The *Make it Count* Project: NAPLAN Achievement Evaluation

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Make It Count was a large scale, government-funded, project aimed at improving the mathematics learning of Indigenous students. NAPLAN Numeracy test results were used as one measure of the effect of the program. In this paper we report on the performance on these tests of Indigenous students in schools involved in the project. Group data and, where available, longitudinal data for individual students are reported.

After years of debate and considerable publicity, the *National Assessment Program – Literacy and Numeracy* [NAPLAN] was introduced in Australia in 2008. Each year since then, NAPLAN tests have been administered nationally to students in Years 3, 5, 7, and 9. Formally, participation in the NAPLAN tests is not compulsory. Compliance, however, is very high. For example, in 2012 approximately 95% of the Australian Year 3 cohort and 92% of the Year 9 cohort completed the NAPLAN tests. The numeracy tests contain both multiple choice and open-ended items, divided into five different strands: Algebra, Function and Pattern; Measurement, Chance and Data; Number; and Space. Data are also reported by proficiency band. For each year level, the proportions of students with scores in the six proficiency bands deemed appropriate for that year level are provided. For Year 3, the bands are 1-6; for Year 5, 3-8; for Year 7, 4-9; and for Year 9, bands 5-10.

Some student background information is also gathered including: student age, gender, Indigenous status, language background status (English or non-English), geolocation (metropolitan, provincial, remote, and very remote), parental educational background, and parental occupation. NAPLAN data are reported overall, separately for these different groupings, as well as by state/territory.

Inspection of the NAPLAN Numeracy data for the years 2008-2012 reveals that, as a group, the performance of Indigenous[1] students is consistently below that of non-Indigenous students. Addressing this issue, and finding ways to minimize this gap, continues to be seen as an urgent educational priority. *Footprints in time*, which also commenced in 2008, is one such initiative: "The main objective of the study is to provide high quality quantitative and qualitative data that can be used to provide a better insight into how Indigenous children's early years affect their development" (Footprints in time, n.d., p. 87). The focus of this ongoing study is on the first nine or 10 years in the lives of Aboriginal and Torres Strait Islander children, and particularly on families living in areas of high or extreme isolation. There is no assumption that the findings are representative of Australia's Indigenous population more generally. No serious attempts are therefore made to use the data from the study to make comparisons between Indigenous and non-Indigenous students.

[1] Indigeneity is determined by self-nomination: "A student is considered to be 'Indigenous' if he or she identifies as being of Aboriginal and/or Torres Strait Islander origin. The term 'origin' is considered to relate to people's Australian Aboriginal or Torres Strait Islander descent and for some, but not all, their cultural identity." (NAPLAN 2012, p. vi)

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A different longitudinal national project, *Make it Count*[2] [MiC], is of particular interest to those concerned with Indigenous children and the teaching and learning of school-based mathematics and numeracy. "Make it Count is an initiative that has developed evidence based, responsive mathematics pedagogies to improve the learning outcomes of Aboriginal and Torres Strait Islander learners" (AAMT Make It Count, n.d. a). Eight clusters of urban and regional schools were involved in the project. Thus findings from the MiC project, too, are not necessarily representative of Australia's wider Indigenous student population, but are restricted to those living in metropolitan and provincial areas.

The Make it Count project

The nature, scope, and length of the implemented MiC intervention program has varied according to the perceived needs of participating schools and their students. In some schools all Indigenous students were directly involved in the project; in others this was not the case. Evaluation of the practice-driven project was multi-faceted and concerned with different features of the program including: student achievement; student experiences in mathematics (numeracy); student attitudes, beliefs and self-concept; teacher and school change; cultural competency of teachers in schools; and school-community partnerships (AAMT Make It Count, n.d. b). In this paper we focus on aspects of the evaluation of student achievement. Cautionary remarks made by Yore and Van der Flier-Keller (2011) are highly relevant to this endeavour. Referring to their extensive, collaborative project aimed at fostering improved performance in mathematics, they concluded that it "made significant contributions to high-quality resources and practices, high-quality professional learning experiences, and enhanced classroom practices – but it **did not provide substantive evidence on student performance**" (p. 248, emphasis added).

