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Effective strategies for improving student learning: results from the low SES NP evaluation

Research report

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Executive Summary

This report was prepared by the Centre for International Research on Education Systems (CIRES) at Victoria University and is part of an evaluation of National Partnership reform initiatives in low-SES schools. The evaluation is being undertaken by the University of Canberra in partnership with Victoria University on behalf of the State of New South Wales. In this report, the authors focus on student performance in the Low SES schools in NSW that participated in the National Partnership Agreements, the extent to which changes in student performance are related to NP initiatives or other factors and the initiatives that may be identified as making the strongest contributions to changes in student outcomes.

Previous findings associated with this study have already identified positive relationships between Low SES National Partnership participation and improved student outcomes over the study period.

They include:

- significant impact on student NAPLAN results over 3 years between 2011 and 2013 in Low SES NP schools.
- scores increasing for each additional year of participation in the program.
- reduction in gain score gaps between Low SES schools and other more advantaged settings.

In investigating how the reforms implemented in NP schools have led to improvement in student learning outcomes and which reforms may be identified as contributing to improvement this report draws on a wide variety of data sources, including:

- student level NAPLAN data in 2011 and 2013 provided by the NSW Department of Education and Training;
- NAPLAN school profile data in 2011 sourced from ACARA;
- school level data from the 2014 Low SES NP Principal Survey and the 2013 low SES NP Teacher Survey; and
- Case studies of Low SES NP schools.

The report develops three key sets of analyses: (1) estimating aggregate school effects on student achievement, (2) testing the relationship between aggregate effects and effort across the broad NP reform strategy areas, and (3) identifying individual strategies or initiatives that were associated with stronger student outcomes.

Aggregate low SES NP effects

Effects for NP schools on achievement scores in Year 5 and Year 9 NAPLAN Reading and Numeracy were estimated using multi-level regression taking into account a number of student and school level factors that influence student achievement, such as student background, prior NAPLAN achievement (two-years earlier), gender and the concentration of students by family SES, concentration of Aboriginal students, school size and school type. The analysis measures how much each school 'value-added' to their student NAPLAN achievement and how well a school performs compared to similar schools.

Schools participating in the low SES NP exhibit overall a positive effect on student achievement, albeit with variations for Reading and Numeracy and between different years of NP implementation. The NP effect is more consistent or stronger on Numeracy than in Reading and more consistent for the Year 9 cohort than for the Year 5 cohort. Schools commencing their low SES NP in 2011 show on average the strongest NP effect among all NP schools.

Compared to students in low SES schools who did not participate in the NP, students in the low SES NP schools perform, on average, 3 points higher in Year 5 Numeracy, 3 points higher in Year 9 Reading and 6 points higher in Year 9 Numeracy.

Low SES reform areas linked to better student outcomes

To examine whether or not particular aggregate effects were associated with effort placed in particular low SES reform areas, at a broad level, data were used from the 2013 Teacher survey, and the 2014 Principal survey to examine the aggregate NP effects. Teachers responded in the 2013 Teacher Survey to a series of questions about changes in teacher practice and school management as a result of NP implementation. Principals were asked in the 2014 survey five groups of questions that are broadly related to the six NP reform areas. For each group of questions, principals responded to three aspects of NP implementation including:

- the intensity of NP implementation (i.e., the total number of NP initiatives implemented),
- the level of effectiveness (from "Not all effective" to "Highly effective"), and
- the total number of NP initiatives that were continuing at the school.

A set of measures were constructed using teacher responses to a series of questions in the survey, including the level of positive changes in teacher practice and the level of positive changes in school management. These were correlated with the low SES NP effects on Numeracy and Reading. A further analysis examines the relationship between the size of the impact of the low SES NP on student Reading and Numeracy achievement and principal views on what reform areas contributed most to impact.

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The results suggest that for primary schools (Year 5) there is a positive relationship between NP school effect scores and principal-reported level of effectiveness for initiatives implemented as part of Reform Area 4, *providing innovative and tailored learning opportunities*. The higher level of effectiveness as perceived by the principal, the more likely the school shows a higher NP effect. The results also show for primary schools a relationship between the number of initiatives implemented from Reform Area 4 and NP school effects. It suggests that schools which placed more effort in this reform area was more likely to show a higher effect on student learning outcomes.

Individual initiatives linked to better student outcomes

NP schools may be faced with some common challenges, such as low attendance and low achievement, however other conditions or circumstances they operate with may vary. Although government schools were required to address all six areas of the NP reform, schools could prioritise their efforts or resources on particular initiatives or activities to address their unique challenges or conditions. Information provided by the principals (in the 2014 survey) enables analyses to identify the impact, if any, of individual NP initiatives or strategies.

To identify what initiatives or strategies that may have different influences on the level of NP effect among NP schools, schools were grouped based on the ranking derived from the size of their NP effect values. Three groups were identified: (1) schools with low NP effect values, suggesting negligible or little effect on Reading and Numeracy achievement, (2) schools with small or modest effects, and (3) schools at the top end of the rank displaying larger effects.

In looking at what separated schools on the basis of whether their improvement in NAPLAN achievement had been ranked relatively higher or lower, the analysis revealed that high impact schools were characterised by the following features:

- They had placed greater emphasis than low impact schools on innovations in teaching practice and addressing student needs
- They had provided stronger welfare and learning support for disadvantaged students through providing teachers with training around individual learning needs, and strengthening the use of Individual Learning Plans (ILPs) for students
- Stronger use of evidence to identify student learning needs
- Stronger emphasis on developing staff through providing opportunities for professional learning and development

For schools where the NAPLAN achievement effect had been low or negative, the analysis revealed that schools tended to be characterised by the following:

- Some had a stronger emphasis on strategies to attract and retain teachers, particularly through leadership positions, which may itself reflect greater need in this area and schools struggling to recruit and retain quality teachers and leaders
- Less focus on innovation in teaching, addressing student needs, and strengthening school accountability and more on staffing and performance management
- Pursued strategies around teacher and leadership recruitment, retention and development suggesting that staff stability was a major issue for them.

The differences in focus and emphasis among NP schools may well reflect the challenges that they face and to which they are responding, rather than the effects of the strategies themselves. For example, schools that show low NP impact on student NAPLAN results have placed greater emphasis on attracting high performing teachers and improving the staffing and performance management role of the principal. They may have issues in staffing and management practices that need (and the schools recognise that need) to be addressed. High impact schools, on the other hand, may have more stable staffing profiles, and it is their staffing and management stability that has enabled these schools to target areas of improvement in teaching practice and in addressing student needs that has delivered real traction from the NP initiatives.

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Glossary

ACARA	The Australian Curriculum, Assessment and Reporting Authority. Has oversight of NAPLAN.
AECG	Aboriginal Education Consultative Group
ARIA	Accessibility/Remoteness Index of Australia—an index that underpins many location classifications.
COAG	Council of Australian Governments, an organisation consisting of the federal government, the governments of the eight states and territories and the Australian Local Government Association. NPs are implemented under the auspices of COAG.
CIRES	Centre for International Research on Education Systems, Victoria Institute, VU.
DEC	Department of Education and Communities, NSW (from April 2011).
DET	Department of Education and Training, NSW (until April 2011).
FTE	Full Time Equivalent.
HAT	Highly Accomplished Teacher (government sector) or equivalent (non-government sector). An initiative within the NP. A HAT models good teaching practice and mentors other teachers through supervision, demonstration and team teaching. A HAT usually has half the teaching load of a regular classroom teacher and is a member of the school executive.
ICSEA	Index of Community Socio-Educational Advantage, a scale that represents levels of educational advantage associated with the educational and occupational background of parents of students. A school's ICSEA value is the average level of the educational advantage of its students. Developed by ACARA to assist with the interpretation of NAPLAN results.
Low SES NP	Low Socio-Economic Status School Communities National Partnership.
MCEETYA	The Ministerial Council on Education, Employment, Training and Youth Affairs, (a Ministerial Council of COAG) which was replaced from July 2009 by the Ministerial Council for Education, Early Childhood Development and Youth Affairs (MCEECDYA) and the Ministerial Council for Tertiary Education and Employment (MCTEE).
NAPLAN	National Assessment Program - Literacy and Numeracy. An annual national standardised literacy and Numeracy testing program for students Years 3, 5, 7 and 9.
NP	National Partnership, agreements between the Commonwealth and state and territory governments made under the auspices of COAG outlining funding.
ISP	Individual Student Plan.
PD/PL	Professional development/Professional learning.
UoC	University of Canberra

1.   Introduction

An ongoing interest among educational policymakers and practitioners is to identify effective school practices that lead to improved student learning outcomes. This is particularly important in helping schools and systems work out how best to invest funds and resources to gain improvements and maximise returns on investment. The National Partnerships initiatives implemented in New South Wales schools provided an ideal opportunity to contribute to this goal because of the structured and targeted approach to reforms and the availability of data, both administrative and survey, with which to estimate and measure impact and change.

The National Partnership Agreements were a series of policy interventions initiated by the Council of Australian Governments (COAG) and implemented across all states and territories in Australia. There were three Smarter Schools National Partnerships - the Literacy and Numeracy, Improving Teacher Quality and Low Socio-Economic School Communities National Partnerships.   All three National Partnerships were designed to improve student learning in schools. Although each National Partnership functioned independently, they were conceived as a mutually complementary reform package. The Low SES Schools National Partnership targeted schools serving disadvantaged communities and provided them with extra resources and targeted policy initiatives to help them build capacity and improve student learning outcomes.

