beginning Year 11 who receive a Year 12 Certificate over the last 10 years or more. In 2006, 80 per cent of students enrolled in Year 11 government colleges in the previous year received a Year 12 Certificate compared 81 per cent in 1996. In this period, the proportion has fluctuated between 79 and 81 per cent, although it did decline to 77 per cent in 2007.[24]

Similarly, there has been little change in the proportion of private school students awarded a Year 12 Certificate. In 2006 and 2007, 92 – 93 per cent of private school students enrolled in Year 11 in February of the previous year were awarded a Certificate compared to 95 per cent in 1996. During the period 1996 – 2007, the proportion has fluctuated between 90 and 95 per cent.

## 4.4 Summary

While the ACT is achieving very high average outcomes by international and national standards, its results are not improving and, in some cases, show a significant decline in recent years.

The results from the three PISA studies conducted in 2000, 2003 and 2006 indicate that the performance levels of ACT students are generally not improving. Average reading literacy performance declined between 2000 and 2003 while there was no significant change in mathematics results.

The proportion of students achieving at the top levels of performance in reading and mathematics has declined significantly since 2000 and 2003 respectively. Meanwhile, there has been no reduction in the proportion of students performing at the lowest levels in both learning areas.

The national benchmark results show no improvement in reading, writing and numeracy between 2001 and 2006, although there are instances of improvement and decline.

Retention rates to Year 12 in ACT government schools are lower now than in 2001 and the preceding years while completion rates for Year 12 have not increased since 1999. There has been no improvement in the proportions of Year 11 students in government and private schools who received a Year 12 Certificate since 1996.

[24] The proportion of students enrolled in Year 11 who received a Year 12 Certificate in 2006 and 2007 is estimated from data provided in the Board of Senior Secondary Studies Year 12 Study and ACT Department of Education and Training School Census data. Earlier year estimates are provided in Atelier 2004.

# 5. A large achievement gap between rich and poor

Many research studies have demonstrated that there is a strong association between student outcomes and socio-economic status of student families in Australia and elsewhere. This relationship is clearly confirmed by the PISA studies. PISA data show that there is a significant relationship between students' performance and their socioeconomic background [Thomson & De Bortoli 2008a: 221]. The relationship is evident in Australia and all PISA countries, although the strength of the relationship differs among countries.

## 5.1 Australia

The PISA 2000 study demonstrated a strong relationship between student reading outcomes and student SES in Australia. Students with lower SES scored less well in reading than other students [Lokan et.al. 2001: 162-165]. The probability of being in the lowest 25 per cent of reading scores in Australia was about twice as likely for a low SES student than for students not in a low SES group [Lokan et.al. 2001: 174]. There was a striking decrease in the probability of being in the low scoring reading group as SES increases, while similar patterns were observed in mathematics and science [Lokan et.al. 2001: 174-176].

A further indication of the degree of inequality in student performance between socio-economic groups is provided by the socio-economic gradient in reading performance. It shows the difference in reading scores that is associated with each unit change in the index of the economic, social and cultural status. A steeper slope indicates a greater difference in performance between low socio-economic background students and high socio-economic background students.The socio-economic gradient for Australia was significantly steeper than the OECD average, indicating a higher level of socio-economic inequality in reading literacy achievement in Australia than the average for all OECD countries [OECD/UNESCO 2003: Table 6.10]. Thus, Australia combines high quality performance with above-average inequality in student performance in reading [OECD 2001: 191].

The gradient for Australia was the steepest for the nine highest performing countries in reading literacy in 2000, apart from the United Kingdom. It was amongst the steepest for the high-income OECD countries. The mean difference in reading literacy between the least advantaged one-sixth of students and the most advantaged one-sixth in Australia was 92 points compared to the OECD average of 82. Of 21 high income countries participating in the study, only Germany, USA, UK, Luxembourg, Liechtenstein, Belgium and France had a higher difference in reading literacy between students from high and low SES backgrounds than Australia.

