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Inequities in student achievement for literacy: Metropolitan versus rural comparisons



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This paper explores inequities in student achievement in literacy that emerge when data are interrogated from a metropolitan, regional and rural perspective. In this analysis, data are drawn from the Programme for International Student Assessment (PISA) and the Australian National Benchmark results for Years 3, 5 and 7 students. The results in relation to geographical location highlight significant differences in student performance.

Introduction: Schooling in rural and regional areas

In 1999, state Ministers of Education agreed:

Schooling should be socially just, so that students' outcomes from schooling are free from the effects of negative forms of discrimination based on sex, language, culture and ethnicity, religion or disability; and of differences arising from students' socio-economic background or geographic location. (MCEETYA, 1999)

This quote, taken from *The Adelaide Declaration on National Goals for Schooling in the Twenty-first Century*, encompasses a fundamental and underpinning tenet of education policy in Australia; that is, the centrality of provision of equal educational opportunities for all students. However, reports (e.g., Arnold, 2001; Boylan, Sinclair, Smith, Squires, Edwards, Jacob, O'Malley & Nolan, 1993; Isolated Children's Parents' Association (ICPA), 1999; Vinson, 2002) focusing on rural and regional education in Australia over the last two decades suggest that equity of education provision has not been achieved.

Associated with problems with rural education have been other issues confronting country regions. Many rural areas have undergone major demographic changes that have affected the educational opportunities of their students. For example, Squires (2003) reported that in the 1900s approximately 54% of Australia's population lived in rural areas; this figure

dropped to 21% towards the end of the 20th century. The immediate effect of urban migration is a reduction in the diversity and availability of employment in rural locations, as corporate rationalisation leads to the closure of banks and other small businesses in small towns (Squires, 2003). Subsequently, employees are forced to either move to larger centres, taking their families with them (thereby reducing the population further) or change their careers. One critical result of these employment changes is that the average household income in approximately 80% of Australian rural municipalities is estimated at being at least 10% below the national average (Squires, 2003).

In rural areas, schools are 'seen as a resource for the community and a local economic strength' (Arnold, 2001, p. 8) resulting in strong school-community links. While this is a positive outcome, it does mean that schools are likely to be affected by even subtle changes that occur in the local community. Literature (e.g., Lyons, Cooksey, Panizzon, Parnell & Pegg, 2006; Roberts, 2005; Vinson, 2002) over the last few years has identified inequities that exist with many teachers and students in rural schools not being able to access a range of educational services that are taken for granted in metropolitan centres.

Some of the major issues highlighted in the rural education literature include:

- difficulties in attracting and retraining experienced teachers (Yarrow, Ballantyne, Hansford, Herschell & Millwater, 1998)
- feelings of isolation experienced by many teachers, particularly those new to the profession (Herrington & Herrington, 2001; Roberts, 2005)
- lack of professional development opportunities for teachers within a reasonable geographical distance from the schools (Boylan & McSwan, 1998; Vinson, 2002)
- lack of adequate preservice preparation of teachers in dealing with scenarios likely to be experienced in rural schools (e.g., multi-age classrooms) (Boylan, 2003)
- inability to employ experienced casual staff (Roberts, 2005) and
- inadequate resources (Roberts, 2005).

In the last few years, filling teaching positions in some discipline areas has become problematic, due to a national shortage of teachers. For example, Skilbeck and Connell (2003) revealed that 67% of schools across Australia had experienced difficulty in finding suitably qualified mathematics teachers. While this is an issue in metropolitan areas it has reached a critical point for rural areas with a growing proportion of schools unable to fill positions with suitably qualified staff (Harris, Jensz & Baldwin, 2005). The result is that in some states and territories, students are being taught by teachers who do not have the deep subject knowledge or the teaching experience to max-

imise students' learning outcomes in specific discipline areas.