Setting the context

Early in the MiC project it was decided that NAPLAN testing results would be used to evaluate, or perhaps more accurately monitor, students' numeracy achievements. NAPLAN testing remains contentious. The limitations of the tests are well known and were recognised in this study. NAPLAN tests are timed, cover only selected components of the mathematics curriculum, and indicate only how well a student performs on the test on a given day. Conveniently, however, NAPLAN represents a common test administered to all students in Australian schools, and the administration of this uniform measure of mathematics assessment is already part of school routines for students in Years 3, 5, 7, and 9. Reliance on NAPLAN data to monitor progress was therefore considered to be only a minimum intrusion into the programs of participating schools.

As described in the National Reports, NAPLAN tests are equated, enabling "the results from NAPLAN tests in different years to be reported on the same achievement scale" (NAPLAN, 2012, p. iv). Minor fluctuations in longitudinal test results are expected, and it is only when "there is a meaningful change in the results from one year to the next, or

[2] *Make it Count* was officially launched at the National Indigenous Education Conference in Hobart on 23 November, 2009 and concluded at the end of 2012. Starting dates of the implementation of the program varied by school. The project was funded by the Department of Education, Employment and Workplace Relations (DEEWR) and managed by the Australian Association of Mathematics Teachers (AAMT) as part of the *Closing the Gap - expansion of intensive literacy and numeracy programs* initiative. For more details of the MiC project see http://makeitcount.aamt.edu.au/.

when there is a consistent trend over several years, that statements about improvement or decline in levels of achievement can be made confidently" (NAPLAN, 2012, p. iv).

Students in the MiC project resided and attended schools in metropolitan and regional/provincial areas, but not in remote areas of the country. The data in Table 1, for students in Year 3 and for the period 2008-2012, highlight the impact of geolocation on mean NAPLAN scores for both Indigenous and non-Indigenous students nationally. There are only small variations by year of test administration. The data highlight the large performance gap between non-Indigenous and Indigenous students Australia-wide, and within each geolocation. The achievement gaps in NAPLAN scores evident for Year 3 are replicated at all other year levels, and in each year the tests were administered.

Table 1
Year 3 NAPLAN mean scores by Indigeneity and Geolocation

Geolocation		2008	2009	2010	2011	2012
Australia-wide	non-Indigenous	400.5	397.7	399.0	401.7	399.5
	Indigenous	327.6	320.5	325.3	334.4	320.1
Metro	non-Indigenous	404.0	401.7	403.0	406.0	404.4
	Indigenous	*345.7*	*339.7*	*343.6*	*348.5*	*339.4*
Provincial	non-Indigenous	392.3	387.4	388.4	390.3	385.6
	Indigenous	*339.2*	*334.3*	*336.5*	*341.8*	*330.7*
Remote	non-Indigenous	377.5	375.3	380.8	378.1	371.9
	Indigenous	305.7	287.4	307.4	313.0	290.8
Very Remote	non-Indigenous	376.1	371.7	370.5	376.0	367.0
	Indigenous	265.9	251.2	261.4	286.6	250.4
Make it Count	*Indigenous*	*340.2*	*341.2*	*329.9*	*332.1*	*340.3*

The data in Table 1 indicate that the performance levels on the NAPLAN tests of Indigenous students in the MiC schools [referred to as MiC students in the remainder of the paper] were generally similar to the mean scores for the national cohorts of Indigenous students in Metropolitan or Provincial regions (see shaded sections of Table 1), and were higher than the national mean scores of students from remote or very remote areas. A comparable pattern of scores was found for MiC students at Years 5, 7, and 9.

The general pattern is clear. Student achievement levels are directly related to geolocation. For each grade level, the further from metropolitan cities schooling takes place, the lower is the mean NAPLAN achievement score. Thus, data for Indigenous students in metropolitan [Metro] and provincial areas, and not the performance of Indigenous students Australia-wide, served as the most appropriate context for the performance of MiC students in the evaluation of the MiC program.