The PISA 2003 study conducted a similar analysis of the relationship between socio-economic background and student performance in Australia. Students in the highest quarter of an occupational index performed 77 points higher in reading, 79 points higher in mathematics, 83 points higher in science and 77 points higher in problem solving than

students in the lowest quarter of the index [Thomson et.al. 2004: 157]. This is a difference of over two years of schooling.

The socio-economic gradient in mathematics for Australia was found to be less steep than the OECD average, indicating a lower level of socioeconomic inequality in mathematics achievement in Australia than the average for all OECD countries [Thomson et.al. 2004: 162-167]. Australia had a lower level of inequality than all of the 13 highest achieving countries, except for Canada, Finland, Hong Kong and Korea.

In the PISA 2006 study students in the highest quarter of an SES index scored 84 points higher in reading, 78 points higher in mathematics and 87 points higher in science than students in the lowest quarter of the index. This means that students in the lowest socio-economic quartile, on average, were achieving at a level two and a half years lower than students in the highest socioeconomic quartile across all three domains.

The study revealed that stark differences exist between the achievement of students from high and low SES backgrounds at both the highest and lowest proficiency levels. More than one-fifth of students in the highest quartile of socio-economic background achieved a proficiency of Level 5 in reading compared to four per cent in the lowest quartile [Thomson & De Bortoli 2008a: 171]. In contrast, only five per cent of students in the highest socio-economic quartile failed to achieve Level 2, compared to 23 per cent of students in the lowest quartile.

In mathematics, 29 per cent of students in the highest quartile of socio-economic background achieved a proficiency of at least Level 5 compared to 6 per cent of students in the lowest quartile [Thomson & De Bortoli 2008a: 207, 214]. Almost a quarter of students (22 per cent) in the lowest socio-economic quartile achieved only at or below Level 1, compared to five per cent of students in the highest quartile of socio-economic background.

Twenty-six per cent of students in the highest socio-economic quartile were achieving at Level 5 or greater in science, compared to six per cent of those students in the lowest quartile [Thomson & De Bortoli 2008a: 75-76]. Almost one-quarter (23 per cent) of students in the lowest quartile of socio-economic background did not achieve Level 2, compared with just five per cent of those students in the highest quartile. Almost five times the proportion of students in the lowest socio-economic quartile compared to those in the highest socioeconomic quartile were achieving below the OECD's baseline level, Level 2.

The socio-economic gradient in science for Australia was steeper than the OECD average, indicating a higher level of socio-economic inequality in science achievement in Australia than the average for all OECD countries [Thomson & De Bortoli 2008a: 223]. Australia has a higher level of inequality than any of the other top ten achieving countries except Liechtenstein, Netherlands and New Zealand.

The slope of the socio-economic gradients for reading and mathematics have declined significantly from that measured in PISA 2000, indicating that Australia's performance, although significantly lower than in PISA 2000, is also more equitably distributed in terms of socio-economic background [Thomson & De Bortoli 2008a: 228]. For science, the gradient first increased in 2003 and then declined in 2006 to a level similar to that in 2000.

## 5.2 ACT

### Achievement gap between high and low SES students

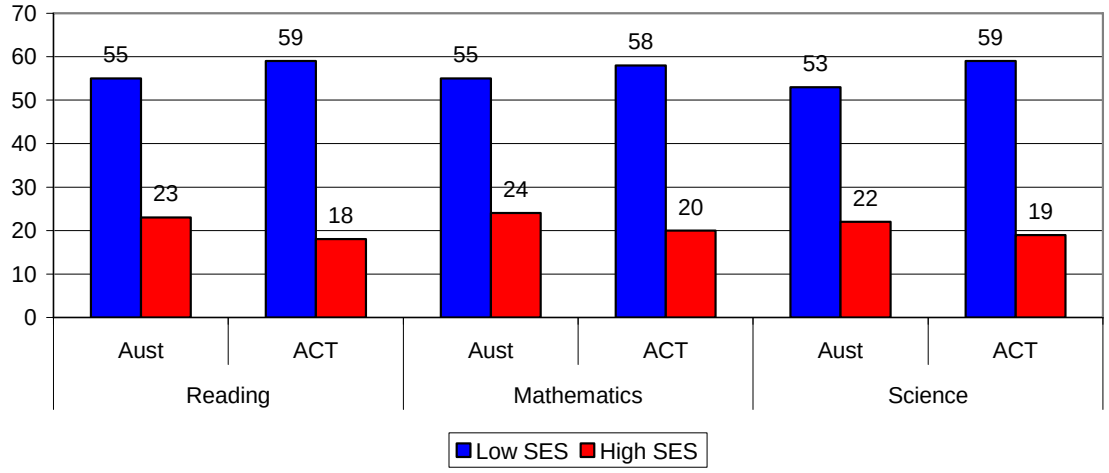
The ACT has the largest difference in performance between students from low and high SES backgrounds in Australia, except for the Northern Territory. The PISA 2006 study shows that the ACT has the steepest socio-economic gradient for science and mathematics in Australia, except for the Northern Territory [Thomson & De Bortoli 2008a: 229-230; see also Thomson & De Bortoli 2008b: 27-30]. For example, in relation to science, the study states that:

> The gradient for the Northern Territory is the steepest, with the Australian Capital Territory almost as steep, while Victoria has the flattest slope. [229]

For reading, the ACT gradient is similar to that of Tasmania and steeper than for the rest of Australia, except the Northern Territory.

Other data from PISA confirms the large achievement gap in the ACT. Figure 18 shows the proportion of 15 year-old students performing below the OECD average for reading, mathematics and science. It shows a large achievement gap between low SES and high SES students.[25]

**Figure 18: Proportion of 15 Year-Old Students Below the OECD Average, 2006 (%)**




***Source*:** Thomson & De Bortoli 2008b: Tables 3.10, 3.11 and 3.12.

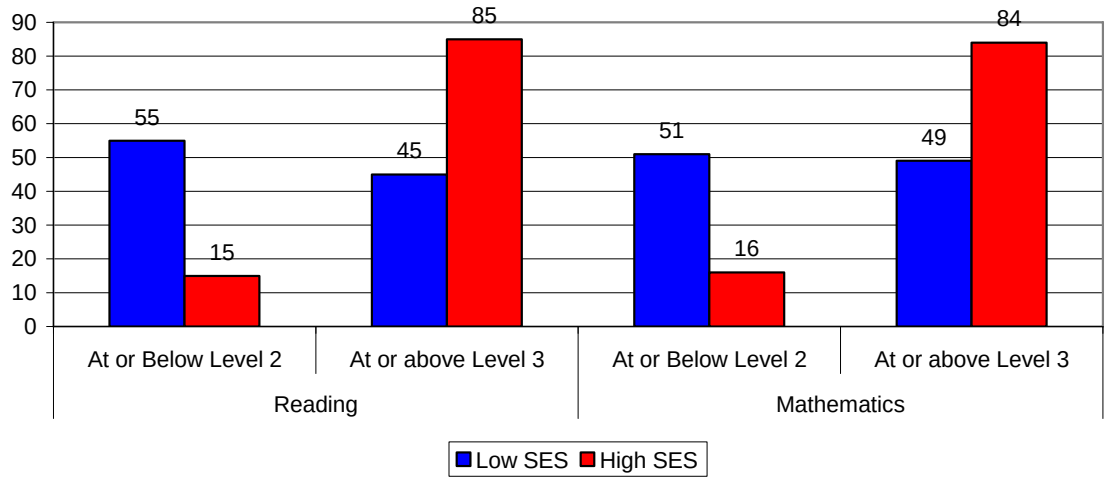
[25] Low and high SES students are defined as those in the lowest and highest quartiles of the socio-economic index used in PISA.

Nearly 60 per cent of ACT 15 year-old students from low SES families were below the OECD average in reading, mathematics and scientific literacy compared to about 20 per cent of high SES students. Conversely, about 40 per cent of low SES students achieved above the OECD average in each area compared to about 80 per cent of high SES students. There is an achievement gap of about 40 percentage points.