Recent evidence from international and national tests indicates that inequities in student achievement do exist in different geographical locations in Australia in the areas of mathematics and science (Alloway, Gilbert, Gilbert & Muspratt, 2004; Cresswell & Underwood, 2004; Human Rights and Equal Opportunity Commission (HREOC), 1999; Jones, 2002). The purpose of this paper is to extend this work to identify and discuss trends into the area of literacy. This is achieved by considering two large-scale data sets that provide valid comparative results that have the potential to highlight the extent of education inequities in the literacy area. These two data sets are the Programme for International Student Assessment (PISA) and the National Benchmarks for Reading and Writing prepared by the Ministerial Committee on Employment, Education and Youth Affairs (MCEETYA).

International test comparisons

In 2003, 15-year-old students from 42 countries made up of 31 from the Organisation for Economic Co-operation and Development (OECD) including Australia, and 11 partner countries participated in the Programme for International Student Assessment (PISA). The test focused on students' scientific, mathematical, and reading literacies along with their problem-solving ability. These areas were assessed using a variety of multiple-choice and extended-response questions based around a stimulus article. The tests were not curriculum-based and involved real-world contexts that were seen to be topical, interesting, and engaging for students. An example of the type of stimulus item used to assess reading literacy in the PISA test was: *Feel good in your running shoes*. Once students had read an initial article, they completed a series of questions aimed at different levels of complexity. Two examples of the types of questions used are:

What does the author intend to show in this text?

- A. That the quality of many sports shoes has greatly improved.
- B. That it is best not to play football if you are under 12 years of age.
- C. That young people are suffering more and more injuries due to their poor physical condition.
- D. That it is very important for young sports players to wear good sports shoes.

One part of the article says, 'A good sports shoe should meet four criteria.' What are these criteria?

The raw data emerging from the PISA test were provided to various organisations in each country with the Australian Council for Educational Research (ACER) contracted to analyse the Australian data. Subsequently, only secondary analyses of the data are possible either from the PISA website or from various monographs published by the ACER.

In 2003 the PISA test involved 12,500 students selected randomly from 321 schools across Australia (Thomson, Cresswell & De Bortoli, 2004). Approximately 70% of these schools were in metropolitan areas, 27% in regional areas, and only 3% of schools were located in remote areas of Australia. The OECD mean score for reading literacy was 494 while the Australian mean score was 525. Finland, with a mean of 543, was the only participating country to significantly outperform Australia for reading literacy (Thomson et al., 2004).

Overall, the PISA results demonstrated that Australian students achieved more highly or at an equivalent standard to most of our traditional Western partners, including the United Kingdom and the United States. Gender differences emerged for all countries (except Liechtenstein and Macao-China), with females significantly outperforming male students in reading literacy. In Australia, the mean score for female students was 545, while the mean score for male students was 506 points (Thomson et al., 2004). This represents a national gender difference in reading literacy of approximately 0.4 of a standard deviation (Thomson et al., 2004).

Similarly, analyses conducted across the states and territories of Australia identified that students in the ACT achieved significantly higher results for reading literacy with a mean score of 549 (see Table 1).

The results presented in Table 1 indicate that the Australian Capital Territory, Western Australia, South Australia and New South Wales achieved means that were statistically similar when compared as a group, while Queensland, Victoria, Tasmania and the Northern Territory were statistically similar to each other (Thomson et al., 2004). However, students in the Australian Capital Territory and Western Australia performed significantly higher (see ↑) than students from Queensland, Victoria, Tasmania and the Northern Territory. As a specific example, students from South Australia achieved significantly higher benchmark results than students in Victoria, Tasmania, and the Northern Territory (see ↓) while they achieved statistically similar results to students from Queensland and New South Wales (see •) (Thomson et al., 2004).

To explore potential differences further, results were analysed across geographical locations (Thomson et al., 2004) using the MCEETYA Schools Geographic Location Classification (MSGLC) (Figure 1). The Standard Error (SE) bar expresses the variation about the mean. The obvious lack of overlap between the SE bars provides a visual cue that these results identify major differences and when analysed statistically were significant at $p = .05$.

Table 1. Multiple comparisons for reading literacy achievement by state/territories.