Monitoring progress

Although evaluation was strongly and consistently emphasized as an important part of the MiC project, not all schools submitted the requested information in a usable format. An additional complexity in the data gathering arose. MiC schools were involved in the program because of their concerns about the mathematics learning of their Indigenous students. Yet, over the timespan of the program, as students progressed from one grade

level to the next, it was not always clear from the data sent to us which Indigenous students were in MiC programs or for how long they were there. Clearly, too, there were changes in year level cohorts as individual students moved to, or away from, participating schools. As a result, the number of individual Indigenous students for whom we had longitudinal NAPLAN data was considerably restricted. It should also be noted that we found that particular students were identified as Indigenous in some years and not in others. We are not quite sure how this came about, although, as noted in the footnote, Indigeneity is a self-nominated category. In what follows, we present two sets of longitudinal data:

- for Indigenous students in MiC participating schools as a group, and
- for students in this group for whom we had individual longitudinal data.

Overall, just over 1450 useable NAPLAN results were submitted. This comprised both one-off data from some schools, and repeated information from other schools. The latter enabled longitudinal performance patterns to be traced for individual students.

Longitudinal Group data

Example 1. NAPLAN mean score differences: For each of the years NAPLAN has been administered, we were able to garner NAPLAN data for Indigenous students from the schools participating in the MiC project. We also drew data from the National reports of NAPLAN performance for Indigenous students across Australia. Space constraints preclude displaying the data for all year levels. Presented in Table 2 are Year 3 and Year 9 mean NAPLAN scores for MiC students from 2008-2012, NAPLAN data for Indigenous students nationally and for Metro and Provincial geolocations, and score differences between MiC students and the national Indigenous sample overall and for the Metro and Provincial sub-groups.

Table 2
Year 3 and Year 9 mean NAPLAN scores for MiC Indigenous students, and for Indigenous students nationally and by geolocation (Metro/Provincial), and difference scores

		2008	2009	2010	2011	2012
Year 3: MiC	Mean	340.2	341.2	329.9	332.1	340.3
	N	60	93	76	108	108
National data: Indigenous students		327.6	320.5	325.3	334.4	320.1
National data: by geolocation	Metro	345.7	339.7	343.6	348.5	339.4
	Provincial	339.2	334.3	336.5	341.8	330.7
Difference scores: (MiC mean – National mean)		12.6	20.7	4.6	-2.3	20.2
Difference scores: (MiC mean – Metro mean)		-5.5	1.5	-13.7	-16.4	0.9
Difference scores: (MiC mean – Provincial mean)		1.0	6.9	-6.6	-9.7	9.6

		2008	2009	2010	2011	2012
Year 9: MiC	Mean	538.5	530	528.7	528.4	543.3
	N	63	62	48	52	62
National data: Indigenous students		515.1	520.2	515.2	515.8	518.2
National data: by geolocation	Metro	528.0	531.4	527.8	526.8	528.7
	Provincial	520.4	525.5	520.6	518.5	521.5
Difference scores: (MiC mean – National mean)		23.4	9.8	13.5	12.6	25.1
Difference scores: (MiC mean – Metro mean)		10.5	-1.4	0.9	1.6	14.6
Difference scores: (MiC mean – Provincial mean)		18.1	4.5	8.1	9.9	21.8

Example 2. Gross comparisons between MiC Indigenous students and national samples: Since many students attend the same primary school for Years 3 and 5 we could expect considerable overlap in the composition of the two groups sitting for the NAPLAN Year 3 test in a particular year and the NAPLAN Year 5 test two years later. Given that in some states Year 7 is still part of the primary school but in others it is the first year in the secondary school, such overlap cannot be assumed as readily for the groups sitting for the Year 5 test in a specific year and for the Year 7 test two years later, nor for those sitting for a Year 7 test and the Year 9 test two years later.

