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Literacy and Numeracy Learning: Lessons from the Longitudinal Literacy and Numeracy Study for Indigenous Students

Nola Purdie

Australian Council for Educational Research (ACER)

Kate Reid

Australian Council for Educational Research (ACER)

Tracey Frigo

Australian Council for Educational Research (ACER)


Alison Stone

Australian Council for Educational Research (ACER)

Elizabeth Kleinhenz

Australian Council for Educational Research (ACER)

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**Literacy and Numeracy Learning: Lessons from
the Longitudinal Literacy and Numeracy Study
for Indigenous Students**

Nola Purdie
Kate Reid
Tracey Frigo
Alison Stone
Elizabeth Kleinhenz

July 2011

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FOREWORD

In 2003, I wrote the Foreword for the Australian Council for Educational Research (ACER) Monograph 57 *Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years* (Frigo et al., 2003). I did so at the time as the Chair of the ACER Indigenous Education Advisory Committee providing comment on the project on behalf of the members of that committee. Some of the members were also field researchers for the qualitative research in the project so were very much involved and as a result able to reflect upon it all in some depth.

We welcomed the monograph of the Indigenous Longitudinal Literacy and Numeracy Surveys project because it was the start of the first longitudinal study on Indigenous students in education in this country. It referenced and built on what we believed was a limited number of publications on literacy and numeracy and we felt that such an evidence-based study would add much to the information teachers needed. The ACER project following the National School English Literacy Survey for Years 3 and 5 students reported in *Enhancing English Literacy Skills in Aboriginal and Torres Strait Islander students* (Batten, Frigo, Hughes, & McNamara, 1998) in 1998 and provided the final impetus for what has now become Phase 1 of the longitudinal study.

The study showed that Indigenous students started school with a similar range of skills and abilities to all other students, most particularly in mathematics, but quickly fell behind. It demonstrated the importance of a good start in schooling for Indigenous students; the need for regular attendance and engagement; supportive teaching strategies; strong links between schools and their communities and environments and the need to recognise Indigenous cultures.

I have said at various times that although our Indigenous communities have said that we are too researched, I believe that we need more detailed research to provide an evidence base that teachers might use in their pedagogy and practice. This contention was backed up by the ACER publication *The Case for change: A review of contemporary research on Indigenous education outcomes* by Mellor and Corrigan (2004). So the need for Phase 2 of the Indigenous Longitudinal Literacy and Numeracy Study is well established.

It is interesting to note that the outcomes for Indigenous students in literacy and numeracy as reported in this Phase 2 monograph are much the same as for those reported in Phase 1. That is, that the achievement for Indigenous students is lower than that of non-Indigenous students, and that the gap in average achievement evident at the beginning of Year 3 remains relatively consistent to the final year of primary school. This suggests to me that we still have much to learn in the early years of schooling as to why Indigenous students, who supposedly start school the same as any student, fall behind so much in the first two years of schooling. Given that the report shows that Indigenous students then experience academic growth at rates similar to other students it would seem that the 'Closing the Gap' strategy has not yet worked well.

This Phase 2 report also refers to three areas in more depth than were covered in Phase 1 that I comment on.

Firstly, it notes that in the last decade there have been many major policy developments by all National, State and Territory jurisdictions. Their statements on strategies, operations and outcome targets are now more detailed than ever before suggesting that we now know much more about 'What Works' than before and therefore governments are more prepared to commit to action.

Secondly, it notes that not all is bad. Many Indigenous students are doing well, even excelling in their outcomes. It is suggested that further research into what contributes to their success would be useful. I have said before that I believe that if schools and parents entered into a 'compact', which recognises that schools operate in a particular cultural way, the more both parties accept and understand this, the better will be the outcomes. I would love to see this theory tested.

Thirdly, the report details many curriculum approaches in literacy and numeracy, commenting on the outcomes. There are now many such 'intervention' programs operating across the country as part of the various National, State and Territory 'Closing the Gap' strategies. It would seem that we are still yet to assess their success.

The fact that we seem to have not yet achieved the aims espoused in current policy via programs and other interventions is a major concern to all Indigenous peoples. However this report adds to the evidence needed to continue the movement to 'Close the Gap'. Clearly there is much more research yet needed to establish credible evidence as originally stated in the ACER *The Case for change: A review of contemporary research on Indigenous education outcomes* publication of 2004 and restated recently in the research paper *School attendance retention of Indigenous Australian students* (Purdie & Buckley, 2010), the first issues paper for the national Closing the Gap Clearinghouse.

Whilst now in 2011 I am not involved so much with ACER I am honoured to be asked to write another foreword for this monograph. It is a valuable contribution to the evidence base for Indigenous school education. As for Phase 1, it restates the importance of a good start in schooling for Indigenous students; the need for regular attendance and engagement; supportive teaching strategies; strong links between school and their communities and environments and the need to recognise Indigenous cultures. I do hope that it is of particular help to teachers and other educators because our community longs for the time when we are respected as culturally-based peoples, achieving school outcomes on par with everyone else. With the above we will be able to take our rightful place in all that this country has to offer.

Emeritus Professor Paul Hughes AM, FACE

CONTENTS

| | |
|--|------------|
| Foreword..... | iii |
| Tables..... | vi |
| Figures | vii |
| Acknowledgements..... | ix |
| List of Abbreviations and Acronyms..... | x |
| Terminology | x |
| EXECUTIVE SUMMARY | xi |
| 1. INTRODUCTION | 1 |
| 1.1 Background to the project | 1 |
| 1.2 Indigenous children and contexts for schooling..... | 2 |
| 1.3 Outline of the report..... | 4 |
| 2. RESEARCH PERSPECTIVES: LITERACY AND NUMERACY DEVELOPMENT AMONG INDIGENOUS STUDENTS | 5 |
| 2.1 Literacy and numeracy achievement for Indigenous students..... | 5 |
| 2.2 What it means to be literate..... | 6 |
| 2.3 What it means to be numerate | 9 |
| 2.4 Foundations of literacy and numeracy achievement | 13 |
| 2.5 Promoting literacy learning among Indigenous students | 23 |
| 2.6 Promoting numeracy learning among Indigenous students..... | 28 |
| 3. RESEARCH DESIGN AND METHODS | 33 |
| 3.1 ILLANS sample | 33 |
| 3.2 Data collection: Materials and procedures | 36 |
| 3.3 Summary | 39 |
| 4. LITERACY AND NUMERACY DEVELOPMENT AMONG INDIGENOUS STUDENTS..... | 40 |
| 4.1 Introduction..... | 40 |
| 4.2 Student characteristics..... | 40 |
| 4.3 Assessment data: 2003–2006 | 41 |
| 4.4 Factors influencing achievement and growth..... | 54 |
| 4.5 Summary | 56 |
| 5. CASE STUDIES..... | 57 |
| 5.1 Introduction..... | 57 |
| 5.2 The schools: Background information | 57 |
| 5.3 School profiles | 60 |
| 5.4 Summary | 68 |
| 6. THE FINAL YEARS OF PRIMARY SCHOOL: CONCLUSIONS..... | 71 |
| 6.1 ILLANS in context..... | 71 |
| 6.2 ILLANS findings | 71 |
| 6.3 Challenges..... | 73 |
| 6.4 Conclusions..... | 73 |
| 7. REFERENCES | 74 |
| APPENDIX A: THE SCHOOLS AND THEIR COMMUNITIES | 84 |
| APPENDIX B: CASE STUDY QUESTIONS..... | 101 |

TABLES

| | | |
|------------|--|----|
| Table 2.1 | Strategies used to improve outcomes for the NIELNS elements (Department of Education, Science and Training, 2003b, p. 12–14)..... | 24 |
| Table 3.1 | Number and location of schools participating in ILLANS 2000–2006..... | 34 |
| Table 3.2 | Maximum numbers of assessments completed by individual students 2000–2006..... | 35 |
| Table 3.3 | Maximum numbers of assessments completed by individual students 2003–2006..... | 35 |
| Table 3.4 | ILLANS data gathering schedule (2000–2006)..... | 37 |
| Table 4.1 | Summary of ILLANS participant characteristics 2003–2006..... | 41 |
| Table 4.2 | Means, standard deviations, and medians for English literacy achievement for Indigenous and non-Indigenous students (2003–2006)..... | 42 |
| Table 4.3 | Teacher assessed levels of achievement for a range of reading skills, Indigenous and non-Indigenous students (2003)..... | 43 |
| Table 4.4 | Teacher assessed levels of achievement for a range of writing skills, Indigenous and non-Indigenous students (2003)..... | 43 |
| Table 4.5 | Percentage agreement and mean responses for Indigenous and non-Indigenous students for teacher assessed student attentiveness (2006)..... | 44 |
| Table 4.6 | Correlations between teacher assessed reading and writing achievement (2003) and the ILLANS literacy assessments for Indigenous and non-Indigenous Students..... | 44 |
| Table 4.7 | Means (and standard deviations) of teacher assessed literacy achievement against peers and the curriculum for Indigenous and non-Indigenous students (2006)..... | 45 |
| Table 4.8 | Correlations between teacher ratings of literacy achievement against peers and the curriculum (2006) and the ILLANS literacy assessments for Indigenous and non-Indigenous students..... | 45 |
| Table 4.9 | Means, standard deviations, and medians for numeracy achievement for Indigenous and non-Indigenous students (2003–2006)..... | 46 |
| Table 4.10 | Teacher assessed levels of achievement for a range of numeracy skills, Indigenous and non-Indigenous students (2003)..... | 46 |
| Table 4.11 | Correlations between teacher assessed levels of numeracy achievement (2003) and the ILLANS numeracy assessments for Indigenous and non-Indigenous students..... | 47 |
| Table 4.12 | Means (and standard deviations) of teacher assessed numeracy achievement against peers and the curriculum, Indigenous and non-Indigenous students (2006)..... | 47 |
| Table 4.13 | Correlations between teacher ratings of numeracy achievement against peers and the curriculum (2006) and the ILLANS numeracy assessments for Indigenous and non-Indigenous students..... | 47 |
| Table 4.14 | Correlation between literacy and numeracy achievement at each assessment point (2003–2006)..... | 48 |
| Table 4.15 | Percentage agreement and mean responses for attitudes towards reading for Indigenous and non-Indigenous students (2006)..... | 49 |
| Table 4.16 | Correlations between student attitudes towards reading and the ILLANS literacy assessments for Indigenous and non-Indigenous students..... | 50 |
| Table 4.17 | Time spent reading each day by Indigenous and non-Indigenous students..... | 50 |
| Table 4.18 | Frequency of library borrowing for Indigenous and non-Indigenous students..... | 51 |
| Table 4.19 | Number of books in the home for Indigenous and non-Indigenous students..... | 51 |
| Table 4.20 | Access to a computer in the home for Indigenous and non-Indigenous students..... | 51 |
| Table 4.21 | Rating of learning environment for Indigenous and non-Indigenous students (2006)..... | 52 |
| Table 4.22 | Rating of teacher-student relations for Indigenous and non-Indigenous students..... | 52 |
| Table 4.23 | Correlations between student ratings of school climate (2006) and the ILLANS literacy and numeracy assessments for Indigenous and non-Indigenous students..... | 53 |
| Table 4.24 | Rating of personal achievement in learning for Indigenous and non-Indigenous students..... | 53 |
| Table 4.25 | Correlations between students' personal learning achievement ratings (2006) and the ILLANS literacy and numeracy assessments for Indigenous and non-Indigenous students..... | 54 |
| Table 5.1 | Case study schools..... | 58 |
| Table 5.2 | English literacy achievement in Phase 2 of ILLANS for Indigenous and non-Indigenous students: Means (standard deviations)..... | 59 |
| Table 5.3 | Numeracy achievement in Phase 2 of ILLANS for Indigenous and non-Indigenous students: Means (standard deviations)..... | 60 |
| Table A.1 | School Background Information..... | 86 |
| Table A.2 | School participation in ILLANS 2000–2006..... | 87 |

FIGURES

| | | |
|------------|---|----|
| Figure 5.1 | School 4 performance on the ILLANS literacy and numeracy assessments 2003–2006 | 62 |
| Figure 5.2 | School 5 performance on the ILLANS literacy and numeracy assessments 2003–2006 | 64 |
| Figure 5.3 | School 14 performance on the ILLANS literacy and numeracy assessments 2003–2006 | 65 |
| Figure 5.4 | School 16 performance on the ILLANS literacy and numeracy assessments 2003–2006 | 67 |
| Figure 5.5 | School 21 performance on the ILLANS literacy and numeracy assessments 2003–2006 | 68 |

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LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|----------|--|
| ACER | Australian Council for Educational Research |
| AEP | Aboriginal Education Policy |
| AIEO | Aboriginal and (Torres Strait) Islander Education Officer |
| ARIA | Accessibility/Remoteness Index of Australia |
| ATAS | Aboriginal Tutorial Assistance Scheme |
| ASSPA | Aboriginal Student Support and Parental Awareness |
| CAEPR | Centre for Aboriginal Economic Policy Research |
| COAG | Council of Australian Governments |
| DART | Developmental Assessment Resource for Teachers |
| DEET | Department of Employment, Education and Training |
| DEEWR | Department of Education, Employment and Workplace Relations |
| DEST | Department of Education, Science and Training |
| ILLANS | Longitudinal Literacy and Numeracy Surveys for Indigenous Students |
| ILSS | Indigenous Language Speaking Students |
| LBOTE | Language Backgrounds other than English |
| LLANS | Longitudinal Literacy and Numeracy Study |
| MCEECDYA | Ministerial Council for Education, Early Childhood Development and Youth Affairs |
| MCEETYA | Ministerial Council on Education, Employment, Training and Youth Affairs |
| NAIDOC | National Aborigines and Islanders Day Observance Committee |
| NIELNS | National Indigenous English Literacy and Numeracy Strategy |
| OECD | Organisation for Economic Co-operation and Development |
| PISA | Programme for International Student Assessment |
| PSPI | Parent School Partnership Initiative |
| SAE | Standard Australian English |

TERMINOLOGY

Australia has two broad cultural groups who are its original inhabitants—the Torres Strait Islander peoples who are the original inhabitants of the Torres Strait Islands and the Aboriginal peoples who are the original inhabitants of mainland Australia, Tasmania, and some of the other adjacent islands. Within these two broad groups, there are many nations, languages and cultures.

In this monograph, the term ‘Indigenous’ refers to people who are of Aboriginal and/or Torres Strait Islander descent. We acknowledge the distinctiveness of each student’s cultural group. Overall, our intent has been to use language that accords respect and dignity to Australia’s first people.

EXECUTIVE SUMMARY

Project overview

Improving educational outcomes for Australian Indigenous students remains at the forefront of government agendas, particularly in light of recent commitments to halve the gap in achievement for Indigenous students in reading, writing and numeracy by 2018. The Australian Council for Educational Research (ACER) has a commitment to conducting research in the area of Indigenous education, as part of ongoing efforts to improve learning opportunities and outcomes for Indigenous students.

Previous research on students' educational attainment has primarily used cross-sectional comparisons to infer developmental trajectories in student abilities. In 1998, work began at ACER on a nationwide longitudinal study of primary school students' literacy and numeracy skills. The *Longitudinal Literacy and Numeracy Study* (LLANS) was initiated at a time when there was a renewed interest in literacy and numeracy development in the early years of schooling, and at a time when national benchmarks were established for minimum acceptable standards for literacy and numeracy in Years 3, 5 and 7. In this context, a longitudinal project monitoring growth in literacy and numeracy across primary school was particularly relevant.

After the launch of LLANS, a clear need for a parallel longitudinal research project into Indigenous students' literacy and numeracy skills was identified. As a result, ACER initiated a longitudinal study of growth in literacy and numeracy among Indigenous primary school students to track development in Indigenous students' English literacy and numeracy skills in the first years of schooling, to measure growth in literacy and numeracy skills over time, and to explore the factors associated with achievement in literacy and numeracy.

In 2000, ACER commenced the *Longitudinal Literacy and Numeracy Surveys for Indigenous Students* (ILLANS), which set out to track the development of English literacy and numeracy skills in a group of Indigenous students from school entry through the early years of schooling and beyond, to establish a data-rich picture of educational opportunities for Indigenous students. Phase 1 of ILLANS collected data from Indigenous students at 13 schools across Australia that had been nominated by education systems as examples of good practice in education for Indigenous students. The first three years of the study were reported in the monograph [*Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years*](#) (Frigi et al., 2003). Students who participated in the LLANS during their first three years of schooling acted as a comparison group for the Indigenous students who participated in Phase 1 of ILLANS. Phase 2 of ILLANS, which is reported in this monograph, followed students through Years 3–6 of primary school (2003–2006). In Phase 2, non-Indigenous students from the same schools acted as a comparison group for Indigenous students who participated in ILLANS.

Project aims and methodology

ILLANS aimed to track the growth in literacy and numeracy achievement of a group of Australian Indigenous students who commenced school in 2000. Phase 2 of ILLANS focused on comparing literacy and numeracy achievement of Indigenous students in the study with non-Indigenous students from the same schools. For Phase 2 of ILLANS, 11 of the original 13 schools from Phase 1 agreed to participate and 14 additional schools across Australia were also recruited. All schools that participated in ILLANS were nominated because they had recognised initiatives and supports for Indigenous students at their school, with many publicly recognised for their efforts. At the end of Phase 2, as children made the transition from Years 2–3, there was widespread mobility in the sample and as a result many children left the study. For this reason, additional children were recruited for the study in Phase 2. Non-Indigenous students at the same schools were recruited to the study in Phase 2, as they were considered a better comparison group for the Indigenous students in this study than the students in the LLANS study used as a comparison group in Phase 1.

Achievement data on literacy and numeracy were collected from participating students in Term 2 of each year during Phase 2 of the study. The data collection followed closely that of the LLANS, with the Developmental Assessment Resource for Teachers (DART) used for literacy assessments and assessment tasks developed specifically for the LLANS used to monitor growth in numeracy.

In addition to achievement data, data on student background (e.g. home language and absenteeism), teacher-rated student achievement and attentiveness, and student ratings of their school's climate and themselves as learners, were collected to provide a richer perspective on the experiences of Indigenous students at ILLANS schools.

Finally, the project aimed to explore in greater depth the characteristics of schools and teachers thought to promote achievement among Indigenous students by conducting interviews with selected staff in a sample of ILLANS schools. Case studies of five schools participating in Phase 2 of ILLANS were conducted in 2005. Selection of these schools was based on a preliminary analysis of quantitative achievement data to select schools that represented a wide range of achievement for Indigenous students. These case studies focused on exploring factors thought to enhance literacy and numeracy learning among Indigenous students. To focus the interviews, the questions were derived from eight priority areas for Indigenous education agreed to by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) in 1995. In particular, the interviews focused on the role of parent and community involvement in the school, the effectiveness of professional development for teachers, and the place of a culturally inclusive curriculum in promoting the achievement of Indigenous students.

Key findings

The findings of Phase 2 of ILLANS showed that the average achievement of Indigenous students in the study was lower than that of non-Indigenous students on English literacy and numeracy assessments across the final four years of primary schooling. At the same time, the results also demonstrated significant variability in achievement within the groups. Many Indigenous students achieve as well as or better than the average performance of all students. There is wide variability between schools in average achievement, with very high achievement in literacy and numeracy recorded by Indigenous students at some schools. This finding reflects the importance of isolating critical school-level factors that support Indigenous students to achieve highly at school. Though the data reflects a gap in average achievement, it is clear that there is growth in English literacy and numeracy skills across time and that the rate of development for Indigenous and non-Indigenous students is similar. Nonetheless, the gap in average achievement that is evident at the beginning of Year 3 remains relatively consistent to the final year of primary school.

A number of school and student-level factors were identified as related statistically to literacy and numeracy achievement. For instance, schools with a very high percentage of Indigenous students (41% or greater) tended to have lower achievement in literacy than schools with fewer Indigenous students. Students at schools where students rated the school climate (e.g. the learning environment and teacher-student relations) favourably also recorded higher achievement in literacy and numeracy. Teacher-rated student attentiveness also predicted achievement in both literacy and numeracy, with students who were rated as more attentive recording higher achievement. Poorer literacy achievement was also more common among students who had frequent absences from school and among students who did not speak Standard Australian English (SAE) at home. Poorer numeracy achievement was evident among students whose parents were in less skilled occupational categories.

On a number of non-academic student measures, Indigenous and non-Indigenous students showed very similar patterns of responses. Indigenous and non-Indigenous students expressed similar attitudes towards reading, spent similar amounts of time each day reading, and borrowed books from the library with similar frequency. Non-Indigenous students were more likely than Indigenous students to have a large number of books in their homes (more than 80) and were more likely to have access to a computer at home.

Almost all students provided positive evaluations of their school's climate, rating the quality of the learning environment and the relationships with their teachers positively. Most students also evaluated their personal achievement highly, expressing enjoyment in attending school and positive attitudes toward learning. These results are important as they reflect a motivation to learn among students and a perception of support available from the school and individual teachers that suggests that Indigenous students have strong support to enhance their academic achievement.

Case studies undertaken at five ILLANS schools provided detailed profiles of schools that supplemented the information on literacy and numeracy achievement. These schools were located in diverse areas across Australia, had unique school and community profiles, and their students evidenced very different patterns of performance on the literacy and numeracy tasks. Despite this, a number of consistent themes emerged in response to discussion around teacher professional development, parent and community involvement in the school, and culturally inclusive curricula. Teachers interviewed adopted a broad range of strategies that focused on building on students' strengths and adapting to their different learning styles. At the same time, they identified a clear need for relevant and ongoing professional development that would help them to develop more strategies for working with Indigenous students and to promote understanding of cultural issues. All schools reported difficulties in engaging parents; staff at the schools worked hard to provide an environment that was welcoming of parents and events that were likely to encourage parents to attend. A forum for Indigenous parents to be involved in decision-making was seen as particularly important in promoting the health, wellbeing and educational attainment of Indigenous students. Though incorporating the perspectives of Indigenous and other cultures in the curriculum was consistently acknowledged as important, there was wide variation in ideas about how this might occur in practice. There appears to be ongoing confusion about what form a culturally inclusive curriculum might take and who should be responsible for Indigenous content in the curriculum.

Conclusions

Between 2000 and 2006, ILLANS monitored the growth in English literacy and numeracy skills within a sample of Indigenous students from the commencement of school to the end of Year 6. This report provides a description of the growth in literacy and numeracy across Years 3–6 of primary school during Phase 2 of ILLANS. Across the final four years of the study, 297 Indigenous students and 685 non-Indigenous students from 25 schools completed at least one literacy or numeracy assessment. Seventy-two Indigenous students completed all four literacy assessments and seventy Indigenous students completed all four numeracy assessments.

Data collected on literacy and numeracy achievement shows that the gap in average achievement between Indigenous and non-Indigenous students evident by the end of the early years of primary school is maintained through to the end of primary schooling. Despite a gap in average achievement, it is evident that Indigenous students in this study experienced growth in their literacy and numeracy skills through the final years of primary school. It is also evident that there is wide variability in achievement between individual students and across different schools. Many Indigenous children succeed at school and are achieving as well as, or better than, non-Indigenous students at the same schools. This evidence affirms the importance of identifying those factors that are critical to supporting the literacy and numeracy achievement of Indigenous students. Developing stronger links between schools and Indigenous communities, promoting attendance among Indigenous students, quality teaching, ensuring a good start to schooling, and developing a school culture in which Indigenous students feel included and supported to learn are key aspects of closing the gap in educational achievement for Indigenous students.

1. INTRODUCTION

1.1 BACKGROUND TO THE PROJECT

The findings of Phase 1 (2000–2002) of the *Longitudinal Literacy and Numeracy Surveys for Indigenous Students* (ILLANS) focused on reporting the achievement of Indigenous students in the first three years of school. The Phase 1 report showed that although Indigenous students experienced consistent growth in English literacy skills across time, their development was not at the same rate as a group of mainly non-Indigenous students who had completed the same assessments in an earlier longitudinal study of a random national sample of Australian students called the *Longitudinal Literacy and Numeracy Study* (LLANS). Phase 1 of ILLANS showed that Indigenous students' achievements in literacy and numeracy were similar to those of the main LLANS sample at school entry; however, between the first and the final assessment, a clear gap in achievement had emerged. Central to the Phase 1 report was the identification of large between-school and between-student variation in achievement. There was variation between students in growth trajectories, and development did not always proceed in a clear linear fashion.

Several factors were found to be associated with the literacy and numeracy achievement of Indigenous students in Phase 1 of ILLANS:

- (a) *School*: Schools accounted for much of the variation in achievement; however, the sample was too small to determine the extent to which classroom or teacher factors accounted for variation in student achievement;
- (b) *Region*: Students who attended schools from metropolitan and regional areas generally achieved at higher levels than students in schools from remote and very remote areas; however, between-school differences were greater than regional differences;
- (c) *Initial achievement*: Student performance on the first assessment was the strongest predictor of subsequent achievement;
- (d) *Language background*: Students who spoke Standard Australian English (SAE) at home consistently achieved at higher levels than students who did not;
- (e) *Attendance*: Students who attended school more frequently achieved at higher levels than students with low attendance rates; students who did not speak SAE at home attended school less frequently; attendance patterns tended to be consistent across time;
- (f) *Attentiveness*: Students who were rated as more attentive in the Kindergarten year achieved at higher levels on both English literacy and numeracy in Year 2 than students rated as less attentive; ratings of attentiveness were also consistent across time.

Case studies conducted by Indigenous consultants in 2000, 2001 and 2002 suggested that the key factors in schools that supported positive outcomes for Indigenous students were: school leadership; good teaching; student attendance and engagement; involving Indigenous parents and communities in schools to support student learning; using whole-of-school approaches to recognising Indigenous culture, and an Indigenous presence at the school.

As the children participating in the study entered their fourth year of schooling (Year 3 in most cases), the study moved into a second phase. There was significant attrition from the study at the end of Phase 1 because many children moved schools between Year 2 and 3. For this reason, more schools were added to the sample and the cohort of students was expanded to include both Indigenous and non-Indigenous students. The expansion of the project was intended to provide further insights into the practices of the schools and teachers that best supported Indigenous students to achieve their potential, particularly in the areas of literacy and numeracy. Data collection for the project ceased in 2006, when the children reached the end of their primary schooling.

This report focuses on reporting data from Phase 2 of ILLANS (2003–2006). An additional contribution of this report is in providing a literature review of recent findings on factors contributing to literacy and numeracy achievement among Indigenous students in Australia. These reviews provide a context for interpreting the quantitative data on literacy and numeracy achievement in the second phase of the study.

The remainder of this chapter provides some background information regarding the historical and contemporary contexts which influence the schooling of Indigenous children.

1.2 INDIGENOUS CHILDREN AND CONTEXTS FOR SCHOOLING

Historical context

In Australia, and world-wide, Indigenous communities experience significant disadvantage across a range of social and economic indicators. Historically, Australian governments have contributed to this situation through discriminatory policies that have failed to adequately support Indigenous people. The history of Indigenous people in this country includes policies of wardship for all adults, control of children by the Aboriginal Welfare Board, forcible removal of children, relocation of clans, exclusion of children from State education, and exclusion from Aboriginal schools reserved for ‘full bloods’.

Successive education policies of State and Territory governments offered schooling for Indigenous children in segregated Aboriginal schools, and then later, assimilation into schools with a European, Christian world view. Early policies supporting segregation permitted Aboriginal children to attend the local school only if they were adequately dressed and well fed. In New South Wales, the ‘exclusion on demand’ policy meant that principals were allowed to remove an Aboriginal child from the school following an objection by either teachers or white parents to an Aboriginal presence in the classroom. This practice did not officially cease until the mid-1970s (Fletcher, 1989).

The educational experiences of Indigenous children varied between and within States and Territories, but for many, negative experiences of the school system remain a source of significant pain and bitterness. The Human Rights and Equal Opportunity Commission’s report *Bringing Them Home* (Wilson, 1997) documents many cases where access to and participation in education was effectively denied or only offered to a very limited extent.

What education was provided generally aimed at completion of their schooling at the level achieved by a ten-year-old child in the State education system. It emphasised domestic science and manual training, thus preparing the children for a future as menial workers within the government or mission communities or as cheap labour in the wider community (Loos & Osanai, 1993, p.20).

Given this history, it is not surprising that education and educational policy is an important area of concern for Indigenous people. Additionally, it is unsurprising that it may be difficult to engage parents of Indigenous school children in school life, because their own negative school experiences have caused ambivalence towards school. Nonetheless, schools are important contexts for addressing disadvantage, and places where Indigenous children can gain the knowledge and skills that will provide them with opportunities for improved social, economic and health outcomes for themselves and their communities.

Policy context

Policy statements over the last two decades convey recognition by all levels of government of the urgency of improving educational outcomes for Indigenous people. The *National Aboriginal and Torres Strait Islander Education Policy* (AEP) outlines 21 goals for an improved system of education to support Indigenous students and communities. The AEP, which prioritises educational access, participation and outcomes, remains the foundation of subsequent government policies and programs.¹

¹ <http://www.dest.gov.au/archive/schools/Indigenous/aep.htm>

In 2000, the Australian Department of Education, Science and Training (DEST) implemented the *National Indigenous English Literacy and Numeracy Strategy* (NIELNS) (Department of Education, Science and Training, 2000). This strategy concentrated attention on Indigenous student learning in the areas of English literacy and numeracy, learning areas that were a focus for improved outcomes for all Australian students. The central areas of the NIELNS were:

- lifting school attendance rates of Indigenous students to national levels;
- effectively addressing hearing and other health problems that undermine learning for a large proportion of Indigenous students;
- providing, wherever possible, preschool opportunities;
- training sufficient numbers of teachers in the skills and cultural awareness necessary to be effective in Indigenous communities and schools and encouraging them to remain at the school for reasonable periods of time;
- ensuring that teaching methods known to be most effective are employed; and
- instituting transparent measures of success as a basis for accountability for schools and teachers.

Australian Directions in Indigenous Education 2005–2008, a document endorsed by the Ministerial Council on Employment, Education, Training and Youth Affairs (MCEETYA) in July 2006 (MCEETYA, 2006), provided systems and schools with the capacity to translate the MCEETYA *National statement of principles and standards for more inclusive schooling in the 21st century*. This document highlights the importance of having improved outcomes in education for Indigenous students as core business for all education providers. Policy recommendations are grouped under five domains:

- early childhood education;
- school and community education partnerships;
- school leadership;
- quality teaching; and
- pathways to training, employment and further education.

All States and Territories also have their respective Indigenous Education Policies. In addition, the majority have published operational plans and strategies that outline areas of focus, targets and the means by which they aim to support improvements in educational opportunities and outcomes for Indigenous students. Recent policy documents include:

- *Indigenous Education: Strategic Directions 2008–2011* (Queensland Department of Education and Training, 2008)
- *Aboriginal Education and Training Strategy 2009–2012* (New South Wales Department of Education and Training, 2008)
- *Indigenous Education Strategic Plan 2006–2009* (Northern Territory Department of Employment, Education and Training, 2006)
- *Aboriginal Education Strategy 2005–2010* (South Australian Department of Education and Children's Services, 2005)
- *Aboriginal Education and Training Operational Plan 2005–2008* (Western Australian Department of Education and Training, revised 2007)
- *Wannik: Learning together; Journey to our future* (Victorian Department of Education and Early Childhood Development, 2008)

Some common themes in these strategies include the need to focus on closing gaps in the rates of Indigenous students' participation, school retention, attendance at school, and levels of literacy and numeracy achievement. Provision of culturally appropriate curricula and teaching are also consistent themes, as is the need to build strong partnerships between Indigenous parents, students and local schools. These documents also note that schools need to become places valued by young Indigenous people and their families, places where they want to come, to learn and to achieve their full potential.

It is generally acknowledged that rates of access, participation and educational outcomes for Indigenous students have slowly improved across time, although these improvements have occurred in a context in which there have been improvements in educational outcomes for all Australian students. Outcomes for Indigenous and non-Indigenous students remain significantly different, and it is unclear why existing policies have not achieved greater success.

The *Report of the MCEETYA Taskforce on Indigenous Education* (MCEETYA, 2000) argued that the success of Indigenous education initiatives was impeded because of low expectations for Indigenous students and perceptions that the gap in educational outcomes for Indigenous students was somehow normal. It was also noted that Indigenous programs were not implemented systematically, were often marginalised, and seldom seen as core business.

Indigenous educational interventions to date have had limited impact, yet National, State and Territory support for improved educational outcomes for Indigenous students remains high. In April 2008, there was strong endorsement by the Council of Australian Governments (COAG) of Indigenous education targets. These included providing access to quality early childhood education programs for remote Indigenous four-year-olds; halving the gap for Indigenous students in reading, writing and numeracy within a decade; and at least halving the gap in attainment rates for Indigenous students in Year 12 or equivalent by 2020 (MCEETYA, 2008a). Closing the gap clearly remains on government agendas and is incorporated as a central tenet in the Australian government's social inclusion plan.

Research perspectives

Over the years, a broad range of research has informed the development of educational practice. Existing research makes it clear that a complex web of educational, social, health and economic factors influences educational outcomes. A key problem in describing the reasons why there is a gap in academic achievement between Indigenous and non-Indigenous students has been that individual factors are often seen in isolation and assigned an influence that is hard to justify. Often, what is presented as research is reliant more on polemic, rhetoric, or openly biased opinion than on careful analysis of the available evidence. Often there is no clear evidence basis, but nevertheless opinions abound. To support the development of policy and related interventions that have sustained, positive impacts on Indigenous people, it is essential to have an evidence-base that has its roots in rigour and credibility.

Research on Indigenous education has addressed a range of issues. Much of it has been in the vein of 'What works?', whereby researchers have presented an evaluation of small-scale initiatives. Of particular interest for this publication is research that has evaluated a range of literacy and numeracy programs for Indigenous students. In terms of educational outcomes, the literacy and numeracy achievements of Indigenous students have received substantial attention. Although there are gaps in the research mapping these achievements over time, it is clear that differences in school achievement between Indigenous and non-Indigenous students have existed for many years and do not appear to be decreasing to any notable extent.

1.3 OUTLINE OF THE REPORT

This chapter has provided an overview of the impetus for the ILLANS project and has briefly discussed the context in which it was conducted. Chapter 2 includes a comprehensive analysis of the most recent literature on literacy and numeracy development among Indigenous children, with particular reference to those factors identified as likely to support achievement. Chapter 3 describes the design and methods used for the study. Chapter 4 describes quantitative analyses of the results for literacy and numeracy achievement during Phase 2 of the project. Chapter 5 presents case study analyses for five schools participating in ILLANS during Phase 2. Finally, Chapter 6 contains a summary of the findings of the research and some conclusions about how schools and teachers can support the literacy and numeracy development of Indigenous students in the primary years of schooling.

2. RESEARCH PERSPECTIVES: LITERACY AND NUMERACY DEVELOPMENT AMONG INDIGENOUS STUDENTS

2.1 LITERACY AND NUMERACY ACHIEVEMENT FOR INDIGENOUS STUDENTS

There is significant evidence that, on average, levels of English literacy and numeracy achievement among Indigenous students across Australia are substantially lower than those of their non-Indigenous peers. It should also be recognised that there are many Indigenous students who achieve highly at school and further work is required to understand the factors that promote school success among Indigenous students. Nonetheless, on standard nationally agreed benchmarks for reading, writing and numeracy the percentage of Indigenous students who achieve the benchmark is significantly lower than the percentage of all students who achieve the benchmark (Australian Curriculum Assessment and Reporting Authority, 2009; MCEETYA, 2007; Thomson, McKelvie, & Murnane, 2006). Results reported from the 2009 National Assessment Program–Literacy and Numeracy (NAPLAN) show that the percentage of Indigenous students achieving above minimum agreed standards in reading, writing, spelling, grammar and punctuation, and numeracy is below that of non-Indigenous students at Year 3, 5, 7 and 9. The gap in achievement between Indigenous and non-Indigenous students widens over time, and there is worrying evidence that the size of the gap in recent years has been increasing (Klenowski, 2009).

Analyses of national benchmark data are problematic when there is no consideration of the diverse geographic locations and lifestyles experienced by Indigenous people (Mellor & Corrigan, 2004). Increasingly, it is recognised that there are important differences between Indigenous communities who live a range of lifestyles (e.g. traditional, transitional or contemporary) in a variety of contexts, each with its own history, context and specific needs (Clancy & Simpson, 2001, 2002). For instance, 28 per cent of Australia's Indigenous population are located in metropolitan cities, but the majority live in regional and remote locations (with 10 per cent in remote and 18 per cent in very remote communities) (ABS, 2003). Factors like school absenteeism within the Indigenous student population are particularly problematic in more isolated, traditionally-oriented communities where family mobility and long absences between attendance at different schools are not uncommon (Bourke, Rigby, & Burden, 2000). For these reasons, the gap in achievement is likely to vary substantially across different States and Territories and between different locations.