	Mean	Mean SE	ACT 549 6.0	WA 546 4.3	SA 532 4.3	NSW 530 4.3	QLD 517 8.1	VIC 514 5.0	TAS 508 7.2	NT 496 6.1
ACT	549	6.0	–	•	•	•	↑	↑	↑	↑
WA	546	4.3	•	–	•	•	↑	↑	↑	↑
SA	532	4.3	•	•	–	•	•	↑	↑	↑
NSW	530	4.3	•	•	•	–	•	•	•	↑
QLD	517	8.1	↓	↓	•	•	–	•	•	•
VIC	514	5.0	↓	↓	↓	•	•	–	•	•
TAS	508	7.2	↓	↓	↓	•	•	•	–	•
NT	496	6.1	↓	↓	↓	↓	•	•	•	–

Note: Read across the row to compare a state's/territory's performance with the performance of each state/territory listed in the column heading (Thomson et al., 2004).

↑ Average performance statistically significantly higher than in comparison state/territory.

• No statistically significant difference from comparison state/territory.

↓ Average performance statistically significantly lower than in comparison state/territory.

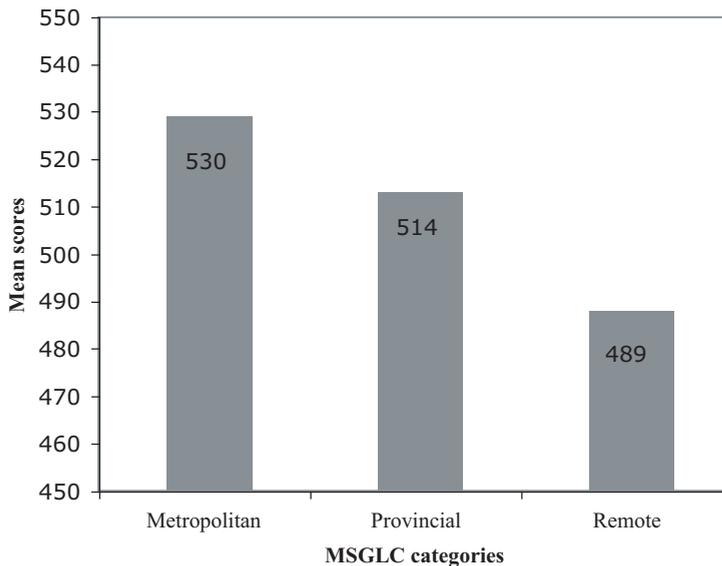


Figure 1. Mean scores for Australian students for reading literacy from PISA 2003 across different geographical locations.

Overall, these 2003 PISA results indicate that students attending metropolitan schools achieved significantly higher results for reading literacy in the PISA test than students attending provincial schools, with these students demonstrating significantly better results for reading literacy than students attending remote schools.

National benchmarking comparisons

In 1997 all Ministers of Education in Australia agreed to ensure that ‘every child commencing school from 1998 will achieve a minimum acceptable literacy and numeracy standard within four years’ (MCYEETYA, 2007, p. 2). To achieve this goal, National Benchmarks for Years 3, 5 and 7 in writing, reading, and numeracy were developed with students being assessed against these benchmarks each year. The national results for 1999-2005 are published in reports available at

<http://www.vcaa.vic.edu.au/prep10/aim/parents/nationalbenchmarks/nationalbenchmarks.html>.

An important addition to the reports in 2003 was an analysis of student performance according to metropolitan, provincial, remote, and very remote geographical locations. This provided comparative data about student achievement across Australian locations using the same metric. This section considers the data for writing first, followed by data associated with reading benchmarks.