A comparison of the performance of Year 3 MiC students in 2008, 2009, and 2010 with their performance in Year 5 respectively in 2010, 2011, and 2012 is shown in Table 3. National results for Indigenous students at the relevant year level and at schools in the Metro and Provincial areas are also shown. Of interest are the percentages of students who performed 'below' or 'below or at' the national minimum standards at the pertinent year levels since "students who are performing ***at*** the National Minimum Standard may also require additional assistance to enable them to achieve their potential" (ACARA 2011). Band 2 is the national minimum standard at the Year 3 level; at Year 5 it is band 4.

For each Indigenous cohort, over 10% scored below the national minimum standard; for some years, and at some grade levels, the percentage of Indigenous students at MiC schools was over 20% (e.g., 2010 Year 5, and 2012 Year 5). For each of the periods considered, and for the national Metro and Provincial students as well as the Indigenous students at MiC schools, the percentages of students at or below the national minimum standards increased from the Year 3 to the Year 5 testing. For example, for Indigenous students at MiC schools, the percentage of students at or below the national minimum standard was 44.9% in Year 3 in 2010 and rose to 53.9% in Year 5 in 2012. Regrettably, these data are difficult to interpret. The different numbers in the groups being compared suggest that there was greater fluidity in same-school attendance from Year 3 to Year 5 than we had anticipated. Nor was it clearly specified which students had, and had not, participated in MiC programs.

Table 3
Percentages of students 'below' and 'at or below' national minimum performance level levels for Years 3 and 5: MIC Indigenous students and national samples of Indigenous Metro and Provincial students (exempt students not counted)

Group	N	% below minimum	% at or below minimum	Group	N	% below minimum	% at or below minimum
		2008 Year 3				2010 Year 5	
MiC	72	16.7	40.3	MiC	106	22.6	60.3
Metro		11.7	36.9	Metro		15.9	42.3
Prov		12.5	40.3	Prov		19.4	49.0
		2009 Year 3				2011 Year 5	
MiC	117	18.8	41.0	MiC	137	15.3	45.2
Metro		14.5	40.9	Metro		13.7	42.9
Prov		16.8	43.1	Prov		16.3	47.8
		2010 Year 3				2012 Year 5	
MiC	78	12.8	44.9	MiC	65	23.1	53.9
Metro		12.5	37.0	Metro		17.3	44.5
Prov		14.5	42.0	Prov		20.5	49.7

Longitudinal data for individual students

Example 3. Individual students' changes in performance bands: In this section we present data for the sample of MiC students for whom we had longitudinal data, that is, scores on two successive NAPLAN tests. Shown in Table 4 are results pertaining to Year 3/Year 5 students in 2008/2010 and Year 3/Year 5 students in 2009/2011 as well as corresponding data for students in Year 5/Year 7 and Year 7/Year 9. As noted above, band 2 is the national minimum standard at the Year 3 level, band 4 at Year 5, band 5 at Year 7, and band 6 at Year 9.

For both sets of Year 3/Year 5 data shown in Table 4, the NAPLAN achievement band for approximately half the students (49% and 54%) increased as, or more than, expected. The percentage of students (12% and 15%) whose performance increased by more than 2 bands (that is, higher than expected) did not differ greatly from the percentage (19% and 14%) whose performance put them in the same or a lower band (that is, their achievement bands were lower than expected two years later).

For the Year 5/Year 7 data, the NAPLAN achievement bands of more than half the students (84% and 60%) increased as, or more than, expected. Similarly, for both sets of Year 7/Year 9 data, the NAPLAN achievement bands for approximately half the students (46% and 58%) also increased as, or more than, expected. The percentages of students who stayed at the same band, that is, did not improve after two more years of mathematics learning (Year 5/Year 7: 13% and 36%; Year 7/Year 9: 0% and 8%), and the percentages of students who moved to a lower band (that is, went backwards) must also be noted. A more nuanced analysis of data than possible within the constraints of this paper is needed to determine whether all students, or largely only those whose performance met or exceeded expectations, were involved in the MiC program.

