

Social inclusion issues and ICT challenges for schools

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Abstract: Educational applications of *Information and Communications Technologies* offer opportunities for social inclusion at the school level and beyond. Many studies note enhanced engagement with learning and improved cognitive outcomes when digital technologies are used to support communication and learning, particularly for students who are socially and academically ‘at risk’. Appropriate and innovative ICT applications improve engagement and connectedness with learning that in turn leads to improved social interaction, good school retention and completion rates, employability and entry into higher education and robust mental health. Today, the positive effects of ICTs as scaffolding devices for literacy, higher order thinking and problem-solving support equity and inclusion in an educational sense. ICT inequalities are linked to differential learning outcomes in schools and classrooms and are powerful drivers of employment opportunities and income differentiation. Unfortunately, many Australian students, especially from poorer or remote communities, have limited opportunities to engage with ICTs at school. Equity and inclusion issues are prominent in discussions about optimizing school learning and are central to continuing government initiatives to improve ICT opportunities in schools. This presentation highlights some issues involved in using digital technologies for building ‘knowledge ready’ skills and the interplay between knowledge-ready skills, academic outcomes and social inclusion more broadly. With pedagogy at the centre of effective ICT use in schools, today’s educators face significant challenges to be *both* effective users of new technologies and promoters of real-world thinking and doing skills (such as reasoning, enquiry, planning, analysis, and self-regulation) that can be applied within and across educational domains.

Keywords: ICT, digital technologies, social inclusion, equity, pedagogy, schooling

Social inclusion issues and ICT challenges for schools

A major challenge for Australian governments, education systems and communities is to improve schooling experiences and overall educational performance. Clearly, sources of social and educational disadvantage are multifaceted, but schooling has a key role to play in combating social disadvantage and closing the educational ‘gap’. Obviously, while *information and communication technologies* (ICTs) are not magic bullets that can narrow or close socio-economically linked achievement gaps, today, they are fundamental to promoting educational achievement and subsequent social outcomes including school completion and employment. It is increasingly well established, and reflected in documents such as *The Future of Schooling in Australia* (2007), that pedagogy, including pedagogies that support ICT use underpin the quality of schooling and differential learning outcomes in schools and classrooms. As such they are powerful drivers of employment opportunities and income differentiation.

Evidence indicates that educational applications of information and communications technologies offer opportunities to promote social inclusion- both at the school level and more widely. At the school level, ‘social inclusion’ refers mainly to active engagement in educational endeavours, connectedness with learning, and strategies to ‘close the gap’ between academic achievements for ‘at risk’ students and those from more advantaged communities. Over the last two decades, many studies have reported better engagement with

learning and improved cognitive outcomes where ICTs are used to support communication and learning, particularly for students who are socially and academically 'at risk'. Appropriate ICT use is especially successful in enhancing academic skills such as literacy, numeracy, thinking and problem-solving. ICTs have the potential to improve engagement with learning, and in turn, to improve learning outcomes that lead to better school retention and completion rates, employability, and entry into higher education (Elliott, 2008).

The Adelaide Declaration of Schooling (1999) represents significant agreement and commitment by all Australian governments to a national framework for schooling. The framework stressed the key role of ICTs in promoting a knowledge economy and preparing young people to thrive in an information-rich world. Nearly a decade later, further deliberations about Australia's social and educational goals resulted in *The Future of Schooling in Australia* (2007). This national statement highlights the importance of high quality schooling for all Australian students, the fundamental role of education to future economic prosperity and sustainable environments, and the integral role of ICTs in the educational armoury.

Underpinning the policy ideas and recommendations in *The Future of Schooling in Australia*, and indeed, the current Australian government's 'Education Revolution', are concerns about student differences in educational opportunities, access and outcomes and clear evidence of links between poor educational and socio-economic factors. These links are evident in a range of areas including Australian students' scores in international and national testing programs. Overall, while Australian students rate well on international measures of student achievement (see the OECD site- www.OECD.edu- for PISA, 2003, 2006 test results) there are significant equity and socio-economically related differences in test performances and these exceed what is found in countries that are economically similar to Australia.