The report of the 2007 national benchmark results (MCEETYA, 2007) went some way towards examining regional variation in achievement by comparing *all* students with Indigenous students in four geolocations. National test results for Years 3, 5 and 7 students show similar patterns. Analyses of this data identify a progressive widening of the gap in achievement between Indigenous students and all students for reading, writing and numeracy, with increasing distance from the metropolitan centres of Australia. In particular, the gap in achievement between students in Year 3 and Year 7 is greater as distance from the metropolitan centres increases. Other studies (such as the Longitudinal Studies of Australian Youth [LSAY], OECD's Programme for International Student Assessment [PISA], and NAPLAN) provide confirmatory evidence that Indigenous students perform at significantly lower levels than non-Indigenous students in standard tests of literacy and numeracy, and that Indigenous students in remote locations experience greater educational disadvantage than their non-Indigenous peers (De Bortoli & Cresswell, 2004; De Bortoli & Thomson, 2009; Jones, 2002; Rothman, 2002; Rothman & McMillan, 2003).

Overall, Australian students achieve relatively well on surveys of mathematics and mathematical literacy skills, yet a significant proportion of students do not achieve basic levels of proficiency at key stages of schooling. Indigenous students are over-represented among this group. For many low achievers, the extent of the gap between low and higher achievers widens as they approach secondary school. This has consequences for their access to and participation in higher-level courses (particularly those that are mathematics and science-related), and their future participation in an ever-changing workforce with increasing demands for skilled labour.

Closing the gap

In 2008, then Prime Minister Kevin Rudd released six explicit targets for redressing Indigenous disadvantage to be met within agreed timeframes. The *Closing the Gap* targets aim to:

- Close the life expectancy gap within a generation;
- Halve the gap in mortality rate for Indigenous children under five within a decade;
- Ensure all Indigenous children aged four years in remote areas can access early childhood education within five years (2013);
- Halve the gap for Indigenous students in reading, writing and numeracy within a decade (2018);
- At least halve the gap in Indigenous Year 12 attainment or equivalent attainment rates by 2020; and
- Halve the gap in employment outcomes by 2018.²

In each budget since the *Closing the Gap* targets were announced, the Australian government has committed additional funding to address Indigenous disadvantage, aimed specifically at closing the gap in educational attainment between Indigenous and non-Indigenous students. The government's financial commitment has included a range of initiatives designed to achieve this goal. For example, in the Northern Territory, assistance has been provided for the Quality Teaching Package (\$23 million) and the Accelerated Literacy Initiative (\$22.7 million). Such investment signals recognition of the complex and difficult task of closing the gap in educational attainment between Indigenous and non-Indigenous students.

Explanations for the underachievement of Indigenous students in literacy and numeracy are multifaceted and inevitably require understanding of the social, historical and cultural factors underlying ongoing difficulties in attaining acceptable levels of literacy and numeracy among Indigenous school children (Bourke et al., 2000). To provide a context for the current research, it is important to review recent relevant research on educational outcomes for Indigenous students. The reviews presented in this chapter are not designed to be exhaustive; instead, their purpose is to explore selected factors underlying the gap in achievement in literacy and numeracy between Indigenous and non-Indigenous students and to highlight areas for substantive change in order to achieve closing the gap targets. The remainder of the chapter includes short definitions of literacy and numeracy and a discussion of the process of developing these skills. Some broad factors are discussed in relation to how they support, as well as hinder, the development of literacy and numeracy among Indigenous children. Finally, a number of recent initiatives to promote the development of literacy and numeracy among Indigenous students are used to illustrate how governments are trying to address the gap in achievement for Indigenous students.

2.2 WHAT IT MEANS TO BE LITERATE

Defining literacy

Effective approaches to learning literacy at school depend on reliable, well considered and articulated visions of literacy and its benefits for students. These approaches are also connected with a range of contextual, cultural and pedagogical factors that combine to influence learning. Current understandings and definitions of literacy are influenced by context and purpose. The literature reflects that there is no one definition of literacy, and that separate definitions are usually the product of different situations and perspectives. According to Freebody (2007):

Definitions of literacy are complex, not only because they aim to describe a complex set of practices, but also because they are, to some significant extent, context-driven. They are tailored to particular features of the script of a language, and the educational, institutional and cultural contexts in which they need to be put to work. Definitions of literacy practices are both expressions of social and cultural histories and projections of preferred futures. (p. 6)

² The 2011 Prime Ministers Report on Closing the Gap (p. 2) available at http://www.fahcsia.gov.au/sa/Indigenous/pubs/closing_the_gap/2011_ctg_pm_report/Documents/2011_ctg_pm_report.pdf

Over time, definitions of literacy have expanded from a narrow focus on functional literacy, characterised as acquiring reading and writing skills that allowed participation in literacy activities associated with an individual's culture or group (Baker & Street, 1994) to a broader focus on multiple literacies that are diverse, multi-dimensional and learned in different ways (Lonsdale & McCurry, 2004; Snyder, 2008). The definition of literacy in *Australia's Language and Literacy Policy* (Department of Employment Education and Training, 1991, p. 9) was comprehensive, and has been used extensively:

Literacy is the ability to read and use written information and to write appropriately, in a range of contexts. It is used to develop knowledge and understanding, to achieve personal growth and to function effectively in our society. Literacy also includes the recognition of numbers and basic mathematical signs and symbols within text.

Literacy involves the integration of speaking, listening and critical thinking with reading and writing. Effective literacy is intrinsically purposeful, flexible and dynamic and continues to develop throughout an individual's life time.

This broad view of literacy includes other language skills, such as speaking and listening, as well as computer literacy and critical thinking, and emphasises the ability to derive meaning from text (De Lemos, 2002). A narrow view of literacy focuses exclusively on the ability to read and write and does not acknowledge the way in which literacy development is embedded in a social and cultural context (De Lemos, 2002). A narrow focus on literacy might view traditional Indigenous cultures as pre-literate (see for instance Johns & Centre, 2006). In contrast, a broad definition of literacy is particularly important for Indigenous students because it encompasses the language and literacy practices of Indigenous culture that are traditionally oral and visual (Freebody, 2007; Tripcony, 2000).

How do children become literate?

Research shows that young children's literacy development begins at home, long before they start school. It is widely recognised that young children's literacy development is enhanced when their parents and caregivers read with them. The impact of these early interactions on literacy development has been studied extensively (see for instance Anderson, 1985; Laosa, 1982; Teale & Sulzby, 1986; Whitehurst & Lonigan, 1998). In Western cultures, for example, interactions between parents and infant children while reading picture books are an important contributor to the development of literacy skills (Bus & Van Ijzendoorn, 1988; Bus, Van Ijzendoorn, & Pellegrini, 1995; DeLoache & DeMendoza, 1987). Fostering a genuine interest in reading before the child starts school is also more likely when parents and caregivers value reading and encourage enjoyable and engaging reading activities with their children (Cairney, 2002; Sonnenschein & Munsterman, 2002). Children's early literacy achievement is also associated with home environments that value and promote the development of literacy (Cairney, 2002). Weigel, Martin and Bennett (2006) categorised mothers' beliefs about their preschool child's literacy development as either 'conventional' or 'facilitative'. Mothers with facilitative beliefs were more likely than mothers with conventional beliefs to express positive beliefs about the impact of reading on their child's literacy development. They were also more likely to have good memories about reading as a child, reported enjoying reading with their child, and believed that they had an active role to play in teaching their children at home. On the other hand, mothers with conventional beliefs were more likely than facilitative mothers to believe that preschool children were too young to learn to read, and that teaching children to read was the responsibility of schools. Conventional mothers were also more likely to report challenges in finding time and an appropriate space to read with their child. Mothers with facilitative beliefs had higher levels of education and reported better academic success than mothers with conventional beliefs, though the groups did not differ on income, literacy ability, or age. Facilitative mothers were also more likely to report enjoyment of reading and to agree that their children frequently observed them writing. Most importantly, mothers' beliefs about literacy development were associated with the level of engagement in literacy activities at home. Mothers with facilitative beliefs read more often to their children, and reported singing songs, drawing pictures, telling stories and playing games more often than mothers with conventional beliefs. Significantly, children of mothers with facilitative beliefs made greater gains in print knowledge and reading interest over a year than children whose mothers held conventional beliefs.

The critical nature of the home environment in fostering the emergence of literacy in young children is embedded in the six main conclusions about children's literacy development based on evidence from research compiled by Rivalland (2000, pp. 1–2):

1. Children who become literate with ease have had a great deal of experience with many written texts from the time they were very young. They have been read to frequently, they have had the opportunity to explore a range of texts, and they have had the support of a mentor.
2. Successful literacy learners have phonological awareness as well as code-breaking skills. They can use the alphabetic principle, i.e. they know that certain symbols and spellings represent the sounds of spoken words, in reading and writing.
3. Children's literacy development depends on their ability to fluently use comprehension and composing strategies to get meanings from texts and to compose their own texts.
4. Children's literacy development is strongly influenced by their social interactions and experiences from birth.
5. Reading and writing of texts involves understanding linguistic and symbolic codes specific to the technology of written language. Texts have specific attributes that learners must consciously understand if they are to become effective literacy learners. Unlike talking, which most children will learn to do as long as they are provided with human interaction, effective literacy learning requires the conscious awareness of sounds, letters, the ways in which texts provide meaning, and knowledge about forms of text.
6. Learning about the 'technology' of literacy necessitates developing understanding of how texts are shaped by particular purposes and values.

In general, low levels of literacy are evident among Indigenous adults, particularly in remote communities. Only in relatively recent generations have Indigenous children undertaken formal schooling (Kral & Schwab, 2004). Kral and Schwab (2004) noted that Indigenous people in two remote sites in the Northern Territory strongly believed that literacy would be developed through participation in formal schooling; there was little recognition that the family and community were also key drivers in children's literacy development. In contrast, Indigenous children from families where a parent or grandparent was literate were more likely to experience an environment that was richer in literacy experiences and, in turn, these children were likely to display more advanced literacy skills. Though conventional Western literacy experiences might be less commonly experienced by Indigenous children prior to school, it is clear that Indigenous children engage in literacy practices within the context of familiar activities. Rennie (2006), for example, describes the process of sharing stories, asking questions, explaining procedures, and interpreting events in relation to the practice of hunting. It is important that the literacy expertise of Indigenous children in their own communities is utilised as a foundation for encouraging the development of literacy in a formal school context.

The major determinants of each child's learning achievement are factors unique to each child, thus emphasising the degree to which the early childhood experience and the quality of care giving relationships can influence literacy achievement in school (Hattie, 2002). At school, the quality of teaching received is the most important variable in predicting student achievement in literacy (Hattie, 2002). The nature and quality of early literacy experiences provide a foundation for targeted literacy teaching in school. On the basis of current understandings that children's literacy development occurs most intensively in their early years of life, the majority of literacy programs and strategies are concentrated in the primary years of schooling.

Three waves of literacy programs and strategies have been identified in Australian primary schools (MCEETYA, 2000, 2001a). First wave strategies consist of effective early years teaching. These strategies (such as First Steps) refer to effective whole class instruction. Second wave strategies involve early intervention. These strategies (such as Reading Recovery) focus on children identified as being at risk of developing literacy difficulties. Third wave strategies focus on children who continue to experience difficulties in the middle and upper years of primary school despite early intervention, or for whom early intervention was not available. Less emphasis is placed on third wave strategies compared with first and second wave strategies; an increased focus on third wave strategies requires urgent consideration given the high proportion of Indigenous students who have difficulties in the middle and later years of primary school.

2.3 WHAT IT MEANS TO BE NUMERATE

Defining numeracy

The significance of literacy to full participation in society has long been accepted. Increasingly, however, numeracy skills are being viewed as equally important, and is now seen as possibly more problematic than poor literacy skills. The impact of poor numeracy skills on future employment has also been less well recognised. At school, a student's level of numeracy influences the subject choices they make, their general academic performance, and affects subsequent career choices (Fullarton, Walker, Ainley, & Hillman, 2003; Lamb, 1997; Marks, McMillan, & Hillman, 2001). Individuals with poor numeracy are more likely to leave school early, and to experience difficulty in successfully obtaining and maintaining full-time employment. Poor numeracy skills often result in a restricted range of employment opportunities, with lower pay and fewer prospects for advancement (Bynner & Parsons, 1997; Lago & DiPerna, 2010; Parsons & Bynner, 1997).

In Australia, in recognition of the positive impact of good numeracy skills for individuals across a range of educational and labour market outcomes, numeracy is regarded as a key product of schooling (MCEETYA, 1999, 2008b). Definitions of numeracy have been problematic because numeracy can be understood in a number of different ways, and because there are many associated and related terms (e.g. mathematical skills, quantitative literacy, mathematical literacy) (Hogan, 2000). Unlike popular perceptions of numeracy as a basic facility with mathematics that is easily measurable, education policies focus on both depth and breadth, emphasising the need for learners to gain a range of numeracy skills that will prepare them to function effectively as learners in their chosen subjects, in future employment and as members of society. The term 'numeracy' originated in the United Kingdom and tends to be used in Commonwealth countries such as Australia, Canada and New Zealand. In the United States, the preferred term is 'quantitative literacy'. Though numeracy was initially used to refer only to number skills, the term is now used to refer to a combination of mathematical knowledge, problem solving and communication skills required by people to function in their broader communities.

Within a definition of numeracy that is broader than a basic capacity for mathematical concepts and calculation, three main characteristics of numeracy have emerged. First, school mathematics is not regarded as synonymous with numeracy. Recent definitions, however, have framed school mathematics as supporting the development of numeracy. Typically, children might acquire mathematical skills and concepts at school; a numerate person will be able to choose the mathematical understandings most appropriate to solve problems in day-to-day life (Milton, 2000). Second, whereas mathematics is a well-established discipline, it is also becoming more common to view numeracy as cross-disciplinary. Third, numeracy focuses on an ability to apply one's mathematical knowledge in order to solve problems across a range of contexts.

Numeracy is not the same as mathematics, nor is it an alternative to mathematics. Rather, it is an equal and supporting partner in helping students learn to cope with the quantitative demands of modern society. Whereas mathematics is a well-established discipline, numeracy is necessarily interdisciplinary. Like writing, numeracy must permeate the curriculum. When it does, also like writing, it will enhance students' understanding of all subjects and their capacity to lead informed lives (Steen, 2001, p. 115).

The Australian Association of Mathematics Teachers (AAMT) *Policy on Numeracy Education in Schools* (Australian Association of Mathematics Teachers, 1998) emphasises that while numeracy is often used as a synonym for school mathematics, numeracy refers to a broader concept. Numeracy is underpinned by learning in mathematics, and includes attitudes to mathematics and dispositions to use mathematics. The concept of numeracy and being numerate goes beyond conceptual learning in school mathematics, referring to students' practical knowledge and the ability of students to make connections with their lives outside of school. Essential to the definition of numeracy is a process of being able to use some element of mathematics (both conceptual knowledge and procedural skills), to achieve a particular purpose, in a particular context (Australian Association of Mathematics Teachers, 1997). The report *Numeracy = Everyone's Business* (Australian Association of Mathematics Teachers, 1997, p. 15) goes on to describe a numerate person as someone who is able:

.....to use mathematics effectively to meet the general demands of life at home, in paid work, and for participation in community and civic life. In school education, numeracy is a fundamental component of learning, performance, discourse and critique across all areas of the curriculum. It involves the disposition to use, in context, a combination of:

- *underpinning mathematical concepts and skills from across the discipline (numerical, spatial, graphical, statistical and algebraic);*
- *mathematical thinking and strategies;*
- *general thinking skills; and*
- *grounded appreciation of context.*

Submissions to the Council of Australian Governments *National Numeracy Review Report* (Stanley, 2008) included a recommendation that opportunities for practice and experience in numeracy should be available across the curriculum. The development of numeracy is therefore the responsibility of teachers across all learning areas, which should be acknowledged through teacher education preparing all teachers to be teachers of numeracy.

In practice, however, many teachers (and parents) view numeracy as interchangeable with the teaching and learning of school mathematics (Milton, 2000; Steen, 2001). This is particularly the case in the early years of schooling where there is considerable overlap between numeracy and school mathematics. This overlap lessens over the years as increasingly complex mathematics is introduced into the curriculum. The two concepts become even further distinct in the senior years where the content of mathematics classes becomes increasingly abstract (Zevenbergen, Dole, & Wright, 2004). Confusion over the relation of numeracy to school mathematics is intensified by the observation that increasing the number of mathematics classes students undertake does not necessarily improve numeracy skills (Hughes-Hallett, 2001). Though mathematics subjects may focus on teaching students a range of mathematical skills that underpin numeracy, they do not necessarily develop the skill and flexibility with context required for numeracy. Milton (2000, p. 108) describes the distinction between mathematical literacy and numeracy as follows:

A chief message of this volume is that more mathematics does not necessarily lead to increased numeracy. Although perhaps counterintuitive, this conclusion follows directly from a simple insight: numeracy is not so much about understanding abstract concepts as about applying elementary tools in sophisticated settings. As the respondents to the case statement emphasize, this is no simple feat. Numeracy takes years of study and experience to achieve. Thus numeracy and mathematics should be complementary aspects of the school curriculum. Both are necessary for life and work, and each strengthens the other. But they are not the same subject.

Deciding on what it means 'to be numerate' has important implications for school curricula, teaching practices, assessment processes and research into strategies that support students to develop numeracy skills. Teachers' understanding of numeracy has important consequences for teaching and learning, and for identifying and assessing student learning needs. Many education policies and initiatives refer to 'literacy and numeracy' in a single context. Some educationalists have referred to numeracy as a form of literacy. In the early years of schooling, teaching content has a considerable focus on mathematical language and concepts (big and small, higher and lower, more and less), and solving real-life problems that are embedded in words. However literacy and numeracy are underpinned by very different areas of learning. It has been argued that subsuming numeracy into a broader definition of literacy poses a serious threat to developing improved

teaching methods to support student numeracy achievement. Difficulties in numeracy may be related to language but they may also relate to a range of other processes that children need to employ in solving problems (Milton, 2000).

How do children become numerate?

Children arrive at school with a range of different experiences, knowledge, skills, interests and attitudes which may make them more or less prepared for numeracy learning. In fact, children show evidence of numerical abilities long before they attend school and receive formal instruction in numeracy (Berteletti, Lucangeli, Piazza, Dehaene, & Zorzi, 2010; Perry, Dockett, Harley, & Hentschke, 2006). These informal mathematical abilities are strongly related to the ability to benefit from formal schooling in mathematics (Duncan et al., 2007). By the time children enter school, there are already marked differences in children's informal mathematical knowledge, which highlights the importance of quality preschool experiences in fostering numeracy development (Levine, Suriyakham, Rowe, Huttenlocher, & Gunderson, 2010). Quality preschool experiences and a home environment in which there is emphasis on number sense (e.g. counting) and language learning support children in making the transition to school and engaging in numeracy activities in the early years (Thomson et al., 2006). At home, parents observed interacting with their young children (aged 14–30 months) spontaneously engage in numerical talk, which includes counting and labelling the number of objects in sets. There is, however, substantial variation in the range of number words used and the frequency with which they are uttered (Levine et al., 2010). Levine's study showed that the variation in numerical talk was related to children's understanding of cardinal number (knowledge that the last word of a count signifies the number of objects in a set) at four years of age. Despite evidence that preschool interactions that foster numeracy can influence later achievement, encouragement for parents to focus on numeracy at home has not been promoted to the same extent as literacy (Doig, McCrae, & Rowe, 2003).

Though research on Indigenous children's conceptions of number is relatively scarce, there is some suggestion that Indigenous children do not begin school with the same understanding of number as other children (Warren & deVries, 2009). For instance, Christie (1985, p. 11) contends that:

Western notions of quantity—of more and less, of numbers, mathematics, and positivistic thinking—are not only quite irrelevant to the Aboriginal world, but contrary to it. When Aborigines see the world, they focus on the qualities and relations that are apparent, and quantities are irrelevant.

Indigenous children do, however, engage in a range of experiences in their own communities that foster the development of mathematical thinking. Rennie (2006), for instance, describes hunting practices in more traditional communities where children had mastered a sense of position and direction through the use of environmental markers. The practice of sharing and the concept of equality were also integral to the process of hunting, where the spoils acquired were shared with other members at the end of the day. There is also growing evidence from experimental work that Indigenous children possess very similar conceptions of quantitative concepts (such as equality) to those of children from other ethnic backgrounds, and that these conceptions are independent of the development of language (Butterworth & Reeve, 2008; Butterworth, Reeve, Reynolds, & Lloyd, 2008). For instance, the Warlpiri language, spoken in the Central Desert north and west of Alice Springs in the Northern Territory, has three generic types of number word, singular, dual plural, and greater than dual plural, as well as quantifiers such as 'few' and 'many'. However, in tasks requiring children to produce an exact number of items (e.g. matching a number of disks to a number shown and then hidden by an experimenter), children who spoke only Walpiri, Anindilyakwa (another Indigenous language), or English performed similarly on the tasks (Butterworth & Reeve, 2008; Butterworth et al., 2008). Other researchers have suggested an aptitude for subitising (determining the number of items in a collection without counting) among some Indigenous children without an ability to count (Willis, 2000), although this view is contentious (see for instance Warren, DeVries, & Cole, 2009). These findings in conjunction suggest that Indigenous children have a rich foundation of numerical understanding to build upon in the early years of schooling, though their linguistic systems for representing number may differ from the English language system.

As students progress through school, numeracy learning is enhanced by effective teaching and assessment practices, a comprehensive and engaging curriculum, and a supportive home environment (Thomson, Rowe, Underwood, & Peck, 2005). Effective teachers of numeracy meanwhile, have a strong professional understanding of both what they are teaching (content knowledge) as well as how best to teach it (pedagogical content knowledge). Effective teachers have a rich repertoire of teaching methods and skills, and know when to employ them:

To be effective, numeracy teaching needs to focus on the learning needs of each student, to acknowledge and build on students' diverse backgrounds, and to promote flexibility, problem solving and effective use of technology. No single approach to teaching numeracy will be effective for all learners (Department of Education, Training and Youth Affairs, 2000, p.44).

International research supports this position and emphasises the need for teachers to employ a variety of instructional methods. Research by Askew et al. (1997) found that effective teachers were those who could identify students' understandings and make connections within their teaching. Rather than concluding that one teaching approach was more effective than another, the researchers argued that it was the teachers' beliefs and understandings about the pedagogical purposes of their classroom practices that seemed to be more important than the forms of practice themselves. Teacher beliefs on what it meant to be numerate meanwhile, influenced teaching strategies and their interpretation of classroom events (Askew et al., 1997). Highly effective teachers of numeracy value their students' problem-solving methods and use teaching strategies that highlight the connections in mathematics. Muir's (2008) observations of teacher strategies for teaching numeracy built on Askew's proposal by demonstrating that choice of task was an indicator of effective numeracy teaching. Good teachers chose problems that challenged all students, that built on their own knowledge and reasoning, while encouraging them to make connections between different areas of mathematics and real life.

Poor numeracy skills in the early years may influence, and be influenced by, other educational factors such as school attendance, motivation, engagement and general academic achievement. Regardless of the source of initial problems, they will manifest themselves developmentally—there are fundamental numeracy skills that tend to underlie the development of subsequent skills (Baturu & Cooper, 2006). The gap between high and low achievers increases as students move from primary through to secondary schooling. Difficulties in progressing in mathematics may be due to a number of factors, including a poorly developed number sense, problems with basic computation skills, understanding of place value, solving word problems, lack of facility with the language of mathematics and lack of mathematical reasoning skills including knowledge of concepts and use of problem-solving procedures (Milton, 2000; Westwood, 2008). Our understanding of why it is that some children, and some groups of children, have problems with numeracy significantly influences decisions about how best to improve numeracy teaching and learning for individual children and groups of children.

For many students, barriers to numeracy learning may also be due to environmental factors associated with schools, classrooms, and social or community contexts (Zevenbergen, 2000; Zevenbergen, Mousley, & Sullivan, 2004). Children who come from a background which is significantly different to the school environment may be disadvantaged in the numeracy classroom. While these students may successfully use a range of numeracy skills at home, this does not necessarily translate to school numeracy or equip them to understand the rules, purposes, practices and demands of numeracy learning activities. Barriers to numeracy learning may not be underlying ability, but the extent to which the school is able to establish a link between home and school learning, to identify and build on the students' skills and experiences (Street, Baker, & Tomlin, 2005).

2.4 FOUNDATIONS OF LITERACY AND NUMERACY ACHIEVEMENT

Fostering literacy and numeracy achievement among Indigenous students is clearly a crucial component of addressing the impact of Indigenous disadvantage. Selection of appropriate teaching strategies does, however, require an understanding of the features of Indigenous cultures and lifestyles. Teachers need to be aware, for example, that Indigenous children are not raised to respond to authoritarian behaviour and that they expect to keep each other safe and work together (Penman, 2006). Lack of knowledge about the factors underlying the literacy development of Indigenous children specifically is implicated in poor pedagogical understanding and practices in relation to Indigenous children. In contrast to the extensive literature on approaches to improving Indigenous literacy, there is relatively little research on approaches to improving Indigenous numeracy attainment (Warren & deVries, 2009).

Approaches to fostering Indigenous educational achievement are likely to be multi-faceted. These approaches must take into account the diverse experiences and lifestyles of Indigenous students in the process of developing effective approaches to fostering the educational development of Indigenous children. For instance, Mellor and Corrigan (2004) identified seven key principles of effective provision of school learning for Indigenous students. These principles relate to: (a) health and nutrition in the early years; (b) the management of educational transitions; (c) good teachers and effective teaching; (d) the broader relationship of the school with its community; (e) the impact of regular school attendance; (f) the influence of schooling on social and moral development; and (g) the role of education in life success and secure employment. The issues embodied in these principles are recurring themes in the literature on school learning of literacy and numeracy. Some of the most salient of these issues are discussed in the following sections. Although for convenience discussion of these issues is presented separately, it should be recognised that there are complex interrelationships between these factors for Indigenous students.

Indigenous health and wellbeing

It is clear that many Indigenous children encounter greater risks to their health and wellbeing than do non-Indigenous children. Relatively recent surveys of the health (Zubrick et al., 2004), the social and emotional wellbeing (Zubrick et al., 2005) and the educational experiences (Zubrick et al., 2006) of Indigenous children conducted as part of the Western Australian Child Health Survey provide insights into the risks experienced by Indigenous children, as well as factors that might be protective. Indigenous Australians face severe disadvantage in modern Australian society, experiencing high poverty, poor health, and lower educational achievement (Wheldall, Beaman, & Langstaff, 2010). World Health Organization (WHO) data show that Australia's Indigenous population is one of the least healthy of all Indigenous populations within comparable developed countries. Hearing impairments caused primarily by middle ear infections (otitis media), are twice as common among Indigenous compared with non-Indigenous children (Trewin & Madden, 2003). In remote areas, rates of hearing difficulties among Indigenous children are likely to be much higher, with some studies reporting up to 50 per cent of Indigenous children suffering from middle ear disorders (Morris et al., 2005). Common consequences of recurrent ear infections are problems likely to impact on literacy development and include impaired speech production and difficulty producing some sounds, as well as learning difficulties (Blair, Zubrick, & Cox, 2005).

Indigenous Australians have a life expectancy that is on average 17 years lower than that of non-Indigenous Australians (Hoy, 2009). High levels of poverty in some Indigenous communities are associated with problems with alcohol, substance abuse and violence. Poverty-related health problems like low birth weight, malnutrition and failure to thrive, affect children's intellectual as well as their physical development (MCEETYA, 2001; Collins & Lea, 1999). There is also little evidence on major indices of disadvantage (e.g. income, education and life expectancy) that the gap between Indigenous and non-Indigenous Australians is narrowing (Cooke, Mitrou, Lawrence, Guimond, & Beavon, 2007).

The structures of Indigenous families are relatively complex. Nuclear family arrangements are rare; instead, it is common for large extended families to live together or in several houses in close proximity. Members on the fringes of the group typically move in and out of the group frequently (Daly & Smith, 2004). The burden of care giving is widely distributed among members in the kin network, rather than limited to a primary care giver (Daly & Smith, 2004). Indigenous families are more likely to experience economic hardship, with higher rates of unemployment, greater reliance on social security payments, and lower incomes in relation to non-Indigenous families (Daly & Smith, 2004). Indigenous households are also typically younger, less educated, and more likely to be renting their homes (Altman, 2004). Poor health among older members of Indigenous families means that Indigenous children often live in households with relatives who experience serious illness and die young (Daly & Smith, 2005).

The impact of disadvantage on educational attainment is marked. Failure to develop literacy skills inhibits students' chances of school achievement and increases the likelihood of their leaving school early (Wheldall et al., 2010). Numeracy skills are strongly associated with general educational achievement from an early age and contribute to learning across curriculum areas. Early mathematical knowledge (such as knowledge of numbers and ordinality) is a powerful predictor of later learning—even more powerful than early language and reading skills (Duncan et al., 2007). Higher numeracy skills in Year 9 has a stronger relationship with positive Year 12 outcomes than Year 9 literacy skills (Marks et al., 2001). Lower educational achievement is associated with poorer employment prospects and lower income (Chiswick, Lee, & Miller, 2003; Pink & Allbon, 2008). Overall, it is difficult, without well-developed literacy and numeracy skills, to participate fully in Australian society (Cowey, 2009; Daly & Smith, 2005). Health, wellbeing and economic measures are closely linked, with ongoing disadvantage both causing, and being caused by, factors like poor health and low educational attainment. The challenges facing Indigenous families are complex and it is essential, for effective, culturally grounded literacy and numeracy learning to take place, that teachers and schools understand, value and are able to work with Indigenous family and community arrangements.

The *Close the Gap* campaign for improvements to Indigenous health was launched in 2007 and includes a commitment to close the life expectancy gap between Indigenous and non-Indigenous Australians in a generation (King, Smith, & Gracey, 2009; Mackean, Adams, Goold, Bourke, & Calma, 2008). The campaign followed on from the framework outlined by the Aboriginal and Torres Strait Islander Social Justice Commissioner in 2005 (Calma, 2005), which recommended establishing real time frames for achieving health equality. Since that time, there have been positive signs in government, and among researchers and health professionals of the need for a collaborative, long-term approach to sustaining health improvements (King et al., 2009; Mackean et al., 2008). Nonetheless, the success of the strategy depends on sustaining the momentum of change over time. A true indication of the campaign's success will only be reflected when long-term, positive changes in health indices for Indigenous Australians are observed.

Preschool experiences of Indigenous children

It is now well understood that learning begins long before children go to school. Parents, grandparents and other adults in formal preschool settings play an important role in enriching children's environments by, for example, talking with them, encouraging a love of learning, telling them stories and singing songs. Children who are read to at home, who are taken to the library, encouraged to play number games, who paint and draw, are taught letters and numbers, as well as songs, rhymes, and poems, are more likely to have higher achievement in literacy and numeracy when they start school (Melhuish et al., 2008). Significantly, a supportive and enriching home learning environment influences educational attainment to a greater extent than parental education or socioeconomic status (Melhuish et al., 2008).

In Indigenous cultures, young children are surrounded by a rich and linguistically complex environment that provides experiences that support both literacy and numeracy development; however, the intricacies of early childhood experiences in Indigenous communities are often misunderstood or marginalised by educators. As part of an ongoing process to better understand

Indigenous child rearing practices, the Warrki Jarrinjaku review involved a collaboration between Indigenous communities and the Australian government in which senior Anangu and Yapa (Aboriginal) women developed an early childhood leadership model (Priest, King, Nangala, Brown, & Nangala, 2008; Warrki Jarrinjaku ACRS Project Team, 2002). This review emphasised that children in these communities are often exposed to two Indigenous languages with several associated dialects. English is rarely used, but sign language, other non-verbal communication, and extensive baby-talk are part of the early literacy learning of these children. From an early age, children are also encouraged to communicate using a variety of signs and gestures (Penman, 2006).

Learning to use and understand non-verbal body language is a key aspect of literacy development for Indigenous children, along with understanding of the natural environment, the complex relationships in their extended family networks, and their own languages and dialects. It has been observed that there are many ways in which the learning styles of Indigenous children may differ from traditional methods of classroom instruction. For example, conventional questioning of students by the teacher to assess knowledge might be culturally inappropriate for Indigenous learners, who may prefer to learn through observation and modelling (Simpson & Clancy, 2005). Fler and Williams-Kennedy (2002, cited in Penman, 2006) identified a number of key differences in the way that Indigenous and non-Indigenous children typically learn. For Indigenous children:

- Learning is a two way process; children learn by doing things together, they have obligations to each other and learning is a whole family obligation.
- Children are not punished for making mistakes; mistakes are part of learning.
- Listening is critical to learning; you do not have to look or appear to be attending to listen and learn.
- Asking questions is more an urban way of learning, watching and listening is more a traditional way.
- Learning is about moving around and looking, not sitting still (Fler and Williams-Kennedy, 2002, cited in Penman, 2006, p. 47).

There are strong indications that to reduce the impact of transition to a formal school environment and to increase the likelihood of success, Indigenous children require early access to formal 'school-like' settings (McTurk, Nutton, Lea, Robinson, & Carapetis, 2008). Many writers claim that Indigenous children often experience a sense of extreme alienation on starting school because school may be very different from home (Taylor, 2010). The substantial literacy and numeracy experiences which Indigenous children bring to the school context are often less valued and are less evident in school programs than the knowledge and experiences of their non-Indigenous peers. Transition difficulties can be compounded for Indigenous children when schools do not recognise and understand the preschool literacy and numeracy experiences of Indigenous children, and when the culture of the school reflects only traditional Western culture (e.g. 'fairy stories' that would be familiar only to non-Indigenous children, or mathematics problems that do not build on children's existing knowledge, for example kinship relationships). For these reasons, Clancy and Simpson (2002) describe the period in which children move between the home culture and the school culture as the 'fire stick' period. They note that, just as the fire stick is not something to be left behind, but moves between sites to light fires, Indigenous children need to know that their home culture is to be kept alive as they move backwards and forwards between the cultures of home and school. The fire stick period, they say, equates with the time needed for Indigenous children to learn how to navigate between their home and school cultures.

Access to high-quality preschool education can provide invaluable preparation for school and enhance school achievement for Indigenous children in the early years (Penman, 2006). High quality programs are generally agreed to be those where there are more highly qualified staff, groups are smaller, the ratio between staff and children is low, and there is involvement from outside experts and parents (Raban, 2000). In some areas, various formal preschool experiences are available to Indigenous children. These include play groups, preschools, multifunctional Indigenous services and mobile services. Preschool services particularly valuable in improving outcomes for Indigenous children involve Indigenous families and the community, engage parents in helping their

children, employ Indigenous staff, integrate child health services, and highlight Indigenous culture (McCrae et al., 2000). However, it is clear that not all Indigenous children have the advantage of these types of preschool experiences. Estimates of preschool attendance among Indigenous children are hampered by poor quality data collection; however, 2001 estimates from census data show the national participation rate in preschool for Indigenous children was below that of their non-Indigenous peers. Participation rates for three-year-olds were 20.5 per cent for Indigenous children, compared with 24.0 per cent for non-Indigenous children. More Indigenous children participate in preschool as four-year-olds (46.1 per cent), but this was significantly less than participation rates for non-Indigenous children (57.1 per cent) (Biddle, 2007). These rates also differ substantially across the states, reflecting state-based variation in funding and service availability (Penman, 2006). It is likely that factors like lower income and lower levels of education underlie differences in participation rates, as both are more common among Indigenous families (Biddle, 2007).

Standard Australian English as a second language for Indigenous students

At school entry, most Indigenous children speak a language or dialect other than Standard Australian English (SAE). In remote Indigenous communities, children may speak an Aboriginal language or Kriol as their first language, but for the majority of Indigenous children, their first language is Aboriginal English. Minority dialects such as Aboriginal English are often viewed by educators as an inferior form of English that needs to be corrected to allow children to learn SAE (Haig, Konigsberg, & Collard, 2005; Siegel, 2007). In reality, Aboriginal English is a complex linguistic system incorporating elements from Indigenous languages, and from English, as well as unique features reflecting meanings from Aboriginal culture (Dunn, 2001; Malcolm & Sharifian, 2005). Failure to recognise and incorporate students' home languages in the classroom may lead to Indigenous children feeling that their identity is being threatened, thus reinforcing the notion that school is a foreign and unfriendly environment (Sharifian, 2008). Even now, there is ongoing difficulty in recognising that Indigenous children often read and write SAE at the same time as they are first learning to speak it. Their need as learners of English as a second language requires specialist knowledge among educators of the complexities of both Aboriginal English and the pedagogical strategies best designed to support children to scaffold from their home language to acquire SAE.

Lack of recognition of the language backgrounds of Indigenous learners has led to ongoing problems in producing a coordinated approach to teaching SAE for Indigenous children, as well as a lack of appropriately trained teachers (Nicholls, 2005). Recently, more emphasis has been placed on reconceptualising Indigenous learners as non-native speakers of English, focusing instead on teaching English as a second or even third language (Zeegers, Muir, & Zheng, 2003). However, many common classroom practices in the teaching of English, in conjunction with misunderstandings of the structure of Aboriginal English, do not support school literacy achievement for Indigenous students (Zeegers et al., 2003). Researchers from the Centre for Applied Language Research at Edith Cowan University (ECU) working in conjunction with the Education Department of Western Australia on the *Towards More User Friendly Education for Speakers of Aboriginal English Project* stressed that effective literacy pedagogy for Indigenous students is built on the recognition that 'Aboriginal children present at school with a rich cultural and linguistic background' (Malcolm et al., 1999, p.9). In particular, authors of the MCEETYA Taskforce on Indigenous Education (MCEETYA, 2000) observed that educators of Indigenous children needed to develop better pedagogical understandings of the process of literacy development for Indigenous children.