The Low SES NP featured six reform areas that encompassed a variety of initiatives implemented by schools:

Reform Area 1:   Incentives to attract high-performing teachers and principals

Reform Area 2:   Adoption of best practice performance management and staffing arrangements that articulate a clear role for principals

Reform Area 3:   School operational arrangements that encourage innovation and flexibility

Reform Area 4:   Provide innovative and tailored learning opportunities

Reform Area 5:   Strengthen school accountability

Reform Area 6:   External partnerships with parents, other schools, businesses and communities and the provision of access

Initiatives associated with staffing, management and accountability fell under 5 out of the 6 reform areas associated with the Low SES NP. Over the life of the Low SES NP, schools implemented a variety of interconnecting and reinforcing strategies associated with the various reform areas.

This report presents results of a further evaluation of the low SES NP reform initiatives. It is part of the evaluation that initially was described as the *Evaluation Services Agreement for DETSSNP1024: Evaluation of School external partnerships*, between the State of New South Wales and the University of Canberra. That evaluation was revised to focus on student performance in low-SES schools that had participated in the National Partnership Agreements and in particular to examine the extent to which changes in student performance are related to NP initiatives or other factors. The revision is consistent with the original aims of the research project and builds on the findings of previous stages of the evaluation, which suggest a more thorough investigation of student performance in the context of NP initiatives.

Part of the aim of this work, consistent with the original evaluation goals, is to evaluate the effectiveness and long term impact of school external partnerships on the school and post-school outcomes of students in disadvantaged schools, as well as assess the extent to which supporting school external partnerships represents value for money in achieving improved student outcomes. The two key research questions to be addressed in that evaluation were:

(1) To what extent have school external partnerships led to improved outcomes in Low SES NP schools after controlling for other activities introduced under the NP?

(2) What activities are associated with the greatest improvements in outcomes for students?

The work undertaken for the current report aims to address these questions as well as to examine the impact more broadly of the different reforms that made up the low SES NP. So, a further question of importance to this study is:

(3) Which reforms have contributed most to improved student outcomes, and why?

These research questions are prompted by a policy interest in how student performance changed between 2008 and 2013 and the extent to which any changes are related to NP initiatives. A key issue for policy is to understand which NP initiatives, if any, had a positive impact on student performance in low-SES school communities and why.

1.1   Previous findings

Previous findings associated with this study have identified positive relationships between Low SES National Partnership participation and improved student outcomes over the study period.

In the evaluation of the staffing, management and accountability initiatives of the low SES NP, comprehensive analyses were undertaken to evaluate the impact of the initiatives in improving NSW student outcomes across a range of measures including NAPLAN results, Year 12 attainment, HSC achievement, ATAR scores, and attendance (CIRES, 2015). The report identified positive effects of some measures at an aggregate or system level as a result of Low SES NP. In particular, the preliminary analysis using NAPLAN matched cohort data suggested that low SES NP schools on average saw a significant impact on student NAPLAN results over 3 years between 2011 and 2013.

The NAPLAN trend analysis employed an approximation of a multiple error component model using OLS with student level fixed effects, to measure effects of Low SES NP participation on NAPLAN scores. Estimation was performed on approximately one million student scores between 2008 and 2013. Results suggested that the Low SES NP has had a significant positive effect on student NAPLAN achievement, with the largest improvement in writing scores. The analysis also indicated the importance of considering the duration that a program has been in place, with Reading, Spelling, Grammar and Numeracy scores increasing by 1 to 1.5 points per additional year of participation in the program.

A number of extensions to the analysis were also considered, including comparing schools with common ICSEA scores, examining heterogeneity in the treatment effect and estimation on Catholic schools. The comparison sample estimates are similar in sign and magnitude to the main results, suggesting modest positive effects on student NAPLAN scores of participation in Low SES NP.

The Low SES NP overlaps with several different programs, and an analytical model was developed to consider the individual effect of each program and its duration. Programs included in the models, in addition to the broad Low SES NP, include the Literacy and Numeracy NP, the Improving Teacher Quality NP (including the NP for the teacher quality enhanced decision making pilot, and the NP for teacher quality for schools participating as a 'spoke' of a Centre for Excellence Hub). Results suggest that participation in the broad Low SES NP program only had the largest positive effects on NAPLAN scores.

An analysis of achievement gain comparing gain scores against the state average and within school variations shows there is a reduction in the gap between the primary schools participating in the Low SES NP and the state average in Reading gain. The reductions are small, but consistent.

1.2 This report

Previous results point to positive aggregate effects of the low SES NP reforms. What they don't show is if the effect is uniform or varies across schools, and if so what might explain variations in impact. While it is important to know if on average the Low SES NP helped improve the education and life opportunities of students from low SES backgrounds through improvements in student outcomes, it is also important to know if the effects vary and what contributes to variation in impact. To examine this aspect, a range of analyses were undertaken using available data to evaluate the variations in effectiveness of the Low SES NP in improving NSW student outcomes using NAPLAN achievement data.

Drawing on quantitative evidence by cross-matching administrative and survey data sources, this report provides analyses on how and to what the extent the NP effect on student NAPLAN results vary across schools. By linking individual student NAPLAN records and data on overall level of NP related practices and features in NP schools (as reported by principals and teachers), this report identifies the key NP initiatives or interventions that may promote or drive student learning improvement. It also provides analyses and insights on other school-level factors that may assist in optimising program effects.

This report builds on the findings of previous stages of the low SES NP evaluation, which suggest a more thorough investigation of student performance in the context of NP initiatives would be worthwhile.

An important goal of the evaluation is to measure the impact of NP interventions by examining student and school performance differences using a multi-level modelling or 'value-added' methodology[1]. Value added (VA) analysis provides a robust way of estimating pupil and school performance. It will be used to identify which elements of the NP initiatives make a difference, in terms of improved results in low-SES NP schools. By linking individual student NAPLAN records between 2011 and 2013, this report is able to track the learning progress of 2 cohorts of students (i.e., Year 3-5 and Year 7-9) in Reading and Numeracy over the 3 years from 2011 to 2013. The VA effect of individual low-SES NP schools on NAPLAN Reading and Numeracy are then estimated.

The VA measures adjust for student and school factors that are known to have an impact on student learning outcomes including, at the student level, prior performance, individual low-SES student background, gender and ATSI status. The contextual characteristics of the school—SES measures, type, location, total enrolments and enrolments by gender, Aboriginality and language backgrounds other than English (LBOTE)—were also applied. The

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[1] Lu, Lucy and Rickard, Karen (2014) *Value-added models for NSW government schools*. Technical Paper. Centre for Education Statistics and Evaluation, NSW Department of Education and Communities, Office of Education.

purpose of defining the VA measures is to ensure that the impact of a students' prior achievement level, socio-economic status background and that of their peers are accounted for when measuring student achievement. This enables identification of which low-SES NP schools, if any, contribute additionally to student achievement relative to the average NP school over the period.

At a more detailed level, the analysis of VA measures helps determine which schools and which NP initiatives have been successful in raising student performance for students and how large the impact has been.

This focus is prompted by a policy interest in how student performance changed between 2008 and 2013 and the extent to which any changes were related to NP initiatives. A key issue for policy is to understand which NP initiatives, if any, had a positive impact on student performance in low-SES school communities and why.

It should be noted that private non-Catholic schools were not included in the analyses.

2. Data sources

This report draws on a wide variety of data sources, including:

- student level NAPLAN data in 2011 and 2013;
- NAPLAN school profile data in 2011 sourced from ACARA
- school level data from the 2014 low SES NP Principal Survey, and
- data from the 2013 low SES NP Teacher Survey.

A major goal of the NP initiatives was to improve the education and life opportunities of students from low SES background through targeting teacher quality, better use of the assessment data, strengthened school leadership and strengthened partnerships with community agencies and members including parents. One major question to be asked, therefore, is whether the reforms implemented in NP schools have led to improvement in student learning outcomes.

NAPLAN is the only available source that provides standardised and calibrated tests of student learning achievements administrated at regular intervals. It provides an annual assessment for all students in Years 3, 5, 7 and 9 in various literacy domains and Numeracy. Although NAPLAN is not a direct measure of curriculum content covered in school programs, they do provide an assessment of essential skills that we might expect children to possess to progress through school and life.

By linking individual student NAPLAN records between 2011 and 2013, we are able to track the NAPLAN achievement of 2 cohorts of students: (1) Year 3 students in 2011 and (2) Year 7 students in 2011. Achievement was measured in Reading and Numeracy in 2013 when the two cohorts were in Year 5 and Year 9, respectively. Over 52,000 student records in 2011 were successfully matched to the 2013 records for both cohorts. This accounts for respectively around 66 per cent of Year 3 students and 70 per cent of Year 7 students in 2011. The profiles of the two cohorts are presented in Table 2.1.

The results in Table 2-1 show that around 4 per cent of students do not have achievement results due to absence, withdrawal or exemption. Exemptions may be granted by schools for students with a disability or with a language background other than English who arrived from overseas and have been attending school for less than a year before the test. Data for students without assessment scores are treated as missing values and are excluded in the analyses.

The results also show the loss of students due to the matching and linking of student records between Years 3 to 5 and Years 7 to 9. Students may have missing data at one point rather than both because they changed schools or were absent or exempt at one of the

measurement points. To ensure that the changes in results or NP effects are linked to the role of programs in individual schools, only students who stayed in the same school between the two NAPLAN assessment periods were included in the analyses. Differences in levels of absence and exemption across schools, and differences in proportions of students staying in the same school across the two time points, may be an influence on the results. However, one thing to note from Table 2-1 is that at an aggregate level the matched sample is sufficiently similar to the total sample to give us confidence that the sample is representative of the population of students. The overall rates of matching for indigenous students, for LBOTE students, for males and females, and for those not assessed because of exemption or absence are roughly similar. There still may be differences at a school level that need to be considered. Future work will be undertaken to examine what impact, if any, this has on estimated value-added scores.