These figures are qualified by the standard errors associated with the performance of low SES students in the ACT which create a large uncertainty range for the actual performance levels. For example, there is an equal probability that the achievement gap between low SES and high SES students in reading in the ACT could be as low as 26 percentage points or as high as 56 percentage points. Similarly, the actual gap in mathematics is somewhere between 21 and 55 points and between and between 35 and 45 points for science.

The significance of these figures is that they show a significant achievement gap between low and high SES students even if it is assumed that the actual achievement gap is at the point of minimum difference between the statistical uncertainty associated with the standard errors of the estimates. Equally, the achievement gap could be extremely high if it is measured at the points of maximum difference between the uncertainty ranges.

**Figure 19: Proportion of ACT 15 Year-Old Students by Proficiency Level, 2006 (%)**



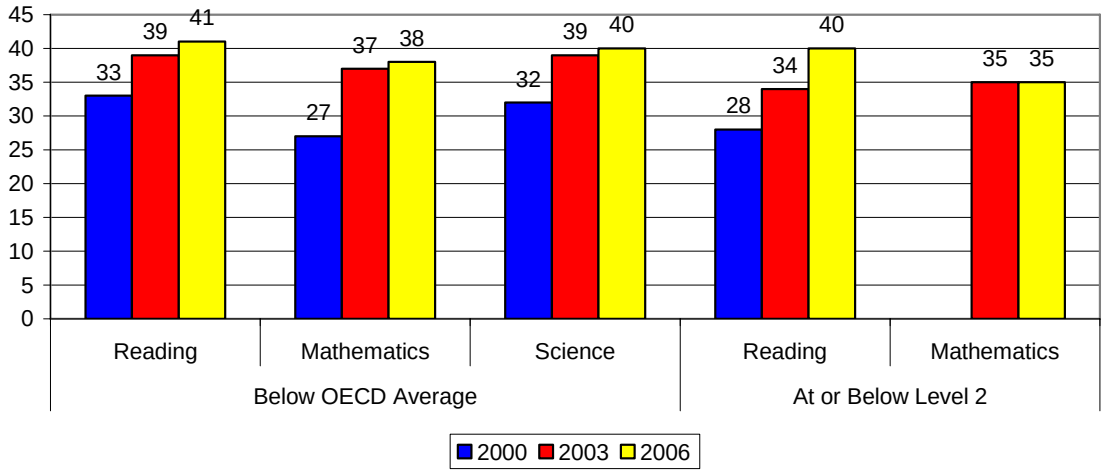

***Source:*** Thomson & De Bortoli 2008b: Tables 3.15, 3.16

The extent of the achievement gap is also revealed in the differences of the proportion of low and high SES students achieving different proficiency levels in the PISA assessments [Thomson & De Bortoli 2008b: 25-26]. In 2006, 55 per cent of low SES 15 year-old students in the ACT achieved at or below Level 2 in reading compared to 15 per cent of high SES students [Figure 19].[26] Conversely, 45 per cent of low SES students were at or

[26] Level 2 has been defined internationally as a "baseline" proficiency level. Students performing below this baseline are at serious risk of not achieving at levels sufficient to allow them to adequately participate in the 21st century work force and contribute as a productive citizen [Thomson & De Bortoli 2008a: 28].

above Level 3 compared to 85 per cent of high SES students. In the case of mathematics, 48 per cent of low SES students were at or below Level 2 compared to 13 per cent of high SES students. Fifty-two per cent of low SES students were at or above Level 3 compared to 87 per cent of high SES students. The gaps remain very large even when the statistical uncertainty of the estimates is taken into account.

**Figure 20: Achievement Gaps Between High and Low SES Students, ACT 2000, 2003, 2006 (% points)**




*Source:* Thomson & De Bortoli 2008b: Tables 3.10, 3.11, 3.12, 3.15, 3.16.

The achievement gaps in the ACT do not appear to be declining. The gaps between the proportion of low and high SES achieving below the OECD average in reading, mathematics and science appear to be larger in 2006 than in 2000 [Figure 20]. Similarly, the gap between the proportions of students achieving at or below proficiency Level 2 in reading was higher in 2006 than in 2000, but there is no change in mathematics between 2003 and 2006.