For writing, the emergent results provided in Figures 2, 3 and 4 consider

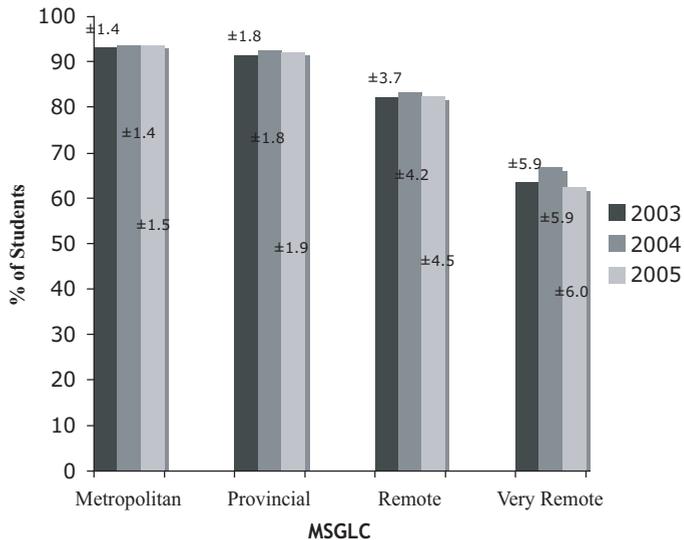


Figure 2. Percentage of Year 3 students achieving the writing benchmark across geographical locations (with 95% confidence level).

the student populations for Years 3, 5 and 7 respectively.

Considering Year 3 students, the pattern in Figure 2 shows a general decrease in student attainment of the writing benchmarks as distance from metropolitan centres increases. In particular, there is a major decrease in achievement between remote and very remote locations. To help interpret these differences further, numbers (standard errors) are provided on each column. For example, in 2005 approximately 94% of Year 3 students in metropolitan areas achieved the writing benchmarks. The ± 1.5 (on this column) indicates that there is a 95% chance that the true percentage is between 92.5 – 95.5 %. In contrast, 63 ± 6 % (i.e., between 57 – 69%) of students in very remote areas achieved the same benchmarks.

A similar pattern is identifiable for Year 5 students shown in Figure 3.

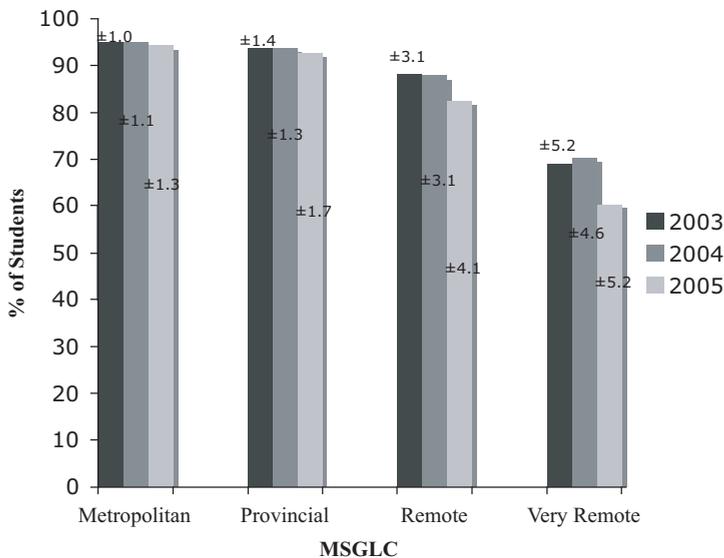


Figure 3. Percentage of Year 5 students achieving the writing benchmark across geographical locations (with 95% confidence level).

Clearly, there is a general decrease in the percentage of Year 5 students achieving the benchmarks in remote and very remote areas. However, when Year 5 results are compared with those from Year 3, the gap between provincial, and remote and very remote areas has widened further. This trend becomes even more evident in the Year 7 results (Figure 4).

A comparison of students’ performances for the reading benchmarks produces similar patterns to those presented above for writing. In terms of Year 3 students (Figure 5), similar proportions of students in both metropolitan and provincial areas achieved the benchmarks over the three-year period. The first noticeable gap in performance emerges for remote areas but this increases with students located in very remote areas.

