

Literacy and numeracy learning: What works for young Indigenous students? Lessons from the Longitudinal Literacy and Numeracy Study for Indigenous Children



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¹ The complete report of the findings of Phase 2 of ILLANS was authored by Nola Purdie, Kate Reid, Tracey Frigo, Alison Stone and Elizabeth Kleinhenz.

Abstract

The *Longitudinal Literacy and Numeracy Study for Indigenous Students* (ILLANS)² tracked the growth in literacy and numeracy skills of a group of Indigenous students from 27 schools across Australia from the beginning of primary school until the end of Year 6. At the time the study was conceived, longitudinal studies on the school achievement of Indigenous students were comparatively rare. A desire to develop a broader picture of primary school experiences motivated data collection that included a range of other data from a variety of informants in addition to academic achievement data. ILLANS commenced in 2000, with the first phase of the study (2000–2002) reported in the monograph *Supporting English literacy and numeracy learning for Indigenous students in the early years* (Frigo et al., 2003). The current paper is a summary of the main findings from Phase 2 of the study (2003–2006) reported in the monograph *Literacy and Numeracy learning: Lessons from the Longitudinal Literacy and Numeracy Study for Indigenous Students* (Purdie et al., 2011).

Context for the study

Most children develop literacy and numeracy skills throughout primary schooling, allowing them to transition successfully to secondary school and to fully access post-school opportunities.

² In this paper and in the monograph on which it is based, 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.

For some children, however, the development of literacy and numeracy is more problematic; Indigenous students are over-represented in this group. On nationally agreed benchmarks for literacy and numeracy, fewer Indigenous students meet agreed standards compared with non-Indigenous students (e.g., 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 *Longitudinal Literacy and Numeracy Study for Indigenous Students* (ILLANS) is important in documenting the academic achievement of a group of Indigenous Australian students over the course of their primary education. At the same time, in developing this study there was recognition that supplementing academic achievement data with additional measures on student background and attitudes would help to develop a more complete picture of the primary school experiences of Indigenous students.

Approach

ILLANS sought to monitor the growth in literacy and numeracy achievement of a group of Indigenous students from school commencement until the end of primary school. Schools that participated in ILLANS were purposively selected based on

State/Territory	Phase 1 schools				Phase 2 schools			
	Metro	Regional	Remote	Very remote	Metro	Regional	Remote	Very remote
Australian Capital Territory	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	

Table 1: Number and location of schools participating in ILLANS 2000–2006^a
a Phase 1 only

	No. of literacy assessments completed			No. of numeracy assessments completed		
	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

Table 2: Maximum numbers of assessments completed by individual students, 2003–2006

nominations from state education departments as exemplifying good practice in the education of Indigenous students. Overall, each state and territory of Australia was represented by schools located in metropolitan, regional and remote areas (as shown in Table 1). Comparisons were made between Indigenous and non-Indigenous students completing the same assessments and surveys as a means of drawing conclusions about the school experiences of this group of Indigenous students. It is also important, however, to acknowledge the diverse backgrounds and experiences of students in this study who identified as Indigenous.

The research was conducted in two phases. In the first phase, undertaken from 2000–2002, 152 Indigenous students from 13 schools across Australia, completed literacy and numeracy assessments that were designed for another ACER project: *The Longitudinal Literacy and Numeracy Study (LLANS)*. Students who participated in the LLANS study provided a comparison group for Indigenous students who participated in Phase 1 of the ILLANS study. Unexpected attrition of students between Phase 1 and 2 of ILLANS necessitated additional recruitment to the sample. Thus, for Phase 2 of ILLANS, an additional 14 schools were recruited, joining 11 of

the 13 original schools. Non-Indigenous students from the same schools participated in Phase 2 of the study as they were deemed to be a more appropriate comparison group than the main LLANS sample. Across the four years of Phase 2, 287 Indigenous students completed one or more assessments in literacy or numeracy. Table 2 shows the maximum numbers of literacy and numeracy assessments completed by students across the four years of Phase 2. Achievement on the literacy and numeracy assessments for each year of ILLANS were modelled using Rasch techniques to place students' performances and the difficulty of items on the same interval

scale (Stephanou, Meiers & Forster, 2000).

Underlying the approach of the ILLANS study was recognition that the development of literacy and numeracy skills is fostered by a range of factors – both those that are intrinsic to the child and those that are characteristic of the child's broader environment (e.g. their school and family). Thus, in addition to standard assessments of literacy and numeracy conducted annually from Years 3–6, a range of other data, both qualitative and quantitative were collected. A number of informants provided these data, including individual students, their teachers, Australian Indigenous Education Officers (AIEOs) and school principals. The main emphasis each year for students was the completion of literacy and numeracy assessments adopted from the LLANS study. Teachers also assessed participating students' achievement (as achieved, developing or not achieved) in specific areas of literacy and numeracy at the beginning of Phase 2, as well as assessing their overall achievement against their peers and against the curriculum. A five-item measure of student attentiveness (Rowe & Rowe, 1999) was completed by teachers during each year of Phase 2. Students also completed questionnaires during the final year of the study that focused on their attitudes towards reading, their perception of their school's climate, and their evaluation of their own personal achievement in learning. Background variables to the study provided by principals, teachers and AIEOs included data on student absenteeism, the main language spoken by students at home, the percentage of Indigenous students attending the school and parental occupation.