Strictly speaking, it is difficult to make definite conclusions about changes in the achievement gaps over time because of the large standard errors on the ACT results for low SES students, especially in 2000. In most cases shown in Figure 20 there is no statistically significant difference in the size of the achievement gaps in 2000 and 2006.

However, there are indications that the gap between the proportions of high and low SES students below the OECD average in reading has increased since 2000. The uncertainty ranges of the proportions for low and high SES students do not overlap in 2000 [see Thomson & De Bortoli 2008b: Table 3.11]. For 2000, the achievement gap could be as low as 8 percentage points or as high as 58 points while in 2006 it could be as low as 26 points or as high as 56 points. This suggests that there has been at least no reduction in the gap between 2000 and 2006 and possibly a significant increase.

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However, the data provided in the ACER report on ACT student performance does not distinguish between students who achieve Level 2 and those who achieve below Level 2.

Figure 18 also suggests that the achievement gaps between the proportion of low and high SES students are larger in the ACT than for Australia. The gap in the proportion of students performing below the OECD average in reading in the ACT is 41 percentage points compared to 32 for Australia; in mathematics it is 38 points in the ACT compared to 31 for Australia; and for science the gaps are 40 and 31 points respectively. However, there are no significant differences between the achievement gaps in the ACT and Australia when the statistical uncertainty of the figures is taken into account [Thomson & De Bortoli 2008b: 21-22]. This is also the case for the proportion of low and high SES students achieving at or below the Level 2 proficiency in reading and mathematics [Thomson & De Bortoli 2008b: 25-26].

## Relative performance of low SES students

One issue of contention in the discussion of the achievement gap between high and low SES students in the ACT is the relative performance of low SES students in the ACT and their counterparts elsewhere in Australia.

The Minister for Education, Andrew Barr, has claimed that the report on ACT student performance commissioned by the ACT Government from the Australian Educational Research Council (ACER) shows that "our lowest socio-economic students performed better than their counterparts anywhere else in Australia" [ABC News, 26 March 2008] and that "ACT students from all socio-economic backgrounds outperform their Australian counterparts" [Barr 2008].

These claims are contradicted by the ACER report [Thomson & De Bortoli 2008b]. It clearly shows that 15 year-old students from the lowest SES level do no better than those in at least several other states. Figures 4.2, 4.3 and 4.4 of the report show the socio-economic gradients for all states in science, reading and mathematics. In each case, the ACT line meets that of other states at the low SES end and in some cases crosses the lines of other states. For example, the ACT line for science crosses that of NSW and meets that of Victoria at the low SES end. This means that lowest SES students in the ACT are doing no better than lowest SES students in these states.

Moreover, the graphs published in the report do not report the statistical confidence limits for the gradients. If these were overlaid on the gradient lines, it is likely that low SES students in the ACT are doing no better than low SES students in every other state except Tasmania and the Northern Territory in reading, mathematics and science and perhaps Western Australia in science.

The ACER report also provides other evidence that low SES students in the ACT are doing no better than their counterparts in other states. Table 4 shows that the proportion of low SES students in the ACT achieving below or above the OECD average in science, reading and mathematics is statistically similar to the average for Australia. Thomson & De Bortoli [2008b] state that there is no significant statistical difference between the results for the ACT and Australia for either low SES or high SES students. The standard errors mean that it is not possible to conclude confidently that actual proportions for the ACT and Australia are different. That is, the low SES students in the ACT are doing no

better than their counterparts across Australia when the statistical uncertainty of the estimates is taken into account. Similarly, high SES students in the ACT are doing no better than their counterparts in the rest of Australia in the proportion of students achieving above and below the OECD average in science, reading and mathematics.