Not surprisingly, social advantage is generally related to higher educational performance. However, in countries such as Finland and Canada the performance gaps between socially advantaged and disadvantaged students are less pronounced than in Australia. This is generally attributed to better school resourcing and teaching. Links between social advantage and educational performance are also found in the *Longitudinal Study of Australian Youth* data (Rothman, 2002). These data document the negative effects of social disadvantage on students' educational pathways and outcomes over some four decades. Worryingly, these gaps begin to show early. Similarly, data from the *Australian Early Development Index* (AEDI) confirms early educational disadvantage. In profiling population level student social and educational development in the first year of school, it pinpoints considerable developmental spreads across significant learning domains with clustering of disadvantage in particular groups of children or communities, and especially in Australian Indigenous communities. The *National Report to Parliament on Indigenous Education and Training 2005* (2007) contains more detailed analyses of Indigenous children's participation and achievement in schooling and in early learning programs. Again, it shows evidence of the developmental spread in the early years of schooling and highlights the complexity of the issues around social and educational provision and equity.

Other state level data from basic skills or national testing regimes show similar socio-economically related variation and 'gaps' in student achievement. In the Northern Territory in particular, data indicate dramatic socially-linked differences in students' literacy and numeracy achievement. Across Australia generally, children's academic achievement is strongly linked to geo-location. Children in remote locations, and especially Indigenous children, perform much more poorly in year 3, year 5 and year 7 maths and literacy tests than do those in urban areas. Geo-location tends to be a proxy for socio-economic status with the poorest people living in rural and remote communities and in some outer suburban areas. Further, learning gaps widen as children progress through school as shown in Tables 1 to 6 in Appendix A. In the Northern Territory, very remote locations are populated mainly by Indigenous children so achievement data for these communities are reporting mainly on Indigenous children's achievement outcomes. Not surprisingly, remote locations are most

poorly served by education services and struggle to provide quality schooling. While reasons for poorer education outcomes are complex and multifaceted, key problems for many schools include their inability to attract and retain qualified teaching staff. It is not uncommon for a school or preschool to have a 100% staff turnover in a school term, semester or academic year.

As indicated in numerous studies (McCain & Mustard, 1999, 2006; MCEETYA, 1996; Stanley, 2004), disengagement with schooling, poor school performance and related behavioural problems often result in failure to complete secondary education, have long term negative impacts on labour market participation and are associated with a range of other social disadvantages such as teenage pregnancy, juvenile offence, and a range of mental illnesses (Griner-Hill & Werner, 2006). Too often though, poor school performance is blamed on individual students or their families. A 'deficit' perspective proposes that inadequacies or deficiencies in educational performance are attributable a student's parents or to a family's social or ethnic group (Bronfenbrenner, 1979; Kozol, 1991) rather than to problems within the school. The challenge for schools and education more widely, is to transform teaching and learning, to draw on the "funds" of knowledge and skills within families and communities, including ICT interests and skills and to build on these to improve teaching and learning (Gonzalez, Moll & Amanti, 2005; Kozol, 1991; Moll, Amanti, Neff & Gonzalez, 1992; Volk & Long, 2005).

Challenges for government, policy and practice

The negative outcomes of poor educational achievement are well documented both in the literature and day-to-day practice. Disengagement with schooling results in short term social exclusion at multiple of levels within school and related contexts, and longer term, to more permanent social exclusion. Hence, the very strong focus in Australia of engaging students with learning to help them develop the 'right skills and knowledge' to help function happily and productively in today's information rich world. As *The Future of Schooling in Australia* (2007) indicated:

Young people need the right skills and knowledge to thrive in an information-rich world. (p.16)... Not only do people now require a base amount of technological and scientific knowledge to understand the world around them, but there is a critical need for skills to prioritise and interpret the proliferation of information... It is (now) clear ... that the collective challenges of increasingly advanced skill demands, almost universal reliance on information technologies for communication....(p. 17).