Table 2-1 **Profiles of matched cohorts for student NAPLAN records 2011-2013: Year 3-5 and Year 7-9, students in NSW government schools and students in participating low SES NP Catholic schools**

		NAPLAN matched cohort		NAPLAN Cohort in 2011	
		Years 3-5	Year 7-9	Year3	Year 7
		Number			
Sex	Male	26,716	27,153	40,238	38,529
	Female	25,439	25,532	38,209	36,395
Indigenous status	Non-Indigenous	49,306	49,694	74,363	70,788
	Indigenous	2,849	2,991	4,084	4,136
LBOTE Status	Non-LBOTE	36,807	36,444	55,742	53,821
	LBOTE	15,135	15,595	22,265	20,379
	Unknown	213	646	440	724
Not assessed	Reading	1,996	2,047	2,884	2,782
	Numeracy	2,109	2,360	3,039	3,172
Total		52,155	52,685	78,447	74,924
		Percentage			
Sex	Male	66.4	70.5	100	100
	Female	66.6	70.2	100	100
Indigenous status	Non-Indigenous	66.3	70.2	100	100
	Indigenous	69.8	72.3	100	100
LBOTE Status	Non-LBOTE	66.0	67.7	100	100
	LBOTE	68.0	76.5	100	100
	Unknown	48.4	89.2	100	100
Not assessed	Reading	69.2	73.6	100	100
	Numeracy	69.4	74.4	100	100
Total		66.5	70.3	100	100

Table 2-2   Profiles of schools with matched cohorts

		Primary	Secondary	Combined	Total*
		Number of schools with matched cohorts			
School Sector	Catholic	72	58	9	**139**
	Government	1,524	370	67	**1,961**
	Total	1,596	428	79	**2,112**
School Location	Metropolitan	956	290	6	**1,252**
	Provincial	616	133	54	**803**
	Remote	20	4	12	**36**
	Very Remote	4	1	4	**9**
	Total	1,596	428	79	**2,112**
NP schools: Year of NP participation	2009	70	22	25	**117**
	2010	105	33	8	**146**
	2011	121	23	1	**145**
	2012	50	16	13	**79**
	Total	346	94	47	**487**
Survey participation	Teacher Survey (2013)				**217**
	Principal Survey (2014)				**188**
		Percentage of schools with matched cohorts			
School Sector	Catholic	17%	54%	64%	**26%**
	Government	94%	93%	99%	**94%**
	Total	78%	85%	96%	**80%**
School Location	Metropolitan	78%	76%	4%	**70%**
	Provincial	74%	80%	46%	**72%**
	Remote	57%	100%	100%	**71%**
	Very Remote	40%	50%	67%	**50%**
	Total	76%	77%	26%	**71%**
NP schools: Year of NP participation	2009	80%	96%	100%	**87%**
	2010	79%	89%	53%	**79%**
	2011	81%	82%	25%	**80%**
	2012	76%	70%	81%	**75%**
	Total	79%	85%	78%	**80%**
Survey participation	Teacher Survey (2013)				**75%**
	Principal Survey (2014)				**70%**

* Totals include schools where the type of school is unknown.

NOTES: Special schools are excluded.

Other important sources of data have been developed over the course of the evaluation through a series of school-based surveys. Surveys of school principals and teachers have assisted in obtaining detailed information about the implementation and effectiveness of low SES NP initiatives or interventions. In this report, data on the low SES NP

implementation and effectiveness collected through the 2014 Principal Survey and the 2013 Teacher Survey have also been linked to their student NAPLAN records using school identifiers.

Data on the low SES NP implementation and effectiveness collected through the 2014 Principal Survey and the 2013 Teacher Survey have been linked to the student NAPLAN records using school identifiers.

Profiles of schools with matching cohorts are provided in Table 2-2. The numbers of schools matched to the NAPLAN cohort data are provided in the first panel of the table. Each percentage reported in the second panel of the table reports what the number of matched schools is as a percentage of all schools for that category. For example, 1524 government primary schools were matched to the NAPLAN cohort data and this represented 94 per cent of all possible government primary schools.

The majority of low SES NP schools — 487 out of 607 or 80 per cent — have been matched to the NAPLAN cohort data for the various analyses in this report.

About 75 per cent of schools that participated in the 2013 Teacher Survey and 70 per cent of schools that participated in the 2014 Principal Survey were matched to student NAPLAN cohort data. While not covering all schools, the matching provides sufficient samples of students and schools to provide confidence in the analytical results presented in the report.

2.1   Limitations of the study

Data matching across multiple sources, and using data from sample surveys (teachers and principals), applies some limitations that need to be considered in using the results in this work.

NAPLAN data were available for government schools and for a small number of Catholic schools (those participating in the low SES NP). Due to the lack of a common school linkage key, some schools were excluded from the matched data set. This mostly affected Catholic schools.

Improvement in NAPLAN results may not be the best or the most ideal way of measuring NP-related effects. Changes may occur in student behaviour, engagement, skills and outlooks and in ways which could have lasting and beneficial effects in a lifelong perspective. Student learning and skills may markedly improve in various classroom subject areas but not necessarily in NAPLAN test domains, or on other measures. By virtue of the program, the NP initiatives may have contributed to low SES schools becoming far better places in nurturing students and addressing their needs, and promoting a better and more engaged and active community as a result of participation without it leading directly to

improved student outcomes. The data used for this study do not allow us to explore this issue.

Data from the 2013 Teacher Survey and the 2014 Principal Survey provide very important sources of information and insights about the implementation and effectiveness of NP strategies and initiatives in schools. Although a sufficient number of schools have participated in both surveys, the overall sample size for both surveys are relatively small. The small sample size may impact on the statistical power of some analyses presented in the report. To overcome this problem to some degree, results using data from the two surveys have been cross validated and compared using different methods. Only the key themes or patterns that are consistently shown across all analyses have been reported.

Administrative data with a wider coverage of schools and more detailed information on their NP implementation have now become available, and will be examined in the next phase of work, but we were not able to incorporate the data into this report.

3.   Methodology and Definitions

To develop rich, robust and comprehensive evidence in evaluating the low SES NP effect on NAPLAN outcomes across NP schools, this report draws on data and information from a wide variety of sources. The data vary considerably as to reference periods, definitions of measures, and types or scale of data. Because of this, for the analyses in this report a triangulation approach has been adopted in recognition of the various limitations of the data and to test the validity of findings from different sources. This is set out in schematic form in Figure 3.1. Using this approach, we are able to draw on evidence from both qualitative and quantitative data and examine the consistency of findings based on different data sources.

Figure 3-1   Flow chart outlining approach to triangulation of data
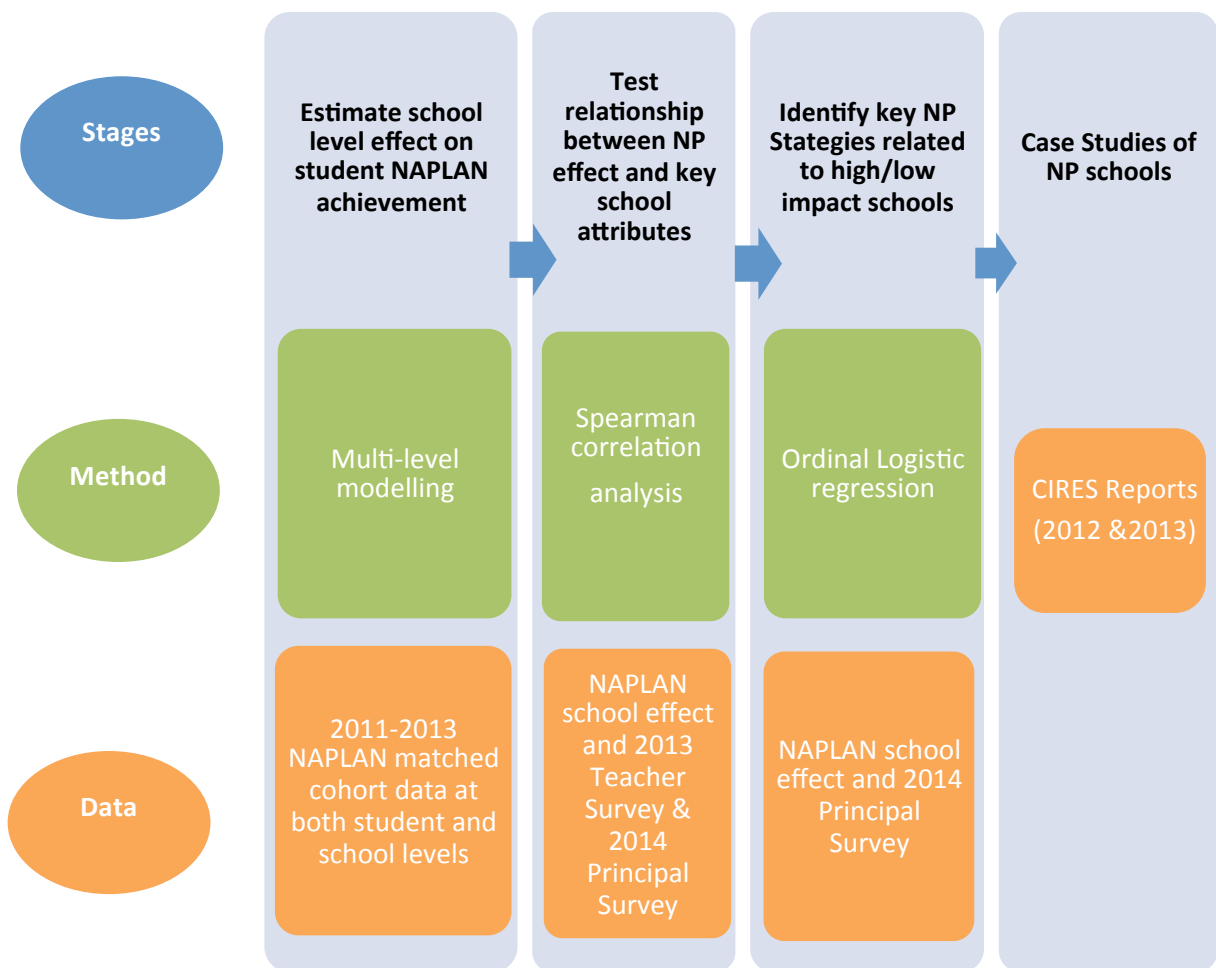
Various statistical methods have been applied in analyses at different stages in consideration of the type or limitation of each dataset, including:

- multi-level modelling to derive measures of school effects on NAPLAN achievement,

- Spearman's rank-order correlation test to identify the relationship between the estimated level of NP effect for a school and the levels of effectiveness of NP initiatives perceived by teachers or the principal. The Spearman's rank-order correlation coefficients are commonly used to measure the strength of association between two ordinal variables.