### Table 4: Proportion of 15 Year-Old Students Achieving Below and Above OECD Average by Lowest and Highest SES Quartiles, 2006

| | Reading | | | | Mathematics | | | | Science | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low SES | | High SES | | Low SES | | High SES | | Low SES | | High SES | |
| | Below OECD Average | | Above OECD Average | | Below OECD Average | | Above OECD Average | | Below OECD Average | | Above OECD Average | |
| | % | SE | % | SE | % | SE | % | SE | % | SE | % | SE |
| **ACT** | 59 | 4.8 | 82 | 2.5 | 58 | 5.8 | 80 | 2.5 | 59 | 4.6 | 81 | 2.0 |
| **Aust** | 55 | 1.2 | 77 | 1.3 | 55 | 1.3 | 76 | 1.2 | 53 | 1.2 | 78 | 1.2 |

**Source:** Thomson & De Bortoli 2008b: Tables 3.10, 3.11 and 3.12.
**Note:** SE – standard error.

Table 5 shows that the proportion of low SES students in the ACT achieving at Level 2 or below and at Level 3 and above for reading and mathematics is not statistically different from the proportions achieving at these levels across Australia. Thomson & De Bortoli [2008b] state that there is no significant statistical difference between the results for the ACT and Australia for either low SES or high SES students. Low and high SES students in the ACT are doing no better than their counterparts across Australia at these proficiency levels.

### Table 5: Proportion of 15 Year-Old Students Achieving PISA Proficiency Standards by Lowest and Highest SES Quartiles, 2006

| | Reading | | | | Mathematics | | | |
|---|---|---|---|---|---|---|---|---|
| | Low SES | | High SES | | Low SES | | High SES | |
| | At or Below Level 2 | | At or Above Level 3 | | At or Below Level 2 | | At or Above Level 3 | |
| | % | SE | % | SE | % | SE | % | SE |
| **ACT** | 55 | 4.9 | 85 | 1.9 | 51 | 5.8 | 84 | 2.0 |
| **Aust** | 49 | 1.3 | 81 | 1.2 | 48 | 1.3 | 82 | 1.2 |

**Source:** Thomson & De Bortoli 2008b: Tables 3.15 and 3.16.
**Note:** SE – standard error.

# 6. Implications and broad policy directions

While the ACT school system, including both government and private schools, continues to demonstrate high average outcomes it faces some major challenges. These are to:

- Increase the proportion of students who receive an adequate education;
- Reduce the large achievement gap between students from low and high SES backgrounds; and
- Reverse the decline in student outcomes in reading and mathematics.

In essence, the challenge remains for the ACT school system to make progress towards the National Goals for Schooling. They set the standard for the ACT school system.

The National Goals for Schooling incorporate dual equity objectives. First, they establish a set of standards and qualities to be achieved by all students when they leave school. Goal 1 sets out a range of non-academic qualities to be achieved by all students. Goal 2 states that all students should attain high standards of knowledge, skills and understanding in the agreed eight key learning areas and in numeracy and literacy. Goal 3 states that all students should have access to the high quality education necessary to enable the completion of school education to Year 12 or its vocational equivalent. Together, these requirements may be stated as a "minimum standard" or "adequate" level of education to be achieved by all students. It can be termed the "adequacy" objective.

The second equity objective is constituted by Goal 3 which requires that schooling be socially just. It requires that student outcomes are free from the effect of negative forms of discrimination and are free of differences arising from students' socio-economic background or geographical location. In addition, it requires that the learning outcomes of educationally disadvantaged students and ATSI students improve and that, over time, they match those of other students. This equity objective may be stated as the social justice or "social equity" objective.

The ACT has virtually made no progress towards meeting the National Goals for Schooling it signed on to in 1999. Too many students are still not achieving an adequate education and there is a large achievement gap between students from low and high SES families which is not being reduced. At the same time, the declines in the proportion of students achieving at the top levels in reading and mathematics threaten the system's reputation of excellence.

## 6.1 The case for equity in education

Achievement of the dual equity objectives of adequacy and social equity in education should be a paramount public policy goal in the ACT.

### Adequacy in education

It is a matter of justice that all children should receive a minimum formal education required to make their own way as adults in society and to contribute to the development of society. Society has a moral obligation to ensure that all children receive an adequate

education. Indeed, the moral authority of a society that calls itself a democracy depends, in no small part, on providing all its potential citizens with an adequate education.