Malcolm et al. (1999, p.12) proposed specific guidelines for teachers in teaching SAE to Indigenous students as a second language:

- learn what you can about Aboriginal culture;
- learn what you can about Aboriginal English—in particular, be more confident and comfortable about permitting the use of Aboriginal English in the classroom, and convey a message of cultural respect and inclusivity;
- be receptive to Aboriginal English dialect features and to what the student already knows;

- be receptive to home and family relationships;
- be receptive to community priorities;
- make explicit school culture; and
- make explicit what you want your students to learn

The diverse language backgrounds of Indigenous students present unique challenges in improving their educational outcomes in both literacy and numeracy. The challenge of literacy learning for Indigenous students impacts both on their acquisition of SAE and also their numeracy learning. Poor literacy learning will disadvantage students when there is an emphasis on solving worded problems. Success in numeracy requires learning the specialised language of mathematics, which must be taught to students explicitly if they are to progress further in mathematics (Warren, Young, & de Vries, 2007). Evidence suggests that acknowledging and integrating children's home language in the classroom, by teachers who are genuinely interested in their students' use of language, leads to a greater engagement in learning among students (Haig et al., 2005).

Quality teaching

It is clear that the quality of schools and of the teaching staff make a substantial contribution to improved student outcomes. Even among schools with similar socioeconomic characteristics, there is substantial between-school variation in student outcomes (Leigh & Thompson, 2008). Within schools, quality of teachers and teaching has been established as the most important factor in improving students' learning (Hattie, 2002; Leigh & Ryan, 2008; Rowe, 2003; Rowe, 2006). For this reason, the issue of 'quality' teaching has become a major issue internationally, and in Australia specifically, where teacher quality in relation to literacy teaching has been the subject of inquiry (Leigh & Ryan, 2008; Rowe, 2006).

In comparatively recent years, Australian national and state education jurisdictions have attempted to improve teacher quality through various kinds of regulation. All Australian States and Territories have now established teacher registration bodies that mandate the necessary qualifications to obtain registration as a teacher. Most Australian teachers have now spent four years in pre-teacher education programs at approved universities. Some teachers, however, such as those who were teaching before the establishment of registration bodies, have yet to meet requirements; with some evidence that these teachers may be concentrated in Indigenous schools (Hughes, 2008). Special arrangements have been made to accommodate these teachers, which some writers contend may be adversely affecting the learning of Indigenous students.

Professional teaching standards that explicate what effective teachers should be expected to know and do are used increasingly as the basis of teacher education courses and on-going professional learning in countries across the world. Most sets of national and international professional teaching standards now reflect an expectation that teachers will develop an understanding of their students and their cultural backgrounds. The United States National Board for Professional Teaching Standards Social Studies-History Standards (p. 8) outlined this responsibility as follows:

Teachers understand that factors such as language, socioeconomic conditions, ethnicity and gender can influence learning. They see student diversity as an asset that can facilitate the pursuit of academic, social and civic aims...These teachers know that culture may affect the interactions they have with students, because children from various cultural backgrounds might be accustomed to differing authority structures or forms of social interaction.

Similar standards are reflected in the requirements of some individual Australian state jurisdictions for accreditation of university teacher education courses and for teacher registration; however, national and state mechanisms in Australia for ensuring that teachers meet the standards are still comparatively weak (Kleinhenz & Ingvarson, 2004). Current moves towards more stringent accreditation of teacher education courses, as well as the introduction of a form of national 'accreditation' or 'certification' for teachers based on agreed professional standards, have strong potential to improve the quality of instruction for Indigenous children. Recommendations from the National Inquiry into the Teaching of Literacy go so far as to suggest linking teacher registration to

an ability to demonstrate literacy skills for effective teaching and verified capacity to teach literacy in a teacher's chosen area (Department of Education, Science and Training, 2005). In 2011, National Professional Standards for Teachers were finalised by the Australian Institute for Teaching and School Leadership (AITSL). These standards were endorsed by Ministerial Council for Education, Early Childhood Development and Youth Affairs (MCEECDYA) in December 2010. Seven professional standards describe what teachers should know and be able to do in three teaching domains at four different career stages (graduate, proficient, highly accomplished and lead teachers). The domain of professional knowledge includes Standard 1 'know students and how they learn' and Standard 2 'know the content and how to teach it'. These standards include an expectation that a graduate teacher will have a broad understanding of and a respect for the culture, history and language of Aboriginal and Torres Strait Islander students in order to understand the impact on their education and to promote reconciliation between Indigenous and non-Indigenous Australians.

A positive impact of teaching on students' developing literacy and numeracy skills is most likely to occur if teachers are well prepared. Certainly, the majority of beginning teachers believe that they are well prepared to teach, to use curriculum documents to support their literacy teaching, and to teach specific aspects of literacy (although teachers are more confident in their preparation to teach reading, writing, speaking and listening compared with viewing, spelling, phonics or grammar) (Louden & Rohl, 2006). There is, however, good reason to believe that teachers are inadequately prepared in their teacher education, or in subsequent professional development, to teach literacy skills using proven strategies grounded in an evidence basis (Department of Education, Science and Training, 2005). There is also evidence that beginning teachers feel less prepared to teach literacy to students from disadvantaged backgrounds. Only about one third of beginning teachers in Louden and Rohl's (2006) study felt prepared to teach Indigenous students and very few senior teachers believed that new teachers were adequately prepared to teach literacy to Indigenous students. Often teachers' lack of preparation to teach Indigenous children is reflected in inadequate knowledge about the background of Indigenous students and a lack of key competencies to help Indigenous students acquire literacy skills (Tripcony, 2000). Most teacher education courses in universities across Australia make some provision for specialist instruction in the teaching of literacy to Indigenous students; however, the amount and nature of this provision varies greatly among courses and providers. This variation is symptomatic of a wider problem in teacher education, with recent recommendations for national accreditation of teacher education courses to improve consistency, increase rigour and make teaching qualifications more portable (Department of Education, Science and Training, 2005).

Children's acquisition of numeracy skills are also profoundly influenced by the effectiveness of the instruction that they receive (Hattie, 2002). Teaching numeracy is challenging; it requires a deep understanding of the mathematics involved and an appreciation of how to create contexts that lead students to engage with numeracy in meaningful ways. A number of different strategies have been identified that are thought to be effective in supporting Indigenous students to learn numeracy. These include exploring mathematical language explicitly to develop a common understanding of mathematical terms, allowing opportunities to discuss mathematical learning, relating mathematical problems to traditional Indigenous culture and contemporary Indigenous issues, as well as using a range of instructional styles and activity types (Frigo, Simpson, & Wales, 2000; Frigo & Wales, 1999; Groves, Mousley, & Forgasz, 2006; Sakrzewski, 1997).

The adequacy of teacher preparation for successful mathematics teaching has been questioned. Graduates enrolling in primary teaching courses are unlikely to have a strong mathematics background and their preparation to teach in this area has been viewed as inadequate (Senate Standing Committee on Employment, Workplace Relations and Education, 2007). A range of factors contributes to poor quality teaching of numeracy. These factors include reliance on discovery-type activity with insufficient guidance and support, an overemphasis on computation skills at the expense of meaning, a lack of continuity, a too-rapid coverage of the curriculum, a lack of revision, and moving to an abstract and symbolic level too soon (Westwood, 2008). Westwood also notes that teachers often fail to take into account students' individual needs in mathematics learning. These factors are likely to be particularly critical for Indigenous learners who may

experience other risk factors including absence from school (which is particularly problematic in numeracy due to the hierarchical nature and interconnectedness of the concepts being taught), racism and community dysfunction (Watson, Partington, Gray, & Mack, 2006).

Quality teaching of Indigenous students requires teachers to understand and empathise with the home backgrounds of their students. There is good evidence that Indigenous teachers are well positioned to understand and respond to the experiences of marginalised Indigenous and non-Indigenous students, as well as to act as role models for achievement (Hartsuyker, 2007; Santoro, 2007). Indigenous teachers are also ideally placed to utilise their cultural understandings to provide appropriate scaffolding for Indigenous learners. School learning activities are most effective when they are designed to integrate and build on students' prior knowledge and experiences in and out of school. This is easier to do when the teachers' own cultural experiences are similar to those of their students. Where the cultural experiences of teachers and students are different, it is the professional responsibility of teachers to be familiar with the cultural knowledge that students bring to school, and to respect and value that knowledge. Teacher education has a role to play in this respect in preparing teachers to teach students from culturally diverse backgrounds (Santoro, 2007). It is also essential that teachers have access to ongoing, relevant professional development targeted at the teaching of literacy and numeracy to Indigenous students.

Overall, there are very few trained Indigenous teachers. Many teachers in remote Indigenous communities who are fully qualified are young, inexperienced, non-Indigenous and tend to spend only a short periods of time at the school (Hughes, 2008; Warren, Cooper, & Baturu, 2010). Ongoing efforts to recruit and retain Indigenous teachers have been largely unsuccessful (Hartsuyker, 2007). For instance, in New South Wales in 2000, only 32 Indigenous teachers were registered (Santoro, Reid, Simpson, & McConaghy, 2004). Indigenous people comprise 28 per cent of the population of the Northern Territory and yet in 2007 only 164 (3.6%) of 4572 teachers registered in the Northern Territory were Indigenous; of these only 75 were fully qualified (Hughes, 2008). The remaining Indigenous teachers have limited qualifications mainly obtained through the Batchelor Institute of Indigenous Education. Indigenous students, particularly in very remote areas, may not have access to a fully qualified teacher. Sometimes a teacher's aide, paid through Community Development Employment Projects, is the only teacher in a class. Teacher's aides often lack basic English literacy and numeracy skills and receive only minimal training and support from qualified teachers (Hughes, 2008).

It is clear that Indigenous teachers are underrepresented in Australian schools. Although there is no direct evidence that Indigenous teachers are better for Indigenous students (Penman, 2006), it could be suggested that improving understanding of Indigenous issues in education is best attained by providing opportunities for more Indigenous people to train as teachers. The Review of Teaching and Teacher Education conducted in 2003 asserted that:

Prospective Indigenous teachers need to be attracted to the profession in greater numbers. Such teachers serve as role models, infuse a broader range of cultural perspectives into schools, and bring a capacity for closer rapport and identification with students from Indigenous backgrounds (Department of Education, Science and Training, 2003a, p. 21).

The Report on the Inquiry into Teacher Education (Hartsuyker, 2007) suggested that Indigenous students could be attracted to teaching courses through (1) developing new programs and redesigning existing ones to: adopt culturally-appropriate pedagogy, (2) involving the community in the design and content of courses (particularly in remote areas), (3) offering flexible delivery modes, (4) instituting equitable selection methods, and (5) offering varied pathways to teaching (such as encouraging Aboriginal and [Torres Strait] Islander Education Officers [AIEOs]³) to formalise their training and qualify as teachers). Fully qualified Indigenous teachers face additional challenges in teaching. They may experience ongoing problems establishing an identity in the school independent from an expert in Indigenous issues, and they often find that all Indigenous matters in the school become their responsibility (Reid & Santoro, 2006). Moreover, they often feel

³ Within this report, the abbreviation AIEO is used to refer to Australian Indigenous people employed by schools in a para-professional capacity to support the education of Australian Indigenous students.

under pressure to act as the mediator between the school and the local Indigenous community (Reid & Santoro, 2006). It is also apparent that Indigenous teachers still experience a great deal of discrimination and questions about the authenticity of their qualifications (Asmar & Page, 2009).

Regular attendance at school

Though reliable data are relatively scarce, existing evidence suggests rates of school attendance of Indigenous students throughout school are lower than those of non-Indigenous students (Bourke et al., 2000; Purdie & Buckley, 2010; Taylor, 2010). Poor school attendance is a risk for school attrition; Indigenous students are more likely to leave school early, resulting in school completion rates that are half those of non-Indigenous students (Gray & Beresford, 2008). Irregular attendance at school may have an adverse impact on school achievement, and is also likely to contribute to a broader sense of disconnection and isolation from the school environment and community (Mellor & Corrigan, 2004; Taylor, 2010). There is, however, wide variation in attendance rates between Australian states and across different geographic areas. Attendance rates are particularly poor in remote areas compared with urban areas, and even vary substantially between schools in remote areas (Schwab, 1998). There is significant variation between Indigenous students in levels of school attendance. Many Indigenous students attend school regularly and are absent from school on relatively few days. Yet there is a significant minority, especially during secondary school, who are reported absent for extended periods (more than 30 days in a year), often for reasons that are unexplained (Bourke et al., 2000).

School achievement is invariably linked with regular attendance; irregular attendance at school among Indigenous students is thus often viewed as contributing to low attainment, poor English language ability and low literacy and numeracy skills (Bourke et al., 2000; Gray & Beresford, 2008). Though some authors have argued for a strong link between the acquisition of literacy and numeracy skills and regular school attendance, there are few empirical tests of the relationship (Ehrich et al., 2010). As part of a pilot program to improve literacy achievement in the Northern Territory, Ehrich et al. (2010) assessed growth in literacy skills over one term among Indigenous and non-Indigenous students in the first four years of primary school. Indigenous children attended school less frequently than non-Indigenous children and for students assessed on an intermediate level test, phonological awareness and early literacy skills were highly associated with attendance. Other data suggests that the relationship between literacy achievement and absenteeism is, at best, weak (Cowey, Harper, Dunn, & Wolgemuth, 2009).

It is likely that absenteeism, rather than acting as a causative factor in low school achievement, is one component of systemic barriers to Indigenous educational achievement. The reasons for poor attendance by Indigenous children are entrenched, complex, and often established at preschool (Taylor, 2010). There is often a correlation between attendance and severe socioeconomic disadvantage (Gray & Beresford, 2002). Policy efforts focused on forcing parents to take responsibility for their children's school attendance (by linking welfare payments to regular attendance) may be of limited effectiveness, especially when they target families experiencing genuine disadvantage (Purdie & Buckley, 2010; Taylor, 2010). Absenteeism may also be symptomatic of a wider sense of disengagement from the school community. A sense of isolation among disaffected students is then merely compounded by repeated absenteeism. Student engagement with school is therefore likely to be a major factor in promoting attendance. A sense of belonging is integral to a sense of self and can influence learning behaviour. According to Osterman (2000), students who are engaged with the school are more motivated and eager to learn. Osterman (2000) further contends that schools have much to contribute to students' engagement with school through effective instruction, teacher support, and a strong school culture.

Culturally inclusive schools and culturally responsive teaching

Culture may be defined as the 'set of ideas, beliefs, assumptions, and norms that are widely shared among a group of people and that serve to guide their behaviour' (Tharp, Estrada, Dalton, & Yamauchi, 2000, p. 107). Such an understanding of culture has implications for being culturally responsive in educational contexts, although there are various interpretations of what this might

mean in practice. A common understanding is that culturally responsive teaching builds on the cultural experiences of Indigenous students (and other students from ethnically diverse backgrounds) to teach more effectively. Culturally responsive teaching assumes that learning will be promoted when the concepts and skills taught are placed within a frame of reference that is meaningful to the student (Gay, 2002; Hayes, Mills, Christie, & Lingard, 2006).

Indigenous education policy documents consistently call for the adoption of culturally appropriate pedagogy based on a body of international research which promotes teaching that is culturally appropriate, relevant and responsive (MCEETYA, 2000). Disregarding cultural differences may have the unintended consequences of disadvantaging, marginalising and even alienating some students. Nevertheless, in many Australian schools, the curriculum and teaching takes little account of Indigenous perspectives and it is rare for the teaching of literacy and numeracy to be related to Indigenous culture in meaningful ways (Baturu, Matthews, Underwood, Cooper, & Warren, 2008). Traditional pedagogical practices used in Australian classrooms are often not appropriate for teaching Indigenous students. For instance, the concept of 'shame' is highly significant in Indigenous culture. Use of open-ended questioning in the classroom, where students may not know the correct answer, has the potential to shame children in front of their peers. Students may also be reluctant to display their work in front of their peers but may be pleased for the teacher to describe the student's work to the class (Zevenbergen et al., 2004).

As previously noted, applying a broad definition of literacy entails regarding literacy development as a social process that cannot be separated from its social and cultural context (De Lemos, 2002). Many educational activities chosen by teachers assume culturally embedded understandings that Indigenous students may not possess (MCEETYA, 2000). These activities do not support Indigenous children to become effective readers and writers, or to develop mathematical competence. Penman (2006), for instance, argues for a literacy curriculum that acknowledges and respects children's existing cultural knowledge. She maintains that confining literacy curriculum content to non-Indigenous cultural traditions and stories (e.g. English nursery rhymes) of which children have no prior knowledge, can cause severe problems for young children who are starting their literacy learning.

A challenge for Indigenous children is that they often come to school speaking languages other than SAE. A key element of cultural inclusivity in schools is recognising the diversity of Indigenous languages, and showing interest in and respect for the use of Indigenous languages. According to an ACER study undertaken in 1998, research shows that several factors are important for effective English literacy teaching and learning practices for Indigenous students. It is important to (a) model SAE and explicitly teach children to code-switch between languages and dialects; (b) understand students' cultural and social environment and employ appropriate teaching strategies; (c) provide training and support for AIEOs; and (d) ensure schools and parents work in partnership to provide environments where students can consistently attend and productively engage in educational opportunities (Batten et al., 1998).

In regard to teaching numeracy, a recurrent theme in the research literature is the need for education systems and teachers to appreciate the diversity of Indigenous cultures and understandings, and to make connections between these and the Western mathematics presented in Australian schools. Many teachers believe that the teaching of mathematics in particular can occur independently of cultural considerations (Gay, 2002). However all students, Indigenous and non-Indigenous, will encounter cultural conflicts in their mathematics classrooms. For Indigenous students, such cultural conflict may occur through the teaching strategies used, the lack of relevance of mathematics activities, confusion in the mathematics language being used ('more' or 'less' may pose particular problems for Indigenous students), or through teachers' lack of awareness of the social, cultural and historical issues that Indigenous students bring to the mathematics classroom. An awareness (among teachers) of the need to link home language and concepts with traditional mathematical language can act as a scaffold for children to relate mathematical concepts to known understandings (Zevenbergen et al., 2004). Perso (2003) presents a model for numeracy education for Indigenous students which incorporates the three elements of: Indigenous people and their cultures; the mathematical understandings brought into the classroom by Indigenous children; and explicit

mathematics teaching, which is required by all children in our schools. According to Enydedy and Mukhopadhyay (2007), theories about culturally relevant teaching approaches in relation to mathematics include a consideration of one or more of the following aspects of instruction:

- *content*—a focus on the familiarity of the content or context of the lesson and the extent to which contexts are taken from students' daily lives;
- *purpose*—a focus on the motivational value of a lesson's perceived value to students' lives outside the school; and
- *process*—the familiarity of the process and participation structures by which students engage with the lesson, and the degree to which students' existing repertoires for participation are made legitimate in the academic context.

A school environment may claim to be culturally inclusive, acknowledging outwardly that their school welcomes all cultures. However, the school may not necessarily be culturally responsive, whereby the school actively seeks to create an environment that integrates Indigenous perspectives and responds to the needs of students and the communities (Watson et al., 2006). Even when there is an attempt to include Indigenous content in the school curriculum, without consultation or input from local Indigenous communities the result may well be a tokenistic inclusion of Indigenous perspectives (Herbert, 1999). Watson et al. (2006) identified a number characteristics of culturally responsive schools that were associated with higher Indigenous achievement in numeracy. These included encouraging student risk-taking and minimising the risk of being right or wrong, providing tasks that scaffold learning and build on what is known, valuing both Western and Indigenous mathematics and engaging in explicit teaching of their differences, and providing a range of learning environments, including outdoors. Effective teachers of Indigenous students require an appreciation of the cultural experiences of their students, and the way in which student backgrounds impact upon learning in the classroom (Howard & Perry, 2001). An ongoing challenge, however, to instituting a culturally inclusive curriculum is that teacher knowledge about the social and cultural background of Indigenous students may be fairly limited (Howard & Perry, 2005).

Creating a culturally inclusive school environment depends also on building strong working relationships between schools, parents and communities. Students benefit through involving families in the life of the school, by minimising discontinuities between home and school, and by establishing a shared understanding between parents, teachers, schools and communities about goals for students. Students benefit when schools acknowledge and respond positively to socially and culturally diverse communities rather than just trying to transmit 'school knowledge' (Cairney, 2000). Goos, Lowrie and Jolly (2007) assert that investing in developing partnerships between home and school can facilitate learning by strengthening teacher-student relationships. In relation to numeracy learning Goos et al. (p. 22) argues that:

Building strong home-school-community partnerships around children's learning in general can lay the groundwork for numeracy-specific learning. In culturally diverse communities we would suggest that partnership building is of paramount importance, and should precede—or at least accompany—the introduction of educational programs that seek to initiate children into numeracy practices that are valued but different from those of their home culture.

Standards developed by teacher registration bodies to define what good teachers should know and be able to do increasingly refer to the importance of teachers knowing their students' cultural backgrounds and developing understandings about diversity. Such knowledge is now being recognised as an important aspect of the professional knowledge base of teaching. The idea that schools should be culturally inclusive is now well established, but there is often a range of interpretations of what that might mean in practice. Though schools and individual teachers now implement a range of practices that they would regard as culturally inclusive, there still needs to be more rigorous research to test the commonly held view that culturally-based education that applies culturally relevant pedagogy, materials and curriculum is an important factor in enhancing the achievement of Indigenous students at school.

Summary

The acquisition of effective literacy and numeracy skills is critical to ensuring effective participation in society. Failure to develop literacy and numeracy presents risks for school attrition, poor employment prospects, and welfare dependency. Thus, it is of ongoing concern that existing data on literacy and numeracy achievement through primary school reflects a substantial gap in achievement between Indigenous and non-Indigenous students. This section has provided a review of some of the foundational issues underlying the gap in Indigenous educational achievement, as well as highlighting those factors (such as quality teaching and preschool attendance) that are likely to have a substantial impact on improving educational attainment for Indigenous students. Recognition of the challenges faced by many Indigenous learners has led to the development of long-term strategies as well as many short-term interventions to improve the achievement of Indigenous students in literacy and numeracy. A small number of these initiatives are discussed in Section 2.5 (literacy) and 2.6 (numeracy). Ongoing efforts to collect data (both quantitative and qualitative) to track the achievement of Indigenous students and highlight successful interventions to improve outcomes remain important.

2.5 PROMOTING LITERACY LEARNING AMONG INDIGENOUS STUDENTS

Many national and state-specific policies and programs have been instituted to improve the literacy achievement of Indigenous students. Since children's literacy development occurs most intensively in the early years of life, the majority of literacy programs and interventions are concentrated in the primary years of schooling. In this section, several examples of programs and strategies designed to enhance literacy skills for Indigenous children will be briefly described and evidence of their efficacy assessed.

The National Indigenous English Literacy and Numeracy Strategy (NIELNS)

Current programs that support the literacy learning of Indigenous students continue to be based on the NIELNS. The ongoing objective of NIELNS is to raise literacy and numeracy standards for Indigenous students to levels comparable with other young Australians. Since 2005, NIELNS has concentrated on the practices of teachers and their support staff, preparing Indigenous children for formal schooling, and helping to engage Indigenous students in schooling to increase Year 12 retention rates.

NIELNS maintained the successful strategies of former initiatives (notably the *Strategic Results Projects* 1998–1999). Some of these strategies were directed towards achieving 'intermediate outcomes' such as improving children's confidence and eating habits, and others towards improving 'readiness for learning' outcomes such as improved attendance, behavioural readiness for learning and better prepared teachers. Other strategies contributed more directly to the improvement of learning outcomes. The NIELNS program has been implemented in government, Catholic and independent schools. Most initiatives were delivered in the schools by independent providers.

An evaluation of the NIELNS program (Department of Education, Science and Training, 2003b), showed that the great majority of NIELNS initiatives were achieving results that contributed to outcomes in the six elements of the program: *Achieving Attendance; Overcoming Hearing, Health and Nutrition Problems; Pre-Schooling Experiences; Getting Good Teachers; Using Best Teaching Methods; Measuring Success, Achieving Accountability*. In general, the evaluation showed that successful results were more likely to be obtained for on-going than short-term interventions, which the authors thought demonstrated that improving literacy and numeracy was a long-term process requiring a sustained intervention. Table 2.1 shows a selection of strategies used by initiatives rated as successful to achieve improved outcomes for each of the six NIELNS elements (see Department of Education, Science and Training, 2003b, pp. 12–14).

In most cases, providers of initiatives targeting Elements 1 (Achieving attendance), 2 (Overcoming hearing, health and nutrition problems) and 4 (Getting good teachers) were unable to establish a direct connection between successful achievement of readiness for learning outcomes and literacy achievement. However, it has been argued previously that these elements are fundamental to redressing disadvantage. Indeed the evaluators contend that ‘It seems self evident, nevertheless that numeracy and literacy outcomes are unlikely to improve unless these foundations for learning are in place’ (Department of Education, Science and Training, 2003b, p. 13). A stronger connection between implemented strategies and improved literacy and numeracy outcomes was evident for Elements 3 (Preschooling experiences) and 5 (Using best teaching methods).

Table 2.1 Strategies used to improve outcomes for the NIELNS elements (Department of Education, Science and Training, 2003b, p. 12–14)

| NIELNS Element | Strategy |
|--|--|
| 1. Achieving attendance | <ul style="list-style-type: none"> • using practical and relevant curriculum and activities to stimulate student interest and, in turn, attendance; • improving access to schooling; • using Indigenous staff to provide liaison between home and school and to give them a sense of belonging; • providing assistance in transition from home to school and from school to work; • increasing parental involvement in the school; and • transporting students to school or preschool. |
| 2. Overcoming hearing, health and nutrition problems | <ul style="list-style-type: none"> • health checks/assessments; • programs to provide meals and educate families and communities; • hearing assessments and awareness raising about Otitis Media and hearing loss; and • VET programs to increase the number of trained and qualified Indigenous health workers. |
| 3. Preschooling experiences | <ul style="list-style-type: none"> • early intervention to promote early literacy in play; • assisting transition to school, including parental involvement; and • using materials that support, value and represent Aboriginal culture in literacy programs in preschools. |
| 4. Getting good teachers | <ul style="list-style-type: none"> • employing additional teachers with literacy and numeracy specialist skills; • improving teacher retention through improved employment conditions; • scholarship support for Indigenous staff or students to undertake Degree/Graduate Diploma teacher education; and • employment of Indigenous teaching or teaching support staff in schools with significant Indigenous student populations. |
| 5. Using best teaching methods | <ul style="list-style-type: none"> • developing or modifying curriculum and devising methods that are suitable for Indigenous literacy and numeracy needs; • supporting teachers with materials, information and advice on techniques and training in specific techniques; • providing intensive literacy and numeracy assistance through special modules and extra teachers in VET or VET in School courses; and • literacy testing leading to individual learning plans and modified curriculum. |
| 6. Measuring success, achieving accountability | <ul style="list-style-type: none"> • providing reports to parents, together with opportunities to discuss feedback; and • the development of student tracking systems to provide better data about students. |

Making Up for Lost Time in Literacy (MULTILIT)

The MULTILIT program developed by Wheldall and Beaman (2000) from the Macquarie University Special Education Centre (MUSEC) has been promoted as highly successful in improving the literacy levels of Indigenous children. Across a number of studies undertaken by the MULTILIT developers, MULTILIT has been shown to be effective in improving the reading performance of older low-progress readers (Pogorzelski & Wheldall, 2002; Wheldall & Beaman, 2000; Wheldall et al., 2010). The initiative focuses on developing effective approaches to teaching older students who are making little or no progress in developing literacy skills and are typically at least two years behind their peers in reading ability. Students attend programs at the clinic at MUSEC and in MULTILIT outreach programs. The MULTILIT initiative focuses not only on service provision, but on ongoing research and product and program development.

MULTILIT uses a non-categorical approach based on considering the needs of individual learners, rather than assuming that a particular teaching approach is necessary for children with a specific disability. Positive teaching is used within MULTILIT as the approach to classroom behaviour management, with all teachers trained in MULTILIT attending a positive teaching course. MULTILIT instruction is designed around the specific needs of the individual learner and relies on a process of planning, managing, delivering and evaluating the instruction.

MULTILIT teachers are comprehensively trained in the Reading Tutor Program, which is the core of the MULTILIT curriculum. Students undertaking the Reading Tutor Program are taught daily, both individually and in small groups, with a focus on three core elements. First, children learn *Word Attack Skills*, which involves learning how to decipher unknown words through learning phonic skills, like breaking up words into their component letter-sounds and 'blending' component letter sounds into words. Second, MULTILIT teaches students to read about 300 common *Sight Words* that can be read automatically without recourse to decoding. Third, during *Reinforced Reading* students undertake reading with a tutor for up to 15 minutes. Tutors use a 'pause, prompt and praise' approach to assist the student to read the text, whereby the tutor pauses after a mistake to allow time for self-correction, supplies prompts to help the child if no self-correction occurs, and provides praise when the student reads correctly, self-corrects, or uses a prompt to read a word (Ellis, Wheldall, & Beaman, 2007).

During 2005 and 2006, the MULTILIT program was trialled at Coen State School in Cape York. At the time, approximately 2400 students were enrolled in schools in Cape York, of whom more than 60 per cent were Indigenous. It was estimated that as many as 80 per cent of Indigenous students in Cape York Schools could require remedial literacy instruction (Cape York Institute, 2007b). At the start of the project, the reading age of students in the project lagged behind their chronological age on average by 39 months in reading accuracy and 45 months in reading comprehension (Storry, 2007). Over the course of the project, students undertook three hours of individual daily instruction for approximately 17 to 18 weeks with MULTILIT professionals from Sydney and local tutors at a MULTILIT Tutorial Centre established at the school. Over the course of a year, fifteen primary school aged children present for the whole year made substantial gains in literacy ability, including 21.4 months in reading accuracy, 10.4 months in reading comprehension, 19 months in single word recognition, 25.9 months in phonic decoding, 22.8 months in spelling, and achieved 75 per cent more words read correctly per minute (Wheldall & Beaman, 2006). These gains occurred despite inconsistent attendance (75 per cent and 67 per cent of all sessions for two groups attending the centre).

Based on the experiences at Coen State School as well as other sites successfully employing MULTILIT to enhance the literacy achievement of Indigenous students, additional support was provided to extend the MULTILIT program in the Cape York region. In 2007, the Senate Standing Committee on Employment, Workplace Relations and Education approved substantial additional funding to implement the MULTILIT program through a partnership between the Cape York Institute for Policy and Leadership and Macquarie University Special Education Centre (MUSEC) (Cape York Institute, 2007a). Support through MULTILIT was to be provided in the communities of Coen, Hope Vale, Aurukun, and Mossman Gorge in the Cape York region of Queensland. It is

envisaged that substantial gains can be made in increasing literacy levels among Indigenous children through establishing MULTILIT tutorial centres at schools and extending MULTILIT practices to ordinary classrooms.

The National Accelerated Literacy Program (NALP)

The NALP is an approach to teaching literacy designed to accelerate the performance of underachieving students. The program provides integrated activities centred on an age-appropriate reading text. NALP is founded on core theoretical principles designed to make explicit the rules underlying literacy lessons, ensuring that texts selected are literate and close to age-appropriate, and by selecting a text that is within the child's zone of proximal development (Cowey, 2005). Teachers undertaking an accelerated literacy approach, work to support students to read texts that are in advance of their reading age by providing a scaffold to develop new understandings, rather than limiting struggling readers to texts suitable for very young readers (Cowey, 2005, 2009).

From 2004–2008, the Northern Territory Government Department of Education and Training (DET) in conjunction with the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) committed significant funding to expand and develop the program. During Phase 1 of the implementation, the program focused on increasing the number of schools involved in the Accelerated Literacy Program and dramatically increasing the number of teachers trained in the approach (Robinson et al., 2009). The implementation sought to increase capacity to deliver the accelerated literacy approach through providing professional development and ultimately training in the approach at the university level. Staff turnover in schools is a particular problem in the Northern Territory which could impact upon the progress of the implementation and the degree to which schools adopting accelerated literacy would develop and maintain networks (Robinson et al., 2009).

An evaluation of the National Accelerated Literacy Program described variable opinions about the initiative's success from staff involved in the implementation (Robinson et al., 2009). Teachers were neutral about the degree to which professional development training and support had enhanced their confidence to teach the Accelerated Literacy Program. Observations of accelerated literacy practice in classrooms found that of nine criteria only *whole lesson organisation* was rated as effectively implemented. Moreover, even when Accelerated Literacy School-Based Coordinators had received a complete allocation of professional development support, they were not necessarily able to effectively support teachers to implement accelerated literacy.

Students participating in the Accelerated Literacy Program between 2005 and 2007 undertook either the Individual Level Test (IL) or the Test of Reading Comprehension (TORCH) as measures of reading achievement. For children assessed using the IL, 31.8 per cent showed acceleration in literacy achievement and 38.9 per cent showed no progress. In contrast, for children assessed with the TORCH, 47.8 per cent showed accelerated reading progress and 24 per cent showed no progress (Robinson et al., 2009). Rates of accelerated progress among Indigenous students in remote areas were particularly poor in relation to other students. The evaluation authors concluded that for students who entered the program at approximately Year 4 level of literacy, the Accelerated Literacy Program held substantial promise in closing the gap between Indigenous and non-Indigenous students; however, the efficacy of the program for Indigenous students in remote areas was limited. This large-scale system-wide undertaking showed promise in improving the literacy achievement of Indigenous students, but also revealed the challenges in changing practice and in providing ongoing support for teachers to deliver improved outcomes for students.

The Murdi Paaki Council of Australian Governments (COAG) Trial

Improving the literacy achievement of Indigenous students is largely contingent on garnering the support of Indigenous people and their communities. Since 2001, COAG has led an initiative of eight trials around Australia that aim to improve coordination of government services, including education, to Indigenous communities based on priorities agreed to by communities. Each trial is led by a partnership of Australian and State and Territory government agencies. The COAG trials

are based on the philosophy that successful interventions to improve conditions for Indigenous people can only occur with the full participation of Indigenous people and their communities. For this to occur, shared understanding must be developed between Indigenous communities, government and other agencies at a variety of levels. Appropriate structures to encourage full and trusting communication among all stakeholders also need to be established.

One of the most successful COAG trials was a shared initiative between Indigenous communities and the Australian and New South Wales governments at Murdi Paaki. The Murdi Paaki region in the north-west of New South Wales comprises 16 major Aboriginal communities. In 2001, there were 7542 Indigenous people living in the region, some 14 per cent of the total population (Department of Education, Employment and Workplace Relations, 2008). In 2003, the percentage of non-Indigenous students in Murdi Paaki in the two highest achievement bands for literacy and numeracy in Year 3 was three times that of Indigenous students. The situation was similar for literacy in Year 5 (Schwartzkoff, Fear, & Corrigan, 2006). Measures of school attendance and retention, unemployment, imprisonment, victimisation, domestic violence, and child abuse or neglect among Indigenous communities in the region reflected disadvantage on multiple indices (Schwartzkoff et al., 2006).

Student literacy was a significant focus of the Murdi Paaki project. As part of the project, a number of initiatives were developed to improve literacy rates among Indigenous students by increasing access to books for disadvantaged Indigenous students. For instance, the *Books in Homes* initiative commenced in June 2003 and provided funding (through the Department of Education, Science and Training in conjunction with the Alan Duff Charitable Foundation for Books in Homes Australia [BIHA]) for nine free books each year to all primary school aged children in the Murdi Paaki region. The purpose of the intervention (which originated in New Zealand) was to improve literacy levels for children who may lack access to books in the home (Warrilow, Fisher, & Valentine, 2004). Approximately 6000 students, of whom 2000 were Indigenous, benefited from this program. Most of these students came from low socioeconomic situations, lived in remote areas, attended disadvantaged schools where access to new books was limited, and had below average literacy ability. In conjunction with the *Books in Homes* initiative, the *Caught Being Good* incentive (introduced in Term 4, 2005) provided opportunities for students to earn a new book each week through demonstrating positive behaviours at school. For example, students could be 'caught being good' by doing their homework, reading their books at school and at home, doing something special for their school or their environment, improving their grades, or showing respect for their teacher and peers. Each participating school also received 144 new books each year for their library. By mid-2006, BIHA had processed 45 000 orders and delivered 136 426 new books to approximately 5800 students in 50 participating Murdi Paaki schools.