- Ordinal logistic regression models to identify the key NP initiatives or strategies associated with low and high impact schools.

Sections 3.1 and 3.2 below describe how the key measures required for the multi-level models have been defined and constructed in the report.

3.1   Measuring student learning

Individual student performance in NAPLAN is assessed on a national assessment scale for each test. The single scale allows students, teachers and parents to monitor progress across the years and compare results to those in previous years as students advance through school. The common scale for each domain is also divided into 10 achievement bands (Band 1 – Band 10) with six bands reported for each year level. A national minimum benchmark standard is set based on band score for each year level, i.e., Band 2 for Year 3, Band 4 for Year 5, Band 5 for Year 7 and Band 6 for Year 9.

While the scale for each of the five domains appears to be similar the results cannot be directly compared across domains. For this report, only results of student performance in two key domains, Reading and Numeracy, have been used for the various analyses. This report does not cover the full set of literacy and numeracy skills of students who participated in NAPLAN.

Figure 3-2 shows that students in NP schools perform consistently lower than those in non-NP schools in both Reading and Numeracy, across different year-levels and across broad stages of schooling. Students in NP schools perform on average at about 40 points below students in non-NP schools. Students in NP schools are also twice as likely to perform at or below the national minimum standard (NMS) in both Reading and Numeracy, and across all year levels.

Figure 3-2   Various measures of student achievements in NAPLAN (2011-2013 cohorts)

Student NAPLAN achievement (Mean Score) by school type

● Non-NP School   ● NP School

	Reading				Numeracy			
	At YR3	At YR5	At YR7	At YR9	At YR3	At YR5	At YR7	At YR9
Non-NP	426	509	545	586	408	497	552	597
NP	378	471	506	553	372	458	512	557
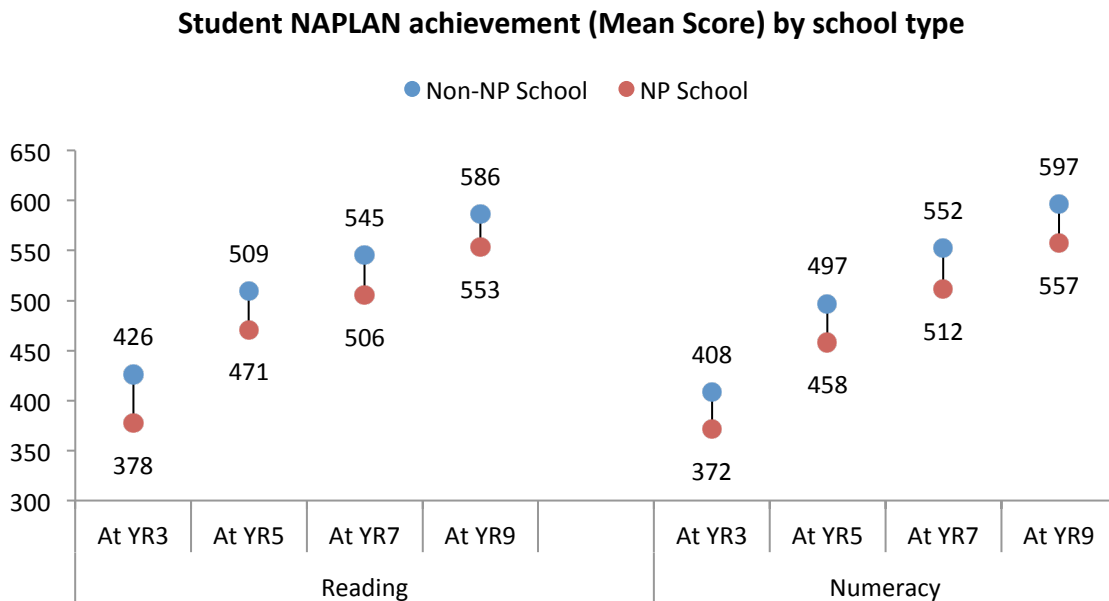
Student NAPLAN achievement by National Minimum Benchmark Standard

■ At or below NMS   ■ Above NMS

	Reading								Numeracy							
	Non-NP school				NP school				Non-NP school				NP school			
	At YR3	At YR5	At YR7	At YR9	At YR3	At YR5	At YR7	At YR9	At YR3	At YR5	At YR7	At YR9	At YR3	At YR5	At YR7	At YR9
At or below NMS	13%	10%	19%	21%	28%	23%	37%	39%	13%	19%	19%	26%	28%	36%	37%	42%
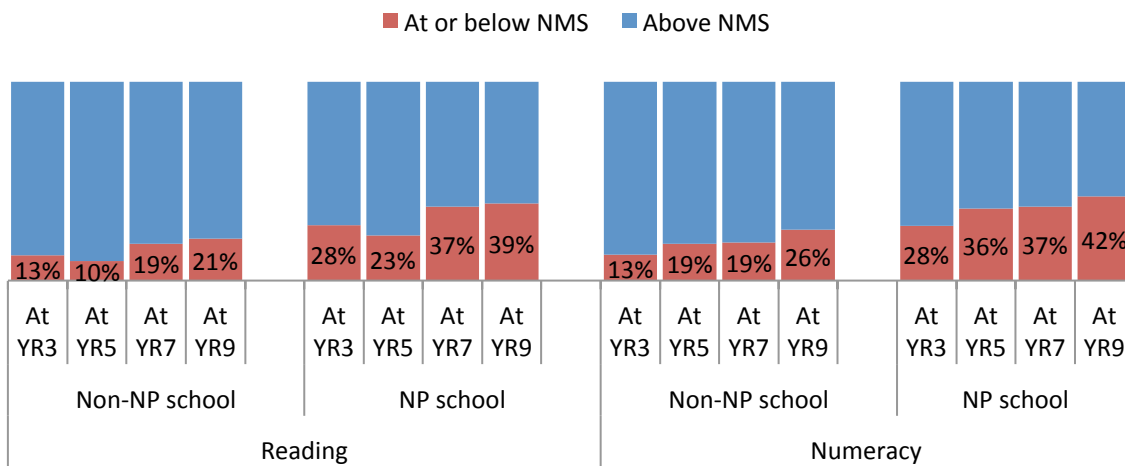
3.2   Measuring school level effects on student progress

Children learn and develop through their interactions with different environments, including their families, peers, schools and a wider community and society. Student learning outcomes in schools often reflect a compounded effect from both individual and school factors.

School level effects (or between school variability) measure the extent to which student outcomes differ across schools, after taking account of student individual factors. For example, students from a particular background attending one school might display academic outcomes that are stronger or weaker compared to students from the same backgrounds attending other schools. Within school effects (or within school variability) measure the extent to which student outcomes differ within the same school based on student individual circumstances/attributes, such as family background and motivation.

Mixed effects or multi-level modelling methods provide a robust approach for addressing challenges associated with hierarchical data, such as NAPLAN data for individual students nested within schools. Using a multi-level modelling approach, we are able to partition and estimate the levels of effect in student outcomes within a school and between schools.

To estimate to what extent NP implementation in a school has contributed to the improvement of student learning outcomes, school effects were calculated for student NAPLAN scores in Reading and Numeracy separately. The effects were calculated using a multilevel linear model (LM) for continuous outcome variables.

In terms of equations, a simple linear mixed model (with one student level predictor and one school level predictor) can be expressed as:

$$y_{ij} = B_{0j} + B_{1j}x_{ij} + \varepsilon_{ij}$$

$$B_{0j} = \alpha_{00} + \alpha_{01}z_j + \mu_j$$

$$\varepsilon_{ij} \sim (0, \sigma^2)$$

$$\mu_j \sim \left(0, \sigma_{00}^2\right)$$

Where Y is a continuous variable for student *i* in school *j*; β_{0j} is the overall mean across schools, X_{ij} represents a student level predictor included in the model; Z_j represents a school level predictor included in the model; the school level residual μ_j is defined as the effect of school *j* on their student outcomes; and $\mathcal{E}_{ij}$ is the random error associated with student i in school j.

4. Aggregate low SES NP effects on student learning

The low SES NP effect for each school can be estimated by modelling achievement scores after taking account of both the prior achievement of students and the factors known from research and analysis to make the biggest differences to the variations in outcomes between schools. Using multilevel modelling to control for student and school level influences on achievement, and including an indicator for low SES NP, it is possible to measure the independent contribution of low SES NP schools to student achievement and to measure how well a school performs compared to similar schools.

This section examines the levels of impact of the low SES NP initiatives on NAPLAN achievement through the following steps:

1. identifying the student and school factors that influence NAPLAN results,
2. modelling school effects on NAPLAN achievement, controlling for the influential factors,
3. examining the size and distribution of the school effects, and
4. identify the NP effect by comparing the size of the school effects of the low SES schools that participated in NP compared to those not participating in NP.

4.1 Influential student background and school factors

To identify key influences on NAPLAN achievement, two types of multi-level models were conducted. The first, a multilevel linear model for continuous variables, was based on Reading and Numeracy achievement scores in Year 5 and Year 9 and included the following student background controls:

- student prior performance (measured by NAPLAN scores in Year 3 or Year 7)

- student SES (based on a scale score derived using an equally weighted index of parental education and occupation)

- ATSI status

- gender, and

- whether the student was from a language background other than English (LBOTE) or not.