While what is 'right' in terms of skills and knowledges for contemporary society is contestable, students must have information and knowledge skills, such as good literacy, to participate in the wider community and workforce. There is strong evidence that the tools and technologies that have transformed the workplace are in themselves catalysts for educational and social growth and transformation. For example, digital technologies can enrich curricula, transform learning processes, shape organisational structures and build social networks and motivate students. Specifically, they are motivating and engaging, particularly for students who find traditional classroom learning difficult, disempowering, alienating or disengaging (Elliott & Shaddock, 2007) (1). ICTs are "partners in cognition" and help support and stimulate thinking and knowledge creation across a range of school-based contexts (Pea, 1987).

A number of researchers (Elliott, 2004; Findlay, Fitzgerald & Davies, 2004; Fitzgerald & Findlay, 2006) have argued that as well as being powerful learning tools, students *want* to use digital technologies because they are central to their cultures. Too often though, poorer students don't have ICT access at home; nor do they have ready classroom access. Despite their potential to enhance learning and to connect people within and across communities, relatively few schools actually integrate state-of-the art digital technologies across the

curriculum in meaningful ways to support and promote learning, let alone allow students to become communicators and knowledge generators. As Elliott (2004) and Fitzgerald and Findlay (2006) have highlighted, while communications technologies have brought the world to our lounge rooms, most schools and classrooms have changed little and continue to position students as 'content consumers' rather than 'content creators'. It is increasingly apparent that schools must become more relevant to young people who have the world at their finger tips. Recent school leaver destination data from the Northern Territory shows that boredom and irrelevant school experiences were key contributing factors in students' decisions to leave school before completion of the final years (DEET, 2008). Failure to understand the global reach and impact of digital technologies in children's lives, the wider community and workplace indicates both a lack of understanding of students' worlds and for pedagogies that engage young people and extend and challenge their thinking.

Beyond the 'digital divide'

Over the last decade or so, discussions around equity and ICT issues in education have shifted from a 'digital divide' focus linked to hardware and broadband accessibility, to 'cognitive divide' with concerns about gaps in students' knowledge and communication skills and the negative impact of these gaps on social inclusion, including educational outcomes, school retention and later employability. Educational enquiry has shifted or should shift from questions about ICT impacts on learning *per se*, as positive effects are well accepted, to the role of ICTs in personalising or customising learning and as scaffolding devices for literacy and higher order thinking and problem-solving- the backbones of equity and inclusion in an educational sense (Elliott, 2000; Elliott, 2004). Concomitantly, contemporary ICT equity issues are linking more to discussions about pedagogy and optimising teaching and learning for students. Indeed, these issues are increasingly at the forefront of new Australian government initiatives to improve ICT access and applications in schools. Closing the "pedagogical divide" is looming as a major education challenge over the next few years.

Clearly, hardware accessibility and ICT skills alone do not enable individuals to benefit from technology, although they are a good start. Literacy, higher order thinking skills, self-regulatory strategies, knowledge construction and team work are essential to effective use of digital technologies and to function in a global community. It is now well established that ICTs, alongside appropriate pedagogies, and in a scaffolding or partner role, are especially successful in enhancing cognitive skills such as communication and thinking and problem-solving, including collaborative knowledge-building. They also support individualised learning programs and academic skill development. There is particularly strong evidence of ways ICTs improve academic and social outcomes for low achieving learners and students with disabilities in both designated special education classrooms and in more 'inclusive' settings. In some cases though, researchers have blurred the distinction between the medium and the pedagogy, attributing positive social and educational impacts to the technology when in fact they may be largely an effect of the pedagogy (Elliott & Shaddock, 2008).

Today, the main issues confronting effective ICT use in classrooms are not so much those of infrastructure and hardware as they were a decade ago, although this is an issue in some schools and in some parts of Australia, but more of pedagogy and teacher competence. The pertinent question is not whether ICTs should be used to support learning, but what pedagogical approaches are most effective to optimise learning experiences and outcomes for students. Teachers indicate consistently that they need support and professional development to make the most of ICTs, including newer converged technologies (Elliott, 2003; Lawless & Pellegrino, 2007). But to date, education providers' professional learning programs, services and support are limited and tend not to ensure quality ICT integration across the school curriculum. As Lawless and Pellegrino (2007) say, ICT training offered 'leaves much to be desired'.