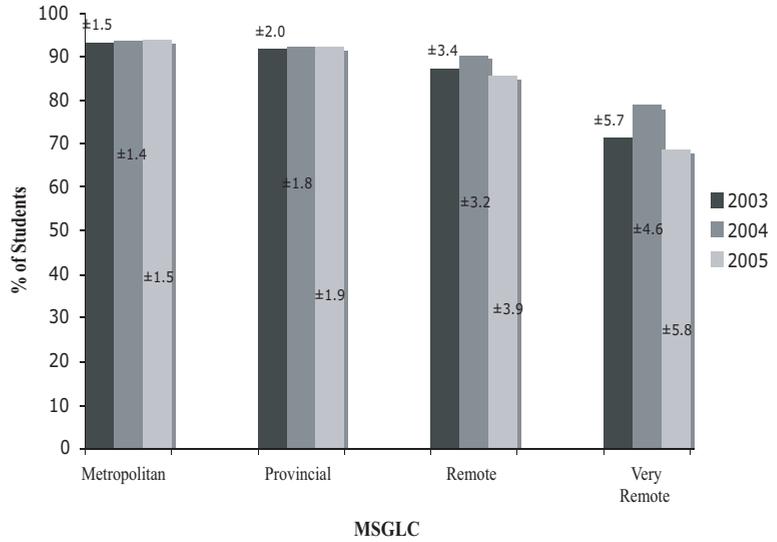


Figure 4. Percentage of Year 7 students achieving the writing benchmark across geographical locations (with 95% confidence level).

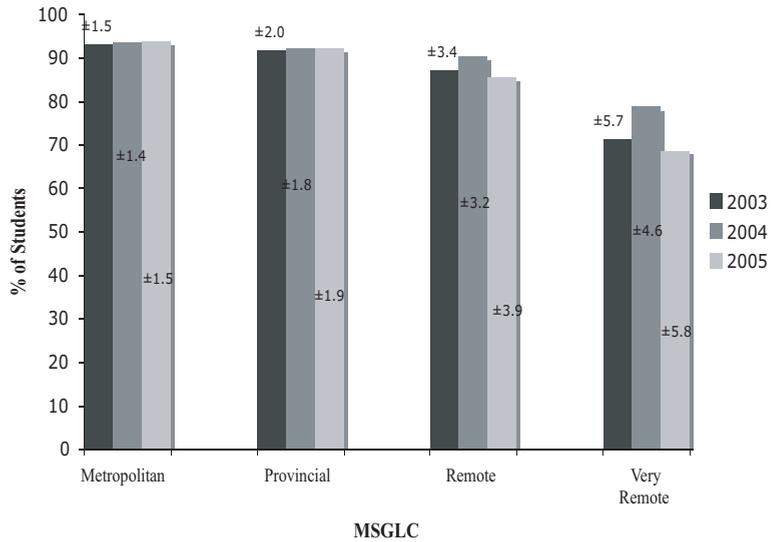


Figure 5. Percentage of Year 3 students achieving the reading benchmark across geographical locations (with 95% confidence level).

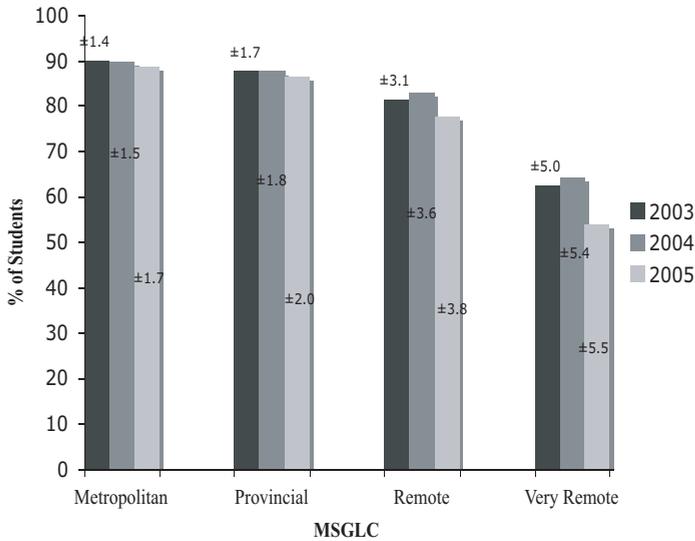


Figure 6. Percentage of Year 5 students achieving the reading benchmark across geographical locations (with 95% confidence level).