The following school-level predictors were used for the analysis:

- school Location (ARIA areas)

- school sector

- school SES (median of student family SES index within the school)

- proportion of LBOTE students

- proportion of Aboriginal students

- proportion of boys

- size of school (enrolments)

- selective entry school or not (secondary schools only)

The model also included a flag for low SES NP schools by participation year to assess whether there were independent effects for participation or not, and whether this contributed to explaining variation in NAPLAN Reading and Numeracy achievement.

Regression diagnostics were undertaken to examine the validity of the model. This included plotting of residuals and running a Kolmogorov-Smirnov test for normality. For each of the models in this section, the results showed that conditional residuals followed a normal distribution and the results from the Kolmogorov-Smirnov tests for normality were not significant, suggesting normality of residuals.

Table 4.1 shows the results of the linear mixed models. It reports the impact of a range of student and school variables on student NAPLAN scores in Reading and Numeracy in 2013. Results from the two models are generally consistent.

4.1.1 Significant student level factors

Previous student achievement, measured in Year 3 in 2011 for Year 5 students and in Year 7 in 2011 for Year 9 students, appears to have the strongest predictive power in NAPLAN outcomes in 2013 for both Year 5 and Year 9 cohorts. However, being from a low SES family, and from an ATSI background exert independent effects on achievement in both Reading and Numeracy for both Year 5 and Year 9 cohorts. Being from a language background other than English is associated with gains in Numeracy at both year levels, and in Reading at Year 9, independently of other factors. Being male is associated with a reduced achievement score in Reading in Year 9 and a higher score, all else equal, in Numeracy in both Year 5 and Year 9.

LBOTE appears to increase in effect in Reading from primary school to secondary school. This may suggest that although being from a non-English language background is associated with little advantage in Reading in the earlier years of schooling, LBOTE students in aggregate tend to excel in secondary school. This is not the case in numeracy where there is already a clear advantage in Year 5.

There may be limitations or deficiencies in using LBOTE as a measure of educational disadvantage. LBOTE students cover potentially very diverse groups of students. Analysis

undertaken by the New South Wales Department of Education and Communities (NSW DEC, 2011) show that in New South Wales, after controlling for the effect of students' parental background and school-level effects, LBOTE students with limited English language proficiency experience twice the level of disadvantage as those who are refugees or who are Indigenous. However, by far the most disadvantaged group are refugee students who have limited English language proficiency and have been in an Australian school for more than one year.

Table 4-1 Estimates of predictors of NAPLAN Reading and Numeracy achievement (standardised scores) in 2013: Year 5 and Year 9 students

	Year 5 Score		Year 9 Score	
	Reading	Numeracy	Reading	Numeracy
Intercept	-0.333	-0.492 (***)	-0.046	0.55 (***)
Student Factor				
Prior performance (Score)	0.711 (***)	0.688 (***)	0.784 (***)	0.81 (***)
Family SES	0.005 (***)	0.004 (***)	0.003 (***)	0.00 (***)
Aboriginal status	-0.053 (***)	-0.068 (***)	-0.090 (***)	-0.05 (***)
LBOTE status	0.007	0.134 (***)	0.036 (***)	0.09 (***)
Gender (Male)	-0.002	0.076 (***)	-0.056 (***)	0.03 (***)
School level factor				
School SES	0.009 (***)	0.008 (***)	0.006 (***)	0.00 (***)
Aboriginal concentration (%)	-0.006 (**)	-0.011 (***)	-0.015 (***)	-0.02 (***)
School size (enrolments)	-0.020 (***)	-0.001	-0.002	-0.02 (**)
Catholic vs Gov.	-0.016	-0.096 (***)	0.012	0.01
Non-selective vs Fully selective			-0.221	-0.75
Partially selective vs Fully selective			-0.160	-0.70
2009 NP school vs Non-NP school	-0.043 (**)	0.026	0.017	0.08 (***)
2010 NP school vs Non-NP school	0.009	-0.005	0.029 (*)	0.04 (**)
2011 NP school vs Non-NP school	0.017	0.055 (***)	0.081 (***)	0.08 (***)
2012 NP school vs Non-NP school	-0.038	-0.035	-0.025	-0.02

***Indicates results are statistically significant at 1% level; ** at 5% level and * at 10% level; All continuous variables have been standardised for comparison of coefficients.

The results in Table 4-1 also suggest that the sex of students appears to have an opposite effect for Reading compared to Numeracy, with male students progressing better in Numeracy and female students doing better in Reading.

Another interesting contrast is that the effect for prior achievement which for Numeracy in Year 9 is stronger than for Reading, whereas the opposite is true in primary school at Year 5 where the effect of prior achievement is stronger for Reading than Numeracy.

4.1.2 Significant school level factors

After controlling for student background characteristics, school-level attributes contribute independently to NAPLAN achievement scores (Table 4-1). A small, but significant part of the variation in student progress is attributed to school environmental factors, such as school level SES, and concentration of ATSI students. For achievement scores in both Reading and Numeracy, schools with a higher SES student intake and a lower concentration of ATSI students gain more positive results, all else equal.

School size (measured by school full time enrolments in 2011) appears to have a small negative effect on student progress in Reading for Year 5 and Numeracy for Year 9.

4.1.3 NP school level effects

Schools participating in the low SES NP exhibit overall a positive effect on student progress, albeit with variations in Reading and Numeracy and between different years of NP implementation.

Schools commencing the low SES NP in 2011 show on average the strongest NP effect while schools participating from 2012 show the least effect. The patterns associated with time spent in the program may reflect several factors, including a 'lag' effect and 'halo' effect for the 2009 NP schools. There may not be sufficient time for the NP initiative to take effect on the 2011-2013 cohorts in schools that joined low SES NP in 2012.

The NP effect appears to be more consistent or stronger on Numeracy than in Reading and more consistent for the Year 9 cohort than for the Year 5 cohort. This warrants further investigations into the difference (if any) in school practices that contribute to these disparities, e.g., whether it is due to teachers/schools devoting more time or resources in Numeracy related activities in secondary schools compared to primary schools. Some researchers believe that math achievement is more dependent on "within school activities" and responds more quickly to curriculum change. Previous studies both within Australia and overseas have found that Reading intervention programs have more difficulty producing demonstrable gains that math programs (Loveless 2013; Helal 2014).

4.2 Estimating the size of school effects

In order to produce school effect measures that are comparable across NP and non-NP schools, school level residuals for each of the 2,112 schools for which data were available were derived using the multilevel models. The models were re-estimated including only variables for both student and school level factors that were shown to exhibit a statistically significant effect on student performance. NP identifying variables were excluded from the

model estimation in order to identify and estimate the effect of NP implementation among NP schools (see Table 4-2 for a list of included variables).

Table 4-2   Student and school level factors used for adjusting school level effect

	Linear mixed model
School effect measure	Student NAPLAN score in Reading and Numeracy
Student level variables and variable type	Prior performance (Continuous) Family SES (Continuous) Aboriginal status (Binary) LBOTE status (Binary) Gender (Male) (Binary)
School level variables and variable type	School SES (Continuous) ATSI concentration (Continuous) School size (Continuous) Selective school (Binary, Year 7- 9 cohort only)

Regression results from the NP effects model show that there are significant variations at the school level in student NAPLAN achievements regardless of year levels and domains, although they are significantly reduced after adjusting for student and school level factors. The estimated school level variances and Intra-class Correlation Coefficient (ICC) statistics are provided in Table A1 in the Appendix.

The estimated school effect for each school takes into account a number of key student and school level factors that influence student achievement, such as student prior achievement, the concentration of students by family SES, concentration of Aboriginal students, school size and school type. It measures how much each school 'value-added' to their student NAPLAN achievement and how well a school performs compared to similar schools.

The school level residuals derived originally from the models are normally distributed (with a mean of zero and constant variance/standard deviation). They are essentially a relative or ranking measure on school effect. Not all schools experienced or displayed the same level of effects. The majority of schools show an average level effect, with some schools showing larger than average effect while some schools show a smaller than average effect.

Figure 4-1 shows the distributions of school level residuals derived from the mixed model measuring the effects on student NAPLAN average score within each school.

Figure 4-1 Distributions of estimated school level effects (school level residuals) by Year levels and Domains