As in other areas of the curriculum, the real impact and effectiveness of pedagogy rests within the control of the school and classroom teacher (Hattie, 2003; Rowe, 2004). While

identifying what really adds value and makes a difference in teaching and learning transactions can be difficult, it is now clear that teacher skill and the quality of interactions with students have positive effects on learning outcomes, especially for students from disadvantaged backgrounds or those with additional learning needs. With evidence pointing to approximately 30% and 50% of the variation in students' academic performance related to teaching, school and classroom contexts (Hattie, 2003), the case for professional learning to improve pedagogy has never been stronger. Regardless of the extent of ICT access in classrooms and schools, there is unlikely to be any substantial impacts on achievement unless teachers are supported to use ICTs to target and personalize pedagogies (Darling-Hammond, 2000; Masters, 2004; Nuthall, 2004). While the connections between teacher skill and ICT are complex, teacher competence is one area that is largely within the control of governments, teacher education providers and schools. Hence, the very strong recent focus on improving the quality of initial teacher education courses and on-going professional learning including areas around ICT related content knowledge and pedagogic skills (Elliott, 2003; 2008; Ingvarson, 2003; Lawless & Pellegrino, 2007; Rowe, 2004).

Central to appropriate ICT scaffolded pedagogy are knowledge-ready skills, including collaborative knowledge construction tasks. Knowledge-ready understandings and skills and collaborative skills underpin longer term academic success (Findlay, 2007). In particular, information selection and retrieval skills and higher order cognitive skills enable communication, data interpretation and analysis and collaborative problem-solving. These skills include real-world thinking and problem-solving strategies such as research design, analysis, composition and communication and reasoning, enquiry, and self-regulation strategies. Students must be able to explain why something is so. Collaborative skills include planning, team work, monitoring and evaluation. Core tools in developing these skills are digital technologies.

The importance of knowledge-ready skills lies in their transferability across a range of contexts. A knowledge culture needs skills that can be applied in both specific domains and more broadly. These skills must provide evidence, reasons or conceptual and contextual considerations that inform solutions and decisions. Good, clear thinking is central to problem-solving and a powerful tool in self realisation and personal social capacity building. Without good clear thinking skills, academic success, and school completion and employment will be elusive. Too often though, most teacher ICT use is for basic skill development or information retrieval and management task. And while such 'basic skills' underpin more complex learning, it is the thinking and problem-solving skills that are critical in building personal and economic prosperity and addressing environmental and societal sustainability (Elliott, 2006).

Clearly, ICT issues do not stand alone. They are connected to the wider issue of learning for the knowledge age and to broader issues of education quality and equity, pedagogy, classroom management, and school governance, renewal and revitalisation. Also important are teachers' perceptions about the value of technology in the community and in education (Elliott, 2004). So, unless teachers hold positive attitudes towards ICTs, have expert knowledge of their teaching areas and are able to optimise the technology for classroom use, they will not provide optimum learning experiences for students.

Promoting social inclusion

Social inclusion can be viewed as a continuum linked to social and educational capacity including the gradations of knowledge, thinking and digital skills needed for today's 'almost universal reliance on information technologies' in communication and commerce (*The Future of Schooling in Australia*, 2007, p.19). At the heart of social inclusion are knowledge-ready skills that include flexible thinking, 'intercultural engagement, communication and understanding' (pp. 17-19). Social inclusion issues, including connectedness with schooling and social cohesion are central to education.

In contrast, disengagement, marginalisation, and limited social and personal empowerment that lead first to social exclusion at school and later to alienation from the workplace are linked largely to poor education and the related constraints of poverty and community disempowerment (Mingione, 1997). Most recently, the position taken in a range of Australian education policy documents, posits that lack of knowledge-age skills and digital literacies are a major contributor to poor educational achievement. It is stressed that students who are not 'confident, creative and productive users of new technologies, particularly information technologies and understand the impact of those technologies on society' are at risk of a range of negative social consequences (*The Future of Schooling in Australia*, 2007, p. 27).

Where individuals and families do not fully participate in their communities or where communities struggle to control their social, civic and economic wellbeing and destinies, social inclusion is elusive. There is a high correlation between 'this elusiveness' and schools and communities with poor connectedness and social capacity (Epstein, 1992) and poor resources including ICTs.