Although these initiatives are highly regarded in the region, there is little hard data on their effectiveness. An evaluation of the Murdi Paaki trial, conducted in 2006, found that substantial progress had been made in helping Indigenous communities and State and Australian governments work together to improve opportunities for Indigenous people (Schwartzkoff et al., 2006). Community Action Plans (CAP) had been completed for each of the sixteen Indigenous communities and Community Working Parties (CWP) were playing a central role as the primary mechanisms for representation and consultation at the community level. Further initiatives had been developed by, or involved input from CWP. These included the Rivertowns Project, which involved community facilitators working with four communities in the Rivertowns area, activities under the Drug Education Strategy, and activities in conjunction with the NALP. Nonetheless, at the time of the evaluation, there was little evidence that the Murdi Paaki Trial had resulted in better outcomes for Indigenous communities. The primary achievement was establishing improved structures for government coordination and communication; this, the evaluators argued, was expected to result in better outcomes for Indigenous people over the longer term (Schwartzkoff et al., 2006).

Summary

Early evaluations of programs such as MULTILIT, the NALP, and the Murdi Paaki COAG Trial suggest that improvements in Indigenous literacy achievement have occurred as the result of targeted programs in specific locations, although it is difficult to find reliable data to confirm that a particular approach or program for teaching literacy skills to Indigenous students has led to sustained improvements in learning outcomes. Longer-term evidence is needed, and research on the initiatives described and others continues. There is a considerable body of qualitative evidence, in the form of case studies and anecdotal evidence, that strongly suggests there have been improvements in student engagement, as well as actual gains in literacy learning among groups of Indigenous students and individuals in particular schools. Nevertheless, it is clear from existing data that the gap in literacy achievement of Indigenous and non-Indigenous students persists despite interventions, and that this gap becomes wider as students progress through school (see for instance recent NAPLAN results, Australian Curriculum Assessment and Reporting Authority, 2009).

2.6 PROMOTING NUMERACY LEARNING AMONG INDIGENOUS STUDENTS

During the past decade, there has been an increased focus on numeracy as an outcome of schooling. As a result, there is a growing level of activity in policy development and in funding programs to improve students' numeracy skills. Many of these policies recognise equity issues and focus on improving learning experiences for young people, including Indigenous students, who experience disadvantage in terms of schooling outcomes. National policies, as well as state-based initiatives have focused specifically on improving numeracy learning for Indigenous students. The following section provides an overview of a selection of these initiatives.

Count Me In Too (CMIT) and Count Me In Too Indigenous (CMITI)

The CMIT numeracy project operates in New South Wales primary schools. The CMIT project has been ongoing in New South Wales for more than a decade, with phases of development, implementation and evaluation stimulating further expansion of the program. Over time the project has extended from lower to higher levels of primary schooling, and has expanded the curriculum focus from number to measurement (Bobis, Clarke, Clarke, Thomas, & Wright, 2005). CMIT focuses on improving teacher knowledge through professional development, and aims to improve student outcomes by developing teacher knowledge about the strategies students use to solve mathematics problems. The basis of CMIT is the Learning Framework in Number (LFIN) which employs Steffe's (Steffe, 1992; Steffe, Cobb, & von Glasersfeld, 1988) psychological model of the development of counting as a qualitative progression in the way that children use counting to solve problems (Bobis et al., 2005). In the context of ongoing professional learning, teachers in partnership with district mathematics consultants work to assess their students and design appropriate instruction based on the LFIN principles. Evaluations throughout the implementation of CMIT have demonstrated that the project has been effective in improving student numeracy outcomes and increasing teacher capacity in numeracy through professional learning (Bobis et al., 2005; Gould, 2000).

CMITI is a research project aimed at identifying teaching attributes that best support numeracy learning for Indigenous students from preschool to Year 2. The project is based on the learning framework of the CMIT project and utilises teacher professional development as a path to improving numeracy learning. Indigenous staff at schools are highly involved with the project and act as a link between home and school. CMITI built on the principles of the CMIT and aimed to enhance its cultural appropriateness for Indigenous students from preschool to Year 2. The project adopted the extended Schedule in Early Number Assessment (SENA) as a means of establishing mathematical knowledge.

Case studies conducted as part of the evaluation of the implementation of the CMITI pilot, found that there was general enthusiasm for the focus on Indigenous students' numeracy learning (Howard & Perry, 2002). Use of SENA allowed for identification of current achievement and measurement of progress of Indigenous students in selected areas such as subitising, sharing, and numeral

identification. Professional learning in numeracy conducted as part of CMITI was valued highly by participants. Teachers used these forums to learn about what other schools had done and to gather ideas for their own programs. Through participating in the CMITI program, Indigenous educators and Indigenous community members of the five schools in the pilot program worked to develop culturally appropriate mathematical resources. Each of the pilot schools made concerted efforts to engage Indigenous parents in classroom activities, with varying degrees of success. The evaluators of CMITI did, however, notice that the link between teacher activities and the learning framework in the CMITI was relatively weak, and recommended greater attention to these links in future professional development. Teachers in the pilot program reported being uncertain about the degree to which the CMITI program was uniquely different from CMIT; they sought greater clarity about the similarity and differences between the programs.

A subsequent evaluation of the successes and challenges of the second year of implementation of the program identified strong program leadership, continuity of staff involved in the program, as well as good relationships between the school and the local preschool, as key factors in the likely continuation of the program. CMITI was also strongest in schools where Indigenous and non-Indigenous participants worked closely to implement the program. Continuing professional development was highlighted as critical in sustaining the momentum of the program and in reinforcing the LFIN, which was weak in the first phase of implementation. Overall, the students involved in the CMITI program were regarded as having benefited from their involvement, showing evidence of improved ability in the six constructs of the learning framework.

Train a Maths Tutor Program

After assessing the needs of some regional schools in northern New South Wales, Baturo and Cooper (2006) developed the *Train a Maths Tutor Program* to train AIEOs to support students' learning in mathematics. AIEOs are typically long-term members of the school community who have an understanding of the Indigenous community and students' home languages. Individuals in these roles had great potential to act as supports to Indigenous students to scaffold students' understanding of formal mathematical concepts. However, Baturo and Cooper (2006) noted that the role of the AIEO was problematic because many AIEOs often had limited numeracy skills and the roles that they were expected to take in the school were variable. Their access to ongoing training was limited. Teachers also had variable expectations of the role of the AIEO in the classroom, with most viewing their roles as primarily assisting with behaviour management, translating, and liaising with the Indigenous community, rather than as partners in teaching numeracy (Warren et al., 2010).

The *Train a Maths Tutor Program* was designed to develop participants' mathematical understanding to the abstract level using concrete/real materials and virtual/computer materials. Across four weeks of daily sessions, the trainers emphasised the mathematical language required to teach three-digit numbers. The training also incorporated an important social element that served to build the cohesion of the group and enhance their profile in the wider community. The eleven participating AIEOs responded very positively to the program, showing significant improvements in their interest in mathematics and confidence in their ability to learn mathematics. After participating in the program, they also felt more interested in and confident in their ability to teach mathematics to students. Prior to the training, AIEOs held beliefs that mathematics comprised a system of facts to be memorised. After the training, their views had shifted to notions that mathematics was a relational system that was actively constructed by the learner. Ratings by trainers and independent observers before and after the training showed large improvements in AIEOs' tutoring skill; their mathematics content knowledge and their pedagogical content knowledge also improved significantly. Although the participants responded positively to the program, and students responded well to AIEOs in the classroom, subsequent assessment of the students they taught was difficult because of irregular school attendance. However, observations suggested that students greatly enjoyed the interactions with the AIEOs and feedback from teachers suggested that they recognised a major change in the teaching ability of the AIEOs. There was a wider impact on the local Indigenous community, as the AIEOs were recognised at a formal graduation ceremony and community elders noted the positive benefits for the community of these achievements among community members.

Though the *Train a Maths Tutor Program* operated on a small scale, it established a number of clear findings of wider relevance to Indigenous numeracy teaching. First, before the program the AIEOs lacked sufficient mathematical knowledge or self-efficacy to assist students in developing numeracy skills. Second, although they were initially hesitant, the AIEOs responded enthusiastically to the training. Third, the program enhanced AIEOs' tutoring skill, expanding their knowledge of mathematics content and their pedagogical content knowledge. The authors suggest that numeracy training should be included as a part of the preparation of AIEOs for their positions, and made available to all AIEOs and schools with Indigenous students.

Make it Count

Make it Count is a four-year project developed by the Australian Association of Mathematics Teachers (AAMT) aimed at developing a sound evidence base of practices shown to improve Indigenous students' numeracy learning. Three million dollars has been allocated by the Department of Education, Employment and Workplace Relations over the life of the project as part of the *Closing the Gap* initiative to extend availability of intensive literacy and numeracy programs. The project was launched in October 2009, and since that time efforts have been directed towards developing and sharing resources, as well as creating networks between professionals involved in mathematics education. Eight school clusters across five states of Australia are working in areas identified as important by the cluster, but with a focus on engaging the community, and developing culturally relevant mathematics pedagogy. An online national professional learning community has been developed to allow educators across Australia with an interest in Indigenous numeracy to communicate, collaborate, and network. A document outlining guiding principles for the project was made available on the website in December 2010. These principles include clusters working to promote mathematical learning by developing high expectations for teachers and Indigenous students, assessing what Indigenous students know about mathematics and using this to inform teaching approaches, and building on students' cultural and home background in teaching mathematics as a means to engage students in school learning of mathematics.

At present, the project is in a relatively early stage and no evaluation of its success is available. However, the project has potential benefits because of its focus on the issue of culturally relevant pedagogy for Indigenous students. Thus far, the cluster groups have worked to:

- develop whole school approaches to mathematics and numeracy that enhance Indigenous students' learning;
- document and share effective models of teacher professional development, whole school change and community engagement;
- build a community of practice that is committed to, and expert in, teaching and school practices that support Indigenous students' learning of mathematics and numeracy; and
- be a catalyst and support for action on mathematics, numeracy and Indigenous learners.⁴

As part of this process, the cluster groups and the project leaders have debated the characteristics of a culturally competent teacher and culturally responsive mathematics pedagogy. Project leaders acknowledge that there is little research in this area and that part of the project outcomes must be reaching agreement on what is meant by these terms before substantial progress can be made.

Supporting Indigenous Students' Achievement in Numeracy

Supporting Indigenous Students' Achievement in Numeracy was a project funded between 2003–2004 by the Australian Government's Numeracy Research and Development Initiative. The aim of the project was to investigate the development and implementation of authentic (rich) assessment tasks on the numeracy outcomes of Indigenous students in the middle years in remote schools in the Northern Territory (Siemon, Enilane, & McCarthy, 2005). Authentic tasks in this

⁴ Make it Count Discussion Paper available at <http://www.aamt.edu.au/Make-It-Count/Publications-and-statements/CultCompaper>

context, are described by the researchers as those which connect to the students in a meaningful way and were contextualised, that is, they used mathematics to solve a realistic problem. They are designed to provide opportunities for less able students to make a start, as well as challenging more capable students and offering insights into students' mathematical thinking (Siemon, Enilane & McCarthy, 2004; Siemon et al., 2005).

Over the course of the project, the schools involved in the research trialled or implemented the tasks with the assistance of members of the research team. Professional learning was identified as a critical factor in building teacher capacity to teach numeracy to Indigenous students in remote schools. Teachers' confidence in teaching and knowledge about numeracy increased through the use of probe tasks, which were devised to more precisely assess students' learning needs. A key learning of the project was the significant time involved in collaborating with schools and achieving the involvement of both school staff and the wider Indigenous community. In general, the results of testing indicated improvements in numeracy achievement for children involved in the study. The researchers noted, however, the high degree of difficulty students experienced in accessing the authentic tasks, although they had been designed to be meaningful to students and the literacy demands of the task were minimised (Siemon et al., 2004, 2005). Though the tasks seemed promising, and there were wider benefits to teachers and schools from a strong numeracy focus, the researchers suggested that more developmental work was required to make the tasks more widely accessible.

Getting it Right-Literacy and Numeracy Strategy (GiR-LNS)

The GiR-LNS was designed to achieve greater equity in literacy and numeracy outcomes for students, in particular for Indigenous students in Western Australia. During a four-year state-wide implementation, the strategy worked on developing teacher expertise in literacy and numeracy through a model of allocating Specialist Teachers to schools to work collaboratively with teachers in classrooms (Meiers, Ingvarson, Beavis, Hogan, & Kleinhenz, 2008). Each school chose either literacy or numeracy as a focus to reduce the demand on teachers at the school. Specialist Teachers undertook seven three-day professional development workshops across two years, while principals undertook a two-day induction. Over a two-year period, 365 full or part-time Specialist Teachers were working in Western Australian Schools. Specialist Teachers operated using a coaching model, and worked in conjunction with classroom teachers to collaboratively identify students' needs and to plan activities.

The evaluation of the GiR-LNS (Meiers et al., 2008) identified a number of elements of the program that contributed to its success. For instance, professional learning provided to Specialist Teachers was highly regarded and was viewed as contributing to increasing teachers' knowledge of numeracy. Classroom teachers highly valued the classroom support provided by Specialist Teachers. In particular, classroom teachers benefited from Specialist Teachers modelling entire lessons and individual strategies for them within a lesson, and from the extensive informal feedback they received as they tried particular teaching practices. Numeracy Specialist Teachers rated highly the impact of participating in the GiR-LNS training on their professional knowledge. Most believed that the GiR training had to a moderate or a major extent deepened their understanding of mathematics concepts, increased their knowledge about how students learn mathematics, and increased their knowledge of learning strategies that promote children's mathematical learning. Numeracy classroom teachers reported that their knowledge and understanding had been impacted to a moderate or a major extent; their knowledge about how to plan teaching and learning for specific groups (including Indigenous children) was impacted to a minor extent. Principals of GiR schools rated highly the benefit to teachers of working with a Specialist Teacher, the impact of the strategy on teachers' confidence in teaching numeracy, and improvements in teachers' ability to diagnose students' learning needs. Almost all principals agreed that the strategy was meeting important needs at the school.

Overall, the GiR-LNS represented a successful approach to improving teacher capacity in teaching numeracy. Classroom teachers and Specialist Teachers felt that a wide range of strategies adopted during the GiR program would continue to be used in the classroom. Most school principals also identified within-school mechanisms for sustaining the changes to teaching practice instigated by the GiR-LNS.

Summary

In comparison to the significant number of literacy intervention programs, there are significantly fewer specialist approaches to numeracy teaching for students experiencing difficulties generally, and for Indigenous students specifically (Milton, 2000). Moreover, the degree to which all of these programs have been subject to evaluation varies considerably. Although many of these initiatives report successes on a small scale, it is unclear to what extent the total population of Indigenous students is able to access them. In the examples of specialist numeracy strategies briefly reviewed in this section, it is clear that professional learning plays a key role in building teacher capacity to provide effective instruction in mathematics. However, the degree to which some of these interventions have ongoing impact is unclear because of a lack of longitudinal student achievement data.

Conclusions

This chapter has provided a review of recent research on the development of literacy and numeracy and the factors likely to support educational achievement for Indigenous students. The purpose of the review was to provide a context for interpreting the longitudinal data on literacy and numeracy achievement collected as part of ILLANS. Reliable data on student achievement is essential to understand the pattern of achievement in literacy and numeracy of Indigenous students across the primary school years. Comprehensive knowledge of the factors that are likely to impact on Indigenous children's school experiences, including both risk and supportive factors, is equally important.

3. RESEARCH DESIGN AND METHODS

The ILLANS project is a longitudinal study conducted over a period of seven years. The initial phase of the project, which commenced in 2000, involved collecting data to map the development of English literacy and numeracy skills in a group of Indigenous students during their first three years of schooling. The students in Phase 1 of the study commenced school in 2000 and the results from the first three years of the project were reported in the monograph *Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years* (Frigo et al., 2003).

In 2003, funding was secured to continue the project and in Phase 2 the number of schools and students in the survey were expanded to include non-Indigenous students at participating schools. This monograph reports on data collected from 2003–2006 during Phase 2. Data collection in Phase 2 involved annual assessments of students' literacy and numeracy skills from Year 3 through to Year 6, periodic teacher ratings of student achievement in literacy and numeracy, and a number of student questionnaires assessing students' opinions about enjoyment of reading and about their school environment.

The following chapter provides an overview of the initial design of the project and describes the changes that were implemented for Phase 2. Information is provided about the (a) schools and students in the study, (b) assessment materials and questionnaires, (c) site visits made to some of the Phase 2 schools, and (d) analyses undertaken.

3.1 ILLANS SAMPLE

The schools

Students who participated in Phase 2 of ILLANS included those who had been in the study from the beginning of Phase 1, as well as new students who joined the study at the beginning of Phase 2. At the commencement of the ILLANS project in 2000, State and Territory Education departments were invited to nominate schools to participate in a longitudinal study designed to map the development of English literacy and numeracy skills in a group of Indigenous students. Schools could be nominated if they had an acknowledged focus on supporting the learning of Indigenous students in their early years and if they had at least five Indigenous students enrolled in their first year of schooling in 2000. Based on these nominations, thirteen schools were invited to participate in ILLANS. These schools were from a range of geographic locations (metropolitan, regional, remote and very remote), represented both large and small primary schools, and had different proportions of Indigenous students in the school population. Indigenous students at these schools came from very diverse cultural and language backgrounds; some spoke Standard Australian English at home, but many spoke an Indigenous language, Aboriginal English, or Kriol as their first language.

From 2000–2002, data were collected each year at these 13 schools. In 2003, as the students moved into their fourth year of schooling (Year 3 for most students), a decision was made to increase the number of schools in the sample and also to increase the number of students completing the assessments by including non-Indigenous students within each school. Additional schools and students were included in Phase 2 of the project for two reasons. First, many students left the study at the end of Phase 1 because there was significant student movement between schools from Year 2 to Year 3. Second, including a wider range of schools and students allowed for additional comparisons. For example, it was possible to compare students from different schools in similar geographical areas and to compare Indigenous students with their non-Indigenous peers within the same schools. Education systems were invited to nominate additional schools to participate in Phase 2, and a further 14 schools were involved in the study from 2003–2006. The first year of Phase 2 of the study initially included all but two of the original 13 schools. One metropolitan and one very remote school decided not to participate in Phase 2. Two remote schools participated in the first year of Phase 2, but not in subsequent years. Table 3.1 lists the number and geographic location of ILLANS schools in each state for Phase 1 and 2.

Table 3.1 Number and location of schools participating in ILLANS 2000–2006

| State/Territory | <u>Phase 1 schools</u> | | | | <u>Phase 2 schools</u> | | | |
|--------------------|------------------------|----------|--------|----------------|------------------------|----------|--------|-------------|
| | Metro | Regional | Remote | Very remote | Metro | Regional | Remote | Very remote |
| ACT | 1 | | | | 1 | | | |
| Queensland | | 1 | | | 1 | 2 | | |
| New South Wales | 1 | | | | 2 | 2 | | |
| Northern Territory | | 2 | 2 | 1 ^a | | 2 | 2 | |
| South Australia | 1 | | | 1 | 6 | | | 1 |
| Tasmania | 1 | | | | 1 | | | |
| Victoria | | 1 | | | | 2 | | |
| Western Australia | 1 ^a | | | | 2 | | 1 | |

^a Phase 1 only

The students

During the initial years of the project, from 2000–2002, a sample of up to ten Indigenous students at each of the 13 schools participated in the study. In 2000, data were collected from 118 students. In 2001 and in 2002 some students had moved and schools were invited to ‘refresh’ the sample each year to include both the original students as well as some new students. Mobility, absenteeism and the non-return of assessments by two schools meant that only 38 students completed all five assessments during this period, although 111 students had completed two or more assessments.

From 2003–2006, the style of assessment changed from the one-on-one interview style of assessment used in Phase 1, to independent completion of the literacy and numeracy assessments in student groups. It was decided that where possible, and with school and parental agreement, assessments would be administered to both Indigenous and non-Indigenous students across the whole year level. Though four of the original schools preferred to continue to assess only Indigenous students, there was still a significant increase in the student sample size (from 82 students completing the final literacy assessment in Phase 1 to 479 students completing the final literacy assessment in Phase 2). The numbers of Indigenous and non-Indigenous students completing one or more of the literacy or numeracy assessments for each year of the entire ILLANS are shown in Table 3.2.

Although student results are reported at each assessment point on the same achievement scale, it should be noted that the student group completing the assessments varied at each time point. There were a number of reasons why there was variability in the sample from year to year. Each year, some schools experienced difficulties in returning assessments. In 2003, one of the remote schools returned incomplete literacy and numeracy profiles as the assessments were too difficult for students to complete independently. Changes in personnel at schools due to extended leave, illness or staff movement were sometimes associated with inconsistent participation of whole classes of children. In other cases, due to time and resource constraints, the school returned assessments only from Indigenous students. There was also variability in the sample over time caused by students moving schools, absences during data collection, and the addition of new students to the sample to replace those who had left the study.

Table 3.2 Maximum numbers of assessments completed by individual students 2000–2006

| Completed Assessments | <u>No. of literacy assessments completed</u> | | | <u>No. of numeracy assessments completed</u> | | |
|-----------------------|--|-------------------------|----------------|--|-------------------------|----------------|
| | Indigenous students | Non-Indigenous students | Total students | Indigenous students | Non-Indigenous students | Total students |
| 0 | 26 | 9 | 35 | 27 | 17 | 44 |
| 1 | 81 | 150 | 231 | 105 | 146 | 251 |
| 2 | 94 | 152 | 246 | 75 | 147 | 222 |
| 3 | 67 | 199 | 266 | 64 | 203 | 267 |
| 4 | 65 | 179 | 244 | 64 | 176 | 240 |
| 5 | 15 | 0 | 15 | 11 | 0 | 11 |
| 6 | 15 | 0 | 15 | 18 | 0 | 18 |
| 7 | 13 | 0 | 13 | 12 | 0 | 12 |
| 8 | 5 | 0 | 5 | 8 | 0 | 8 |
| 9 | 12 | 0 | 12 | 9 | 0 | 9 |
| Total | 393 | 689 | 1082 | 393 | 689 | 1082 |

Note. Non-Indigenous students were only included from Phase 2 of ILLANS and could complete a maximum of four assessments.

Table 3.3 shows the number of Indigenous and non-Indigenous students who completed between one and four assessments during Phase 2 of ILLANS. Overall, 287 Indigenous students and 680 non-Indigenous students completed at least one of the literacy assessments during Phase 2. Slightly fewer students (281 Indigenous and 672 non-Indigenous) completed at least one numeracy assessment in Phase 2 of the project.

Considered together, Table 3.2 and 3.3 clearly reflect the challenge of conducting longitudinal research generally and with Indigenous students particularly. Table 3.2 demonstrates that retaining Indigenous students in the study was a challenge, particularly during the Year 2–3 transition; overall, few Indigenous students completed all nine assessments. Altogether, 1065 students from 27 different schools completed at least one of the nine sets of English literacy or numeracy assessments; 816 students completed two or more literacy assessments and 787 students completed two or more numeracy assessments. Only 12 Indigenous students completed all literacy assessments and only 9 students completed all numeracy assessments. Though the total participation in Phase 2 of ILLANS was close to 1000, only 72 Indigenous and 179 non-Indigenous students completed all literacy assessments in Phase 2, and only 70 Indigenous and 176 non-Indigenous students completed all numeracy assessments.

Table 3.3 Maximum numbers of assessments completed by individual students 2003–2006

| | <u>No. of literacy assessments completed</u> | | | <u>No. of numeracy assessments completed</u> | | |
|-------|--|-------------------------|----------------|--|-------------------------|----------------|
| | Indigenous students | Non-Indigenous students | Total students | Indigenous students | Non-Indigenous students | Total students |
| 1 | 70 | 150 | 220 | 87 | 146 | 233 |
| 2 | 78 | 152 | 230 | 58 | 147 | 205 |
| 3 | 67 | 199 | 266 | 66 | 203 | 269 |
| 4 | 72 | 179 | 251 | 70 | 176 | 246 |
| Total | 287 | 680 | 967 | 281 | 672 | 953 |

3.2 DATA COLLECTION: MATERIALS AND PROCEDURES

Phase 2 of ILLANS utilised both quantitative and qualitative data collection methods to provide a complete picture of student achievement, and of teacher and student perspectives on factors supporting literacy and numeracy development. The development of students' English literacy and numeracy skills was monitored through a series of assessment tasks. In addition, questionnaires and field visits were used to collect information about school programs and teaching strategies that supported the development of English literacy and numeracy skills, as well as other factors that impacted on students' achievement.

For a comprehensive description of the assessments used during the first phase of the project, please refer to the monograph *Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years* (Frigo et al., 2003).

English literacy and numeracy assessments

The assessment tasks used to map the development of students' English literacy and numeracy skills were developed for another ACER project: the *Longitudinal Literacy and Numeracy Study* (LLANS). The tasks are set within a framework of developmental assessment and are sufficiently linked to allow student performance to be reported on a common scale within English literacy and numeracy (Anderson & Meiers, 2001; Meiers et al., 2006).

From 2000–2002 (Phase 1), the tasks were administered on a one-to-one basis, were designed to take place in a meaningful context, and were based around familiar classroom activities. The tasks included many hands-on activities that used familiar classroom materials such as picture books, rods, counters, coloured stars and pipe cleaners, to emphasise process as well as product, and were in line with State and Territory curricula. In most cases, the children worked one-on-one with either their teacher or an AIEO who recorded their responses in booklets that were returned to ACER for data analysis.

From 2003 onwards (Phase 2), the assessments were administered in a whole-class setting and students worked independently to complete English literacy and numeracy assessment booklets. ACER's Developmental Assessment Resource for Teachers (DART) literacy assessments were used for the literacy component of the survey. Due to time and cost restraints, only the reading component of the DART was used to assess students' literacy skills. The reading component of the DART assesses students' ability to make meaning from a variety of written text types. Students are provided with a full colour set of stimulus material in magazine form, and an accompanying question and answer booklet. The DART Middle Primary forms were used in 2003, 2004 and 2005, and the DART Upper Primary form was used in 2006. In 2005, the DART literacy assessment used for ILLANS was a middle primary assessment that differed from the upper primary assessment used in the main LLANS study. In 2006, versions of Survey 8 were used in preference to Survey 9. It was felt that these would give a slightly better coverage of the range of student abilities. Schools were also given the option of using Survey 6 materials with students of lower achievement levels.

As in the initial years of the project, the numeracy tasks used from 2003–2006 were specifically developed for the LLANS project. Four broad aspects of numeracy, number, space, measurement, and chance and data, continued to be investigated in each of the assessments. Each assessment was composed of a number of short units with around eight questions of a range of difficulty.

The assessment tasks were administered at the beginning and at the end of each year in the first two years of the study and the middle of each subsequent year. The timing of each assessment was based on the main LLANS study enabling comparison between Indigenous students and their non-Indigenous peers. Students' answer booklets were returned to ACER, where they were marked and scored. The ILLANS data gathering scheduled is outlined in Table 3.4.

Table 3.4 ILLANS data gathering schedule (2000–2006)

| <u>Phase 1</u> | | | <u>Phase 2</u> | | | |
|---|---|---|---|---|---|---|
| 1st year of school: 2000 | 2nd year of school: 2001 | 3rd year of school: 2002 | 4th year of school: 2003 | 5th year of school: 2004 | 6th year of school: 2005 | 7th year of school: 2006 |
| Survey 1: Term 1 | Survey 3: Term 1 | Survey 5: Term 2 | Survey 6: Term 2 | Survey 7: Term 2 | Survey 8: Term 2 | Survey 9: Term 2 |
| Survey 2: Term 4 | Survey 4: Term 4 | | | | | |

Responses of students to tasks in the main LLANS study were used to construct a scale that located achievement against a statement of the skills typical of students at a range of levels of achievement (Meiers & Forster, 1999). The scale was devised using Rasch measurement techniques ‘to display the performance of children and the difficulty of task on the same interval scale, in the same units of measurement’ (Stephanou, Meiers, & Forster, 2000, p. 40). This produced separate scales for English literacy and numeracy with the best student performances and the hardest tasks at one end of the scale, and poorer student performances and the easiest tasks at the opposite end of the scale. The use of common items across assessments enabled the calibration of all tasks, including those from the DART assessments, so that they could be displayed on a single scale.

Questionnaires

Questionnaires were used to collect baseline data about school programs, teaching strategies and student background characteristics from principals, teachers and AIEOs at each of the schools. Information from these questionnaires was used to develop profiles of the schools in the study (see Appendix A).

Principals were asked to provide information about their experience in the education system and any recent professional development courses that they may have undertaken. They were asked to describe the general characteristics of the school community and to provide information about the percentage of Indigenous students and of students who spoke languages other than English at home. Information was also collected about English literacy and numeracy programs used across the school, any additional support provided to students in literacy and numeracy sessions, and additional support provided to students with special needs. Principals were also asked to describe the strategies they used to welcome Indigenous parents and caregivers into the school and to encourage their involvement in their child’s education.

Teachers were asked to respond to questions about their teaching experience, how long they had been at their current school and to specify any recent professional development they had undertaken. Teachers also described the composition of the class they were currently teaching, including the percentage of Indigenous students and students with language backgrounds other than English in their classes, whether they taught in a multi-age classroom, and if other teachers also taught their students. Teachers were asked to outline their approach to teaching both English literacy and numeracy, the amount of time they spent on these areas of learning, and to list the availability of resources and support personnel at the school.

Both teachers and principals were also asked to comment on the following issues:

- how they took into account the learning need of students from diverse language and cultural backgrounds (including curriculum, teaching and assessment practices);
- how they were inclusive of the language and cultural backgrounds of Indigenous students (including curriculum, teaching and assessment practices);
- the most important thing they did that impacted on students’ literacy learning, particularly for Indigenous students;

- the most important thing they did that impacted on students' numeracy learning, particularly for Indigenous students; and
- how they made links between school learning and home and community practices.

AIEOs were asked to complete a questionnaire that asked about their experience in schools, their involvement in professional development activities, and the type of work they were involved with across the school and in classrooms. In 2006, principals, teachers and AIEOs responded to a number of items regarding school climate, focusing on their beliefs about Indigenous education and the experiences of Indigenous students at the school.

Teachers were also asked to complete questionnaires that provided information about each of the students participating in the project. The information collected from these questionnaires included the students' age, gender, main language or dialect spoken at home, whether they had attended preschool, their school attendance, attentiveness in class, and parental occupations. The teachers were asked to indicate if the students had any special needs, including physical and/or learning disabilities, and whether they received special education support in the classroom. As well as providing demographic data, the 2003 questionnaire asked teachers to make judgements about the teacher-student relationship and to rate the student's level of English literacy and numeracy achievement against State Curriculum Standards and against their peers in the classroom. This information was collected initially in 2003 and updated each year against a class list. Short forms of the student questionnaire were completed by the teachers in 2005 and 2006. These questionnaires asked for a rating of each student's level of attentiveness and their level of English literacy and numeracy achievement in comparison to peers and against State or Territory curriculum standards. Data on students' attentiveness in class was collected in 2003, 2005 and 2006, as were data on school attendance.

During the final year of data collection (2006), all students completed a survey that asked them to rate (a) their reading habits and attitudes towards reading, (b) their school's learning environment and teacher-student relations (as a measure of school climate), and (c) and their sense of personal learning achievement.

Case studies

Site visits to each of the 13 schools that participated in the project from 2000–2002 were an important part of the project in its initial years. Indigenous researchers visited the schools on a number of occasions each year for between two and four days in total. Information was collected, through observation, interviews and the collection of documentation, about the school, the students' classroom environments and their communities. The interviews conducted with principals and teachers during these visits focused on the school's approach to supporting education for Indigenous students, their literacy and numeracy programs, and teachers' classroom teaching practices.

The size and scope of the study changed in 2003 and it was not feasible to continue to visit all participating schools. In 2004, a preliminary analysis of the data was undertaken and five schools were identified for site visits in 2005. The schools profiled in the Phase 2 case studies represent a range of geographic locations and diverse student populations.

Assessment results for Indigenous students at the Phase 2 case study schools show wide variability in achievement in relation to non-Indigenous students in the school and to the sample overall. Some schools showed little gap in achievement between Indigenous and non-Indigenous students and high achievement in relation to the total sample, whereas other schools had a large gap between Indigenous and non-Indigenous students within the school and low achievement overall compared to the total sample.

One Indigenous and one non-Indigenous researcher from ACER conducted the interviews with available staff (principals, teachers and AIEOs) at the case study schools. All interviews were tape-recorded, transcribed and subjected to thematic analysis. An interview schedule is included in Appendix B.

3.3 SUMMARY

Phase 2 of ILLANS entailed a shift in emphasis from Phase 1. This involved expanding the number of schools and incorporating non-Indigenous students in the study. Non-Indigenous students attending the same schools as Indigenous students in the study were deemed to be a more appropriate comparison group than the main LLANS sample used in Phase 1.

Each year, students completed English literacy and numeracy assessments and the principal, teachers and AIEOs were asked to complete a series of questionnaires about themselves and their students. A small number of site visits were made to schools in 2005 to provide researchers with an opportunity to see the schools in operation and to explore some of the factors that either supported or hindered children's development of English literacy and numeracy skills.

Given the extended time frame of the study and the amount of data collected, which was both quantitative and qualitative in nature, these data provide a unique opportunity to explore and increase our understanding of the nature of growth in English literacy and numeracy skills in this group of students.

4. LITERACY AND NUMERACY DEVELOPMENT AMONG INDIGENOUS STUDENTS

4.1 INTRODUCTION

This chapter reports on results from the English literacy and numeracy assessments completed during Phase 2 of ILLANS from 2003–2006. The first part of this section reports on the characteristics of students participating in Phase 2 and on the achievement of these students in literacy and numeracy in their final four years of primary school. This section also includes a report of teacher-assessed student achievement and student ratings of school climate and personal learning achievement. Following this, there is an examination of some of the school and student-level factors that were identified as related to achievement in literacy and numeracy in the final year of the study.

4.2 STUDENT CHARACTERISTICS

Background information about each student was collected through questionnaires completed by classroom teachers. Detailed student questionnaires were completed in 2003 and in each subsequent year schools were asked to verify that background information was correct and to provide information on new students joining the study. The 2003 questionnaire, which was similar in scope to the 2000, 2001 and 2002 questionnaires, required information on students' age, gender, main language spoken at home, physical and learning disabilities, and parents' occupation. In addition, the questionnaires asked about students' attendance at school, the number of schools they had attended, and whether the student received additional support such as ESL, literacy or numeracy support.

Due to non-returned and partially completed forms, the availability of data on student characteristics is variable. A number of schools also requested that additional students (often those new to the school) join the project after 2003. To provide an overview of the characteristics of students participating in Phase 2 of ILLANS, any student who participated during 2003–2006 is included in Table 4.1.

Slightly more boys than girls participated in the study. The number of Indigenous students is greater than might be expected given the populations of Indigenous students at the schools because four of the original schools only assessed their Indigenous students. Eighty-eight per cent of the Indigenous students were Aboriginal, eight per cent were Torres Strait Islander and four per cent were both Aboriginal and Torres Strait Islander.

The classification of students' home languages was somewhat problematic given informants different levels of understanding regarding Aboriginal English and variability in teachers' knowledge about their students' home languages. However, this question was retained because the research literature highlights the large number of Indigenous students for whom Standard Australian English (SAE) is a second language or dialect. A significant proportion of Indigenous students were identified as speaking a language other than SAE at home, including Aboriginal English or another Indigenous language. Non-Indigenous students spoke predominantly English at home, although there was a great deal of missing data on this item.

Schools were assigned to one of five different geolocations (metropolitan, inner regional, outer regional, remote or very remote) based on a classification system derived from the population of the city or town and its Accessibility/Remoteness Index of Australia (ARIA) classification (Jones, 2000). Table 4.1 shows that most of the non-Indigenous students in this study attended schools in metropolitan or inner regional areas (71%). The proportion of Indigenous students attending schools in similar locations was 65 per cent. A large school with a relatively low proportion of Indigenous students accounted for the larger number of non-Indigenous students assessed in an outer regional area. It should be noted that these classifications refer to the region of the student's school and do not necessarily reflect their home location; Indigenous students commonly travel from remote or very remote locations to attend schools in larger centres.

Table 4.1 Summary of ILLANS participant characteristics 2003–2006

| Characteristics | Indigenous students (<i>n</i> = 297) | | Non-Indigenous students (<i>n</i> = 685) | |
|--|--|----|--|----|
| | N | % | N | % |
| Gender | | | | |
| Male | 152 | 51 | 358 | 52 |
| Female | 145 | 49 | 327 | 48 |
| Indigenous background | | | | |
| Aboriginal | 260 | 88 | – | – |
| Torres Strait Islander | 25 | 8 | – | – |
| Aboriginal & TSI | 12 | 4 | – | – |
| Main home language | | | | |
| SAE | 141 | 55 | 458 | 93 |
| Aboriginal English | 74 | 29 | – | – |
| Indigenous language | 36 | 14 | – | – |
| Other | 1 | <1 | 32 | 6 |
| Not sure | 3 | 1 | 3 | <1 |
| School locality | | | | |
| Metropolitan | 104 | 35 | 405 | 59 |
| Regional-inner | 88 | 30 | 84 | 12 |
| Regional-outer | 53 | 18 | 172 | 25 |
| Remote | 49 | 16 | 24 | 4 |
| Very remote | 3 | 1 | 0 | 0 |
| Parental occupation | | | | |
| Professional/managerial | 19 | 9 | 59 | 16 |
| Clerical/skilled | 46 | 21 | 99 | 26 |
| Semi/unskilled | 66 | 30 | 119 | 31 |
| Other (unemployed, home duties, not living with child) | 91 | 41 | 103 | 27 |

Note. Percentages reported exclude missing data.