School effect on student NAPLAN scores

Year 5 Reading

Year 5 Numeracy

Year 9 Reading

Year 9 Numeracy
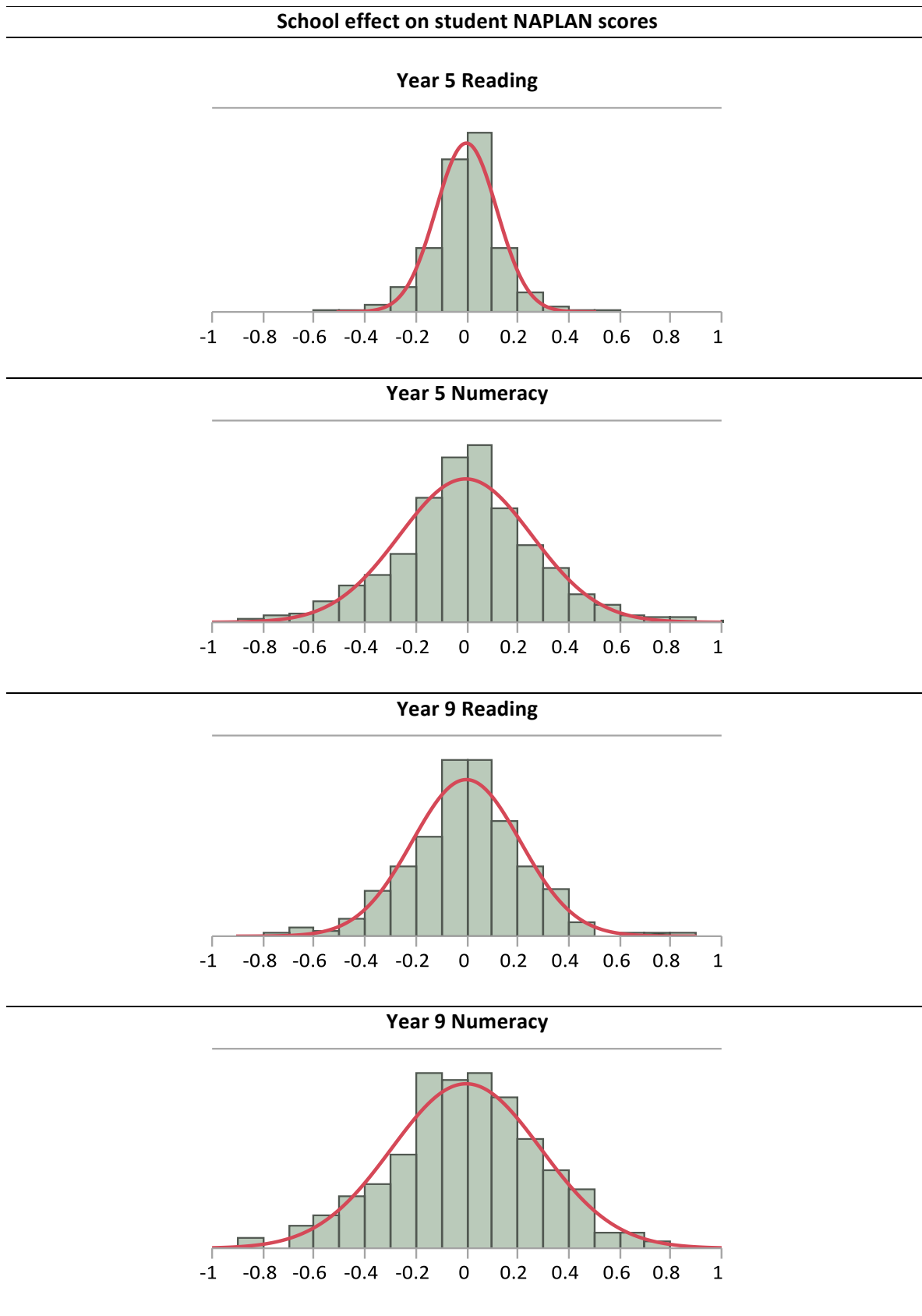
4.3 Comparing school effects between low SES NP schools and low SES non-NP schools

The regression analyses in Section 4.1 show that schools participating in the low SES NP exhibit overall a positive effect on student progress, albeit with variations in Reading and Numeracy and between different years of NP implementation. Schools commencing their low SES NP in 2011 show on average the strongest NP effect among all NP schools.

In this section, by comparing the estimated school effects among low SES NP schools and low SES non-NP schools, we are able to further identify and quantify the size of NP effects on student NAPLAN achievement. The low SES schools are defined as schools that are ranked at the lower 50th percentile based on their school SES index (measured as median of student family SES index within the school). To make the school residual results more meaningful, the standardised school residuals were transformed back to the scale of NAPLAN score (Figure 4-2).

Figure 4-2 School effect on student NAPLAN scores, comparing low SES NP and low SES non-NP schools
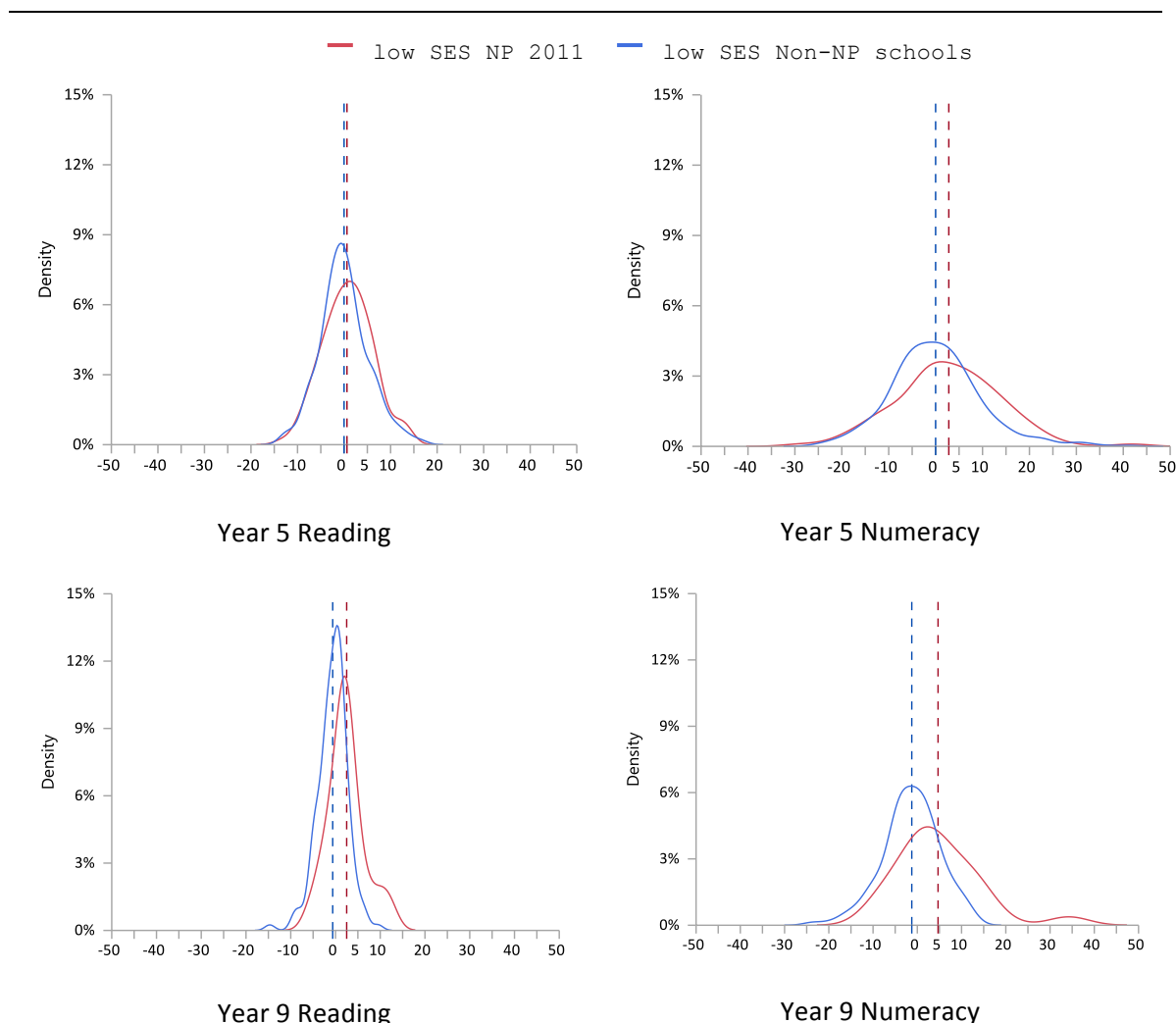
Figure 4-2 compares the distributions of school effects on student NAPLAN scores among low SES schools by NP participation status. Results show a positive gap or advantage for low SES NP schools compared to the low SES non-NP schools after controlling for the range of other influential student and school influences. The advantage is more consistent or stronger on Numeracy than Reading and more consistent for the Year 9 cohort than for Year 5. This is consistent with the regression results presented previously in section 4.1. The narrow spread of school effect sizes in Reading for both Year 5 and Year 9 cohorts may reflect that Reading intervention programs have more difficulty producing demonstrable gains than math programs, or they are more difficult to measure in NAPLAN instruments (see section 4.1 for more detailed discussion).

Results for effects on student NAPLAN scores (Figure 4-2) show that students in the low SES NP schools perform on average 3 points higher in Year 5 Numeracy, 3 points higher in Year 9 Reading and 6 points higher in Year 9 Numeracy, compared to the same cohort in low SES schools that did not participate in NP.

Not all NP schools experienced or displayed the same level of effects on student learning outcomes after introducing the low SES NP reforms. Some NP schools show little or no effect at all, despite teachers and principals in their survey responses reporting changes in practices and some even expressing a view that the reforms had had a marked impact at their school (CIRES, 2015). Other schools display marked effects with strong improvement in NAPLAN achievement. Apart from the school level factors included in the low SES NP effect estimation models, there are other school level factors that may have an influence on student NAPLAN achievement, such as strategic and operational differences in NP implementation and varying conditions or circumstances in which schools are operated. Section 5 will focus on variations of school effects among all NP schools and the variations in their NP initiatives and practices that may have influenced their school outcomes.

5. Initiatives linked to better student outcomes

This chapter presents the results of analyses attempting to identify the practices and features of NP schools that contributed to the differential impact of NP reforms on student outcomes. What are the reform initiatives that have contributed to some schools recording strong impact and improvement, and what characterises schools that show no or little impact?

The chapter begins looking at the broad NP school reform areas and whether a focus by schools on particular reform area led to greater gains. To examine this, data from principals on the impact of reforms are used in conjunction with NAPLAN results to assess the impact of broad reform areas. We commence with an analysis based on the information reported by the principals on what initiatives and school practices were implemented at their schools and which reforms they felt had the greatest impact.

Following this, attention turns to examine the information provided by teachers on the positive changes that occurred in their schools after NP implementation linked to changes in teacher practices and changes in school management.

The chapter concludes by looking in a far more detailed way at individual initiatives within reform areas to identify individual initiatives and practices that accounted for stronger school effects. Analyses have been undertaken to identify whether and how these initiatives or school practices may have contributed to the improvement in student learning outcomes.