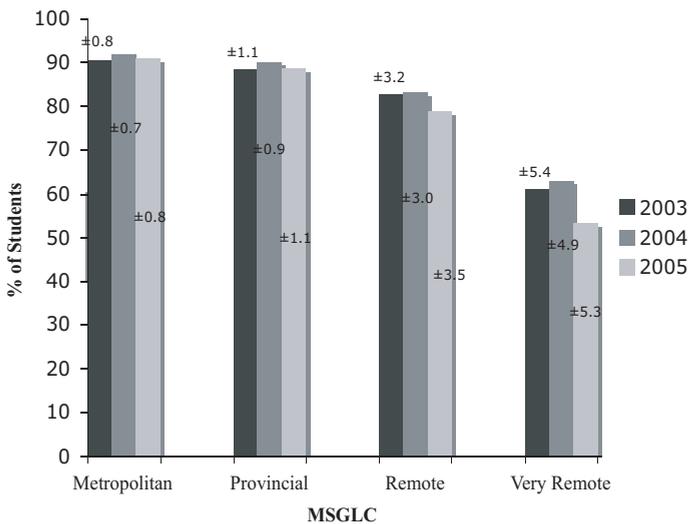


Figure 7. Percentage of Year 7 students achieving the reading benchmark across geographical locations (with 95% confidence level).

The results for the Year 5 reading benchmarks (Figure 6) mirror the pattern above in Figure 5. The difference identifiable here is that there is a general decrease in the proportion of students achieving the benchmarks over the four locations when compared to the younger cohort. This trend is exemplified again in relation to Year 7 students (Figure 7).

Overall, the benchmarking data sets for writing and reading show:

- a higher percentage of students in metropolitan areas achieve the benchmarks than students in remote and very remote areas
- students in provincial areas achieve similar results to students in metropolitan areas
- an initial gap appears between provincial and remote areas, and this widens between remote and very remote locations and
- the 2005 results for remote and very remote locations were lower than those attained for writing and reading in 2003, while this distinction did not appear for students in metropolitan and provincial areas.

Discussion and implications for educators

In considering the results presented above it is clear that there is a difference between the academic performance of students in remote and very remote areas compared to their peers in metropolitan and provincial locations. This immediately raises the question: *Why should such differences exist?* Clearly, one important component overlooked in these comparisons is the achievement of Indigenous students in relation to literacy (Thomson et al., 2004). At present, data are not available to quantify statistically whether the lower achievement of students in remote and very remote locations is related solely to the performance of Indigenous students or whether this is a broader issue. This is because the national benchmarking reports identify data for *Indigenous* students and *All* students without comparing Indigenous to non-Indigenous students. However, evidence based on proportions within the general population would suggest that the differences in student achievement for literacy identified in this paper are universal and not only related to Indigenous education.

Another confounding factor to consider with geographical location is socio-economic status (Canadian Council for Learning, 2006; Cresswell & Underwood, 2004; Howley, 2003; Williams, 2005). As referred to earlier, a large proportion of households in rural municipalities receive an income at least 10% below the national average (Squires, 2003). Clearly, the availability of higher earnings allows parents greater flexibility to support financially students accessing wider learning opportunities. However, even when socio-economic status is controlled as a variable during statistical analyses, differences are still identifiable between metropolitan and rural areas (Lyons et al., 2006).

Further explanations identified for variations in student achievement include the lack of specialist teachers with appropriate teaching qualifications (Harris et al., 2005), limited professional development opportunities (Vinson, 2002), feelings of isolation by teachers (Roberts, 2005), and inadequate pre-service teacher preparation (Boylan, 2003). While media attention often focuses on the role and impact of teachers on student achievement, given the close link between rural schools and their communities this perception represents a major oversimplification of a complex interplay that exists among a range of factors within any community. While teachers are critical and what they do in the classroom accounts for 30% of the variance in student learning (Hattie, 2003) there are factors beyond schooling that impact on the situation. Hence, this is why there is no simple solution to ameliorate the situation.

Although efforts have been attempted by state and territory educational authorities to address issues related to variations in student achievement for literacy, these often have minimal impact. Given the complexity of the problem identified here, a coordinated approach involving a range of stakeholders is necessary to address the inequity in a holistic manner. While the focus of this paper is about literacy that underpins all subject areas, it is necessary to consider the broader implications concerning ways of improving learning opportunities for all students in rural areas.