As Warschauer (2003) has said, factors affecting the development of knowledge-ready skills are complex and mutually reinforcing. Wealthier schools and communities can afford good teachers and relevant digital technologies. In turn, good ICT access together with good teaching enhances educational outcomes and employment opportunities that underpin social inclusion. Importantly as social inclusion also involves participation and control over one's life chances, students with limited knowledge-ready skills are unlikely to have access to a wide range of economic opportunities. Simply putting computers into schools and classrooms where there is inadequate or volatile teaching capacity, poor programming and pedagogy and limited physical resources such as water and electricity, clean rooms and teaching materials has little to no educational benefit and may in fact, divert attention from deeper social, educational and economic issues.

While social inclusion is interpreted differently depending on the context, and can be somewhat difficult to define and measure in a school context, at its core is the process of actively engaging students in learning, enhancing the quality of learning experiences, and developing the skills and capabilities 'essential for participation in today's society and economy (British Educational Communications and Technology Agency, 2005).

In line with recent thinking about the education dimensions of social inclusion, contemporary Australian education policy thinking emphasise the key roles of both technology and pedagogy for growing a knowledge-skills base that will make 'meaningful use' of information resources and position students for academic success and employment in information related work areas.

Integrating ICTs across school curricula and harnessing their scaffolding powers as teaching and learning partners are central to building this knowledge base. In Australia, all education sectors emphasise the importance of integrating ICT use across curricula, developing digital literacy and knowledge-ready skills, and building teaching ICT skills for professionals. In this sense, computers, the internet and other digital tools can promote inclusion in a curriculum or classroom sense. In the longer term, these 'inclusionary policies' have broader educational, social and economic goals but can be realised only with inspired school leadership, thoughtful, visionary policy, curriculum and pedagogy.

As highlighted above, meaningful educational engagement with ICTs is not so much about hardware and information accessibility, but about pedagogical appropriateness. What is clear from the literature and from classroom practice is that effective ICT use is inextricably entwined with curriculum and pedagogy and by definition with quality teaching and learning outcomes. While there is much in schools and communities that is contestable and difficult to influence, the pedagogical dimensions so important to good educational outcomes are well evidenced and are squarely in school and government control. Clearly, some teacher personal characteristics are innate, but generally, good content knowledge and pedagogic skills are acquired through quality teacher education courses and professional development (Caldwell, 2005; Crowther et al., 2002; Darling-Hammond & Sclan, 1996; Hayes et al, 2006; Hattie, 2003; Lawless & Pellegrino, 2007).

The ideas considered here point to both the key roles of ICT in improving educational experiences and outcomes and by definition improving social inclusion, and the complexity of integrating ICTs in meaningful, educationally significant ways. The challenges of actively building knowledge-ready skills can be compounded for many students, schools and communities by a matrix of disadvantage resulting from cumulative and interwoven effects of poverty, isolation and alienation. While it is not possible for schools to overcome poverty-related disadvantages that impact negatively on educational aspirations and learning outcomes (Hayes *et al.*, 2006; Rothstein, 2004), initiatives to actively engage children with learning, and 'deliver the necessary knowledge and skills to thrive in an information-rich world' (*The Future of Schooling in Australia*, 2007, p. 25) are the pillars of social inclusion and require on-going application, commitment and resourcing including targeted professional learning for teachers and teacher education.

¹ The full report on which this paper is based, the "Project to Improve the Learning Outcomes of Students with Disabilities in the Early, Middle and Post Compulsory Years of Schooling", is available at <http://www.dest.gov.au/schools/losd>