Table 4
Summary of NAPLAN proficiency band movements for students for whom we had longitudinal data: Year 3/Year 5; Year 5/Year 7; and Year 7/Year 9

Years	Total N	Up >2 bands	Up 2 bands (expected)	Up 1 band	Stayed at same band	Moved to a lower band
Year 3 2008 / Year 5 2010	43	5 (12%)	16 (37%)	14 (32%)	7 (17%)	1 (2%)
Year 3 2009 / Year 5 2011	72	11 (15%)	28 (39%)	23 (32%)	6 (8%)	4 (6%)
		Up > 1 band	Up 1 band (expected)		Stayed at same band	Moved to a lower band
Year 5 2008 / Year 7 2010	38	24 (63%)	8 (21%)		5 (13%)	1 (3%)
Year 5 2009 / Year 7 2011	50	7 (14%)	23 (46%)		18 (36%)	2 (4%)
Year 7 2008 / Year 9 2010	13	0	6 (46%)		7 (54%)	0
Year 7 2009 / Year 9 2011	12	1 (8%)	6 (50%)		4 (34%)	1 (8%)

Example 4. Changes in performance in mean NAPLAN scores: In Table 5, changes in NAPLAN performance over time are in terms of gains in mean scores for MiC Indigenous students (for whom we had longitudinal data), and for Indigenous and non-Indigenous students nationally and by geolocation (Indigenous only).

The shaded entries in Table 5 indicate when the gains in mean NAPLAN scores for MiC Indigenous students were higher than those of Indigenous students in the Metro and Provincial areas nationally (see Year 3/Year 5 in 2009-2011; Year 5/Year 7 in 2008-2010 and 2009-2011). The consistently low increases in the MiC students' mean NAPLAN scores between Years 7 and 9 are of concern – but note small sample sizes.

From Table 5 it can also be seen that increases in mean NAPLAN scores at successive testings for Indigenous students nationally differ little from those of non-Indigenous students (e.g., Year 3/Year 5 in 2009-2011: All non-Indigenous students, gain=93.6; All Indigenous students, gain=100.6. Year 5/Year 7 in 2010-2012: All non-Indigenous students, gain=49.2; All Indigenous students, gain=52.5).

As noted earlier in the paper, and illustrated in Table 1, there is a considerable gap in the performance at Year 3 of Indigenous and non-Indigenous students nationally. That difference in the performance, it seems, remains as the two groups progress through school, that is, Indigenous students never close this gap. In some schools, Indigenous students in years K-2 were involved in the MiC program. Reliance on NAPLAN scores did not allow the mathematical progress of these students to be monitored.

Table 5
Gain in NAPLAN numeracy scores for MiC Indigenous students for whom longitudinal data are available, and relevant groups' national mean score gains

	MIC		National data			
Period	N	Mean gain	Mean gain: All Indig	Mean gain: Indig (Metro)	Mean gain: Indig (Prov)	Mean gain: All Non-Indig
Year 3 to Year 5 cohorts						
2008 – 2010	36	66.9	89.3	91.1	88	92.1
2009 – 2011	57	109.0	100.6	98	95.6	93.6
2010 – 2012	32	88.4	88.7	91.3	89.6	93.6
Year 5 to Year 7 cohorts						
2008 – 2010	28	81.4	69.5	69.0	67.3	71.9
2009 – 2011	46	72.8	54.3	52.7	52.6	58.2
2010 – 2012	29	41.0	52.5	48.3	49	49.2
Year 7 to Year 9 cohorts						
2008 – 2010	13	19.6	39.0	34.3	35.6	39.9
2009 – 2011	12	26.3	41.4	35.7	39.8	39.7
2010 – 2012	25	14.8	40.7	34.8	36.1	36.1

Final words

Using NAPLAN numeracy scores alone to monitor the performance of MiC students yielded mixed results. The improvement in 2012 in the performance of MiC students, relative to national data, the substantial percentage of MiC students showing at least expected growth in terms of NAPLAN bands, and the modest instances of MiC students achieving higher than national gain scores over two-year cycles are heartening. In contrast, the persistent high proportion of MiC students at or below the national minimum standard and failing to show expected growth in mean NAPLAN scores is disappointing. Further analyses, drawing on qualitative data and carefully tracking the involvement in MiC programs of students in the early years of schooling and beyond, are clearly warranted.

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