It was this realisation that led to the development of the National Framework for Rural and Remote Education by MCEETYA in 2001 (MCEETYA Task Force, 2001). The framework was the outcome of collaborative work undertaken in response to the Human Rights and Equal Opportunity Commission (HREOC, 1999) National Inquiry into Rural and Remote Education. Overall, it was designed to:

- provide a framework for the development of nationally agreed policies and support services
- promote consistency in the delivery of high quality education services to rural and remote students and their families
- provide reference points and guidance for non-government providers of services and support for education in rural and remote areas and
- facilitate partnership building between government and non-government providers of services and support related to the provision of education in regional, rural and remote locations.

The framework provided an underlying philosophical position, drawn from extensive research findings that argued for the type of inter-governmental and inter-agency collaboration required to really 'make a difference'. Despite an agreement that practical action would follow to ensure improvement for children and students in rural and remote Australia, unfortunately little has resulted from this initiative (Lyons et al., 2006).

The principal recommendation emerging from the SiMERR National Survey (Lyons et al., 2006) proposed the development of a National Rural School Education Strategy to fulfill the mandate initiated by the original Taskforce and mapped by the Framework, while avoiding the same fate. The National Strategy would be the most effective mechanism whereby consensus views could be turned into coordinated and focused actions.

The National Rural School Education Strategy would be expected to address service delivery to rural and regional communities in a cost effective way, recognising that such communities have many differences and that this will require solutions tailored to the community and the context. It will also be important that the National Rural School Education Strategy builds on existing programs and services, and ensures appropriate linkages between stakeholders.

Conclusions

This paper explored the underachievement of rural and remote students in the area of literacy when compared to the performance of students in metropolitan areas of Australia. By utilising the PISA 2003 and National Benchmark data for literacy we addressed issues of previous concern from educators about the validity and reliability of results along with their representativeness of the Australian context. Overall, the results from both data sets show patterns of inequity concerning student achievement in writing and reading that are critical, particularly in relation to remote and very remote locations.

Our aim here is not to lay blame but to place the issue of lower student achievement in particular geographical locations onto the educational and political agenda. It is clear from the previous studies undertaken in relation to rurality that the inequity highlighted here is not a new entity, but has persisted for considerable time. This is also not surprising given the complex relationship that exists between rural and remote schools and the broader communities in which they exist.

The disparity in educational outcomes of students in writing and reading literacy identified in this paper across geographic contexts is similar to those in the mathematics and science areas. It is our belief that while there needs to be educational strategies put in place across different learning areas to address this situation, this must be accompanied by a more holistic focus that considers the suite of broader factors impacting on student achievement. While we believe that those responsible for coordinating and implementing holistic strategies to harness the strengths of rural and remote communities should be from education, there needs to be a truly national agenda if the currently identified inequity is to be overcome.