It is also in society's interest to ensure that all children receive an adequate education. Social waste is incurred if some children do not receive an adequate education. It means that human talents that could contribute to society are not fostered. All children have talents that can be realised through education and formal learning. By failing to develop those talents, society incurs lost opportunities for its development and enrichment.

Further social waste is incurred by the long-term social and financial costs to a society of inadequate education. The social costs of inadequate education are high in that those who are not able to participate socially and economically in society generate higher costs for health, income support, child welfare and security. Inadequate education for some leads to large public and social costs in the form of lower income and economic growth, reduced tax revenues, and higher costs of such public services as health care, criminal justice, and public assistance. For example, many studies show that the health of individuals is better for those who have received more education [Feinstein 2002b; Muennig 2007; Wolfe & Haveman 2002]. Thus, an adequate education for all can be expected to lead to better health care and reduced public expenditure on health. Similarly, there is substantial evidence that more education reduces the incidence of crime [Feinstein 2002a; Moretti 2007; Wolfe & Haveman 2002] and reduces public expenditure on social security and welfare [Waldfogel et.al. 2007].

A recent study of the economic consequences of inadequate education and students dropping out of school before completion of high school in the United States found that it results in reduced government tax revenues and higher government expenditure [Levin et.al. 2007; see also Levin & Belfield 2007: ch.9]. It estimated that the net economic benefit to government of increased expenditure to increase high school graduation rates was 2.5 times the cost of the investment.

In today's society, an adequate education means successful completion of Year 12 or its equivalent. As discussed above, those who do not complete Year 12 have to a large extent cut themselves off from further education and training and have limited future employment prospects. All students should complete Year 12 to gain the knowledge and skills they require to enter the workforce or to on to further education in TAFE or the universities. This also means that the school system should ensure that all children make satisfactory progress through their school years in order to successfully complete Year 12.

## Social equity in education

Social equity in education means that students from different social groups should have similar education outcomes. It does not mean that all children should achieve the same education outcomes; instead, the focus of social equity is the comparative performance of students from different social backgrounds.

As demonstrated in this paper, there are large disparities in education outcomes amongst students from low and high SES backgrounds across Australia and in the ACT. These disparities largely reflect differences in family resources and education between social groups. There is an extensive research literature indicating that family SES is strongly correlated with student academic achievement.[27] Family location in the socio-economic structure of societies has a strong influence on student outcomes.

Large disparities in education outcomes mean that what social group an individual is born into strongly affects their life chances. Large disparities in school outcomes according to different social backgrounds entrench inequality and discrimination in society. Students from more privileged backgrounds have greater access to higher incomes, higher status occupations and positions of wealth, influence and power in society than students from more disadvantaged backgrounds.

In a democracy, education outcomes should not depend on family background and wealth. A democracy should strive to reduce the education advantage and disadvantage conferred according to whether a child is born to rich or poor parents or to a particular race.

There is no reason in principle to consider that innate talents, motivation and effort to succeed in schooling are distributed differently between the children of different races, ethnic backgrounds or socio-economic background. No social group is innately more intelligent or talented than others. Thus, continuing differential access to education according to family background is unjust and entrenches inequality and systematic discrimination in society.

Improving social equity in education outcomes can contribute to reducing social inequality and injustice. Ensuring that all children receive an adequate education is an important step in this direction, but it is not a sufficient condition.

Social equity in education would not be achieved even if all students gained the minimum education threshold, such as completion of Year 12. Average outcomes of students from high SES backgrounds could still be much higher than those from low SES backgrounds even though all students in the latter group achieved the minimum standard. Low SES students could be clustered just above the minimum standard while the large majority of high SES students are clustered well above the standard. In terms of the National Goals for Schooling, student outcomes would still not be "free" of differences arising from different backgrounds and outcomes for low SES students would not necessarily "match" the outcomes of other students.