All schools in the study were located in areas classified as socially and economically disadvantaged against a number of indicators. An attempt was made to classify students' socioeconomic background by asking teachers to identify the parents' occupations. This question was asked in Phase 1 of the study and again in the first year of Phase 2 (2003). This data has some limitations because not all schools provided this information for all students and in some instances teachers indicated the occupation of one parent only. Where information was available, the highest occupation level in the household was selected as an approximate indicator of the socioeconomic status of the family. In general, higher proportions of non-Indigenous parents were in professional or managerial roles compared with Indigenous parents, whereas higher proportions of Indigenous parents recorded their occupational status as other, which incorporated the unemployed and parents undertaking home duties.

4.3 ASSESSMENT DATA: 2003–2006

Student assessment results reported in this chapter were collected from 2003–2006 across 25 schools participating in Phase 2 of the study. These results included assessment data collected from Indigenous students who participated in the initial years of the study and who were still at the same school in 2003.

Literacy achievement

Results for English literacy achievement for students participating in any of the assessments from 2003–2006 are shown in Table 4.2. Literacy achievement for Indigenous students is generally below that of non-Indigenous students throughout Phase 2. The achievement gap reduced in Survey 8 but widened again for the final assessment. Across all surveys, there is significant variability in achievement within the groups; many Indigenous students achieve as well as, or better than the average of all students. Although the data reflects a gap in achievement for individual surveys, there is clear evidence of growth in literacy achievement for Indigenous students across the final four years of primary schooling. Moreover, the rate of literacy development for Indigenous and non-Indigenous students is very similar.

Table 4.2 Means, standard deviations, and medians for English literacy achievement for Indigenous and non-Indigenous students (2003–2006)

| | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|------------------|------------------|------------------|------------------|------------------|
| <u>Mean (SD)</u> | | | | |
| Indigenous | 83.2 (16.8) | 88.5 (14.1) | 96.0 (13.3) | 98.3 (15.5) |
| Non-Indigenous | 94.6 (12.7) | 97.4 (14.2) | 102.5 (12.7) | 108.6 (13.9) |
| <u>Median</u> | | | | |
| Indigenous | 83.8 | 89.6 | 97.0 | 99.0 |
| Non-Indigenous | 95.2 | 97.6 | 103.0 | 109.0 |
| <u>Number</u> | | | | |
| Indigenous | 220 | 192 | 175 | 128 |
| Non-Indigenous | 490 | 530 | 396 | 351 |

Teacher assessed literacy profiles

Teachers provided ratings of student achievement in reading and writing at the beginning of Phase 2. Tables 4.3 and 4.4 show the percentage of Indigenous and non-Indigenous students rated as achieved, developing, or not achieved for different aspects of reading and writing development. To facilitate interpretation, the column for students rated as achieved against the specific skill is highlighted. Due to rounding in the table below, percentages may not always add up to 100. The pattern of ratings across all items was similar. Non-Indigenous students were more likely to be rated as achieved and less likely to be rated as developing or not achieved, whereas Indigenous students were less likely to be rated as achieved, and more likely to be rated as developing or not achieved.

Table 4.3 Teacher assessed levels of achievement for a range of reading skills, Indigenous and non-Indigenous students (2003) (%)

| | Indigenous (n = 219) | | | Non-Indigenous (n = 414) | | | Total (n = 633) | | |
|---|-------------------------|----|----|-----------------------------|----|----|--------------------|----|----|
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Reads short texts | 44 | 44 | 11 | 72 | 26 | 2 | 62 | 33 | 5 |
| Reads and recalls information from texts | 38 | 49 | 13 | 66 | 32 | 2 | 56 | 38 | 6 |
| Uses a range of strategies when constructing meaning from text | 28 | 56 | 16 | 56 | 41 | 4 | 46 | 46 | 8 |
| Works out the meaning of some unfamiliar phrases and words in context | 26 | 56 | 18 | 47 | 49 | 5 | 40 | 51 | 9 |
| Reads and connects information and ideas in simple texts. | 40 | 46 | 14 | 60 | 37 | 3 | 53 | 40 | 7 |
| Reads a small range of unfamiliar texts | 26 | 50 | 24 | 48 | 45 | 6 | 41 | 47 | 12 |
| Uses a variety of media texts to find information | 11 | 50 | 39 | 20 | 64 | 16 | 17 | 59 | 24 |
| Reads and makes inferences from ideas in texts | 17 | 52 | 31 | 30 | 59 | 10 | 26 | 57 | 18 |
| Describes the features of a range of texts | 12 | 63 | 26 | 36 | 52 | 12 | 28 | 55 | 17 |
| Uses text organisation to construct meaning | 18 | 57 | 25 | 40 | 50 | 9 | 32 | 53 | 15 |
| Constructs responses to unfamiliar texts | 9 | 55 | 36 | 23 | 61 | 16 | 18 | 59 | 22 |
| Supports responses to texts with evidence | 15 | 50 | 35 | 29 | 59 | 12 | 24 | 56 | 20 |

Note. 1 = Achieved 2 = Developing 3 = Not Achieved

Table 4.4 Teacher assessed levels of achievement for a range of writing skills, Indigenous and non-Indigenous students (2003) (%)

| | Indigenous (n = 218) | | | Non-Indigenous (n = 414) | | | Total (n = 632) | | |
|---|-------------------------|----|----|-----------------------------|----|----|--------------------|----|----|
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Writes two or three understandable sentences | 51 | 35 | 14 | 71 | 27 | 2 | 64 | 30 | 6 |
| Writes a short text that develops ideas | 39 | 39 | 22 | 62 | 32 | 6 | 54 | 35 | 12 |
| Writes with awareness of the need to support the reader | 18 | 43 | 39 | 35 | 51 | 14 | 29 | 48 | 23 |
| Uses punctuation and conventional spelling | 28 | 42 | 30 | 44 | 40 | 16 | 38 | 41 | 21 |
| Elaborates ideas to enhance a coherent text | 12 | 53 | 35 | 28 | 53 | 19 | 23 | 53 | 24 |

Note. 1 = Achieved 2 = Developing 3 = Not Achieved

Teacher assessed student attentiveness

In 2006, as in previous years, teachers rated their students on five attentiveness dimensions (concentration, curiosity, perseverance, attention span and purposefulness of activity) on a five-point scale from 1 = *High* to 5 = *Low* (Rowe & Rowe, 1999). Percentages of Indigenous and non-Indigenous students rated as above average or high on each dimension of attentiveness are shown in Table 4.5. Table 4.5 also shows the mean on each dimension (where a higher score indicates poorer attentiveness). On each of the five aspects of attentiveness, non-Indigenous students were more likely to be rated as having above average levels of attentiveness than Indigenous students.

Table 4.5 Percentage agreement and mean responses for Indigenous and non-Indigenous students for teacher assessed student attentiveness (2006)

| Attentiveness dimension: | Indigenous students (<i>n</i> = 126) | | Non-Indigenous students (<i>n</i> = 354) | | Total (<i>n</i> = 480) | |
|--------------------------|--|------------|--|------------|----------------------------|------------|
| | % Above Average | Mean (SD) | % Above Average | Mean (SD) | % Above Average | Mean (SD) |
| Concentration | 42 | 2.8 (1.24) | 56 | 2.4 (1.20) | 52 | 2.5 (1.23) |
| Curiosity | 48 | 2.7 (1.20) | 65 | 2.2 (1.11) | 61 | 2.3 (1.15) |
| Perseverance | 40 | 2.8 (1.18) | 55 | 2.4 (1.18) | 51 | 2.5 (1.20) |
| Attention Span | 38 | 2.9 (1.26) | 56 | 2.4 (1.16) | 51 | 2.5 (1.21) |
| Purposefulness | 47 | 2.8 (1.25) | 60 | 2.2 (1.09) | 57 | 2.4 (1.16) |

Correlations between teacher ratings and literacy achievement

Separate measures of teacher-assessed reading and writing achievement were calculated by summing the number of achieved ratings for each student. Correlations between teacher assessed achievement in literacy in the first year of Phase 2 and the Phase 2 ILLANS literacy assessments are shown in Table 4.6 separately for Indigenous and non-Indigenous students. Significant associations between teacher ratings of achievement and the ILLANS literacy assessments are evident for each year of Phase 2 of the study. Similar associations are recorded for Indigenous and non-Indigenous students between teacher-assessed reading achievement and the ILLANS assessments; however, for Indigenous students, the associations between teacher ratings of writing achievement and the ILLANS literacy assessments are lower than for non-Indigenous students. Understandably, the associations decline over time for all students; however, it is notable that teachers' ratings of achievement from the first year of Phase 2 still explained some of the variation in literacy achievement in the final year of schooling. Teacher assessed achievement in reading was highly correlated with teacher assessed achievement in writing for both Indigenous and non-Indigenous students ($r = .882$).

Table 4.6 Correlations between teacher assessed reading and writing achievement (2003) and the ILLANS literacy assessments for Indigenous and non-Indigenous Students

| Teacher assessed achievement: | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|-------------------------------|------------------|------------------|------------------|------------------|
| Reading | | | | |
| Indigenous | .405*** | .352*** | .310*** | .342*** |
| Non-Indigenous | .408*** | .348*** | .341*** | .343*** |
| Writing | | | | |
| Indigenous | .406*** | .345*** | .294*** | .313*** |
| Non-Indigenous | .474*** | .404*** | .357*** | .403*** |

* $p < .05$, ** $p < .01$, *** $p < .001$

In the final year of the study (2006), teachers also provided an overall rating of each student's literacy achievement against their peers and against the curriculum. Achievement was rated on a five-point scale where 1 = *Well below the expected level* and 5 = *Well above the expected level*. When rated against their peers and against the curriculum, Indigenous students on average were rated as achieving below non-Indigenous students (Table 4.7).

Table 4.7 Means (and standard deviations) of teacher assessed literacy achievement against peers and the curriculum for Indigenous and non-Indigenous students (2006)

| Teacher assessed achievement: | Indigenous (<i>n</i> = 126) | | Non-Indigenous (<i>n</i> = 353) | | Total (<i>n</i> = 479) | |
|-------------------------------|---------------------------------|------------|-------------------------------------|------------|----------------------------|------------|
| | % Above Expected | Mean (SD) | % Above Expected | Mean (SD) | % Above Expected | Mean (SD) |
| Against peers | 17 | 2.4 (1.11) | 37 | 3.1 (1.20) | 32 | 2.9 (1.21) |
| Against curriculum | 12 | 2.3 (1.04) | 24 | 2.8 (1.07) | 21 | 2.7 (1.09) |

Correlations between teacher ratings of student achievement against their peers and the curriculum and the ILLANS literacy assessments are shown in Table 4.8. Teacher ratings of achievement in the final year of primary school were significantly correlated with performance on each of the ILLANS assessments. For Indigenous students, teacher ratings tended to be most highly correlated with the surveys closest to the rating, whereas teacher ratings of achievement in the final year of primary school tended to be also highly associated with earlier ILLANS assessments for non-Indigenous students. This pattern suggests greater variability in the performance of Indigenous students on ILLANS assessments over time, compared with non-Indigenous students.

Table 4.8 Correlations between teacher ratings of literacy achievement against peers and the curriculum (2006) and the ILLANS literacy assessments for Indigenous and non-Indigenous students

| Teacher assessed achievement: | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|-------------------------------|------------------|------------------|------------------|------------------|
| Against peers | | | | |
| Indigenous | .428*** | .383*** | .531*** | .504*** |
| Non-Indigenous | .624*** | .609*** | .625*** | .563*** |
| Against curriculum | | | | |
| Indigenous | .471*** | .489*** | .532*** | .550*** |
| Non-Indigenous | .613*** | .604*** | .620*** | .513*** |

* $p < .05$, ** $p < .01$, *** $p < .001$

Teacher-rated attentiveness was positively associated with students' literacy achievement in Year 6 for both Indigenous ($r = .386$) and non-Indigenous students ($r = .457$), although the association was somewhat higher for non-Indigenous students.

Numeracy achievement

Results for numeracy achievement for students participating in any of the assessments from 2003–2006 are shown in Table 4.9. On average, numeracy achievement for Indigenous students is generally below that of non-Indigenous students throughout Phase 2. The gap in achievement between Indigenous and non-Indigenous students narrowed slightly between survey 7 and 8, but was stable over the final two years of the study. The range of numeracy achievement within the groups is also highly variable, meaning that many Indigenous students achieve better than the average for all students. Though the data reflects a gap in achievement for individual surveys, the rate of development for Indigenous students was very similar to that of non-Indigenous students.

Table 4.9 Means, standard deviations and medians for numeracy achievement for Indigenous and non-Indigenous students (2003–2006)

| | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|------------------|------------------|------------------|------------------|------------------|
| <u>Mean (SD)</u> | | | | |
| Indigenous | 97.0 (14.82) | 104.6 (12.42) | 109.4 (12.54) | 119.2 (12.60) |
| Non-Indigenous | 107.4 (12.96) | 113.5 (11.38) | 116.6 (11.17) | 126.5 (12.61) |
| <u>Medians</u> | | | | |
| Indigenous | 97.9 | 106.0 | 109.0 | 119.0 |
| Non-Indigenous | 107.4 | 113.7 | 116.0 | 126.0 |
| <u>Number</u> | | | | |
| Indigenous | 194 | 189 | 172 | 126 |
| Non-Indigenous | 472 | 523 | 407 | 351 |

Teacher assessed numeracy profiles

Teacher ratings obtained in 2003 of student achievement across a range of numerical skills are shown in Table 4.10. To facilitate interpretation, the column for students rated as *Achieved* against the specific skill is highlighted. Due to rounding in the table below, percentages may not always add up to 100. The pattern of teacher ratings for numeracy skills is similar to teacher ratings for reading and writing. For each skill, Indigenous students tended to be more likely to be rated as *Developing* or *Not Achieved*, and less likely to be rated as *Achieved*, compared with non-Indigenous students, who were more likely to be rated as *Achieved* and less likely to be rated as *Developing* or *Not Achieved*.

Table 4.10 Teacher assessed levels of achievement for a range of numeracy skills, Indigenous and non-Indigenous students (2003) (%)

| | Indigenous (n = 218) | | | Non-Indigenous (n = 415) | | | Total (n = 632) | | |
|--|-------------------------|----|----|-----------------------------|----|---|--------------------|----|----|
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Counts forwards and backwards to 99 | 58 | 32 | 9 | 81 | 18 | 1 | 73 | 23 | 4 |
| Identifies and continues simple number patterns | 50 | 40 | 11 | 76 | 22 | 1 | 67 | 28 | 5 |
| Adds and subtracts two 2-digit numbers | 43 | 44 | 13 | 64 | 33 | 3 | 57 | 37 | 6 |
| Multiplies two single-digit numbers. | 35 | 42 | 23 | 51 | 41 | 8 | 45 | 41 | 13 |
| Writes a 3-digit number from a written description. | 41 | 40 | 20 | 63 | 33 | 5 | 55 | 35 | 10 |
| Adds up coins (up to \$5) | 38 | 50 | 13 | 50 | 44 | 7 | 46 | 46 | 9 |
| Recognises and names familiar 2-and 3-D shapes | 34 | 57 | 10 | 57 | 41 | 2 | 49 | 46 | 5 |
| Uses simple bar graphs | 37 | 53 | 10 | 54 | 42 | 4 | 48 | 46 | 6 |
| Draws hands on a clock face | 27 | 55 | 18 | 57 | 41 | 2 | 47 | 45 | 8 |
| Measures length of a drawing to within a centimetre | 35 | 52 | 13 | 61 | 36 | 2 | 52 | 42 | 6 |
| Understand language referring to a simple map | 32 | 49 | 19 | 51 | 45 | 4 | 44 | 47 | 9 |
| Solves numerical problems set in familiar situations | 25 | 55 | 20 | 44 | 50 | 7 | 38 | 51 | 11 |

Note. 1 = Achieved 2 = Developing 3 = Not Achieved

Correlations between teacher ratings and numeracy achievement

An overall measure of teacher-rated numeracy achievement was computed by summing the number of *Achieved* ratings for each student. Correlations between teacher assessed achievement ratings and the ILLANS numeracy assessments are shown in Table 4.11. For non-Indigenous students, teacher ratings of numeracy achievement in 2003 were moderately associated with all ILLANS numeracy assessments. In contrast, for Indigenous students, the associations declined markedly over time and were not significant by the final year of the study, suggesting far greater variability in numeracy performance among Indigenous students.

Table 4.11 Correlations between teacher assessed levels of numeracy achievement (2003) and the ILLANS numeracy assessments for Indigenous and non-Indigenous students

| Teacher assessed achievement: | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|-------------------------------|------------------|------------------|------------------|------------------|
| Numeracy | | | | |
| Indigenous | .451*** | .280*** | .255*** | .198* |
| Non-Indigenous | .446*** | .363*** | .394*** | .402*** |

* $p < .05$, ** $p < .01$, *** $p < .001$

In the final year of the study, teachers also provided an overall rating of each student's numeracy achievement against their peers and against the curriculum. Achievement was rated on a 5-point scale where 1 = *Well below the expected level* and 5 = *Well above the expected level*. When rated against their peers and the curriculum, Indigenous students on average were rated as achieving below non-Indigenous students (Table 4.12).

Table 4.12 Means (and standard deviations) of teacher assessed numeracy achievement against peers and the curriculum, Indigenous and non-Indigenous students (2006)

| Teacher assessed achievement: | Indigenous ($n = 126$) | | Non-Indigenous ($n = 353$) | | Total ($n = 479$) | |
|-------------------------------|-----------------------------|--------------|---------------------------------|--------------|------------------------|--------------|
| | % Above Expected | Mean (SD) | % Above Expected | Mean (SD) | % Above Expected | Mean (SD) |
| Against peers | 19 | 2.4 (1.11) | 39 | 3.1 (1.20) | 34 | 2.9 (1.22) |
| Against curriculum | 9 | 2.2 (1.02) | 26 | 2.8 (1.12) | 22 | 2.7 (1.13) |

Correlations between teacher ratings of student achievement against their peers and the curriculum and the ILLANS numeracy assessments are shown in Table 4.13. The strength of association between teacher ratings and performance for non-Indigenous students was consistently higher than for Indigenous students.

Table 4.13 Correlations between teacher ratings of numeracy achievement against peers and the curriculum (2006) and the ILLANS numeracy assessments for Indigenous and non-Indigenous students

| Teacher assessed achievement: | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|-------------------------------|------------------|------------------|------------------|------------------|
| Against peers | | | | |
| Indigenous | .521*** | .264** | .454*** | .473*** |
| Non-Indigenous | .632*** | .585*** | .684*** | .708*** |
| Against curriculum | | | | |
| Indigenous | .547*** | .411*** | .591*** | .511*** |
| Non-Indigenous | .618*** | .572*** | .642*** | .670*** |

* $p < .05$, ** $p < .01$, *** $p < .001$

Teacher-rated attentiveness was positively associated with numeracy achievement in Year 6 for both Indigenous ($r = .313$) and non-Indigenous students ($r = .506$), although the association was substantially higher for non-Indigenous students.

Association between English literacy and numeracy achievement

The achievement of Indigenous students in English literacy in ILLANS was strongly associated with their numeracy achievement. Relevant correlation coefficients are recorded in Table 4.14. The magnitudes of the correlation coefficients in Table 4.14 show a strong association in the early stages of the study that declines towards the later stages of the study; however, the association is higher again for Indigenous students in the last year of the study.

Table 4.14 Correlation between literacy and numeracy achievement at each assessment point (2003–2006)

| | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|----------------|------------------|------------------|------------------|------------------|
| Indigenous | .674*** | .583*** | .551*** | .638*** |
| Non-Indigenous | .697*** | .632*** | .588*** | .584*** |

* $p < .05$, ** $p < .01$, *** $p < .001$

Student attitudes and achievement

In 2006, students were asked to complete a survey about their feelings about various aspects of school and learning, and about their reading habits and interests. Questions assessing student attitudes towards reading and their reading habits were derived from a number of different studies that have explored the relationship between student attitudes and achievement among older children (see for instance reports on PISA, De Bortoli & Cresswell, 2004; and the Literacy Advance Research Project [LARP], Purdie, Frigo, & Searle, 2006). Survey data were obtained from 123 Indigenous and 342 non-Indigenous students. The purpose of this section is to assess the degree to which student attitudes towards their school, reading and learning are related to their literacy and numeracy achievement during ILLANS.

Students' attitudes towards reading

In the final year of the study, students completed a survey on their attitudes to reading by rating 14 items on a scale from 1 = *Strongly Disagree* to 4 = *Strongly Agree*. For ease of interpretation, Table 4.15 reports *Agree* and *Strongly Agree* responses combined as percentage agreement, as well as mean ratings. Responses of Indigenous and non-Indigenous students were very similar across most items. Compared with non-Indigenous students, Indigenous students were more likely to agree that they read only if they had to, and to agree that they read only to get the information they needed. These results are comparable with those found in the PISA study (De Bortoli & Cresswell, 2004). Non-Indigenous students were more likely to agree that they often read in bed compared with Indigenous students.

There were also a number of differences across the items as a function of students' gender. Male students were more likely than female students to agree that: they read only if they had to, reading was a waste of time, they read only to get the information they needed, and that they couldn't read for more than a few minutes. In contrast, female students were more likely than male students to agree that: reading was one of their favourite hobbies, they enjoyed going into bookstores or libraries, they often read in bed, they asked friends to recommend books they enjoyed, and they sometimes received books as gifts. The generally more positive attitudes towards reading held by females is consistent for Indigenous and non-Indigenous students and is similar to the findings of PISA (De Bortoli & Cresswell, 2004).

Table 4.15 Percentage agreement and mean responses for attitudes towards reading for Indigenous and non-Indigenous students (2006)

| How much do you disagree or agree with these statements about reading? | Indigenous (<i>n</i> = 123) | | Non-Indigenous (<i>n</i> = 342) | | Total (<i>n</i> = 465) | |
|--|---------------------------------|--------------|-------------------------------------|--------------|----------------------------|--------------|
| | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) |
| I read only if I have to | 63 | 2.7 (0.87) | 39 | 2.3 (0.91) | 46 | 2.4 (0.92) |
| Reading is one of my favourite hobbies | 37 | 2.2 (1.00) | 43 | 2.3 (0.99) | 42 | 2.3 (1.00) |
| I like talking about books with other people | 46 | 2.4 (0.97) | 42 | 2.4 (0.91) | 43 | 2.4 (0.92) |
| I find it hard to finish books | 33 | 2.2 (0.87) | 26 | 2.0 (0.91) | 28 | 2.1 (0.90) |
| I feel happy if I receive a book as a present | 70 | 2.8 (0.91) | 70 | 2.8 (0.90) | 70 | 2.8 (0.90) |
| For me, reading is a waste of time | 26 | 2.0 (0.95) | 17 | 1.8 (0.86) | 19 | 1.8 (0.89) |
| I enjoy going to a bookstore or a library | 61 | 2.7 (1.01) | 64 | 2.8 (0.99) | 63 | 2.7 (0.99) |
| I read about my favourite activities/hobbies | 79 | 3.0 (0.81) | 73 | 3.0 (0.87) | 75 | 3.0 (0.85) |
| I enjoy reading magazines more than books | 73 | 3.1 (0.97) | 67 | 2.9 (1.00) | 69 | 3.0 (1.00) |
| I read only to get information that I need | 57 | 2.7 (0.92) | 36 | 2.3 (0.95) | 41 | 2.4 (0.96) |
| I cannot sit still and read for more than a few minutes | 37 | 2.2 (0.98) | 27 | 2.0 (1.02) | 30 | 2.0 (1.00) |
| I often read in bed | 41 | 2.2 (1.04) | 64 | 2.7 (1.06) | 58 | 2.6 (1.08) |
| I ask my friends to recommend books they enjoyed | 41 | 2.3 (0.89) | 41 | 2.3 (0.95) | 41 | 2.3 (0.93) |
| I sometimes receive books as gifts | 66 | 2.7 (0.95) | 66 | 2.7 (0.95) | 66 | 2.7 (0.95) |

Student engagement with reading has been shown to be significantly related to their achievement for both Indigenous and non-Indigenous students (De Bortoli & Cresswell, 2004; Kirsch, 2002). An overall measure of reading engagement was created by summing agreement responses (for positively worded items) and disagreement responses (for negatively worded items) for the 14 reading attitudes items. Table 4.16 shows the correlations between student attitudes towards reading and achievement in literacy for Indigenous and non-Indigenous students. Similarly to PISA, engagement with reading is positively associated with achievement for non-Indigenous students. In this study, however, the association for Indigenous students was significant only for the final literacy assessment and was substantially smaller than the association for non-Indigenous students.

Table 4.16 Correlations between student attitudes towards reading and the ILLANS literacy assessments for Indigenous and non-Indigenous students

| Student attitudes towards reading: | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|------------------------------------|------------------|------------------|------------------|------------------|
| Indigenous | .176 | .077 | .191 | .192* |
| Non-Indigenous | .282*** | .245*** | .283*** | .309*** |

* $p < .05$, ** $p < .01$, *** $p < .001$

Students' Reading Habits

The majority of students surveyed spent some time each day reading for enjoyment. Table 4.17 reports the percentage of Indigenous and non-Indigenous students who reported time spent reading for enjoyment. Of the students who indicated that they did not read each day for enjoyment, 15 per cent were non-Indigenous students and 28 per cent were Indigenous students. Apart from the higher proportion of Indigenous students who did not spend any time each day reading, the amount of time spent reading was very similar for Indigenous and non-Indigenous students. Male students (25.0%) were more likely than female students (12.0%) to report that they did not spend any time reading during the day. More than a third of Australian 15-year-olds surveyed in PISA did not read for enjoyment each day, with Indigenous students (39%) significantly less likely than non-Indigenous students (33%) to read for enjoyment (De Bortoli & Cresswell, 2004).

Table 4.17 Time spent reading each day by Indigenous and non-Indigenous students

| | Time spent reading for enjoyment each day | | | | |
|----------------|---|-------------|---------------|--------------|-------------|
| | Nil | <30 mins | 30–60 mins | 1–2 hours | >2 hours |
| | % | % | % | % | % |
| Indigenous | 28.2 | 42.7 | 17.3 | 7.3 | 4.5 |
| Non-Indigenous | 15.4 | 44.7 | 21.1 | 13.2 | 5.7 |
| Total | 18.7 | 44.2 | 20.1 | 11.7 | 5.4 |

Time spent reading each day was not related to achievement on the literacy assessments for either Indigenous or non-Indigenous students.

Almost half of all students borrowed books from the library several times a month. The frequency of book borrowing by Indigenous and non-Indigenous students was very similar (Table 4.18). When compared with the results from PISA, it is evident that students borrow far fewer books from the library as secondary students than they do at the primary level. Forty-five per cent of Indigenous students and 39 per cent of non-Indigenous students participating in PISA never or hardly ever borrowed books from the library (De Bortoli & Cresswell, 2004). Female students were also more likely than male students to borrow books from the library several times a month and less likely to never or hardly ever borrow books. There is some evidence that students who borrow books from the library more frequently had higher literacy achievement than students who never or hardly ever borrow books from the library. For instance, literacy achievement in the final assessment is higher for students who borrow books from the library at least once a month compared with students who borrow books from the library a few times a year or less often.

Table 4.18 Frequency of library borrowing for Indigenous and non-Indigenous students

| | Books borrowed from the library | | | |
|---------------------|---------------------------------|-------------------------|-------------------------|----------------------------|
| | Never or hardly ever % | A few times a year % | About once a month % | Several times a month % |
| Indigenous students | 22.1 | 15.9 | 15.9 | 46.0 |
| Non-Indigenous | 14.1 | 15.9 | 23.7 | 46.4 |
| Total | 16.1 | 15.9 | 21.7 | 46.3 |

Non-Indigenous students were more likely to have more than 80 books in the house and less likely to have no books in the house, compared with Indigenous students (Table 4.19). There was a clear relationship between having more books in the house and literacy achievement. Average achievement on all literacy assessments for students who reported that they had no books in the house was significantly lower than the average achievement of students who reported that they had at least some books in the house.

Table 4.19 Number of books in the home for Indigenous and non-Indigenous students

| | Number of books in the home | | | |
|-------------------------|-----------------------------|-----------|------------|-----------|
| | None % | < 40 % | 40–80 % | > 80 % |
| Indigenous students | 16.0 | 32.8 | 32.8 | 18.5 |
| Non-Indigenous students | 5.6 | 24.0 | 31.5 | 38.9 |
| Total | 8.3 | 26.3 | 31.8 | 33.6 |

Indigenous student were less likely than non-Indigenous students to have a computer in their home (Table 4.20). These figures are comparable to those reported in PISA where 35 per cent of Indigenous students and 8 per cent of non-Indigenous students did not have a computer in the home.

Table 4.20 Access to a computer in the home for Indigenous and non-Indigenous students

| | Computer at home | |
|-------------------------|------------------|---------|
| | Yes % | No % |
| Indigenous students | 61.5 | 38.5 |
| Non-Indigenous students | 91.6 | 8.4 |
| Total | 83.8 | 16.2 |

The learning environment and teacher-student relations

Overall, the students surveyed evaluated their schools' climate positively. The school climate survey included questions about the relevance of the learning that students experienced, the extent to which they felt their families were welcomed and their culture valued, and questions about the quality of teacher-student relationships. Student responses are reported in Table 4.21 and 4.22 as a percentage agreement as well as a mean response. Indigenous and non-Indigenous students alike rated their school climate positively and their schools' learning environment highly. In particular, students felt that their families were welcomed in the school and their culture was valued. They regarded the things that they learned as important, worthwhile learning and interesting. Most students also felt that teachers were interested in students' well-being, that teachers provided extra help to students when required, and that they were fairly treated by teachers.

Table 4.21 Rating of learning environment for Indigenous and non-Indigenous students (2006)

| | Indigenous students (<i>n</i> = 124) | | Non-Indigenous students (<i>n</i> = 343) | | Total (<i>n</i> = 467) | |
|--|--|--------------|--|--------------|----------------------------|--------------|
| | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) |
| My school is a place where: | | | | | | |
| <u>Learning Environment</u> | | | | | | |
| The things I am taught are worthwhile learning | 93 | 3.2 (0.66) | 95 | 3.3 (0.59) | 94 | 3.3 (0.61) |
| The things I learn are important to me | 96 | 3.5 (0.63) | 95 | 3.4 (0.60) | 95 | 3.4 (0.61) |
| We do interesting work | 84 | 3.0 (0.73) | 86 | 3.2 (0.74) | 86 | 3.1 (0.74) |
| The work I do is a good preparation for the future | 92 | 3.4 (0.73) | 91 | 3.4 (0.70) | 91 | 3.4 (0.71) |
| My family is welcome | 97 | 3.5 (0.64) | 95 | 3.4 (0.62) | 96 | 3.5 (0.62) |
| All cultures are valued | 93 | 3.4 (0.68) | 93 | 3.5 (0.69) | 93 | 3.5 (0.69) |

Table 4.22 Rating of teacher-student relations for Indigenous and non-Indigenous students

| | Indigenous students (<i>n</i> = 124) | | Non-Indigenous students (<i>n</i> = 343) | | Total (<i>n</i> = 467) | |
|---|--|--------------|--|--------------|----------------------------|--------------|
| | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) |
| My school is a place where: | | | | | | |
| <u>Teacher-student relations</u> | | | | | | |
| Students get along well with most teachers | 74 | 2.9 (0.79) | 76 | 3.0 (0.80) | 76 | 2.9 (0.79) |
| Most teachers are interested in students' well-being | 89 | 3.1 (0.72) | 92 | 3.3 (0.67) | 92 | 3.2 (0.69) |
| Most teachers really listen to what I have to say | 81 | 3.0 (0.81) | 83 | 3.1 (0.77) | 83 | 3.1 (0.78) |
| I will receive extra help from my teachers if I need it | 89 | 3.3 (0.73) | 90 | 3.3 (0.73) | 90 | 3.3 (0.73) |
| Most of my teachers treat me fairly | 83 | 3.1 (0.78) | 87 | 3.3 (0.76) | 85 | 3.2 (0.77) |

A measure of school climate was constructed by averaging students' ratings across the eleven school climate items. Table 4.23 shows the correlations between student ratings of school climate and literacy and numeracy achievement in ILLANS for Indigenous and non-Indigenous students. Ratings of school climate were significantly related to literacy and numeracy achievement in the final year of the study for all students, with generally stronger associations for Indigenous students.

Table 4.23 Correlations between student ratings of school climate (2006) and the ILLANS literacy and numeracy assessments for Indigenous and non-Indigenous students

| | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|---------------------|------------------|------------------|------------------|------------------|
| Literacy | | | | |
| Indigenous students | .427*** | .246* | .301** | .312*** |
| Non-Indigenous | .269*** | .158** | .181** | .253*** |
| Numeracy | | | | |
| Indigenous students | .370** | .313** | .253** | .253** |
| Non-Indigenous | .159* | .080 | .129* | .164** |

* $p < .05$, ** $p < .01$, *** $p < .001$

Sense of personal learning achievement

Almost all students provided very positive self-evaluations of their learning accomplishments. Student responses to the eight items assessing sense of personal learning achievement are shown in Table 4.24 as a percentage agreement as well as a mean response. Generally, all students felt proud to be a student, found learning fun, liked going to school and learning, and felt they were a good student. Non-Indigenous students were more likely than Indigenous students to agree that they worked hard at school and to agree that they knew how to cope with their school work.

Table 4.24 Rating of personal achievement in learning for Indigenous and non-Indigenous students

| | Indigenous students ($n = 118$) | | Non-Indigenous students ($n = 337$) | | Total ($n = 455$) | |
|--|--------------------------------------|--------------|--|--------------|------------------------|--------------|
| | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) | % Agree- ment | Mean (SD) |
| I feel proud to be a student | 89 | 3.3 (0.74) | 89 | 3.3 (0.76) | 89 | 3.3 (0.75) |
| I find that learning is a lot of fun | 79 | 3.1 (0.80) | 75 | 2.9 (0.80) | 76 | 3.0 (0.80) |
| I work hard | 79 | 3.1 (0.75) | 88 | 3.3 (0.75) | 86 | 3.2 (0.76) |
| I like to go to school each day | 78 | 3.1 (0.87) | 78 | 3.0 (0.87) | 78 | 3.0 (0.87) |
| I achieve a satisfactory standard in my work | 86 | 3.1 (0.70) | 87 | 3.1 (0.70) | 87 | 3.1 (0.71) |
| I know how to cope with my school work | 79 | 3.1 (0.71) | 90 | 3.3 (0.71) | 87 | 3.2 (0.74) |
| I like learning | 78 | 3.1 (0.85) | 78 | 3.0 (0.85) | 78 | 3.1 (0.85) |
| I am a good student | 87 | 3.2 (0.80) | 86 | 3.2 (0.80) | 86 | 3.2 (0.80) |

An overall measure was created by computing an average of the eight personal learning achievement items. Table 4.25 shows the correlations between student ratings of personal learning achievement and the ILLANS literacy and numeracy assessments for Indigenous and non-Indigenous students. Significant associations are evident between student ratings of personal learning achievement and the ILLANS literacy and numeracy assessments for both Indigenous and non-Indigenous students, though these associations are relatively small. Student ratings are more consistently associated with literacy than numeracy achievement, particularly for Indigenous students.

Table 4.25 Correlations between students' personal learning achievement ratings (2006) and the ILLANS literacy and numeracy assessments for Indigenous and non-Indigenous students

| Teacher assessed achievement: | Survey 6 2003 | Survey 7 2004 | Survey 8 2005 | Survey 9 2006 |
|-------------------------------|------------------|------------------|------------------|------------------|
| Indigenous students | | | | |
| Literacy | .229* | .319** | .209* | .172 |
| Numeracy | .223* | .158 | .007 | .184 |
| Non-Indigenous | | | | |
| Literacy | .265*** | .120* | .201** | .225*** |
| Numeracy | .242*** | .112 | .178** | .219*** |

$p < .05$, ** $p < .01$, *** $p < .001$

4.4 FACTORS INFLUENCING ACHIEVEMENT AND GROWTH

There are many factors that influence the development of students' literacy and numeracy skills. The following section includes exploratory analyses of the relationship between school level and student level factors and achievement in ILLANS literacy and numeracy assessments in the final year of the study for all students.

School level factors

The characteristics of the school that students attend are key factors likely to influence students' educational achievement. To explore the relationship between literacy and numeracy achievement and school level factors, multiple regression analyses were used to predict scores on the final ILLANS assessments from the school's geographic location, the percentage of Indigenous students at the school, and students' rating of school climate. Some schools had very small numbers of students participating in the study, so for the purpose of this analysis only schools with more than ten students were included.