References

- Alloway, N., Gilbert, P., Gilbert, R. & Muspratt, S. (2004). *Factors Impacting on Student Aspirations and Expectations in Regional Australia*. Canberra, ACT: Department of Education, Science and Training.
- Arnold, P. (2001). Review of contemporary issues for rural schools. *Education in Rural Australia*, 11(1), 30–42.
- Boylan, C. (2003). Putting rural into preservice teacher education. Paper presented at the joint Australian Association for Research in Education/New Zealand Association for Research in Education Conference, Auckland. Retrieved August 2005, from <http://www.aare.edu.au/03pap/alpha.htm>
- Boylan, C. & McSwan, D. (1998). Long-staying rural teachers: Who are they? *Australian Journal of Education*, 42(1), 1–12.
- Boylan, C., Sinclair R., Smith, A., Squires, D., Edwards, J., Jacob, A., O'Malley, D. & Nolan, B. (1993). Retaining teachers in rural schools: Satisfaction, commitment, and lifestyles. *Rural Education Issues: An Australian Perspective, Key Paper 3*.
- Canadian Council on Learning (2006). *Lessons in Learning*. Retrieved February 2007, from www.ccl-cca.ca/CCL/Reports/LessonsInLearning/LiL1March2006.htm
- Cresswell, J. & Underwood, C. (2004). *Location, Location, Location: Implications of Geographic Situation on Australian Student Performance in PISA 2000*. Australian Council for Educational Research Monograph (No. 58). Camberwell, ACT: Australian Council for Educational Research.
- Harris, K., Jenz, F. & Baldwin, G. (2005). *Who's Teaching Science? Meeting the Demand for Qualified Science Teachers in Australian Secondary Schools*. Report prepared for Australian Council of Deans of Science by the Centre for the Study of Higher Education. Melbourne, VIC: University of Melbourne.
- Hattie, J. (2003). Teachers make a difference: What is the research evidence? Keynote address to the Australian Council for Educational Research Annual Conference. Melbourne, Victoria. Retrieved February 2007, from www.vision-schools.co.nz/assets/documents/john_hattie.PDF
- Herrington, A. & Herrington, J. (2001). Web-based strategies for professional induction in rural, regional and remote areas. Retrieved August 2005, from <http://www.aare.edu.au/01pap/her01711.htm>
- Howley, C. (2003). Mathematics achievement in rural schools. *ERIC Digest*. Retrieved February 2007, from www.ael.org/digests/edorc03-3.pdf
- Human Rights and Equal Opportunity Commission (HREOC) (1999). *Bush Talks*. Sydney: Commonwealth of Australia. Retrieved from http://www.hreoc.gov.au/human_rights/rural_australians/bushtalks/index.html
- Isolated Children's Parents' Association (ICPA) (1999). Submission to the National Inquiry into Rural and Remote Education.
- Jones, R. (2002). *Education Participation and Outcomes by Geographic Location*. Camberwell, ACT: Australian Council for Educational Research.
- Lyons, T., Cooksey, R., Panizzon, D., Parnell, A. & Pegg, J. (2006). Science, ICT and mathematics education in rural and regional Australia: The SiMERR national survey. A research report prepared for the Department of Education, Science and Training. Retrieved from <http://www.dest.gov.au>
- MCEETYA (1999). *The Adelaide Declaration on National Goals for Schooling in the Twenty-first Century*. Retrieved September 2005, from <http://www.mceetya.edu.au/nationalgoals/natgoals.htm>
- MCEETYA Task Force on Rural and Remote Education, Training, Employment and Children's Services (2001). *National Framework for Rural and Remote Education*. Retrieved April 2006, from <http://www.mceetya.edu.au/pdf/rural.pdf>

- MCEETYA (2007). *National Report on Schooling in Australia: National Benchmark Results for Reading, Writing, and Numeracy Years 3, 5 and 7 for 2005*. Retrieved April 2007, from <http://www.mceetya.edu.au/mceetya/anr/>
- Roberts, P. (2005). *Staffing an Empty Schoolhouse: Attracting and Retaining Teachers in Rural, Remote and Isolated Communities*. Sydney: NSW Teachers' Federation.
- Skilbeck, M. & Connell, H. (2003). *Attracting, Developing and Retaining Effective Teachers: Australian Background Report*. Canberra, ACT: Commonwealth of Australia.
- Squires, D. (2003). Responding to isolation and educational disadvantage. *Education in Rural Australia*, 13(1), 24–40.
- Thomson, S., Cresswell, J. & De Bortoli, L. (2004). *Facing the Future: A Focus on Mathematical Literacy among Australian 15-year-old Students in PISA*. Camberwell, ACT: Australian Council for Educational Research.
- Vinson, A. (2002). *Inquiry into Public Education in New South Wales: Second Report September 2002*. Retrieved August 2005, from www.pub-edinquiry.org/reports/final_reports/03/
- Williams, J. (2005). Cross-national variations in rural mathematics achievement: A descriptive overview. *Journal of Research in Rural Education*, 20(5). Reading from www.umaine.edu/jrre/20-5.pdf
- Yarrow, A., Ballantyne, R., Hansford, B., Herschell, P. & Millwater, J. (1998). Teaching in rural and remote schools: A literature review. *Teaching and Teacher Education*, 15, 1–13.