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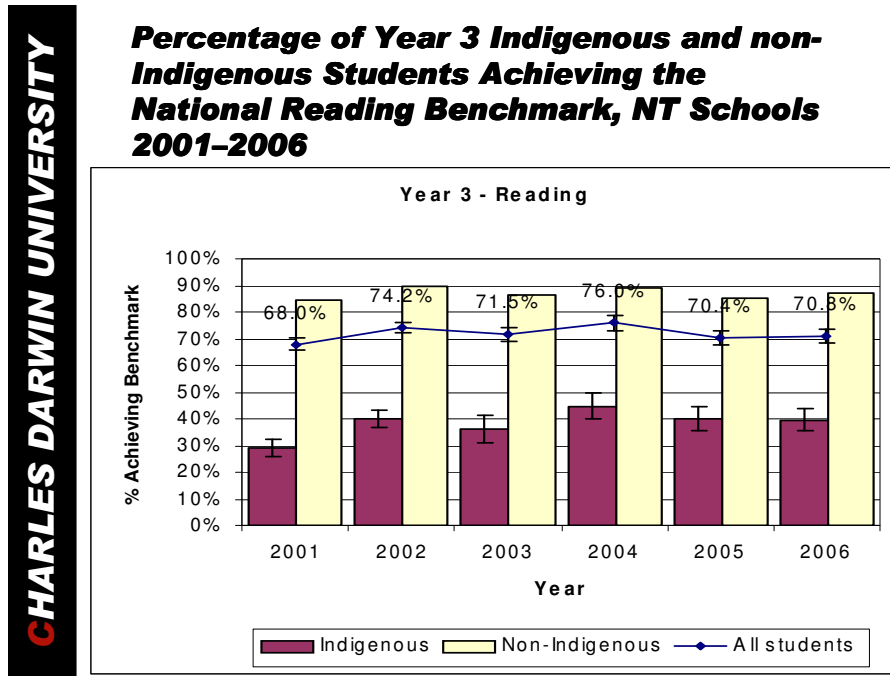
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Appendix A

Table 1



All achievement data are from: Northern Territory Board of Studies (2007). *Northern Territory Board of Studies Annual Report for 2006*. Darwin: Northern Territory Board of Studies

Table 2

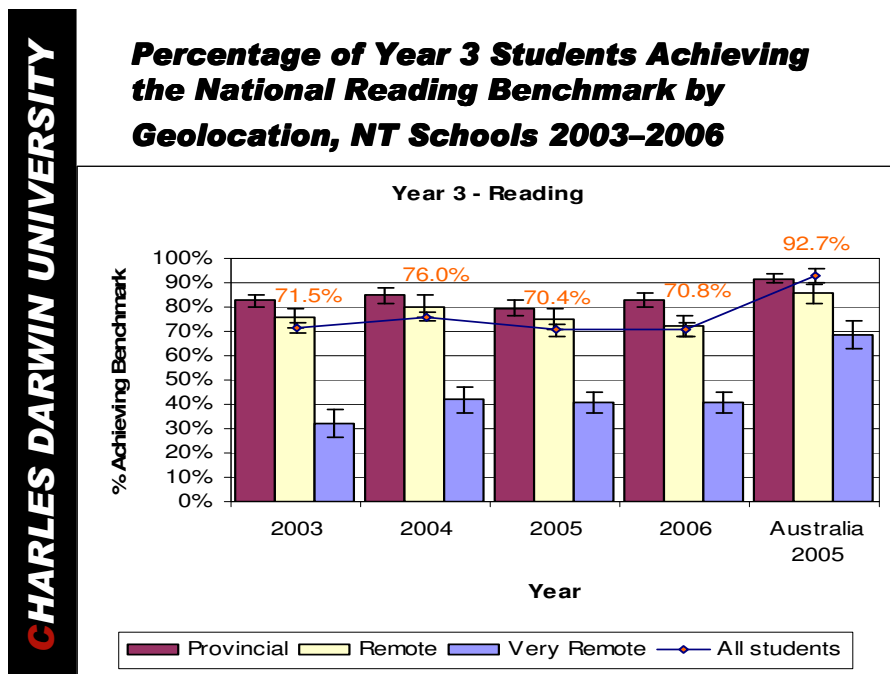


Table 3

Percentage of Year 5 Indigenous and non-Indigenous Students Achieving the National Reading Benchmark, NT Schools 2001-2006