The schools in this study were classified according to their remoteness using the Accessibility/Remoteness Index of Australia (ARIA), developed by the Australian Bureau of Statistics. Of the schools included in the final year of the study that had more than ten participating students, seven were located in capital cities and were classified as metropolitan, five were classified as regional and one was classified as remote. Schools were classified according to the percentage of Indigenous students in the school as fewer than six per cent, 6–10 per cent, 11–20 per cent, 21–40 per cent, and 41 per cent or greater. A measure of school climate was constructed by averaging students' ratings across the eleven school climate items.

Literacy achievement

Overall, the regression model predicting literacy performance in the final year of primary school from school level factors was significant, although the proportion of variance explained by the model was very small ($R^2 = .10$, $p < .01$). School climate ratings and the proportion of Indigenous students at the school were significant independent predictors of literacy achievement. Schools with higher proportions of Indigenous students tended to have lower literacy scores than other schools. Literacy achievement in the final year of ILLANS also tended to be greater for students who rated their school's climate more favourably ($r = .267$).

Numeracy achievement

School level factors also predicted numeracy performance in the final year of primary school, although the proportion of variance explained by the model was marginal ($R^2 = .05, p < .01$). School climate was the only significant independent predictor of numeracy achievement with a zero order correlation between school climate ratings and numeracy achievement of .206.

Student level factors

Selected student level factors were used to explore their relationship to literacy and numeracy achievement. Multiple regression analyses were again used to predict literacy and numeracy achievement in the final year of primary school from an estimate of student absenteeism, home language, parental occupation, teacher ratings of student attentiveness, and student ratings of personal learning achievement. Some caution is warranted in interpreting results based on these analyses because of limitations in the student-level variables. The characteristics of these variables and their limitations are discussed below.

Absenteeism

Indigenous students are often reported to be absent from school more often and for longer periods compared with non-Indigenous students. Absenteeism is often cited as one of the reasons that Indigenous students fail to reach their academic potential. Information on absenteeism was requested for each year that the study was conducted. During the first three years of the study, schools reported how many days the students were absent during the first six months of the year and then reported absenteeism for the entire year. Unfortunately, schools responded inconsistently to this question between 2003 and 2006 resulting in incomplete data. Some schools indicated that they were too busy to provide this information or had privacy concerns. From the partial data set that was obtained, each student's record was examined and classified according to a maximum percentage that a student spent away from school in any of the periods for which data was collected and supplied by schools. Student absenteeism was classified in band widths of a maximum of less than 25 per cent of the time, or 25 per cent or more of the time.

Language background

Teachers were asked to indicate the language background of both Indigenous and non-Indigenous students. For the purpose of the analyses, the main language spoken at home was classified as Standard Australian English (SAE), or as other than SAE. Other languages incorporated Aboriginal Languages, Aboriginal English, Kriol, as well as other languages not specified.

Parental occupational status

In 2003, teachers were asked to record the occupations of students' parents. Information on parental occupation has some limitations. In many instances, only the occupation of one parent was recorded, or the data were incomplete or not updated. Nonetheless, using available data on the occupation of students' mothers and fathers, a measure of parental occupation was constructed comprising four levels—professional or managerial, clerical or skilled, semi-skilled or unskilled, and not in the labour force.

Attentiveness

Student attentiveness or level of engagement in classroom learning processes was measured in 2006 with a scale developed by Rowe and Rowe (1999). Teachers rated their students' attentiveness against five paired statements (about the student's level of concentration, motivation, perseverance, attention span, and purposeful activity) and an analysis was based on a mean score of their responses to each statement. Scores were reversed on the original scales before calculating an average of the five items so that a mean score of '5' indicated a high level of attentiveness while a score of '1' indicated a low level of attentiveness.

Student rating of personal learning achievement

A mean score of the eight items used to assess students' self rating of their personal learning achievement was also used as a student-level factor in the regression.

Literacy achievement

Overall, the regression model predicting literacy performance in the final year of primary school from student level factors was significant and explained a higher proportion of the variance than school-level factors ($R^2 = .30$, $p < .01$). Teacher ratings of student attentiveness, student absenteeism, parental occupation, and the main language spoken at home were significant independent predictors of literacy achievement. Students rated by teachers as more attentive recorded higher literacy scores in the final ILLANS assessment, as did students who spoke Standard Australian English at home, and those whose parents were in professional occupations. Absenteeism levels above 25 per cent were associated with poorer literacy achievement.

Numeracy achievement

The regression model predicting final year numeracy achievement from student-level factors was also significant ($R^2 = .32$, $p < .01$). Teacher ratings of student attentiveness again predicted numeracy achievement in the final year of the study, with students with higher attentiveness ratings recording higher numeracy achievement than students with lower attentiveness ratings. Absenteeism levels above 25 per cent were again associated with poorer numeracy achievement. Professional parental occupation was the only other significant predictor in the student-level factors regression model. Children whose parents had a professional occupation achieved more highly than children whose parents had other occupations.

4.5 SUMMARY

Quantitative data on student background, their achievement in English literacy and numeracy, and student attitudes towards school and learning collected throughout Phase 2 of ILLANS were useful in describing the achievements of a group of Indigenous students from Years 3–6. The key findings from the analyses included:

- Indigenous students continue to improve their literacy and numeracy skills over the last four years of primary school at a similar rate to their non-Indigenous peers; however, the gap in achievement between Indigenous students and their non-Indigenous peers evident at the start of Year 3 remains until the end of primary school.
- There is enormous variability in literacy and numeracy achievement within as well as between groups. Many Indigenous students are achieving highly in literacy and numeracy relative to their peers, although overall a lower proportion of Indigenous students are achieving better than the average of their peers, compared with non-Indigenous students.
- Teacher assessments, both at a global level (ratings against their peers and the curriculum) as well as for specific skills in literacy and numeracy reflect the same pattern as ILLANS achievement data; fewer Indigenous students are rated highly compared with their non-Indigenous peers.
- At the same time, Indigenous students express highly positive attitudes towards learning, their school environment, and their teachers. They feel proud of their accomplishments and enjoy learning. In these areas, Indigenous students hold similar attitudes to their non-Indigenous peers.
- Analyses of factors affecting achievement and growth in literacy and numeracy showed that both school-level factors (such as school climate) and student-level factors (such as attentiveness, absenteeism, and main language spoken at home) were related to student achievement in literacy and numeracy. Overall, student-level factors emerged as more important than school-level factors.

5. CASE STUDIES

5.1 INTRODUCTION

Five schools were selected for site visits by researchers from ACER in 2005. Two of these schools had participated in Phase 1 and 2 of the project, and three schools joined the study in 2003 at the beginning of Phase 2.

The purpose of visits to schools was to gain further insight into how these schools operated their literacy and numeracy learning programs and to explore the different approaches they used to support the learning of Indigenous students. Major areas of discussion included culturally inclusive curricula, teachers' professional learning, and partnerships between home and school.

The schools were selected after a preliminary analysis of ILLANS literacy and numeracy data based on the student assessments undertaken in 2004. For some of the case study schools, the average achievement of Indigenous students was above that of all Indigenous students. For other schools, the average achievement of Indigenous students was below the achievement of all Indigenous students. The extent of the gap between the performance of Indigenous and non-Indigenous students at the school was also taken into consideration.

The school profiles in this section were compiled from data collected during interviews conducted at each of the schools in 2005. The interview questions were based on the eight priority areas for Indigenous education and training agreed to by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) in 1995, with a particular focus on priority areas six through eight. Priority areas six through eight focused on increasing the involvement of Indigenous parents and other community members in educational decisions, increasing access to professional development for staff involved in Indigenous education, and on the implementation of culturally inclusive curricula. Interview questions for staff at each school were designed to elicit evidence of strategies developed to target these priority areas. MCEETYA's priority areas are as follows:

- i. improving Indigenous literacy;
- ii. improving Indigenous numeracy;
- iii. increasing the employment of Indigenous Australians in education and training;
- iv. improving educational outcomes for Indigenous students;
- v. increasing Indigenous enrolments;
- vi. *increasing the involvement of Indigenous parents/community members in educational decision making;*
- vii. *increasing professional development for staff involved in Indigenous education;*
- viii. *and expanding culturally inclusive curricula*

5.2 THE SCHOOLS: BACKGROUND INFORMATION

Detailed profiles for each of the schools selected for site visits are included in Appendix A of this monograph. The profiles are based on information collected through the annual questionnaires sent to the schools. Table 5.1 contains an overview of some of the key characteristics of Schools 4, 5, 14, 16 and 21, which were visited by ACER researchers in 2005. Detailed information on the literacy and numeracy achievement of the case study schools during Phase 2 of the project is shown in Tables 5.2 and 5.3.

Table 5.1 Case study schools

| School | Area | Sch Popn 2003 | Ind % | Ind LBOTE ⁵ % | LBOTE % | Reason for selection |
|-----------|----------|---------------|-------|--------------------------|---------|---|
| School 4 | Remote | 392 | > 60 | 6–10 | 1–5 | Indigenous students lower achieving than all Indigenous students. A gap between Indigenous and non-Indigenous students in the school |
| School 5 | Regional | 377 | 21–40 | 0 | 0 | Indigenous students higher achieving than all Indigenous students A gap between Indigenous and non-Indigenous students in the school |
| School 14 | Regional | 540 | 41–60 | 41–60 | 1–5 | Indigenous students lower achieving than all Indigenous students A gap between Indigenous and non-Indigenous students in the school |
| School 16 | Regional | 600 | 6–10 | 0 | 1–5 | Indigenous students higher achieving than all Indigenous students |
| School 21 | Metro | 450 | 11–20 | 0 | 41–60 | Indigenous students achieving as well as, or better than, non-Indigenous students |

⁵ Language Background Other Than English

Table 5.2 English literacy achievement in Phase 2 of ILLANS for Indigenous and non-Indigenous students: Means (standard deviations)

| | 2003 Survey 6 | 2004 Survey 7 | 2005 Survey 8 | 2006 Survey 9 |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Total sample | Mean (SD) | Mean (SD) | Mean (SD) | Mean (SD) |
| Indigenous | 83.2 (16.8) | 88.5 (14.1) | 96.0 (13.3) | 98.3 (15.5) |
| <i>N</i> | 220 | 192 | 175 | 128 |
| Non-Indigenous | 94.6 (12.7) | 97.4 (14.2) | 102.5 (12.7) | 108.6 (13.9) |
| <i>N</i> | 490 | 530 | 396 | 351 |
| School 4 | | | | |
| Indigenous | 74.1 (11.7) | 83.1 (12.2) | 90.5 (15.6) | 89.0 (21.4) |
| <i>N</i> | 19 | 15 | 15 | 10 |
| Non-Indigenous | 90.7 (11.5) | 97.0 (10.9) | 105.9 (7.4) | 112.1 (8.7) |
| <i>N</i> | 10 | 12 | 9 | 9 |
| School 5 | | | | |
| Indigenous | 93.7 (9.5) | 91.6 (13.0) | 95.8 (8.5) | 101.1 (10.8) |
| <i>N</i> | 13 | 17 | 19 | 16 |
| Non-Indigenous | 100.6 (11.5) | 105.1 (14.2) | 106.9 (10.6) | 113.6 (12.7) |
| <i>N</i> | 34 | 30 | 31 | 26 |
| School 14 | | | | |
| Indigenous | 81.8 (13.8) | 84.5 (13.8) | 89.6 (12.1) | 87.1 (17.4) |
| <i>N</i> | 27 | 32 | 18 | 14 |
| Non-Indigenous | | 93.6 (16.6) | 102.7 (17.7) | 96.9 (19.2) |
| <i>N</i> | | 30 | 22 | 13 |
| School 16 | | | | |
| Indigenous | 91.2 (11.9) | 94.0 (12.4) | 107.0 (5.3) | 105.7 (8.3) |
| <i>N</i> | 13 | 15 | 10 | 11 |
| Non-Indigenous | 96.9 (14.6) | 97.1 (14.8) | 102.6 (14.6) | 109.2 (11.9) |
| <i>N</i> | 53 | 72 | 40 | 46 |
| School 21 | | | | |
| Indigenous | 93.1 (11.2) | 98.9 (14.7) | 104.7 (12.4) | 112.0 (11.4) |
| <i>N</i> | 8 | 6 | 6 | 5 |
| Non-Indigenous | 92.2 (12.7) | 95.4 (11.9) | 102.0 (11.2) | 108.3 (13.6) |
| <i>N</i> | 34 | 27 | 22 | 23 |

Table 5.3 Numeracy achievement in Phase 2 of ILLANS for Indigenous and non-Indigenous students: Means (standard deviations)

| | 2003 Survey 6 | 2004 Survey 7 | 2005 Survey 8 | 2006 Survey 9 |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Total sample | Mean (SD) | Mean (SD) | Mean (SD) | Mean (SD) |
| Indigenous | 97.0 (14.8) | 104.6 (12.4) | 109.6 (12.5) | 119.2 (12.6) |
| <i>N</i> | 194 | 189 | 172 | 126 |
| Non-Indigenous | 107.4 (13.0) | 113.5 (11.4) | 116.6 (11.2) | 126.5 (12.6) |
| <i>N</i> | 472 | 523 | 407 | 351 |
| School 4 | | | | |
| Indigenous | 88.3 (12.2) | 99.2 (11.7) | 101.8 (11.8) | 110.2 (15.2) |
| <i>N</i> | 20 | 19 | 17 | 10 |
| Non-Indigenous | 107.1 (9.1) | 116.6 (9.7) | 123.9 (7.4) | 129.0 (7.9) |
| <i>N</i> | 10 | 12 | 9 | 9 |
| School 5 | | | | |
| Indigenous | 113.6 (9.3) | 105.6 (8.0) | 107.9 (11.7) | 119.4 (7.9) |
| <i>N</i> | 13 | 17 | 17 | 15 |
| Non-Indigenous | 118.8 (13.9) | 117.9 (11.6) | 117.6 (12.6) | 132.9 (13.3) |
| <i>N</i> | 34 | 32 | 29 | 25 |
| School 14 | | | | |
| Indigenous | 94.3 (12.9) | 100.5 (12.7) | 104.8 (13.4) | 116.0 (11.3) |
| <i>N</i> | 24 | 27 | 18 | 14 |
| Non-Indigenous | | 112.1 (13.4) | 116.8 (14.3) | 124.5 (12.1) |
| <i>N</i> | | 29 | 20 | 14 |
| School 16 | | | | |
| Indigenous | 104.5 (8.5) | 111.3 (8.1) | 113.2 (10.2) | 123.7 (7.7) |
| <i>N</i> | 13 | 14 | 14 | 11 |
| Non-Indigenous | 106.4 (13.7) | 112.4 (13.0) | 115.2 (9.9) | 126.2 (10.2) |
| <i>N</i> | 51 | 70 | 61 | 47 |
| School 21 | | | | |
| Indigenous | 107.5 (12.1) | 114.0 (5.2) | 119.5 (9.5) | 122.2 (10.5) |
| <i>N</i> | 8 | 6 | 6 | 5 |
| Non-Indigenous | 108.6(7.3) | 115.2 (7.9) | 121.9 (10.4) | 128.2 (13.3) |
| <i>N</i> | 33 | 27 | 21 | 23 |

5.3 SCHOOL PROFILES

School 4

School 4 was a remote school that had been involved in ILLANS from the beginning of the project in 2000. The school had a sizeable proportion of Indigenous students who tended to gravitate towards this school in the township rather than to other primary schools. The school enrolment at the time of the case study was 227 students, of whom 70 per cent were Indigenous. A significantly higher proportion of boys were enrolled at the school. As a result, all-boy classrooms had been introduced and a regular program was developed that aimed to improve the confidence and outcomes at school for boys. Similar numbers of males and females completed one or more surveys for this project; however, there were more non-Indigenous boys than non-Indigenous girls (non-Indigenous students: 10 male, 3 female; Indigenous students: 12 male, 16 female). All of the non-Indigenous students in the study had attended preschool. In contrast, only 50 per cent of the Indigenous students in the study had attended preschool.

School attendance varied depending on the community circumstances. Extended student absences were usually followed up by the AIEO. A large percentage of students arrived late to school regularly and the school dealt with this by educating teachers and staff about the individual circumstances of the children. A liaison officer was available to follow up with families if students were absent for an extended period. To encourage regular school attendance for Indigenous students, a school bus picked up students from local communities and food was provided at recess and lunchtime for those students who may not have brought their own from home. To target Indigenous students who had disengaged from school, the school also offered a bridging program. The program focused on teaching and equipping students with skills to enable them to make a smooth transition back into mainstream schooling.

Overall, the school made concerted efforts to establish effective relationships with parents and community members and viewed itself as a school with an open door policy. Formal parental involvement in the school was limited and most contact with the school was directed through the AIEO, Indigenous teachers and teachers' assistants who worked at the school. School personnel noted that changes to Aboriginal Student Support and Parental Awareness (ASSPA) funding⁶ in 2004 had also impacted on the level of involvement of Indigenous parents. ASSPA had been a vehicle to encourage parental involvement in the school, allowing them to feel as though they had a level of control and say over what was happening within the school. Since ASSPA had been withdrawn, funding had been reduced for a number of Indigenous programs and staff interviewed reported that Indigenous parents felt disenfranchised by the changes. Though parents had limited formal involvement in the school community, staff felt that Indigenous parents felt comfortable having their children at the school and in visiting the school to pick up or drop off children, or talk to teachers informally. A large number of Indigenous staff were employed at the school and non-Indigenous staff felt that this was important for maintaining good relationships with the Indigenous community. The school also conducted home visits when necessary and promoted the school to parents through visiting Indigenous communities.

Professional development was in theory an integral part of this school; however, some staff felt that professional development opportunities tended to be limited to theoretical approaches or school-based aspects. The staff felt that they would benefit greatly from physically going out more often to the communities. They also felt that their professional development needed to be an ongoing concern.

There were mixed reactions from staff about a culturally inclusive curriculum as at the time of the site visits there was no whole-school approach. Some staff felt that Indigenous content should only be taught by Indigenous people, whereas Indigenous staff who were interviewed felt that this was a responsibility of all teachers within the school. Indigenous staff felt that there was very little coverage of Indigenous history or culture as part of the curriculum. Typically, a short period of time might be devoted to Indigenous studies within another unit, but Indigenous studies were not taught as a stand-alone subject.

Although the average achievement of the Indigenous students at School 4 tended to be lower than the average achievement of the sample as a whole, clear growth across the years is evident in both literacy and numeracy achievement. The range in achievement levels is quite substantial by the time students completed their last assessments. Across time, the gap in achievement levels between the Indigenous higher achievers and the lower achievers widens, as evidenced by the much larger standard deviation for the Indigenous students compared with the non-Indigenous students (see Tables 5.2 and 5.3). Figure 5.1 shows graphically the school's performance for Indigenous and non-Indigenous students, compared with the performance of all Indigenous and non-Indigenous students in the study.

⁶ ASSPA, which operated in schools up until 2004, provided funding for Indigenous Education based on a formula funding model. It was replaced by the Parent School Partnership Initiative (PSPI) which was a submission-based funding model.

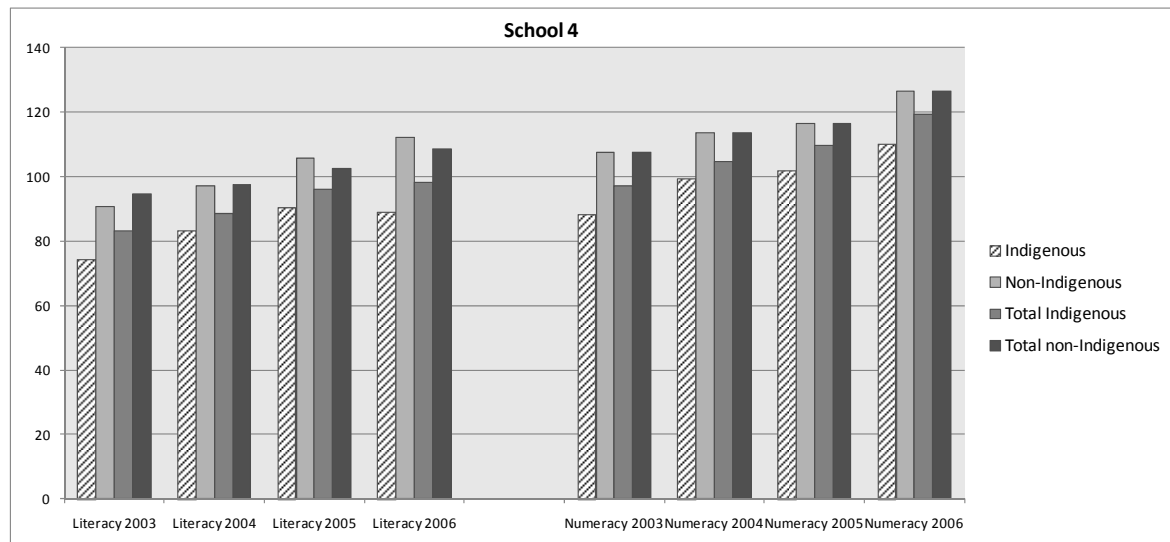


Figure 5.1 School 4 performance on the ILLANS literacy and numeracy assessments 2003–2006

School 5

School 5 was located in a small rural town and had an enrolment of approximately 400 pupils at the time the case study was undertaken. The student population was multicultural, with Indigenous students comprising approximately 20 per cent of all students in 2005. The local area was described as quite disadvantaged, with a high proportion of public housing, and with approximately 80 per cent of the school community eligible to receive state government payments paid to low income earners to support their child's education. There was a strong Indigenous community in the area and there were locally run organisations that supported employment, education and training by, and for, Indigenous people. Staff at the school believed that key factors affecting the success of Indigenous students' learning were their lack of language experience (most spoke Aboriginal English or an Aboriginal language at home) and school readiness. School readiness was a consistent theme that emerged in this project in explaining the educational outcomes of Indigenous and non-Indigenous students. There were few problems at the school with student absenteeism, although student lateness was an ongoing concern. The principal had created an environment of high expectations and encouraged ongoing improvement for all students and staff in the school, which in turn fostered a culture of high expectations of staff from students.

The school had been visited on a number of occasions during the initial years of the project. The researchers' interest in this school remained high throughout the project, as the school was high achieving compared to others, particularly for the numeracy assessment in 2002. From 2003 to 2006 the average results for Indigenous students at School 5 were on a par with, or higher than, other schools in the study. Although the Indigenous students at the school performed relatively well compared to other students in the study and often better than the average for all Indigenous students, their results were significantly below the non-Indigenous students at School 5 from 2003–2006. Another interesting feature of this school was the option for Indigenous students of enrolling in a specialised Indigenous Education Unit which catered only for Indigenous students. On enrolment, Indigenous parents were provided with two choices with regard to their child's educational experience. Indigenous children could be enrolled in either the Indigenous Education Unit, or in the mainstream school population. Indigenous students who enrolled in the Indigenous Education Unit stayed there for the duration of their primary education. Once parents decided where their children would be enrolled it was rare for students to be able to transfer between the mainstream school and the Indigenous Education Unit. Students who arrived at the school in later years were allowed to enrol in either the mainstream school or the Indigenous Education Unit, but they were also informed that their child would not be allowed to swap between the unit and the mainstream school. The Indigenous Education Unit integrated closely with all aspects of the school but gave additional

emphasis to Indigenous culture and tradition. A small number of the students in this study attended the Indigenous Education Unit.

The Indigenous Education Unit was originally established to prepare Year 6 Indigenous students for Year 7 as a means of addressing high dropout rates in secondary school. Eventually, the unit evolved to cater for all year levels. Student access to the Indigenous Education Unit was facilitated through a school bus service that picked students up in the morning. Although Indigenous parents had choice over their children's educational experience, the majority of Indigenous children were educated in the mainstream classrooms. Reactions from staff were mixed about the benefits of Indigenous students attending the Indigenous Education Unit. The benefits of smaller class sizes, more specialised individual care and a greater emphasis on Indigenous culture were recognised as being highly positive for students. However, concerns were raised regarding the isolation of the students, their lack of exposure to a range of role models, and their difficulties coping when they were expected to integrate into the mainstream school environment for special events. Further concerns were raised about students' preparedness to transition from an exclusively Indigenous environment, made up mostly of siblings and cousins, to an environment in high school which did not cater for this type of schooling.

Overall, there was limited parental participation in the school. Lack of parent participation was universal and not specific to Indigenous parents. Some staff felt that Indigenous parents often felt uncomfortable in the school environment, particularly if they had experienced negative events in their own schooling. There were, however, a small number of parents who regularly attended the school. These parents were usually found in the vicinity of the Indigenous Education Unit which had a staff room and computer facilities that were accessible to Indigenous parents and which could be accessed without needing to visit the school reception.

The majority of staff felt that it was important for teachers to have appropriate training prior to working with Indigenous students and ongoing professional development relevant to working with Indigenous students. A need for additional support in this area was identified. One teacher commented that the 'Blue eyes Brown eyes PD' was something she found to be very useful for her because it challenged her values, which then led the teacher to assess her beliefs about working with Indigenous children.

The school did not follow a whole school approach to providing a culturally responsive curriculum and there was clear variation between teachers in interpretations of what a culturally inclusive curriculum might mean. Some teachers approached this issue by clearly recognising all cultures in the school and Indigenous culture in particular, by displaying pictures of Indigenous children and asking parents to bring in significant items to the school. It was generally perceived that the Indigenous Education Unit provided a clearer emphasis on cultural inclusivity than the mainstream school. Classroom teachers had access to sessions on Indigenous culture planned by Indigenous teachers, but there was little indication that these resources were used in the classroom. Lack of confidence, time constraints, and a desire from mainstream teachers for more ongoing professional development to aid cultural understanding were suggested as reasons why some teachers choose not to incorporate these resources into their classroom program. The school participated in National Aborigines and Islanders Day Observance Committee (NAIDOC) week activities, which were arranged by the AIEOs.

Indigenous students at School 5 tended to perform at least as well as, or better than, the average of all Indigenous students in ILLANS literacy and numeracy assessments. Throughout Phase 2 of the study, there was a gap in performance between Indigenous and non-Indigenous students at the school. After high performance by all children at the school in the first literacy and numeracy assessments in Phase 2, there was a clear drop in the achievement of Indigenous students, followed by slow growth through to the end of the study. Figure 5.2 shows the school's performance on ILLANS literacy and numeracy assessments, against the performance of all children in the study.

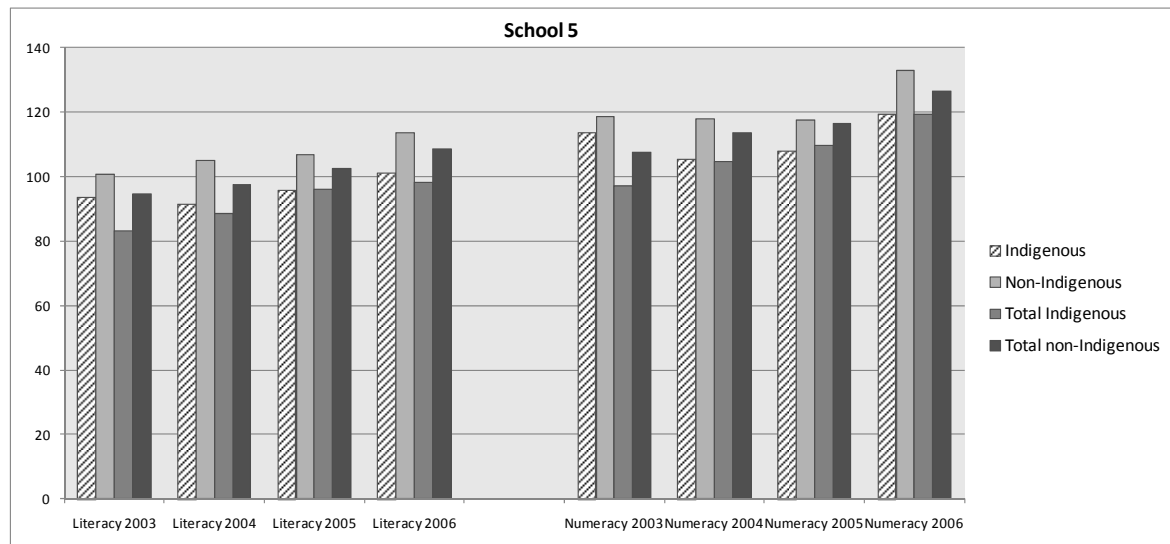


Figure 5.2 School 5 performance on the ILLANS literacy and numeracy assessments 2003–2006

School 14

School 14 was located in the western suburbs of a large regional centre and had an enrolment of 412 students. Most of the students lived in the surrounding suburbs, which contained a high proportion of public housing. Half the students at the school were Aboriginal, Torres Strait Islander or Cook Islanders. More than ten languages other than English were represented at the school. Thirty-two per cent of students spoke English as a second language with 46 per cent of these students being either Aboriginal or Torres Strait Islander. There were profound health problems among students at the school, including major hearing loss among Indigenous students, as well as noted issues with family and community violence. Irregular attendance by Indigenous students was an issue at this school. The AIEO was responsible for following up students with poor attendance records. One factor contributing to poor attendance was the fact that parents of students from either the Cook Islands or Torres Strait Islands would remove their children from school, sometimes for two weeks at a time, without informing the school. Many students arrived late to school each morning. To reduce the impact of consistent lateness, the school scheduled 15 minutes of fitness activities at the start of school so that students arriving late were less likely to miss the early morning literacy block. Staffing instability also seemed to have had an impact at the school. One teacher interviewed came to her class in Term 2 of the previous year after the students had been taught by 12 different teachers in Term 1. In turn, the school population was highly mobile. By the end of the ILLANS study, 56 per cent of students who had participated had either left the school, or had transferred to the school during the study. The school had used ASSPA funding to provide breakfast and lunch programs for students. The school viewed these programs as so important to providing a good basis for children's learning that after the withdrawal of ASSPA funding they continued the programs through donations from local shops and staff contributions.

Overall, there was limited parental involvement in the school in the traditional sense (such as listening to reading) by Indigenous parents and community members. Some staff members felt that many families no longer had time to be involved in the school during the day. Parent involvement in ASSPA had been a way for the school to maintain connections between the school and parents, but participation had declined as a result of the policy change in allocation of funding to schools. There were some occasions that encouraged a higher level of parent participation, for instance sports events, dance and cultural activities such as NAIDOC Week and Harmony Day. The school had made ongoing efforts to increase the amount of contact between the school and parents. One strategy that the school had implemented was organising a barbeque for parents and staff at the beginning of the year. The purpose of the barbeque was to provide an informal and relaxed environment to facilitate staff interactions with parents.

Teachers' responses indicated that the school had not provided professional development for staff involved in Indigenous education. Three of the four teachers interviewed had undertaken their teacher training at the same university and they were of the view that the Indigenous studies program delivered at that university was beneficial to their understanding and teaching of Indigenous students. Another teacher indicated that he had taught in the Cape York area and that he had gained a great deal from this experience including learning an Indigenous language. This teacher pointed out the importance of professional development being relevant to the context in which teachers are teaching, as he found his experiences in Cape York were not necessarily transferable to his current school.

There was no whole-school approach to achieving a culturally inclusive curriculum, so individual teachers addressed this issue in different ways. Two teachers indicated that they tried to ensure that perspectives from the different cultures in the class were included in whatever theme or topic they were covering. One felt that integrating an Indigenous perspective occurred when it was relevant to the unit being studied. Another felt that it was important to relate classroom learning to aspects of her students' culture so that it was relevant and interesting for students. She noted that it was a balancing act because of the diversity of cultures in her classroom, but found that she often also learned from her students during the process. Another teacher indicated that he did not deliberately try to include a culturally inclusive approach in the classroom because he felt that it was a highly political area and likely to be replaced with a different approach.

Figure 5.3 shows the literacy and numeracy performance of School 14 over Phase 2 of ILLANS against the performance of all other Indigenous and non-Indigenous students in the study. There was clear growth in numeracy development among Indigenous students at School 14 over the course of the study, whereas literacy growth was less pronounced. Indigenous students at the school had lower achievement in literacy and numeracy than non-Indigenous students at the school, and also compared with all Indigenous students in the study.

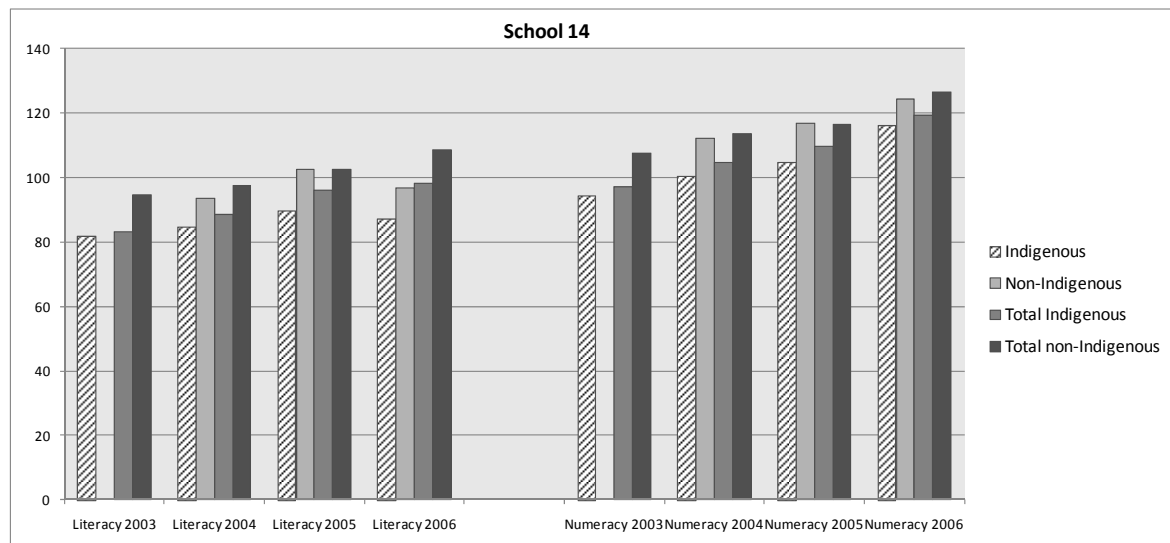


Figure 5.3 School 14 performance on the ILLANS literacy and numeracy assessments 2003–2006

School 16

School 16, located in a regional area, had an enrolment of close to 600, of whom more than 10 per cent were Indigenous. Staffing at the school was described as relatively stable, with many of the same staff employed at the school since it had opened almost 15 years ago. Indigenous students at the school were described as living within the local community, rather than in more isolated areas in Indigenous communities. The local community was described as generally of low socioeconomic status with a high unemployment rate. Few problems were identified with absenteeism or lateness at

the school. Behaviour problems and difficulties with diverse abilities in a classroom were managed through streaming. The school regularly grouped high ability children in their own classroom, and children who experienced more difficulties in a separate classroom with support from a full-time integration aide and a visiting behaviour management specialist. Teachers felt that these arrangements worked well for the teachers, who could focus their teaching on a narrower range of ability, and also for the students, who received more targeted instruction. High achieving students could be pushed ahead, and students who needed more support to achieve did not fall behind. A preschool transition program for Indigenous children was available and was viewed as successful in providing opportunities for Indigenous children to build their confidence in a classroom setting before entering school.

All interviewees spoke positively about the strong school leadership and the impact that this had on the school community and on their experiences at work. A whole-school approach to curriculum development was evident in the focus on specific program areas with concurrent professional development, and collaborative planning and assessment meetings. It was clear that staff felt highly supported and valued by the leadership within the school and that they enjoyed coming to work. The strong leadership was instrumental in creating a culture in which staff were motivated and positive about the school and where interactions between staff were positive and productive. There was a strong team approach to planning through stage groups that were described as very close and working well to achieve good outcomes for students and the school. The stage groups received good communication from the school executive and the principal. Teachers were consulted about and involved in planning their working life, and teachers' knowledge about specific students was valued in planning classroom organisation for a new year.

Parental involvement in the school was minimal, with a small core group of parents regularly assisting with classroom activities. Some school events, like sports days and multicultural celebrations, tended to attract more parents to the school. In general, however, school staff reported repeated, relatively unsuccessful attempts to engage with parents. Attempts to engage parents were directed at the entire community, rather than specific attempts to engage the Indigenous community. Staff felt that the recent changes to policy impacting ASSPA funding had not had any significant impact on the school or levels of parental involvement because the school had maintained a close relationship with former members of the ASSPA committee.

Some staff had received professional development in Indigenous issues previously, although none had undertaken this training at their current school. Most staff interviewed seemed to feel that a specifically Indigenous perspective was not necessary because at their school everyone was treated similarly. Though there was a clear recognition of the Indigenous community within the school, there was also a very strong view that all children were considered equally and on an individual needs basis. Teachers felt that Indigenous and non-Indigenous students were equally likely to be at the top, or at the bottom of the class. Teachers viewed the school as culturally inclusive with Indigenous students not isolated or segregated in the classroom or the yard. Perhaps as a result of this strong sense of equality and integration, there was little discussion on the issue of a culturally inclusive curriculum. One teacher felt that the current curriculum policy worked well to allow for the integration of Indigenous issues in classroom content.