The school effects measure used in this section is based on the results of the multilevel linear model outlined in section 4.

5.1   Key NP reforms

To improve student learning outcomes, the Low SES NP sought to build capacity in participating schools. The Low SES NP featured six reform areas that encompassed a variety of initiatives implemented by schools:

Reform Area 1:   Incentives to attract high-performing teachers and principals

Reform Area 2:   Adoption of best practice performance management and staffing arrangements that articulate a clear role for principals

Reform Area 3:   School operational arrangements that encourage innovation and flexibility

Reform Area 4:   Provide innovative and tailored learning opportunities

Reform Area 5:   Strengthen school accountability

Reform Area 6:   External partnerships with parents, other schools, businesses and communities and the provision of access.

All schools were required to implement activities from one or more of the six reform areas over the duration of their four-year participation in the Partnership. Government schools were required to address all areas in each year of their participation. Schools could also choose to introduce strategies to address activities from the two other Smarter Schools National Partnerships—Literacy and Numeracy and Improving Teacher Quality—where these also addressed a specific reform area. Schools were able to choose strategies associated with other reform areas as part of their school consultation process.

5.2 Overall levels of change linked to reform areas as perceived by principals

In September 2014, principals from 267 NP schools responded to a survey addressing their experiences of and reflections on the impact of the Low SES NP reforms. This survey sought perceptions from the principal of the low SES NP program overall, together with information on their own school's processes and initiatives. Compared to an earlier Principal Survey in 2012, principals in this survey were able to draw on a more sustained experience and understanding of the reform areas, and to project a picture of the sustainability of their school initiatives.

Consistent with the earlier survey, principals were very positive about the effectiveness of most of the NP initiatives, including in developing their existing staff capacity, developing operational arrangements that encouraged innovation and flexibility in staffing, and building teacher and student access to more innovative and tailored learning opportunities.

At the same time, principals were least likely to express 'strong' support for propositions that they had been able to either attract or retain quality staff. In their open-ended responses a number of principals clarified some of the complexities associated with the Low SES NP program to assist in understanding this picture. They made reference, for example, to the enhanced mobility of quality teachers whose development had been supported through Low SES NP initiatives – such teachers were in demand on leadership teams elsewhere and for at least some schools were therefore difficult to hold on to.

In relation to student learning outcomes, principals seemed to be more reserved in their sense of impact. Almost all principals (97 per cent) felt that the program had allowed their

students to access 'more innovative and tailored learning opportunities' and a comparable proportion agreed that as a result of their participation in the program 'student learning outcomes improved'. Only a third, however, 'strongly agreed' that the program had achieved impact on student outcomes (CIRES 2015).

The interest in the current analysis is to examine the relationship between the size of the impact of the low SES NP as measured by school effects (residuals) related to Reading and Numeracy achievement and principal views on what reform areas contributed most to impact. Principals were asked in the 2014 survey five groups of questions that are broadly related to the six NP reform areas. For each group of questions, principals responded to three aspects of NP implementation including:

- the intensity of NP implementation (i.e., the total number of NP initiatives implemented),
- the level of effectiveness (from "Not at all effective" to "Highly effective"), and
- the total number of NP initiatives that were continuing at the school.

Three measures have been constructed for analyses of these aspects of NP implementation in a school. The first and third measures are direct aggregation measures by counting the total number of valid responses within each group of questions. For the second measure, the categorical responses have been converted to ordinal scores (i.e., 0 for Not At All Effective, 1 for Somewhat Effective, 2 for Effective and 3 for Highly Effective) and then summed to estimate for each school the overall level of NP effectiveness as perceived by the principal.

As all three measures derived from the survey are ordinal in scale, the Spearman rank correlation method was used to measure the association between school NP effects (as measured by VA effect scores) and the effectiveness of NP implementation as reported by principals in the survey.

Figure 5-1 shows the varying number of initiatives schools have implemented within each reform areas across all NP schools.

Table 5.1 presents the results of the correlation analysis between the three measures (number of initiatives in each reform area, principal perceptions of level of effectiveness of reforms, and whether the initiatives have continued post low SES NP) and NP school effect VA scores.

The results suggest that for primary schools (Year 5) there is a positive relationship between NP school effect scores and principal-reported level of effectiveness for initiatives implemented as part of Reform Area 4, *providing innovative and tailored learning opportunities*. The higher level of effectiveness as perceived by the principal, the more likely the school shows a higher NP effect. The results also show for primary schools a relationship

between the number of initiatives implemented from Reform Area 4 and NP school effects. The more initiatives implemented in a school, the higher the NP impact in the school. It suggests that schools that placed more effort in this reform area were more likely to show a stronger effect on student learning outcomes.

Figure 5-1   Distribution of NP initiatives implemented in schools by reform areas
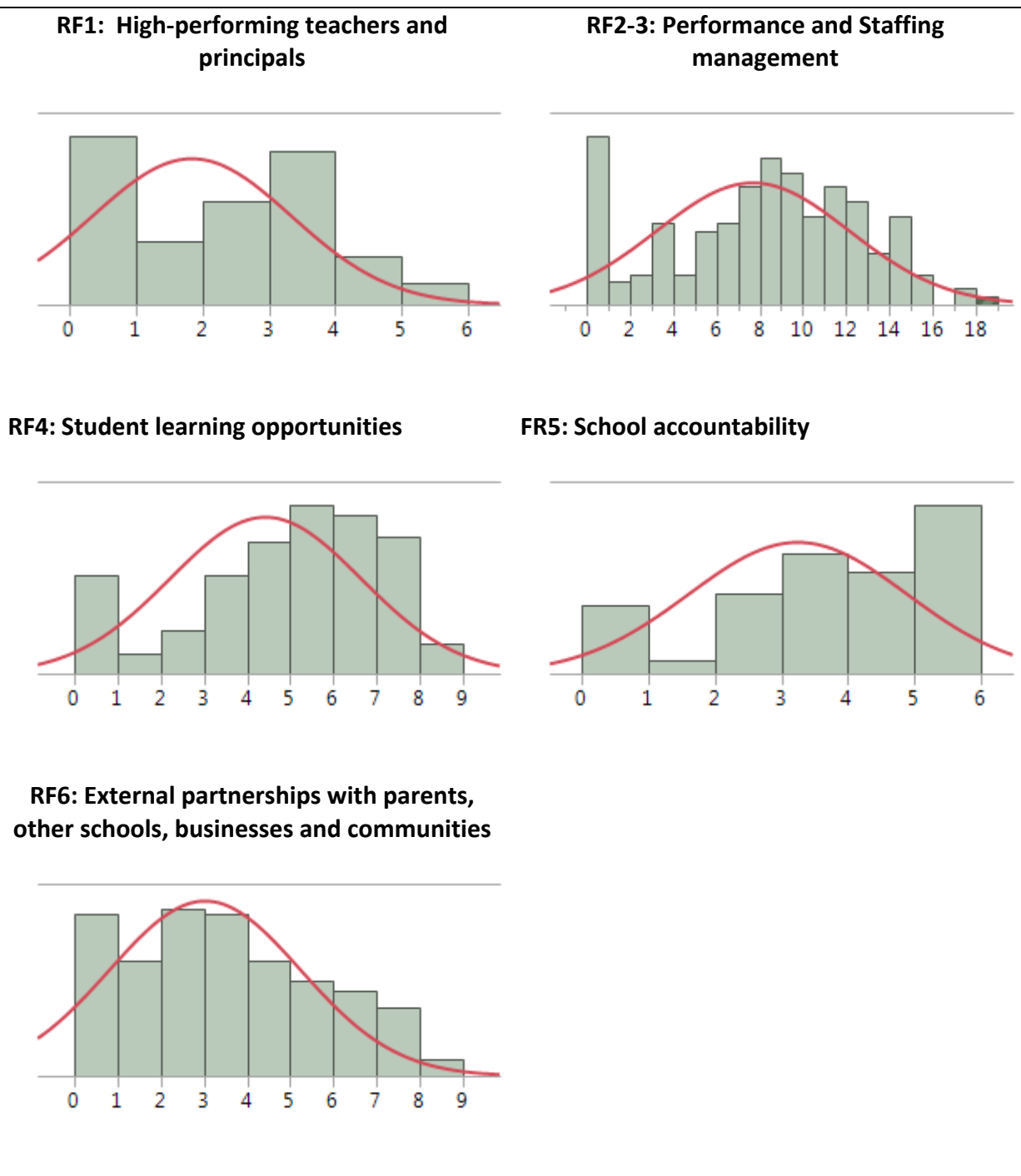

RF1: High-performing teachers and principals

RF2-3: Performance and Staffing management

RF4: Student learning opportunities

FR5: School accountability

RF6: External partnerships with parents, other schools, businesses and communities

Table 5-1 Tests of Spearman Correlation between school NP effects and the effectiveness of NP implementation as perceived by the principal