CHARLES DARWIN UNIVERSITY

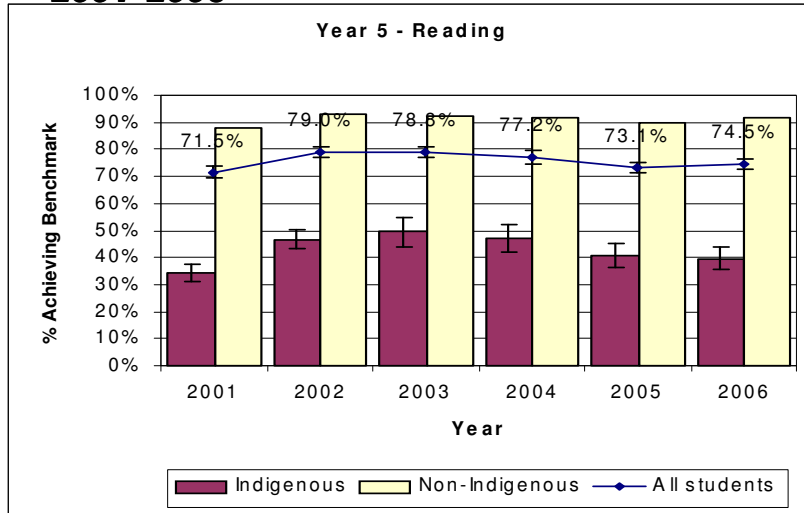


Table 4

Percentage of Year 5 Students Achieving the National Reading Benchmark by Geolocation, NT Schools 2003-2006

CHARLES DARWIN UNIVERSITY

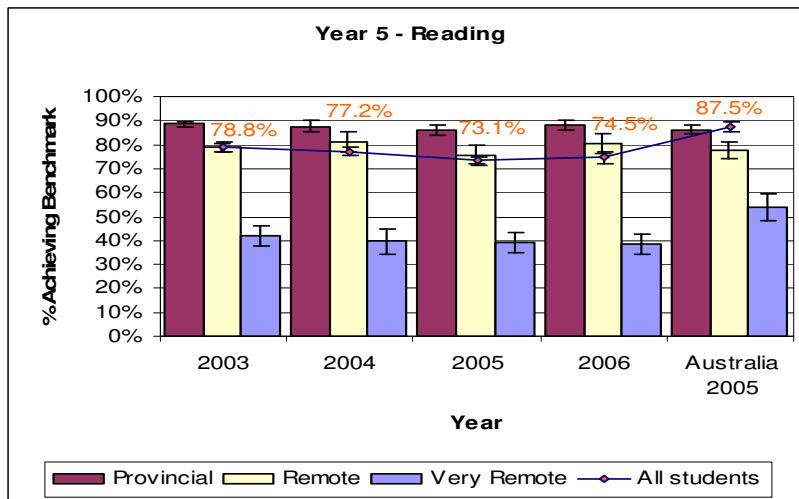


Table 5

CHARLES DARWIN UNIVERSITY

Percentage of Year 3 Indigenous and non-Indigenous Students Achieving the National Numeracy Benchmark, NT Schools 2001–2006

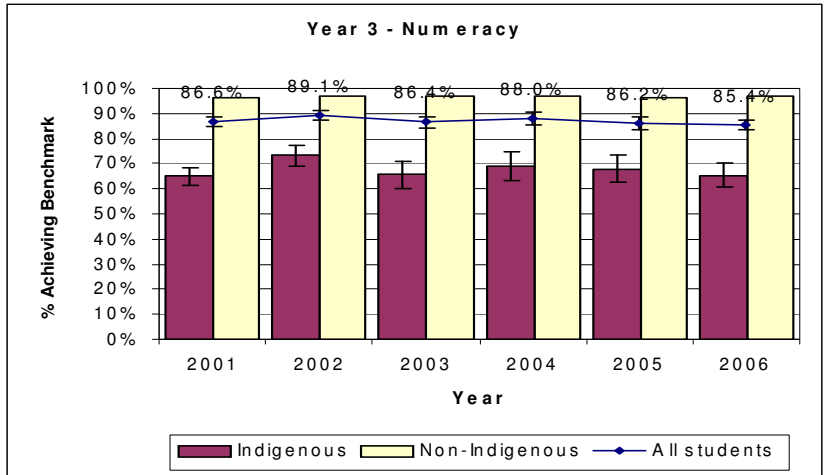


Table 6

CHARLES DARWIN UNIVERSITY

Percentage of Year 5 Indigenous and non-Indigenous Students Achieving the National Numeracy Benchmark, NT Schools 2001–2006