Of particular interest in School 16 is that the results for this school indicated that the students were achieving well relative to the rest of the sample on both literacy and numeracy assessments. Indigenous students were achieving at a similar level to the non-Indigenous students at the school. Indigenous students were achieving significantly better than the average of all other Indigenous students in the study, and were achieving similarly to other non-Indigenous students in the study. Figure 5.4 shows the performance of Indigenous and non-Indigenous students at School 16 compared with the averages for all other children participating in ILLANS.

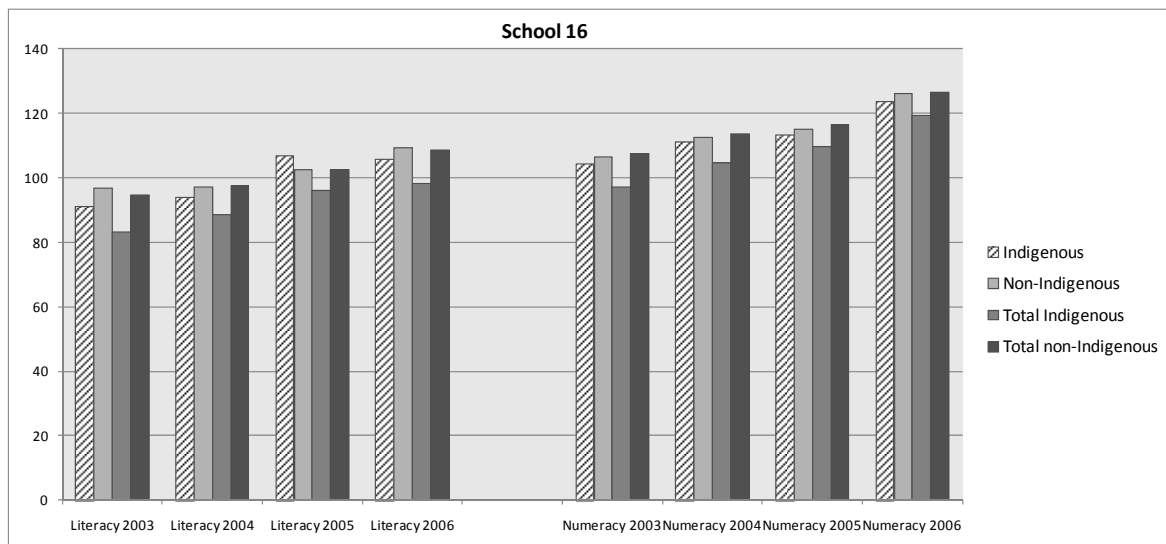


Figure 5.4 School 16 performance on the ILLANS literacy and numeracy assessments 2003–2006

School 21

School 21 was located in a capital city in a suburb with relatively low socioeconomic status and a highly transient school community. The population of the school in 2005 was close to 500. Its population was highly multicultural, with approximately 60 per cent of its students from non-English speaking backgrounds, and approximately 12 per cent Indigenous students. Approximately 10 per cent of the staff identified as Indigenous. Funding to cover extras like excursions was problematic and staff noted that they often used old and outdated resources. Staff interviewed emphasised that the school worked hard to be inclusive of students from a wide range of home environments and cultures. They felt, however, that problems began when students left to attend high school, with conflict between different groups of students much more pronounced in this environment. In response to an increase in behaviour problems at the school, the principal worked with staff to change classroom composition to minimise disruption to other children.

Staff interviewed reported that overall there was limited parental participation in the life of the school. Attendance at the school by students was described generally as very good, but very few parents attended formal events such as parent-teacher interviews. Some activities at the school in which Indigenous students excelled, such as sporting and cultural events, attracted a large number of Indigenous parents. With the withdrawal of ASSPA funding, the parent committee no longer met and no other parent organisation had taken its place. According to the teachers at the school, the principal worked hard to establish relationships with Indigenous parents. Further, the principal played an active role in encouraging positive relationships with staff, students, parents, and the community and staff felt this was one of the major strengths of his leadership. Staff indicated that they felt valued and supported and this in turn made for an enjoyable work place.

Generally, staff felt that professional development was limited and some staff questioned the quality and relevance of some professional development that they had attended. There was a strong feeling that any training around Indigenous issues had to be specialised to the area, as there were strong regional differences in Indigenous cultures. Teaching experiences of individual teachers at the school were varied and ranged from never having taught Indigenous students to having worked in a remote Indigenous community in the Northern Territory. Despite the diverse backgrounds of the teachers interviewed it was clear that staff at this school shared a strong commitment to providing a high quality education for all students. Teaching staff were well supported and excellence at the school was promoted by the strong leadership within the school.

A major asset of the school was the common belief held by staff and the principal that all children could achieve success. An associated strength was acknowledgement that all cultures are valued and should be respected. A culturally inclusive curriculum was achieved through integrated units which were a part of a whole-school approach. All staff and students played a valuable role at the school in fostering an awareness and appreciation of other cultures within the school community. This was achieved through theme work during classroom time, whole-school cultural celebrations and events such as cultural dance groups, and visiting elders and parental participation that involved sharing of skills and cultural knowledge. Celebrations of cultural events such as Harmony Day and NAIDOC Week provided students with an opportunity to share their culture and skills in a way that may not have otherwise been possible.

Literacy and numeracy achievement in ILLANS for School 21 shows that Indigenous students achieved more highly than non-Indigenous students at the school for literacy and had similar achievement for numeracy. Moreover, on literacy assessments, Indigenous students at the school were performing better than other students in the study (both Indigenous and non-Indigenous). Figure 5.5 shows the performance of students at the school on literacy and numeracy assessments in Phase 2 of ILLANS.

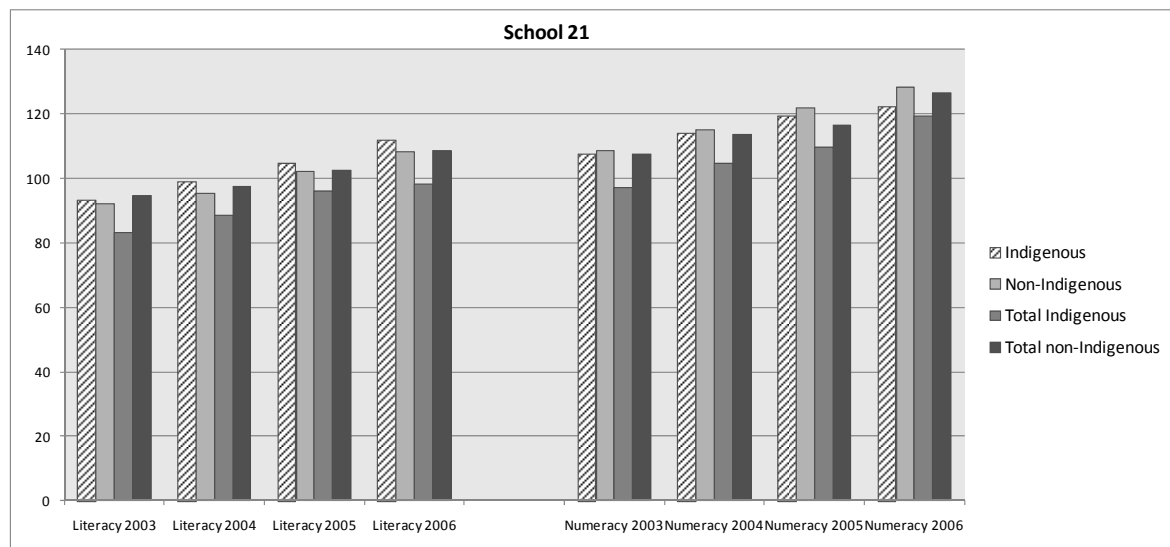


Figure 5.5 School 21 performance on the ILLANS literacy and numeracy assessments 2003–2006

5.4 SUMMARY

Case studies conducted at five of the schools participating during Phase 2 of this longitudinal study provided valuable qualitative data to explore the school contexts supporting achievement of Indigenous students in literacy and numeracy in this study. Each school had quite diverse school populations and the schools were located in very different environments; however, a number of common themes arose consistently across schools. The case study visits focused on exploring issues of parental involvement, professional development for teachers, and a culturally inclusive curriculum in line with three of MCEETYA's priority areas for Indigenous education and training. A number of other key themes also emerged and these are considered briefly below, along with the main discussion areas.

Parental involvement

All schools described difficulties in encouraging parental involvement at the school. Staff often felt that parents had very limited time to undertake activities at the school and were most likely to visit the school for sporting events or cultural celebrations like NAIDOC week. Indigenous students tended to be particularly successful in sporting events and schools felt this was an important context for engaging and motivating students and encouraging Indigenous parents to celebrate their children's success. All schools worked hard to make the environment welcoming and open to parents and felt that this was important in engaging Indigenous parents, particularly if their own school experiences had been negative.

Up until 2005, one of the key avenues for Indigenous parental participation in schools had been the school's ASSPA Committee. Most schools commented on the dissolution of their ASSPA committees and the negative impact this had had for students, parents, and the school. For some parents, ASSPA had been a vehicle for what some parents considered to be valid inclusion in decision-making processes. As well as providing support for Indigenous parents, the ASSPA committees had contributed positively to the education, health and wellbeing of students, with both Indigenous and non-Indigenous students benefitting from their activities, which included breakfast programs, school camps, concerts, Indigenous performers, and homework centres.

Professional development

Schools identified a clear need for relevant, ongoing professional development in learning strategies for engaging Indigenous students and in raising cultural awareness. In practice, however, teachers had limited access to professional development and when available it was often of little relevance. Formal professional development was identified as a critical need for teachers, many of whom had little experience of working with Indigenous children, to raise cultural awareness and to prepare teachers for developing pedagogical approaches to accommodate different approaches to learning. Often informal learning bridged the gap created by lack of access to formal professional development, with inexperienced teachers developing understanding from more experienced teachers and Indigenous staff. At the same time, in some schools Indigenous staff felt under pressure to be responsible for all Indigenous resources, content and issues at the school because other staff did not feel competent to take on these tasks. Thus, lack of access to professional development for non-Indigenous staff is a risk for Indigenous staff members who may be forced to take on unacceptable responsibility for managing Indigenous issues at the school.

Cultural inclusiveness

Discussions about the extent to which schools and teachers were culturally inclusive proved contentious. Some schools felt efforts to be culturally inclusive were fairly tokenistic and usually limited to NAIDOC week activities. Indigenous perspectives tended not to be included in classrooms outside of this period. Some non-Indigenous teachers felt that including Indigenous content in the curriculum should be the responsibility of Indigenous teachers. A number of Indigenous teachers disagreed, believing that all teachers had a responsibility to include an Indigenous component in classroom teaching. In fact, one school had access to units developed by an Indigenous teacher in the school but most teachers choose not to use them, a decision possibly related to lack of confidence or lack of time in an already full curriculum.

Most schools comprised a student population of many different cultures. An ongoing challenge was how to provide a culturally inclusive curriculum to adequately represent all student experiences. Some schools took on this challenge from a whole-school approach, looking at a particular topic from the perspective of different cultures in the classroom. Other schools seemed to adopt a more ad hoc approach, with decisions about integrating different cultural perspectives left to individual teachers. There was agreement that being culturally inclusive meant being responsive to a wide range of cultures and for Indigenous children, that included a mix of Indigenous cultures. Sometimes, Indigenous resources developed for a particular area did not appropriately reflect the culture of the Indigenous students in a different region.

Leadership

Schools where staff expressed strong satisfaction in their work and held highly positive attitudes towards Indigenous students, tended to also express support for the strong leadership in the school. There was some evidence from the case study schools that a strong culture of support for staff, encouragement of excellence among students, and belief from the school's leadership that all students can succeed, was implicated in good assessment results.

Attendance and mobility

Regularity of student attendance at the case study schools varied widely. In some schools, absenteeism and lateness were chronic problems that the school addressed through following up with families through contact with the AIEO and through home visits. Schools also worked to educate staff about the difficult backgrounds of some of these children, in order to encourage students to continue attending school. One school modified the curriculum to minimise the impact of chronic lateness on literacy learning by scheduling fitness as the first activity of the day. In another school, student attendance was good and Indigenous absenteeism was not a serious issue.

Teacher mobility, particularly in schools in more remote areas, was raised as a potential threat to school stability and, as a consequence, student achievement. Staff turnover in some schools was quite high and had an unsettling effect for students who were sometimes in classes that were without a permanent teacher and had many teachers during the term.

Teaching

Staff at all case study schools emphasised the importance of developing and maintaining a positive relationship with students and having high, yet realistic expectations. They believed strongly that all students should be treated fairly and equally, and that learning strategies should be targeted to individual students' needs. Rather than adopting a fixed approach, teachers drew on a range of teaching strategies to cater for their students' needs. Some schools focused on identifying students' strengths and using that as a basis to motivate and engage students in areas of the curriculum in which they lacked confidence or struggled with academically. Overall, there was a consistent view that all children enjoyed a combination of hands on and traditional teaching methods provided that they were at a level that was appropriate to their developmental stage. Many teachers rejected the notion that Indigenous students learned better using concrete materials; instead, they felt that learning preferences were strongly variable both within and between different groups of children.

There was a general agreement that any student at risk responded to intensive one-on-one teaching. In one school, the Indigenous Education Unit employed a Reading Recovery teacher in addition to the Reading Recovery teacher at the mainstream school. Funding from the education system for Reading Recovery is dependent on student numbers and accessible to only a small number of students. It is also limited to particular year levels and for a defined length of time. The extra Reading Recovery teacher at this school meant that the school was able to offer an extension of intensive support so that students with higher level needs would not slip back after their initial sessions.

Conclusion

Case study visits to five schools participating in Phase 2 of ILLANS provided a medium to explore in-depth issues surrounding some of the pronounced between-school variability in literacy and numeracy achievement. Each of the schools experienced challenges in attempting to engage parents (both Indigenous and non-Indigenous) in the life of the school. There was also evidence that notions of a culturally inclusive curriculum varied widely and practices to support the integration of different cultural perspectives were quite different between schools. Each of these schools had diverse communities and experienced unique challenges associated with their school communities. The case study visits identified a clear need among staff at these schools for ongoing, relevant professional development to empower them to work with Indigenous students more effectively.

6. THE FINAL YEARS OF PRIMARY SCHOOL: CONCLUSIONS

6.1 ILLANS IN CONTEXT

Most children develop literacy and numeracy skills throughout primary schooling that allow them to successfully transition to secondary school and to fully participate in society. For some children, however, the acquisition of literacy and numeracy is more problematic; Indigenous students are overrepresented in this group. On nationally agreed benchmarks for literacy and numeracy, fewer Indigenous students meet agreed standards compared with non-Indigenous students (see for instance, De Bortoli & Cresswell, 2004; De Bortoli & Thomson, 2009; Rothman, 2002; Rothman & McMillan, 2003). The reasons for Indigenous educational disadvantage are complex, entrenched, and require concerted and sustained efforts to address. The six *Closing the Gap* targets set explicit deadlines for making substantial improvements in education and employment outcomes for Indigenous people, including halving the gap in achievement for Indigenous students in reading, writing and numeracy by 2018. In this context, the ILLANS study is important in documenting the achievement and school experiences of a large number of Indigenous Australian students over the course of primary schooling.

The ILLANS project was conceived in response to a recognised need to conduct longitudinal research into the literacy and numeracy achievement of Australian Indigenous students. Phase 1 of the project ran from 2000–2002 and monitored the literacy and numeracy achievement of Indigenous students in 13 schools across Australia from their first year at school to the end of Year 2. Their achievement was compared with the achievement of students in another ACER study (LLANS). This report has described the literacy and numeracy achievement of Indigenous students participating in Phase 2 of ILLANS, compared with non-Indigenous students at the same schools undertaking the same assessments. Additional students were recruited to the study at the end of Phase 1 because of attrition due to student mobility between schools at the end of Year 2. Non-Indigenous students at the same schools were also recruited to the study, because they were regarded as a more suitable comparison group than the main LLANS study.

A range of methodologies have been used throughout ILLANS. In conjunction with quantitative data on student achievement, a range of non-academic data was collected from students, their teachers, and other staff at the school. Site visits to five of the Phase 2 schools allowed for a deeper exploration of the quantitative data through identifying qualitative themes that emerged in in-depth interviews with school staff. Thus, efforts have been made throughout the research to supplement the data on student achievement with student perspectives, as well as insight from the schools on factors that promote and hinder the achievement of Indigenous children at school. In the remainder of this section, the key findings of Phase 2 of ILLANS are presented, and the challenges of conducting this research are briefly discussed.

6.2 ILLANS FINDINGS

Student achievement data in literacy and numeracy showed a clear gap in average achievement between Indigenous and non-Indigenous students throughout Phase 2 of ILLANS. Thus, the gap in achievement evident by the end of Year 2 in Phase 1 of ILLANS was stable through to the end of primary schooling. This pattern points to the critical nature of early intervention and access to high quality preschool education to establish a solid basis for achievement in the later years of school. At the same time, similarly to the Phase 1 achievement data, the pattern of results in Phase 2 shows enormous variation in achievement across all literacy and numeracy assessments. Considerable overlap in the achievement of Indigenous and non-Indigenous students in the literacy and numeracy assessments also means that many Indigenous students achieve as well as non-Indigenous students, even though average scores are higher for the non-Indigenous sample. The pattern of results over time also shows that there is clear growth in literacy and numeracy over the four years of the study for both Indigenous and non-Indigenous students.

The aim of ILLANS was to collect data from a range of other sources on both the literacy and numeracy achievement of Indigenous students and on additional factors that could impact on their school experience. In support of the literacy and numeracy assessments, teacher ratings of their students' achievement in the first year of Phase 2 show that a higher percentage of non-Indigenous students had achieved aspects of reading, writing and numeracy development compared with Indigenous students. By the end of Phase 2, teacher ratings indicated that on average they assessed the achievement of their Indigenous students as lower than that of non-Indigenous students as compared with their peers and the curriculum.

At the same time, on a number of non-academic measures, Indigenous and non-Indigenous children reported very similar attitudes and behaviours. Engagement with reading was similar for Indigenous and non-Indigenous students, as was the amount of time spent reading each day. All students reported that they borrowed books from the library with similar frequency, although there were significantly fewer books in the homes of Indigenous compared with non-Indigenous students, and Indigenous students were less likely to have a computer at home. It was also very positive that almost all students rated the quality of their schools' learning environment extremely highly. Almost all students felt that they were learning worthwhile things and the things learned were personally important and interesting. They also agreed that their school was a place where their family was welcomed and their culture was valued. Most students also rated the quality of teacher-student relations highly. Most students also agreed that teachers were interested in students' well-being and really listened to what they had to say. They felt their teachers treated them fairly and they were able to receive extra help when required. Indigenous students also provided very positive self-evaluations of their school achievement. They expressed pride in being a student, believed learning was fun, and felt they were good students. These findings are extremely positive, because they reflect an engagement with school, a desire for learning, and a belief in ability among Indigenous students that are critical factors in promoting school achievement and in maintaining the desire to attend school.

Schools are the primary medium for addressing Indigenous educational disadvantage. Thus, it is encouraging that almost all students in this study rated their schools' climate (the quality of the learning environment and of teacher-student relations) very highly. The importance of the school context is reflected in the fact that students who rated their school climate more favourably tended to achieve more highly in both literacy and numeracy than students who rated their school climate less favourably. The impact of positive school environments and good teaching is also evident in large between-school variations in literacy and numeracy achievement. Indigenous students at some of the ILLANS schools achieved much more highly than the average achievement of all Indigenous students and sometimes as well as, or better, than non-Indigenous students at the same school.

Case study analyses in Phase 1 and Phase 2 of ILLANS were designed to explore in greater depth, through interviews with selected school staff, the critical school-level factors supporting Indigenous students to develop literacy and numeracy skills. These schools were selected after preliminary examination of the literacy and numeracy achievement data because they represented a range of different patterns of performance for their Indigenous students. Some of the key factors identified by schools as critical in enhancing the quality of the school environment for Indigenous students and in promoting educational attainment were:

- Effective school leadership promotes staff satisfaction, is a means to encourage excellence among students, and is a strategy to support Indigenous students to achieve highly at school.
- Encouraging parental involvement, particularly of Indigenous parents is challenging, but where it occurs it can act as a source of support for Indigenous students to experience success at school.
- Relevant professional development for teachers is essential for promoting knowledge about working with Indigenous students, particularly among teachers who are inexperienced and who have not worked extensively with Indigenous children.
- Good teaching has the potential to improve educational attainment for Indigenous students. Teachers support the development of literacy and numeracy by encouraging high expectations for all students, developing positive relationships with students, using a variety of learning strategies to suit individual learners, and providing specialist intervention when necessary.

A quantitative analysis of student-level factors related to literacy and numeracy achievement showed that teacher ratings of student attentiveness or engagement with classroom learning predicted both literacy and numeracy achievement in the final year of the study. A culturally inclusive curriculum is a school-level characteristic thought to enhance school engagement for Indigenous students. Exploration of this issue during case study visits, however, suggested that there were diverse opinions on what a culturally inclusive curriculum might mean and how it should be implemented in practice. Often, culturally inclusive practices were limited, focusing on NAIDOC week activities or they were regarded by non-Indigenous teachers as the responsibility of Indigenous teachers. Though there was a general sense that being culturally inclusive meant acknowledging the experiences and cultures of different students in the classroom, the way in which this might be reflected in teaching practices designed to incorporate Indigenous perspectives was not clear.

In support of previous research, students with lower levels of absenteeism and students who spoke Standard Australian English at home had higher literacy achievement in the final year of the study. In addition, children whose parents were in professional occupations exhibited higher achievement in numeracy than students whose parents were in less skilled occupations. Problematic levels of absenteeism (absent for 25% or more of the time) were far more common among Indigenous students (4% of non-Indigenous and 19.7% of Indigenous students participating in the final year of the study). It should be noted, however, that the recording of both absenteeism and parental occupation in ILLANS were problematic and the findings should be interpreted cautiously in light of this.

6.3 CHALLENGES

Undertaking the ILLANS project highlighted the great challenges associated with conducting longitudinal research generally, and with Indigenous students specifically. The commitment of schools to the research meant that 10 of the original schools remained in the project throughout Phase 1 and Phase 2 (a period of seven years). Fourteen schools that joined the project in Phase 2 supported the research for the final four years of the project. The commitment of school personnel to the project was instrumental in the project's success. The enormous mobility of the sample, particularly between Years 2 and 3, when many students moved schools and left the study, made it extremely difficult to track children across all of the assessments. As a result, in conjunction with absenteeism during assessments, many students missed one or more assessments, and very few completed all assessments across Phases 1 and 2. For this reason, modelling growth across the entire seven years of ILLANS was not possible.

6.4 CONCLUSIONS

The ILLANS project followed Indigenous children from their first year of school in 2000 through to the end of primary schooling in 2006. Literacy and numeracy skills of children in the study were assessed using materials developed for ACER's LLANS research. Phase 1 of ILLANS compared the academic performance of Indigenous students in the early years of school with the achievement and growth in literacy and numeracy of the main LLANS group. Phase 2 of ILLANS reported in this monograph followed Indigenous students through the final four years of primary schooling and compared their performance in literacy and numeracy with a sample of non-Indigenous students drawn from the same schools. In conjunction, both phases of ILLANS illustrate a gap in achievement between Indigenous and non-Indigenous students for both literacy and numeracy that widens over the course of schooling. Yet the data also clearly showed enormous variability both within and between the groups. Many Indigenous children succeed at school and are achieving as well as, or better than, non-Indigenous students at the same schools. This research has made some progress in exploring those factors that support Indigenous students to achieve highly in literacy and numeracy. Developing stronger links between schools and Indigenous communities, promoting attendance among Indigenous students, quality teaching, ensuring a good start to schooling, and developing a school culture in which Indigenous students feel included and supported to learn are key aspects of closing the gap in educational achievement for Indigenous students.

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APPENDIX A: THE SCHOOLS AND THEIR COMMUNITIES

Appendix A provides profiles of the schools that participated in the project. The profiles are based on the responses of principals, teachers and AIEOs to a series of questionnaires that were sent to the school each year at the time the assessments were conducted. Many of the schools had a number of characteristics in common, yet they were also very different in terms of their geographic locations, the size and the cultural mix of their student populations, the individual programs they developed and delivered to meet students' needs, and the diverse language and cultural backgrounds of the communities in which they were located.

The students who participated in this project came from a range of government primary schools that were situated across Australian States and Territories. It is well recognised that student learning takes place in, and is influenced by, a range of contexts and factors - at school, in classrooms, at home and within communities. Although the main focus of the project was on the developing literacy and numeracy skills of the students, an important part of the project was the ongoing collection of information about the contexts in which students developed these skills.

THE SCHOOLS

The data collection for Phase 1 of ILLANS took place from 2000–2002. Thirteen government schools located across Australian States and Territories participated in Phase 1. Five schools were located in capital cities in metropolitan areas, four were in large regional centres (including a capital city), two were in smaller more remote towns, and two were in very remote areas.⁷ The original 13 schools selected to participate in the study all had at least five Indigenous students in their first year of compulsory schooling and all were chosen because they had programs in place to support their Indigenous students. As might be expected, these schools were located in communities where a significant number of Indigenous people resided.

Phase 2 of ILLANS was undertaken from 2003–2006. For this phase of the study, it was decided to increase both the number of schools, and the number of students from whom data would be collected. All but one of the original 13 schools continued to participate in the project⁸, and an additional 12 schools, many in similar geographic locations to the Phase 1 schools, were invited to join. In 2003, data were collected from 24 schools.⁹ In 2004, the two schools from very remote locations decided not to continue with their involvement in the project. However, an additional two Indigenous community schools accepted invitations to join, so in 2004 data were again collected from students across 24 schools. In 2005, one of the Indigenous community schools did not continue with the project as it had only one student participating and that student moved to another school.

In total, 27 schools have been involved with this project over the entire course of the study. Profiles of 26 of the schools are presented, including the three original schools that ceased their involvement in the project but excluding the Indigenous school where only one student participant was involved for one year.

The profiles include brief descriptions of the communities in which the schools are situated, an indication of the numbers and composition of the student population, some general information about the schools' approaches to literacy and numeracy education, their approaches to providing a culturally relevant education for the students at their schools, particularly their Indigenous students, and the ways in which they work to establish relationships with the Indigenous parents and carers in the school community. School profiles rely on information collected through surveys during the study. As not all schools returned all surveys, the information on some schools is less detailed than others.

⁷ Schools were categorised based on their remoteness using the Accessibility/Remoteness Index of Australia (ARIA), developed by the Australian Bureau of Statistics (Department of Health and Aged Care, 2001)

⁸ This school was a pre-primary school—the adjoining primary school did not wish to participate in the project.

⁹ One of the very remote schools returned student profiles rather than complete the assessments.

There are a number of characteristics shared by many of the school communities in this project. All of the schools were primary schools and all were from the government education system. Typically, the school principals described their schools as situated in disadvantaged or economically depressed areas. Most of these schools were in areas with high unemployment rates and had a significant proportion of both single parent and highly transient families, both Indigenous and non-Indigenous. Transience for some was attributed to employment, housing needs, and moving on from situations of domestic violence, as well as for cultural reasons in the case of some of the Indigenous families. While the families of individual students may not all have these characteristics, these themes consistently emerged in descriptions of school communities by principals.

There were also differences between the school communities reflected in their geographic locations (metropolitan, regional and remote areas), the size and composition of school populations, and the strategies they use to support learning and address student needs. A number of the schools had large percentages of Indigenous students; others described student populations with a multitude of languages and cultures. There was diversity within Indigenous communities as well, in terms of the number of languages and dialects of English spoken, living situations (some families were long-term residents while others had moved from other locations, some from quite remote areas, to live there) and socioeconomic circumstances.

In many of the schools there was a concerted effort on the part of a core group of people in the school community, Indigenous and non-Indigenous, to establish effective working partnerships with families and to maximise students' learning opportunities. The relationships that schools had with Indigenous communities varied, with some schools having a notable Indigenous presence at the school and significant programs in place to promote and support Indigenous culture; other schools were seemingly less active in this respect.

An overview of some of the schools' key characteristics is provided in Table A.1. A more detailed profile of each of the schools follows, along with information about their literacy and numeracy programs and specific initiatives aimed at supporting Indigenous students and their families. These profiles are based on questionnaires completed by school principals, teachers and AIEOs.

Table A.2 shows the years of participation in the project of each of the schools.

All participants in this study were guaranteed anonymity; consequently, none of the schools are identified by name or region. ACER's Standing Committee on Indigenous Education agreed that the intention should be for the reader to focus on the issues and themes raised in the report rather than on particular locations. Schools from Phase 1 of the project are labelled as Schools 1 to 13; the schools that joined the project in 2003 or later are labelled as Schools 14 to 26.

Table A.1 School Background Information

| School | Area | School Popn 2000 | School Popn 2003 | School Popn 2006 | Indigenous % | Indigenous LBOTE % | LBOTE % |
|------------------------|-------------|------------------|------------------|------------------|--------------|--------------------|---------|
| Phase 1 Schools | | | | | | | |
| 1 | Regional | 500+ | 441 | – | 61+ | 21–40 | 11–20 |
| 2 | Remote | 309 | 390 | 387 | 41–60 | 21–40 | 1–5 |
| 3 | Metro | 731 | 730 | 672 | 11–20 | 1–5 | 41–60 |
| 4 | Remote | 370 | 392 | 230 | 61+ | 6–10 | None |
| 5 | Regional | 409 | 377 | 310 | 21–40 | – | – |
| 6 | Very remote | 255 | – | – | 61+ | 61+ | 0 |
| 7 | Metro | 268 | 250 | 230 | 21–40 | 0 | 0 |
| 8 | Very remote | 75 | 85 | – | 61+ | 61+ | 0 |
| 9 | Regional | 80/445 | – | – | 41–60 | 6–10 | 11–20 |
| 10 | Regional | 43/220 | 261 | 243 | 41–60 | 11–20 | 11–20 |
| 11 | Metro | 100 | 110 | 85 | 1–5 | 1–5 | 1–5 |
| 12 | Metro | 415 | 350 | 357 | 11–20 | 1–5 | 11–20 |
| 13 | Metro | 274 | | | 21–40 | 21–40 | 11–20 |
| Phase 2 Schools | | | | | | | |
| 14 | Regional | | 540 | 387* | 21–40 | 1–5 | 0 |
| 15 | Remote | | 342 | 352 | 41–60 | – | – |
| 16 | Regional | | 600 | 574* | 6–10 | 0 | 1–5 |
| 17 | Metro | | 418 | 425 | 6–10 | 1–5 | 1–5 |
| 18 | Metro | | 230 | 228* | 11–20 | 6–10 | 1–5 |
| 19 | Metro | | 160 | 158 | 21–40 | 41–60 | 21–40 |
| 20 | Metro | | 595 | 587* | 6–10 | 0 | 21–40 |
| 21 | Metro | | 450 | 503 | 11–20 | 0 | 21–40 |
| 22 | Metro | | 384 | 489 | 6–10 | None | 61+ |
| 23 | Metro | | *70 | 125 | 61+ | – | – |
| 24 | Metro | | 127 | 134 | 61+ | 0 | 0 |
| 25 | Regional | | 302 | 227 | 21–40 | 1–5 | 6–10 |
| 26 | Regional | | 103 | 78 | 41–60 | 0 | 1–5 |

*Figure supplied from ACER School Sampling Frame

Table A.2 School participation in ILLANS 2000–2006

| School | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1 | ✓ ¹ | ✓ ¹ | ✓ | ✓ ⁴ | ✓ ⁴ | ✓ ⁴ | x |
| 2 | ✓ | ✓ | ✓ | ✓ ⁴ | ✓ ⁴ | x | x |
| 3 | ✓ | ✓ ¹ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 6 | ✓ ¹ | ✓ | ✓ ² | ✓ ² | | | |
| 7 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 8 | ✓ | ✓ ¹ | ✓ | ✓ | | | |
| 9 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ ⁴ |
| 11 | ✓ | ✓ | ✓ | ✓ ⁴ | ✓ ⁴ | ✓ ⁴ | ✓ ⁴ |
| 12 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 13 | ✓ | ✓ | ✓ | | | | |
| 14 | | | | ✓ | ✓ | ✓ | ✓ ⁴ |
| 15 | | | | ✓ ³ | x | ✓ | x |
| 16 | | | | ✓ | ✓ | ✓ | ✓ |
| 17 | | | | ✓ | ✓ | ✓ | ✓ |
| 18 | | | | ✓ | x | x | ✓ ⁴ |
| 19 | | | | ✓ | ✓ | ✓ | ✓ |
| 20 | | | | ✓ | ✓ | ✓ | ✓ |
| 21 | | | | ✓ | ✓ | ✓ | ✓ |
| 22 | | | | ✓ | ✓ | ✓ | ✓ |
| 23 | | | | | ✓ | x | ✓ |
| 24 | | | | ✓ | ✓ | ✓ | ✓ |
| 25 | | | | ✓ | ✓ | x | ✓ |
| 26 | | | | ✓ | x | ✓ | ✓ |

Notes to Table A.2:

1. There were two assessments points in this year. The school only completed one assessment point.
2. Instead of the assessments, teachers completed student profiles
3. Students completed literacy assessments but not numeracy assessments
4. Only Indigenous students were assessed

INDIVIDUAL SCHOOL AND COMMUNITY PROFILES

Schools (2000–2006)

The first 13 schools described in this section are those that commenced their involvement with this project in 2000. All of these schools were nominated by education systems as examples of good practice in education for Indigenous students and all had at least five Indigenous students in their first year of school. The profiles are a synthesis of the responses of principals, teachers and AIEOs to questionnaires that were sent to the school each year at the time the assessments were conducted. Not all schools responded to these questionnaires each year.

School 1

Situated in a suburb of a large regional centre, School 1 has a culturally diverse community. The school community was described as being from a low socioeconomic area and there were a number of highly mobile families, including those who come from remote locations. The area had a high crime rate and a number of students were in formal or voluntary care. Many of the families lived in high-density public housing that was the focus of a major renovation and rejuvenation program during the first phase of this project.

In the late 1990s, Indigenous students were in the minority at the school, but this had changed substantially by 2002. By 2006, the school population of 470 students comprised more than 70 per cent Indigenous students. The increase in Indigenous students at the school was attributed to a strong Indigenous presence among staff members (both teaching and non-teaching) and a whole-of-school emphasis on acknowledging and respecting Indigenous cultures and languages.

Many students at the school were from non-English speaking backgrounds. Among these students were Indigenous students who spoke Aboriginal English, Torres Strait Islander Kriol and Indigenous languages. The ESL teacher at the school, a non-Indigenous woman with considerable experience working in remote communities, had a significant influence on the teaching practices of her colleagues and was well regarded by both teachers and parents. Her approach to recognising and building on students' diverse language backgrounds was based on *FELIKS* (Fostering English Language in Kimberley Schools), which identified teaching strategies to support students learning standard Australian English as their second language. This teacher remained on staff for the duration of the project.

The general approach to literacy teaching at the school encouraged a range of teaching practices and resources including *Walking Talking Texts*, guided reading and writing, support-a-reader/writer, phonemic awareness—all in the context of language—and print-rich classrooms. Numeracy teaching practices acknowledged the influence of children's language and emphasised hands-on activities that were relevant to students' experiences and backgrounds. In 2006, Year 1 students participated in an Indigenous ESL program supported through ILSS (Indigenous Language Speaking Students) funding. It was anticipated that this would lead to improved literacy and numeracy outcomes in subsequent years. Across the curriculum, there was an emphasis on student health and wellbeing, instilling confidence in the children, and involving them in the performing arts.

School 2

School 2 is one of two remote schools in the first phase of the project. School 2 had a school population which steadily increased during the time of the project to around 390 students. The proportion of Indigenous students remained stable at approximately 50 per cent and about half of these students spoke a language other than English at home. Some students lived in town while others lived in communities on the outskirts of town. These communities were visited by a mobile preschool. Over the course of the study, the school had three different principals.

Students from School 2 come from diverse socioeconomic conditions, ranging from families where both parents were unemployed to double income families. Most of the students lived in the town, with the remainder travelling to school from two remote Aboriginal camps. The school reported transiency and absenteeism among some of its students, particularly those from the remote camps who travelled to school via a one-hour bus trip each day.

The school had been acknowledged for its record in improving student attendance, particularly through its two mobile preschools which operated from the school. Since they were established, the preschools had improved attendance rates for students in their initial school years. An increase in attendance in the first year of school from 30 to 65 per cent in two years was attributed to the flow-on from access to preschool. Even so, some students who were participants in the longitudinal study had significantly high levels of absenteeism.