Even similar average outcomes between students from different backgrounds are not a sufficient condition for social equity in education because the range of outcomes for low SES students as a group could be much larger than that for high SES students. Moreover, even if the range of outcomes and the mean were the same for each group, the

[27] For example, see Sirin [2005] for a meta-analysis of the literature on socio-economic status and student achievement.

distribution of outcomes could be entirely different. For example, the low SES group of students could have a greater number of students clustered below the mean and the high SES group could have a greater number of students clustered above the mean. In any of these circumstances, student outcomes would not be "free" of the effects of different student backgrounds and the outcomes for the low SES group of students would not "match" those of the high SES students.

The social equity goal of the National Goals for Schooling clearly involves a stronger equity concept than all students, or some high proportion of them, achieving a minimum standard. It logically requires that the range and distribution of outcomes be the same for each group of students from different social backgrounds. It is clearly not being achieved in the ACT or, for that matter, across Australia.

## 6.2 Towards greater equity in education

The education priority in the ACT is to develop and implement a systematic approach to improve equity in education outcomes. It requires a comprehensive plan that is implemented at different levels starting at the school system and rolling out to schools, classrooms and individual students. This should be formulated by an independent public inquiry into improving equity in education in the ACT. The inquiry should be conducted by an expert taskforce which consults broadly with the ACT community.

The inquiry should be informed by the best evidence available on how to improve student outcomes and reduce achievement gaps. It should draw on the experience of education systems that have had greater success in achieving equity in education than the ACT. For example, Finland has achieved higher average school outcomes than Australia and with much smaller gaps in achievement between students from low and high SES families. Finland's school system demonstrates the importance of several factors such as a multi-layered approach to supporting students who have fallen behind [Grubb 2007].

The inquiry should also draw on the extensive research literature on improving equity in education and improving student outcomes in low SES schools [for example, see Friedlaender & Darling-Hammond 2007; Grubb 2008; Kendall et.al. 2008; Muijs et.al. 2004; Plank et.al. 2008]. This research highlights the importance of three strategies:

- improving teaching and learning opportunities for students who have fallen behind;
- providing a range of student welfare, behavioural and learning support measures; and
- developing home/school partnerships.

Improving teaching and learning opportunities includes providing extra learning opportunities, having high expectations of all students, ensuring quality teaching for low achievers, a challenging and relevant curriculum that respects cultural differences of students from different social groups and whole school planning for education equity.

Increased student welfare support in schools, especially those with a high proportion of students from low SES and Indigenous families, is also of critical importance. Multi-disciplinary teams consisting of teachers, counsellors, social workers, health

professionals and other social welfare professionals implement early intervention programs and to assist students who have fallen behind.

Parent participation in schooling and the learning of their children is fundamental to improving attendance at schools and outcomes for students not achieving expected progress. Reviews of research studies have shown that students who are farthest behind their peers make the largest improvement in outcomes under parent involvement programs [for example, Desforges 2003; Henderson & Mapp 2002].

Finding out what works to reduce student achievement gaps is the first step for change. Another step is to review the current method of allocating funds to schools in the ACT. The existing funding framework for ACT government schools is only marginally structured to address equity. It retains a strong emphasis on equal funding per student with relatively minor adjustments for identified student need.

In addition, the funding arrangements for private schools are nominally directed at the SES status of school communities. However, the arrangements are fatally flawed in terms of the achievement of equity in education. The SES funding model has delivered high levels of funding to private schools where students from high income families form the large proportion of enrolments. Nearly all private schools in the ACT are over-funded according to their SES assessment and the over-funding is almost entirely directed to the higher SES schools. These schools also receive funding from the ACT Government. As such, the current arrangements serve to promote further advantage and inequity in school outcomes.

A new system of funding ACT schools is needed to develop a more equitable system of funding public and private schools and to better achieve the National Goals for Schooling. An independent public inquiry should be established to devise a system of funding schools that gives greater emphasis to differences in student learning need between schools.

Such a review has much overseas experience to draw on. Many education systems around the world are facing increasing pressure to better direct school funding to addressing learning needs in schools. Questions about the allocation of school finance are increasingly being linked to improving education outcomes and equity in education [for example, see Ladd et.al. 1999; Ross & Levacic 1999; Schrag 2005; West & Peterson 2007]. Given the longstanding neglect of the achievement gap in the ACT, it is time for such questions to be put on the public agenda.

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