Site visits were undertaken annually during Phase 1 of the project to each of the 13 participating schools. The approach to case studies changed

in the second phase of the project as individual visits were no longer possible because of the expanded number of schools and students. Preliminary analyses of student achievement data collected in 2004 provided a basis for selecting five case study schools to visit during 2005. Choice of schools was motivated by a desire to visit schools with quite different patterns of literacy and numeracy achievement among their Indigenous students. 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 during these visits included culturally inclusive curricula, teachers' professional learning, and partnerships between home and school.

Selected findings from Phase 2

Patterns of achievement

Quantitative data on student background, 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. 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 average achievement between Indigenous students and their non-Indigenous peers evident at the start of Year 3 remains until the end of primary school (see Tables 3 and 4). There is, however, enormous variability in literacy and numeracy achievement within as well as between groups. Although the average achievement for Indigenous

students overall is lower compared with non-Indigenous students, many Indigenous students achieve at a high level in literacy and numeracy relative to their peers. Moderate associations between literacy and numeracy achievement are evident at each year of the study, indicating that students who achieve highly in literacy also tend to achieve highly in numeracy. Substantial between-school variation in achievement was also evident. It was clear that in some schools in the study, Indigenous students are performing as well as or better than their non-Indigenous peers. In other cases, the gap in achievement between Indigenous and non-Indigenous students paralleled the overall pattern, with Indigenous students recording lower average achievement than non-Indigenous students at the same school.

Patterns of teacher ratings, both at a global level and for the development of specific literacy and numeracy skills tended to reflect the overall trend of the student achievement data. Teachers rated fewer Indigenous students as having developed specific literacy and numeracy skills compared with their non-Indigenous peers, and tended to provide lower ratings of the achievement of their Indigenous students against their peers and the curriculum. On five elements of attentiveness (concentration, curiosity, perseverance, attention span and purposefulness) teachers also tended to provide lower ratings to Indigenous compared with non-Indigenous students.

On a number of different measures of engagement with reading, Indigenous and non-Indigenous students expressed similar opinions. Indigenous students reported similar attitudes across the majority of reading attitude items. Differences in reading attitudes were evident only where Indigenous students were more likely to agree that they read only if they had to, and

	Survey 6 2003	Survey 7 2004	Survey 8 2005	Survey 9 2006
Mean (SD)				
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)
Median				
Indigenous	83.8	89.6	97.0	99.0
Non-Indigenous	95.2	97.6	103.0	109.0
Number				
Indigenous	220	192	175	128
Non-Indigenous	490	530	396	351

Table 3: 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
Mean (SD)				
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)
Medians				
Indigenous	97.9	106.0	109.0	119.0
Non-Indigenous	107.4	113.7	116.0	126.0
Number				
Indigenous	194	189	172	126
Non-Indigenous	472	523	407	351

Table 4: Means, standard deviations, and medians for numeracy achievement for Indigenous and non-Indigenous students (2003–2006)

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 also more likely to agree that they often read in bed compared with Indigenous students. A higher proportion of Indigenous students did not spend any time each day reading; in other respects, the amount of time spent reading was very similar for Indigenous and non-Indigenous students. Indigenous students tend to

have fewer books in the home than non-Indigenous students, but they borrow books from the library as often as non-Indigenous students. Students tended to provide favourable ratings of their schools' climate and of their own personal learning achievement and there were no differences in the ratings provided by Indigenous students and their non-Indigenous peers.

Factors related to achievement

Multiple regression analyses were conducted to explore the relationship

between student achievement in literacy and numeracy in the final year of the study and selected school- and student-level factors. School climate emerged as an important predictor of student achievement in both literacy and numeracy with students who provided favourable ratings of their school's climate recording higher achievement. Of the student-level factors, attentiveness, language spoken at home, absenteeism and parental occupation were associated with both literacy and numeracy achievement. Students rated as more attentive by their teachers tended to record higher literacy and numeracy achievement, while students who spoke Standard Australian English at home also tended to achieve more highly in literacy than students who spoke other languages at home (including an Indigenous language). Higher levels of student absenteeism were associated with lower achievement in literacy and numeracy, whereas students whose parents were in professional occupations tended to achieve more highly in literacy and numeracy.

Case studies

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.

Challenges

Undertaking the ILLANS project highlighted some significant challenges associated with conducting longitudinal research generally, and with Indigenous students specifically. The commitment of schools to the research meant that ten 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 achieving the goals of the project. 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, and 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. Even within the two phases of the study, slightly different groups of students completed assessments at each year level as few students completed both assessments at each time point. Comparisons between Indigenous and non-Indigenous students undertaking the same assessments provide an estimate of the achievement and attitudes of Indigenous students in this study; acknowledged diversity in the experiences of students who identify as Indigenous should be recognised in interpreting the findings of the study.

Conclusions

The ILLANS project followed Indigenous children from their first year of school in 2000 through to the end of primary schooling in 2006. Phase 1 of ILLANS compared the achievement and growth of Indigenous students in the early years of school with the main LLANS group. Phase 2 of ILLANS summarised in this paper 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 also 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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