There was strong support for the school from the families of children attending the school. Families believed that the school's small size was important in enabling it to accommodate the needs of its Indigenous students. The school supported students who had significant needs through its pastoral care program and the use of ASSPA funds, which contributed to the provision of lunches and uniforms. Many of the older and longer serving staff members had developed good relationships with the Aboriginal community. There was one Indigenous teacher at the school as well as an AIEO.

School 3

School 3 was the largest of the Phase 1 schools surveyed. Situated in a major metropolitan city, the school maintained a population of just under 700 students. Over the years, the cultural diversity of the student population had increased. In 2006, around 13 per cent of the students were Indigenous and over 41 per cent of the non-Indigenous students were from language backgrounds other than English. The school community was characterised as having a low socioeconomic background.

There were a number of programs and associated teaching strategies which formed the basis for the school's approach to literacy and numeracy teaching. The *Early Years Literacy Initiative* was the main approach to literacy in the school, while *Count Me In Too K-1* was the basis of the school's approach to numeracy teaching. The school had also actively been involved in the Mathematics in Context project. Extra support and early intervention figured prominently, especially in the use of ESL and Reading Recovery teachers, in-class tuition, and the *Parents and Children Coming Together* (PACT) tutor program.

During the initial years of this project, there had been an overall increase in enrolment of Indigenous students at the school from 30 to 100, which reflected continued efforts to develop positive relationships between the school and the local Indigenous community. This number had been maintained in recent years and parents continued to be involved with the school as in-class tutors, through monthly Indigenous parent meetings and through home visits. The initiatives undertaken by senior staff and the AIEO to visit Indigenous families and develop an intimate knowledge of students' abilities, learning needs and backgrounds continue. The AIEO played a significant role in curriculum development and contributed to the success of Indigenous children at the school by influencing the ways in which the school supported the students.

School 4

The second remote school in the survey had a school population of about 370 students in 2000. Changing demographics in the local community meant that by 2006 the enrolment had dropped to 230. However, the total number of Indigenous students at the school remained stable so the proportion of Indigenous students increased over this timeframe to make up approximately 70 per cent of the school population. In 2006, between six and ten per cent of the Aboriginal students were reported to speak a language other than English. There were a large number of students with high needs and who were deemed 'at risk'. The student population could be transient, with some students moving between remote communities.

The school population was comprised of students from a diverse mix of cultures. Some of the Indigenous students had lived in the town for many generations and mobility among these students was not an issue; others had moved from remote communities or outstations and lived in town either with their families or in a foster care program. Around 30 of the students were transported by bus from town camps. There were two preschools attached to the school—one on-site and one off-site in one of the town camps. Some students who came from outstations where there were no educational facilities lived in foster care arrangements.

The principal had had a long association with Indigenous education and, along with other senior staff members, was involved with various community groups. In 2000, the main approach to literacy used at the school was First Steps but in 2001 the Scaffolding Literacy Program was introduced, which was reported as showing initial signs of success. An ESL teacher and a home reader tutor provided support for children who were not read to at home, by listening to children read in the classroom. An AIEO provided additional literacy and numeracy support. There was a Homework Centre at the school, ASSPA lunches and, for children with special academic and social needs, a STAR Centre Program.

To develop and maintain good relations between the school and Indigenous families, the school undertook home visits, provided tours of the school, and explicitly encouraged parent involvement. In order to cater for the needs of a diverse student population, the school also offered an accelerated literacy program, as well as ESL support.

School 5

School 5 is situated to the north of a large regional city. The school population declined slightly since the commencement of the ILLANS project from over 400 students in 2002 to 310 students in 2006. The number of Indigenous students at the school remained stable, which resulted in a slight increase in the proportion of Indigenous students at the school, from 23 per cent in 2003 to 28 per cent in 2006. The families were mainly from low socioeconomic backgrounds and around 25 per cent of the school population was transient over a 12 month period.

There was a relatively large local Indigenous community in the area including long-term residents and those who had moved from interstate. Indigenous families at the school had the option of enrolling their students in a separate Indigenous Education Unit that operated at this school. In the unit, there was an emphasis on oral language and Indigenous cultures, both the local culture and the cultures of other Indigenous communities across Australia. There were two Indigenous teachers at the school. The Indigenous Education Unit was a focal point for parents of all Indigenous students at the school—including those in the main school—and provides an area for parents to meet.

The main literacy program operating at the school was the *Early Years Literacy Program*; the Indigenous Education Unit funded an extra *Reading Recovery* teacher. The school also had a strong commitment to integrating information technology across learning areas, with computers in every classroom, a separate computer lab and a teacher employed at the school to work one-on-one with Indigenous students using information technology facilities. Although the school did not have a homework centre, there was an opportunity for one-on-one tutoring during school hours and after school. In 2005, the school had joined a project focussed on accelerated literacy.

School 6

School 6 is one of the two schools in the survey from a very remote area. The student population of this school was 255 in 2000; nearly all students were Indigenous (97%) and most spoke an Indigenous language as their first language. The community is located approximately 275km from a large regional city. This school was involved in the project from 2000 to 2003, although in 2003, the school had limited participation. The assessments were not suitable for the students and teachers completed literacy and numeracy profiles. Participation in the project ceased from 2004 onwards.

During the time that data were collected from the school, the School Council's major policy was that the school would teach only in English. All teachers were ESL trained and there was an ESL specialist teacher located in one classroom but available to support all teaching staff. *Walking Talking Texts* was used at the school and there was some awareness of the *Accelerated Literacy Program*. In 2002 there was an intention to increase the emphasis on phonics. Numeracy teaching was linked closely with the literacy program. A mobile preschool operated from the school, although it ceased operation for a period in 2002. As with many very remote schools, the high turnover of staff was an issue for the community.

The principal at the time of participation in ILLANS was still at the school in 2006 and was one of the key Elders in the community. She takes a pro-active role to promote school and student needs, and expectations to parents. She had very high expectations of her students and staff, as evidenced in her determination to participate in this research project for as long as possible. She was very explicit in demanding that teachers not drop their standards just because they were teaching in a community school—she wanted to 'extend the students beyond their comfort zone' in learning. The school's weekly professional development sessions attended by both Indigenous and non-Indigenous educators, were a crucial strategy for planning, sharing, passing on what works, and encouraging problem solving and group resolution for identified areas of difficulty.

School 7

This school is situated in an outlying urban region of a metropolitan area with approximately 230 students in 2006, of whom approximately 22 per cent were Indigenous. There were a large number of young and single parent families in this community, which had the lowest median age in the state and one of the highest unemployment rates and lowest income rates. Rates of home ownership in the area had increased slightly, but generational poverty was an issue. The school's population was highly transient with a turnover of approximately 30 per cent of students each year. Absenteeism was a large problem at the school with those with extensive absences falling behind those who were more regular attendees.

A range of programs was used to support students' literacy and numeracy development, including *Program of Additional Structure and Support* (PASS), which is an explicitly phonics-based program, and Reading Recovery. There were also intervention programs to aid specific students in their literacy and numeracy achievement. Two Aboriginal Tutorial Assistance Scheme (ATAS) tutors were at the school, working either on a one-to-one basis with students or assisting a teacher with classroom activities. The school employs an AIEO who was focusing on building the relationship between the school and the community.

School 8

School 8 is the second very remote school in the study. It is a small school with 85 students in 2003. The students come from a community where English was seldom spoken, which was situated on traditional lands 1000 km north of a metropolitan city. The community comprises predominantly Indigenous people, as well as some non-Indigenous people who work for the community. The school was one of eight on the traditional lands and comes under the control of an Indigenous Education Committee. A large percentage of the school population was extremely mobile and on average, teachers stay at the school for about two years.

The literacy program at the school was essentially ESL based but also utilised *First Steps* and the *Early Years Literacy Program*. Many of the students had good oral bilingual skills but poor writing skills. Approaches to numeracy were practically based where possible with an emphasis on mathematical language. The preschool provided a valuable exposure to English and the school culture through a targeted literacy and numeracy program that facilitated the transition to school. The Indigenous Education Committee required that the school curriculum focus on teaching Standard Australian English and did not include Aboriginal Studies per se.

School 8 school had a limited participation in the project in 2003. The assessments were generally not suitable for the students and only one student attempted both the literacy and numeracy assessments in 2003. This school ceased to participate in the project from 2004 onwards.

School 9

School 9 is located in one of the northern suburbs of a regional centre. During the initial years of this project, almost half of the school population of over 500 students were Indigenous (a percentage which had increased substantially since 2000). By 2006, there were just over 380 students at the school of whom 50 per cent were Indigenous.

The school community comprised a diverse mixture of cultural groups and families that come mainly from lower socioeconomic backgrounds. Many of the Indigenous families were long term residents in the area although some had moved from remote communities to settle in the area. While the majority of students spoke Standard Australian English as their first language, many also spoke Aboriginal English, Torres Strait Islander Kriol, and Indigenous languages.

During the first phase of the study, the principal had been at the school for a very long time, was a strong advocate for Indigenous students, families and staff, and a popular local identity, personally known to many Indigenous families both through the school and socially. The employment of Indigenous staff members ensured a strong Indigenous presence at the school, supported with many Indigenous programs and events. There had been a strong commitment to data collection and a focus on supporting the transition of students from primary to secondary school.

During Phase 2 of the study, the school had a new principal and by 2006, the school was engaged in the *National Accelerated Literacy Program* (NALP).

School 10

School 10 is situated near a large regional centre and had a school population of approximately 250 students. Since the project commenced, total enrolments increased from 220 students (peaking at 290 students in 2002). Over this time, the percentage of Indigenous students had also increased from 35 per cent in 2000 to 48 per cent in 2006. Some of the Indigenous students at the school come from the local area, while others travel from two Aboriginal town camps. The community in which the school is located was multicultural, with about 20 different countries represented and 50 per cent of the students from non-English speaking backgrounds. The local suburb was a low socioeconomic area and there were a number of highly mobile families.

The school had designed its own literacy program, which provides for an intensive focus on the development of oral language skills, including phonological awareness, explicit teaching and scaffolding literacy. Students were provided with ESL support, and in-class tuition from ATAS tutors. As part of the program, which was integrated with First Steps, individual students were screened on an ongoing basis for oral language development, phonological awareness, and development of perceptual motor skills. The program involved the active participation of teachers, a speech pathologist and an occupational therapist in the delivery of holistic programs for students. By 2006, there had been a move towards implementing the NALP.

The principal was at the school for the duration of this project. He had a long history with the community and personal relationships with most of the families through education, sport, and knowledge of 'the homelands'. The school had developed a range of strategies to involve parents and communities in their students' school learning including class visits to one of the town camps, developing resources with one of the camps, producing 'moving books' on video, creating literacy backpacks for students, and hosting a community playgroup. The school had developed spaces for students to use that were similar in design to Aboriginal meeting places. Students used these spaces throughout the day for recreational purposes and as outdoor classrooms. Parents were also welcomed to the school through orientation evenings, social events and home visits.

School 11

School 11 was the smallest of the Phase 1 metropolitan schools. At the beginning of the project, total enrolments were declining, but in recent years the school population had remained relatively stable at between 80 and 90 students. The percentage of Indigenous students at the school increased steadily and significantly in recent years, to just under 50 per cent. The broader community was described as disadvantaged but enthusiastic about learning. The school was situated in a suburb marked by high unemployment, a transient population, and a low socioeconomic status. The Indigenous students were highly mobile, but overall were good attendees with very few days absent.

The school uses a range of literacy and numeracy programs with an emphasis on employing extra staff to keep student learning groups small. Daily guided reading sessions were undertaken by all students and in 2003, the *Count Me In Too* numeracy program was introduced, with staff undertaking professional development activities to support its implementation. The size of the school encourages a whole school approach to a range of initiatives adopted by the school, with staff, school board and budget lines all dedicated to achieving the best learning outcomes for all students.

The small size of the school also enhances the close ties among the school community and there was an emphasis on developing welcoming, supportive, and respectful relationships with parents. Indigenous parents were often at school to lead painting, dance and craft workshops, participating on Committees and helping with the Breakfast Program. An Aboriginal dance group led by an Indigenous man had performed at many local venues and all children were eligible to participate if they choose. There were also plans to introduce an Indigenous language to the teaching program. The school continues to operate a health room which was visited by local health professionals providing free health and support services to the school community. This school and its principal had been the recipients of a number of awards in recognition of the work that they had engaged in with the local Indigenous community. There was a strong commitment to the *Dare to Lead* initiative across the school.

School 12

School 12 is a metropolitan school with a school population of approximately 350 students in 2006 (a slight decrease in number from the 400 students enrolled in 2000) that was described as serving an area with high levels of poverty. The Indigenous population at the school had been steady at 18 per cent for a number of years but had slowly decreased to approximately 12 per cent in 2006. Half of the students in the sample spoke Aboriginal English as their main home language. The school had a high proportion of new arrivals and students who came from non-English speaking backgrounds. There was a high degree of transience and mobility in the school population, but many of the Indigenous families were long term residents of the community stable and the community had strong family links.

By 2003, the school had appointed a new school principal to succeed the principal who had been at the school when the study commenced in 2000. This new principal came with considerable experience and continued a commitment to the school's *Accelerated Literacy* program (previously known as *Scaffolding Literacy*). The school had previously reported a relatively high teacher turnover.

The school had a strong emphasis on literacy with a regular literacy block conducted with at least two adults per class; ESL teaching strategies were used and *Reading Recovery* provided early intervention. Staff continued to participate in accelerated literacy professional development activities during the second phase of the project. Explicit teaching emphasised the need to code switch between home languages and Standard Australian English. In terms of numeracy, the school emphasised the need for explicit teaching, with concrete and hands-on tasks that utilised contextual situations, a cross-curricular approach and focused on mathematical language. No consistent approach had been developed for numeracy education across the whole school.

Indigenous families were supported with a peer induction program and 'parent packs'. Staff in the school front office provided a friendly and approachable face and families were introduced to the school Indigenous education team. There were a number of Indigenous people on staff, and parents were invited to be involved in classroom support and school events. Family links were acknowledged and each family's home language, including Aboriginal English, was acknowledged on enrolment. Students were able to participate in a school-based club for Indigenous students. The school had maintained an open and relatively constructive relationship with the local Indigenous families, largely facilitated by AIEOs. There were many events and activities that the school community participated in, both general and those with a specific Indigenous focus.

School 13

The final school that participated in Phase 1 of this study was located in a metropolitan capital city. Many of the 274 students enrolled at the school came from single parent families, had a lower socioeconomic profile, and had parents with limited education. The area was considered to be one of the most disadvantaged in the state. Approximately 22 per cent of students at the school were Indigenous and about a third of these students were speakers of Aboriginal English. Students come from a range of cultural backgrounds and over 10 per cent of students spoke a language other than English. A high number of the students at this school were highly transient, with some attending more than four schools in a year.

The students in this study came from the junior primary school, which was located next to the primary school. At the time of the school's participation in this project, the plan was to amalgamate the two sites. Parents of students at School 13 were concerned by the amalgamation as they valued the school's small size and more personal environment. As well as mainstream kindergarten, the junior primary school also offered an Aboriginal kindergarten for four half days per week. The pre-primary students who had participated in the study moved to the adjacent primary school, which chose not to participate in the study. No further data were collected for these students from 2004 onwards.

Overall, the school climate appeared supportive of the Indigenous students and their needs, as evidenced by the work of the ASSPA Committee, a Homework Class, a full-time AIEO, NAIDOC activities and professional development for staff. The majority of Indigenous students performed very well academically and were in the top ten per cent of the school's population. The school took pride in a 'hands on' approach to learning which was seen as beneficial for all students, and especially for Indigenous students. Literacy programs included the *First Steps Continua* and strategies, and Literacy Net, which used class and individual profiles, and had a strong oral language component. Numeracy teaching strategies were hands on, and used concrete materials. Overall, teaching activities focused on building students' self-esteem and confidence especially in Years K–3.

Schools (2003–2006)

The majority of the 14 schools that joined the project from 2003 onwards were selected because they were in similar locations to the original schools. The addition of these schools to the study provided an extra reference point for the data that had been collected by providing a group of 'like schools'.

Not surprisingly, the general characteristics of these schools and their communities were very similar to the schools described in the previous section. They were often located in socioeconomically disadvantaged areas, with multicultural communities, and there were high levels of mobility and transiency in the school community. Profiles of 12 of the schools follow. One school is omitted because the only participating student subsequently moved to another school.

School 14

School 14 is located in the western suburbs of a major regional town. The local community was described as socially and economically disadvantaged, with domestic and community violence, and health issues (including major hearing loss) among students. Students from the school lived locally,

many in public housing. The school had students from diverse cultural backgrounds. In 2003, 40 per cent of the 540 students were Indigenous and 15 per cent were Cook Islanders, many of these speaking English as a second language. By 2005, there had been a decrease in student numbers to just over 400 students and an increase in the estimated percentage of Indigenous students to 65 per cent.

The teachers who completed questionnaires had experience in teaching ranging from 1–32 years. One of these teachers had been at the school for 14 years, but the remainder had been at the school for less than five years. A number of the teachers had engaged in professional development, mostly related to literacy. Students were assessed to determine if they required assistance in literacy or numeracy, and learning support was provided across the school through teacher aides, ATAS tutors and Reading Recovery. Support for students also included a school breakfast/hungry lunch program. An ongoing challenge noted by teachers was the huge range of student abilities within the same classroom.

There was a strong focus on oral language development at the school. Literacy sessions include a range of strategies to meet students' needs, including modelling and building children's confidence. Most of the teachers structure the day to include a two hour literacy block and a one hour numeracy block, and a number of the teachers alternate the order in which these occur. There was a general consensus among teachers that their main challenge was finding ways of engaging students, giving them a sense that they were valued and building their confidence. A major professional development focus had been literacy, including PD on ESL for Indigenous children. A recent libraries/communities grant where students learnt to use video cameras and made a 15 minute film of their families was very successful.

Indigenous parents could participate in the school-funded ASSPA Committee, there was a special room to welcome parents, and interpreters were available. An Aboriginal Liaison Officer was employed from school funds. Indigenous events were celebrated (e.g. Harmony Day, Reconciliation Day), and culturally inclusive resources, including Indigenous resources, were available for the normal teaching and learning program. Contact between home and school was described as 'focused and intense'. Activities included Big Breakfasts (to which parents were invited) and a Big Day Out (which involved parents and students working together). Across the school, attempts were made to focus on positive happenings in the local community.

AIEOs engaged in activities ranging from classroom assistance to home-school liaison; they liaised with family services, community health and the police, organised cultural events, and spoke with families about the after school reading program, hearing tests and health checks. One of the AIEOs had been at the school for over 10 years (with 20 years experience in the system), while another was new to the school.

School 15

This school is located in a remote township. Over half of the students were Indigenous and many spoke Standard Australian English as a second language or dialect, thereby qualifying for the ILSS program which operated in Year 1. Attendance for Indigenous students was significantly lower than for non-Indigenous students, although attendance had slowly improved in recent years.

The school had a strong literacy focus on improving literacy skills for all students. The school's priority in literacy was reading and throughout the year staff had been engaged in professional development in First Steps Reading including Literacy Net. The Aboriginal Education Specialist Teacher and the ILSS Teacher supported all staff and worked collaboratively with teachers to ensure effective teaching and learning programs were implemented in these areas. Numeracy at the school was supported by a 0.5 Getting It Right-Numeracy (GIR-N) teacher who assisted teachers in planning and implementing strategies to improve numeracy across the school. Her focus in 2006 was the Years 1–3 classes. The GIR-N teacher worked collaboratively in classrooms and delivered professional development to staff.

The school promoted an inclusive school culture and Two Way learning principles were promoted and embraced throughout the school. There were pre-primary and kindergarten sections of the school on site, including a focused Indigenous kindergarten program. Developing the capacity of Indigenous staff to take on leadership roles within the school and community was a key focus for the school. Parents and caregivers were encouraged to work in partnership with the staff to support students.

School 16

Situated in a large and growing regional centre, this school had a student population of around 600 students. The school drew students from across the entire socioeconomic spectrum, but there were a significant proportion of low income families and single parents. Around 10 per cent of the students were mobile or transient, which was attributed both to the growth in availability of housing in the areas, as well as to lifestyle, with families often relocating along the coast. Indigenous students comprised 10 per cent of the school population.

In 2003, the principal had been at the school for many years and was still at the school in 2006. The teachers who responded to the surveys over this time included an experienced group (five teachers had been teaching for over 20 years), although most teachers surveyed had been at the school for five years or less.

Literacy programs at the school incorporated a range of teaching strategies (modelling, small group work, guided reading and independent reading) and teacher aides and tutors assisted in the classrooms. The school used *Count Me In Too* as a numeracy program and students worked in ability groups. Classes were streamed at this school and when asked to describe the composition of their classes, teachers typically referred to whether they were 'top, middle or bottom'. In 2006, there was also a class for girls only and a class for boys only that were team taught by two teachers in a double-teaching space. The literacy and numeracy sessions for these classes were taught in gender-specific groups, and other subjects were shared.

Issues of inclusivity and diversity at the school were viewed by the teachers in terms of all students being given a variety of opportunities to cater for their needs. Parents were invited to school activities and asked to support home reading and homework. There was nothing in the responses of the teachers that indicated whether there were any specific initiatives to include Indigenous families, language or culture at the school.

In 2003 and 2005, AIEOs gave very positive accounts of the school's approach to supporting Indigenous students and families. In particular, they mentioned a literacy and numeracy program which aimed to build the capacity of Indigenous parents and community members to become more actively involved in Indigenous students' education. However, there was no mention of this program by other staff members and the school indicated that there was no AIEO employed at the school in 2006.

School 17

This school is located in the suburbs of a capital city in an area of high poverty. The school catered for a diverse population, and had a relatively high number of special needs and ESL students. The school population had fluctuated at around 400 with a gradual increase over recent years. In 2003, 12 per cent of the school community were Indigenous, but by 2006 this figure had decreased slightly to approximately 9 per cent.

The literacy and numeracy teaching program included a focused two-hour daily literacy block with explicit teaching methods and in-school individual tuition for Indigenous students. Literacy programs included First Steps and Jolly Phonics and there was early intervention with Reading Recovery. ESL support was available in the school and teachers' plans were designed to accommodate the needs of all learners. The school had a technology focus and had introduced smart boards into classrooms. Students were split into numeracy classes according to ability level. They received individual support, homework booklets that targeted areas of need, open-ended tasks, and daily feedback on progress. A dedicated numeracy coordinator worked with teachers and AIEOs to develop individual learning plans for all students.

Indigenous parents participated at the school through volunteering and committee membership. Aboriginal teachers and AIEO's provided support and kept in constant contact with families through home visits.

School 18

School 18 is a relatively small school of 230 students in a metropolitan city. There was a small number of ESL students at the school and approximately 13 per cent of Indigenous students, some of whom were mobile. The community was described as being of low socioeconomic status. The school was in an area of high unemployment, family structures and backgrounds were diverse, and there were high levels of poverty and transience.

Literacy sessions were conducted in daily blocks and teachers incorporated a large range of strategies to support learning. These strategies include explicit teaching, scaffolding, and a consistent pedagogy that emphasised contemporary resources (e.g. texts) and content that was relevant and interesting to the children. An Accelerated Literacy program was introduced at the school in 2004 and teachers had engaged in professional development to support its implementation. Numeracy sessions were developed to include modelling and repetition, and used a variety of activities and resources to encourage student interest and engagement. Extra funding was allocated to AIEOs to provide in-class support for students.

Teachers who responded to the survey supported a Student Initiated Curriculum which involved students playing an active role in discussing the activities that they completed to increase motivation and creative learning. Teachers felt that by taking account of student experiences in their curriculum planning and by promoting student learning experiences that were relevant and culturally meaningful they established a base for success for all students. As part of the curriculum, all students undertook Aboriginal Studies. Indigenous culture at the school was acknowledged in various celebrations and at assemblies.

The school also had a Family Learning Centre and an Aboriginal Culture room which was operated by the AIEO and the Aboriginal Education teacher. There was also a Centre for Hearing Impaired students at the school, a special education program, and a preschool.

School 19

School 19 is a small urban school situated in a capital city. The local community was socioeconomically diverse, but poverty and transience contribute to educational disadvantage at the school for some students. In 2003, 20 per cent of the 160 students were Indigenous and about half of these students spoke an Indigenous language as their first language; this figure was similar in 2006. These students had moved to attend the school and were not living in their home community. Approximately half of all students in the school had not attended preschool. In recent years, there had been a change in the cultural background of non-Indigenous students with an increase from less than 5 per cent to over 20 per cent of non-Indigenous students who spoke a language other than English at home. Many of these students were refugees from countries where they were likely to have experienced trauma associated with war (e.g. Sudan, Afghanistan). The school emphasised providing a welcoming and safe environment for all its students.

Due to the high numbers of students from non-English speaking families, ESL teaching strategies had a high priority, with an ESL teacher and a separate classroom being allocated to support learning for these students. Numeracy teaching also had a considerable language focus and was incorporated into literacy and living skills programs. Experiences of all students were shared as a basis for literacy work that had a real-life focus. Teaching approaches included explicit teaching, individual learning plans with high support, and using ESL scales focused on growth across years. Teachers catered to a wide range of abilities within individual classrooms and had to manage this challenge as well as the challenge of building relationships with students from diverse backgrounds.

Indigenous students were supported in a number of different ways. For example, Indigenous studies and an Indigenous language were included in the curriculum, and there was a club for Indigenous students that met weekly and performed regularly at assemblies. There was an active ASSPA committee and the school promoted relationships with Indigenous parents through regular meetings, sharing family stories in class and through its relationship with community support agencies.

School 20

Like many of the other schools in this project, this school services a local community with a low socioeconomic background and a substantial percentage of families from non-English speaking backgrounds (40%). The school was large, with almost 600 students, of whom approximately 10 per cent were Indigenous. Given the diversity of the school population, a culturally inclusive approach was adopted in the school's planning processes.

The whole-school approach to literacy and numeracy teaching relied on early intervention, high expectations, catering for different approaches to learning, and implementing teaching strategies as outlined in departmental resources. The *Count Me in Too* program featured in the school's approach to numeracy.

School 21

With a relatively stable school population of around 500 students, this school is situated in a suburb of a capital city that is generally described as significantly disadvantaged. The families that make up the school population were described as multicultural and proud of their school. Fifteen per cent of students were Indigenous and approximately 40 per cent of non-Indigenous students were from non-English speaking backgrounds. Many of the families were from low socioeconomic backgrounds and many students had only one parent at home; transience within parts of the school community was high. A high proportion of children at the school were in foster care.

There had been a strong commitment at this school to improving academic outcomes by maximising student learning time and raising teacher expectations. Literacy and numeracy teaching was described as intensive, developmentally appropriate, with an emphasis on oral language development and early intervention. The school had a special Year 1 language development class for non-English speaking students. Numeracy classes also focused on language, as well as mathematical knowledge development with an emphasis on using concrete tasks. In addition, enterprise education principles were invoked, with students running the tuckshop, cake stalls, car-washes, and other fundraisers as practical ways of developing and using numeracy skills. Student assessment results in literacy and numeracy showed considerable improvement in recent years and the principal attributes this to a committed and hard working staff.

Parents and the school community were supportive and encouraging of their students. The school maintained an active approach to recruiting parents and engaging them in conversations about student success. Relationships were based on conversations about the successes of their children and were promoted through parent participation in the ASSPA committee, workshops, chats, and phone calls. The school had strong links with Indigenous community groups and boys and girls dance troupes.

School 22

School 22 is located in the northern suburbs of a capital city. The cultural backgrounds of students at this school were diverse; 66 per cent of students spoke English as a Second Language and 10 per cent of students were from an Indigenous background. The school community was described as significantly disadvantaged in terms of its socioeconomic status.

When first surveyed in 2003, the school was described as being in the early stages of strengthening its community ties. Social events were held to provide opportunities for staff and school leadership to speak with and listen to the community, but the process was ongoing. By 2006, a range of initiatives were underway including open mornings, lunches with presentations, film afternoons,

and other whole school celebrations. A special Indigenous Room was used by Indigenous students and Indigenous teachers for meetings, learning sessions and as a place to display information on history and identity. Indigenous groups were invited to perform, and there was an Indigenous Boys Group at the school.

The morning literacy block included extra support for students, a focus on phonological awareness and oral language development; an Accelerated Literacy program was being implemented in 2003. In numeracy, visual and interactive learning was emphasised, which included the use of Smartboard technology, and a variety of games were used to enhance students' number skills. There was increasing emphasis on using opportunities to explore cultural identity through class work. Early in each school year, each student worked on developing an individual profile linking their home and life experiences, which teachers then used in their teaching and learning programs. Indigenous students also developed a family tree with the assistance of family and community members that went on display in the Indigenous Room.

School 23

This school is an Indigenous school in a metropolitan setting that caters for school entry to Year 12. The school joined the project in 2004, at which time there was a school population of 70 students (95 per cent Indigenous students). In 2006, the size of the school population had increased to 125 students, of whom most were Indigenous (98%). The local community was described as low socioeconomic background and transient. Most of these students spoke Aboriginal English as their first language, and a small percentage spoke another Indigenous language as their first language.

The school had close links with the preschool and endeavoured to support programs for students before they commenced school. Literacy teaching strategies included the use of a Literacy block, developing a scaffolded approach, teaching of genres, and Reading Recovery as an early literacy intervention. Numeracy teaching took place during a numeracy block and involved supporting learning by teaching in smaller groups to suit age and ability levels.

The school aimed to create a family environment with an open-door policy. Working together and developing relationships with families was emphasised and there was a bus service to support student attendance. The school endeavoured to have Indigenous representation on staff. As much as possible, teachers made reference to the local Indigenous people and culture in all areas of the curriculum and the local Indigenous language was taught as part of the curriculum at all year levels.

School 24

This urban Indigenous school situated within the suburbs of a capital city, opened in 2001. The population of the school had remained stable at around 130 Indigenous students, with just over 100 primary school students; the remainder were in pre-primary and kindergarten programs. Although all students were Indigenous, the families were described as diverse. Classes were relatively small compared to other schools, which allowed for more individualised support from teachers to students. Attendance at the school was relatively high and students had access to transport through a school bus service. The school encouraged the employment of Indigenous staff members and all non-teaching staff were Indigenous.

There was an emphasis on collaborative planning among school staff and literacy teaching programs encompassed a range of strategies, including those associated with First Steps. In recent years, there had been an emphasis on teaching approaches that focused on phonological awareness. Teachers also made use of resources designed to support students who experienced conductive hearing loss. Numeracy programs focused on using concrete objects, learning centres, and small group instruction.

Parents were encouraged to be involved at the school through meetings, special events and morning teas. The school maintained a flexible approach with families so that students could be supported in a variety of situations. An Indigenous language was taught as part of the school's language education program, throughout daily lessons and as a distinct learning area in the curriculum. There was a 'celebration of all things Indigenous' at the school. Indigenous visitors and guest speakers were encouraged and students had been invited to perform Indigenous songs at other schools.

School 25

This school is situated in a township near a large regional city. The families were mainly from low socioeconomic backgrounds and many experience issues associated with family dysfunction, hardship and neglect. The community was strongly supportive of the school, and there was a high level of family involvement. Student numbers decreased over the duration of the school's involvement with this project from around 300 students in 2003, to just under 230 students in 2006. Twenty per cent of students were Indigenous in 2003 and this figure had risen slightly in 2006 to 25 per cent.

There was a comprehensive approach to literacy learning at the school that incorporated individual learning plans, early intervention, data collection and analysis, and the use of culturally responsive teaching and resources. Numeracy teaching emphasised the use of real-life experiences and incorporated the use of videoconferencing as a teaching tool. Staff at the school believed that students were encouraged to have high expectations of themselves through teachers having high expectations of students, and that this expectation should be reflected in planning, self-assessment activities, and student portfolios.

The school had been actively involved in the *Dare to Lead* initiative and there had been a considerable focus on making links between the school and the community; this included working with non-Indigenous parents to increase their understanding of the school's approach to supporting Indigenous students. Indigenous parents were encouraged to establish early links with the school, beginning with playgroup. The school had open classroom access for parents in the mornings, had established links with local Indigenous community organisations and Indigenous educators, had invited community Elders into the school, had Indigenous representation on committees, Indigenous student leaders, and supported a range of cultural activities such as an Indigenous dance group.

School 26

School 26 is a small school located in a fairly isolated rural community about an hour away from a major regional town. Approximately 50 per cent of the students were Indigenous and most of these lived on a local mission situated not far from the town. Other students came from local farms or from families who had moved to the region, which was characterised as low in socioeconomic status and high in unemployment. When the school joined the project in 2003 there were just over 100 students enrolled. This level of enrolment remained fairly stable while the percentage of Indigenous students had increased slightly from 40 to 50 per cent in 2006.

As the school was small, literacy and numeracy programs could be individualised while maintaining a whole school approach. The isolation of the school meant that many of the students needed specific support developing language skills. Teaching for literacy and numeracy incorporated explicit teaching practices, small group instruction and valued student home languages (including Aboriginal English). Local knowledge and contexts were included as content across curriculum areas.

The school had a relaxed atmosphere and maintained positive relationships between parents and the local community through home visits, liaising with the children's centre at the mission, community consultation, and encouraging community involvement at school. Community members were encouraged to work at the school. Local heritage was valued and the curriculum included a cultural program with local Elders and tutors, and an Indigenous language program, Indigenous Studies and a boys' traditional dance group. In 2006 there was a weekly resource-making day with the AIEOs.

APPENDIX B: CASE STUDY QUESTIONS

Are you familiar with the 21 goals of the National Aboriginal and Torres Strait Islander Education Policy and the eight MCEETYA priorities for Indigenous education? (Provide copies for reference).

QUESTIONS AROUND THE EIGHT MCEETYA AREAS

Adapt the following as appropriate for principals, teachers, AIEOs. Explore the last three areas (parent/community involvement, professional development, culturally inclusive curriculum) in greatest depth—begin with these).

Expanding culturally inclusive curricula

- What is your understanding of a culturally inclusive curriculum?
- What does this school/you do to promote this MCEETYA priority?
 - › Does the school curriculum include Indigenous studies?
 - › Does the school celebrate any Indigenous cultural days?
 - › How does the school celebrate Indigenous cultural days?
 - › What Indigenous resources does the school have for students and teachers?
 - › Does the school have any Indigenous posters/flag flying?

Increasing professional development for staff involved in Indigenous education

- What professional development programs with an Indigenous focus has the school promoted/ have you attended?
- Are there particular skills/knowledge that you would like to develop in terms of educating Indigenous students?

Increasing the involvement of Indigenous parents/community members in educational decision making

- Does the school have a Parent School Involvement Program (PSIP)?
- What level of involvement does the school have with the Indigenous community? The non-Indigenous community
- What level of parental participation does the school have from Indigenous and non-Indigenous parents?
- What does the school do to encourage parental involvement from Indigenous and non-Indigenous families?
- Does the school run any specific programs for parents?
- If so, are these attended by Indigenous parents?
- Are there any Indigenous parents on the school's parent body?
- Do you have a good relationship with Indigenous parents/community?
- What strategies do you use to encourage good relationships?
- Does the school have a racism policy? If so, has it made any difference?

Improving Indigenous literacy

- Is there a formal, documented literacy policy at this school? (Describe)
- If so, how effective is it?
 - › Is there a whole school approach to literacy teaching?
 - › What programs are used?
 - › What support is provided for classroom teachers (materials, support staff, time release etc)?
 - › How often do teachers participate in literacy PD? Who runs this (in-house or external)?
 - › Assessment- measuring and mapping progress?

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Improving Indigenous numeracy

- Is there a formal, documented school numeracy policy at this school? (Describe)
- If so, how effective is it?
 - › Is there a whole school approach to numeracy teaching?
 - › What programs are used?
 - › What support is provided for classroom teachers (materials, support staff, time release etc)?
 - › How often do teachers participate in numeracy PD? Who runs this (in-house or external)?
 - › Assessment- measuring and mapping progress?

Increasing the employment of Indigenous Australians in education and training

- How important do you think it is to have Indigenous teachers/AIEOs? ...Explain

Improving educational outcomes for Indigenous students

- Apart from literacy and numeracy outcomes, what other school outcomes do you think are important for Indigenous students? Are these different from outcomes for non-Indigenous students?
- If students have been identified as at risk, are there any procedures/programs that the school follows (for example, are those students monitored more closely and intervention programs put in place immediately? Is it left to the classroom teacher or are other specialist teachers involved?)
- How does the school deal with students who appear to be not achieving?

Increasing Indigenous enrolments

- Is absenteeism a problem at this school?
- Is there a difference between absenteeism for Indigenous and non-Indigenous students?
- How does the school promote regular school attendance?
- Does the school do anything to address the low secondary school completion rates of Indigenous students?

Indigenous Unit

- Is there a special Indigenous Unit at your school?
- If so, is there a separate literacy and numeracy policy/program for students in the unit?
- How much time per day is spent on literacy and numeracy
- What type of teaching strategies do teachers use when working with the students? (do they do anything different from what they would do for non-Indigenous students)
- What type of, and how much, communication is there between teachers in the Indigenous Unit and teachers in rest of the school?
- Of the eight MCEETYA priorities for Indigenous students, which do you think is the most important, and why?