	Reading		Numeracy		
	Coefficients	Prob > |r=0|	Coefficients	Prob > |r=0|	
Primary (Year 5)					
Number of NP initiatives implemented					
Attract high performance teachers (RF01)	-0.05	0.59	0.03	0.76	
Staffing & performance management (RF02-03)	-0.03	0.71	0.06	0.51	
Student Learning opportunity (RF04)	0.17	0.04 ***	0.18	0.04	***
Continuous improvement (RF05)	0.10	0.25	0.15	0.07	
Engagement with parents/carers (RF06)	0.12	0.17	0.12	0.16	
Level of effectiveness of NP initiatives					
Attract high performance teachers (RF01)	-0.05	0.59	0.03	0.76	
Staffing & performance management (RF02-03	-0.03	0.71	0.06	0.51	
Student Learning opportunity (RF04)	0.17	0.04 ***	0.18	0.04	***
Continuous improvement (RF05)	0.10	0.25	0.15	0.07	
Engagement with parents/carers (RF06)	0.12	0.17	0.12	0.16	
Number of NP initiatives retained at school after NP					
Attract high performance teachers (RF01)	0.17	0.05 ***	0.05	0.53	
Staffing & performance management (RF02-03	0.04	0.71	0.00	0.97	
Student Learning opportunity (RF04)	0.09	0.33	0.09	0.36	
Continuous improvement (RF05)	0.21	0.03 ***	0.09	0.36	
Engagement with parents/carers (RF06)	0.12	0.23	0.14	0.15	*
Secondary (Year 9)					
Number of NP initiatives implemented					
Attract high performance teachers (RF01)	-0.04	0.79	-0.22	0.10	**
Staffing & performance management (RF02-03)	-0.17	0.19	-0.08	0.55	
Student Learning opportunity (RF04)	-0.09	0.49	-0.03	0.85	
Continuous improvement (RF05)	-0.01	0.92	0.10	0.44	
Engagement with parents/carers (RF06)	0.03	0.81	-0.17	0.20	
Level of effectiveness of NP initiatives					
Attract high performance teachers (RF01)	0.08	0.56	-0.19	0.16	
Staffing & performance management (RF02-03	0.04	0.75	-0.08	0.54	
Student Learning opportunity (RF04)	0.10	0.45	-0.02	0.87	
Continuous improvement (RF05)	0.17	0.21	0.11	0.40	
Engagement with parents/carers (RF06)	0.20	0.14 *	-0.06	0.67	
Number of NP initiatives retained at school after NP					
Attract high performance teachers (RF01)	0.09	0.58	-0.20	0.20	
Staffing & performance management (RF02-03	0.05	0.73	-0.10	0.49	
Student Learning opportunity (RF04)	0.04	0.78	0.05	0.73	
Continuous improvement (RF05)	0.07	0.63	0.07	0.65	
Engagement with parents/carers (RF06)	-0.16	0.27	-0.28	0.05	***

***Indicates that results are statistically significant at 5% level; ** indicates statistical significance at 10% level and * at 15% level.

The results suggest that primary schools that placed more effort on initiatives linked to providing innovative learning opportunities were more likely to show a stronger effect on student learning outcomes.

The relationships appear to be stronger or more consistent for primary schools than for secondary schools. This may be due to the small number of secondary schools (i.e., 46 secondary vs 128 primary schools) included in the analysis, which reduces the statistical power in this test.

5.3   NP effects associated with changes in teacher and school practice

Teachers in schools are an important source of information about the implementation and effectiveness of National Partnership strategies. Their views and reflections on the NP implementation and effectiveness in their own schools were collected in the 2013 Teacher Survey. A total of 2,408 teachers from 290 NP schools responded to the survey.

The low SES NP evaluation (CIRES, 2015) reported that the overall views of teachers about the Low SES NP initiatives were strongly favourable, with the majority of teachers indicating that the low SES NP initiatives had encouraged the kinds of changes intended.

In this report, a set of measures has been constructed using teacher responses to a series of questions in the survey, including the level of perceived positive change in teacher practices and the perceived level of positive change in school management as a result of NP implementation. Both measures are calculated as the percentage of teachers who provided a valid response for the relevant questions.

The Spearman rank order correlation method has been applied in testing the extent to which there is an association between NP school effects (the NP effect on student NAPLAN scores) and positive changes in a school resulting from NP implementation as perceived by teachers. The Spearman correlation coefficients are calculated based on the ranking of variables in the test. A positive coefficient indicates a positive relationship, while a negative indicates a reversed relationship. For example, the positive coefficients for questions related to changes in teacher practice indicates that the more aspects of change in teacher practice in a school, the more likely the school shows a high level of NP effect on NAPLAN.

Table 5.2 presents the results for NP effects on student NAPLAN scores. There is a positive relationship between the level of NP effect and the level of positive changes related to parents and community engagement in school. This suggests that the higher the level of effectiveness in parents and community engagement in a school, the more likely the school shows a high level of NP effect outcome on NAPLAN achievement.

Table 5-2 Test of Spearman Correlation between NP school effect and the effectiveness of NP implementation as perceived by teachers

	Reading			Numeracy		
	Coefficient	Prob>|ρ|		Coefficient	Prob>|ρ|	
Primary (Year 5)						
Changes in teacher practice						
Meeting student individual learning needs	0.08	0.31		0.13	0.11	*
Communicating with parents/carers	0.16	0.05	***	0.17	0.04	***
Managing classroom behaviours	0.08	0.34		0.11	0.18	
Involving parents/carers in student learning	0.16	0.04	***	0.04	0.64	
Being supported in classroom	0.10	0.20		0.10	0.21	
Able to explain school goals	0.15	0.06	**	0.16	0.04	***
Teaching in general	0.12	0.12		0.06	0.44	
Level of positive views on school management						
The school runs more smoothly	0.13	0.11	*	0.05	0.56	
Teachers use better strategies to support learning	0.08	0.28		0.02	0.82	
Improvement in the way teachers relate to students	0.06	0.44		0.04	0.58	
This school uses more effective methods to determine how well teachers are performing	0.14	0.10	**	0.12	0.15	*
There is a more strategic approach to school planning	0.09	0.27		0.11	0.15	*
School communicates better with parents and carers	0.10	0.20		0.17	0.03	***
School is more effective in engaging parents and carers from diverse social and cultural groups	0.12	0.15	*	0.19	0.02	***
School is more engaged with its wider community	0.16	0.05	***	0.15	0.06	**
School has become a better place in which to teach	0.15	0.06	**	0.10	0.23	
School has become a better place for students to learn	0.13	0.10	**	0.06	0.43	
Secondary (Year 9)						
Changes in teacher practice						
Meeting student individual learning needs	0.12	0.38		0.10	0.44	
Communicating with parents/carers	0.07	0.61		0.24	0.08	**
Managing classroom behaviours	-0.07	0.61		0.13	0.37	
Involving parents/carers in student learning	0.08	0.56		0.19	0.17	
Being supported in classroom	0.13	0.35		0.15	0.29	
Able to explain school goals	-0.05	0.71		0.17	0.23	
Teaching in general	0.17	0.21		0.19	0.16	
Level of positive views on school management						
The school runs more smoothly	0.02	0.89		0.04	0.78	
Teachers use better strategies to support learning	-0.03	0.80		0.12	0.36	
Improvement in the way teachers relate to students	0.04	0.75		0.15	0.27	
This school uses more effective methods to determine how well teachers are performing	0.01	0.97		0.04	0.77	
There is a more strategic approach to school planning	0.09	0.52		0.19	0.16	
School communicates better with parents and carers	0.22	0.10	**	0.14	0.31	
School is more effective in engaging parents and carers from diverse social and cultural groups	0.24	0.09	**	0.26	0.06	**
School is more engaged with its wider community	0.22	0.10	**	0.25	0.06	**
School has become a better place in which to teach	0.12	0.37		0.13	0.34	
School has become a better place for students to learn	0.05	0.71		0.13	0.33	

***Indicates results are statistically significant at 5% level; ** at 10% level and * at 15% level.

5.4   Individual NP initiatives or practices associated with NP effect

All NP schools may be faced with some common challenges, such as low attendance and low achievement, however some conditions or circumstances they operate under may vary. Although government schools were required to address all six areas of the NP reform, schools could prioritise their efforts or resources on particular initiatives or activities to address their unique challenges or conditions.

In this section, based on information provided by the principals (in the 2014 survey), we focus on the impact of individual NP initiatives or strategies and attempt to identify which particular initiatives or strategies may individually have contributed to the improvement of student NAPLAN outcomes.

5.4.1   Grouping low SES schools based on estimated level of impact

Using the results of the multilevel linear model estimating Reading and Numeracy achievement to derive school effects (school level residuals), all schools (NP and non-NP) were grouped into three categories:

1. schools displaying higher NP effects on student NAPLAN scores, defined as schools ranked towards the top of the distribution (top 25 per cent)

2. schools displaying positive, but more modest effects on NAPLAN results, defined as schools ranked in the middle 50 per cent, and

3. schools displaying no effects or weak effects, defined as schools ranked towards the bottom of the distribution (bottom 25 per cent).

Schools were ranked based on the values of their school residuals separately on Reading and Numeracy and separately for their Year 5 and Year 9 cohorts. Schools with both Year 5 and Year 9 results were grouped according to the higher ranking among the two results.

Table 5.3 shows the distributions of low SES NP schools according to their school effect category — low, middle or high — and by school type.

For Reading and Numeracy, about 30 per cent of low SES schools were towards the top of the performance distribution displaying higher levels of school effects on student achievement, a further 50 per cent were in the middle group, while about 20 per cent were in the bottom group exhibiting low effects on student achievement. In primary schools, nearly eight out of ten low SES NP schools displayed at least modest effects on Reading and Numeracy performance with over 30 per cent in the top group of schools. Secondary schools on the other hand saw around 85 per cent in the top two groups, but a much higher

proportion—nearly 40 of this group—with effect scores placing them in the top group. Only a very small proportion of combined schools were in the bottom group.

Table 5-3   Low SES NP schools by school effect category

School type	School group	Reading		Numeracy	
Primary	Low	76	22%	80	23%
	Middle	167	48%	163	47%
	High	103	30%	103	30%
	Total	346	100%	346	100%
Secondary	Low	15	16%	13	14%
	Middle	41	44%	47	50%
	High	37	40%	34	36%
	Total	93	100%	94	100%
Combined	Low	2	4%	0	0%
	Middle	37	79%	32	68%
	High	8	17%	15	32%
	Total	47	100%	47	100%
All NP schools	Low	93	19%	93	19%
	Middle	245	50%	242	50%
	High	148	30%	152	31%
	Total	486	100%	487	100%

It is relevant to note that grouping low SES NP schools based on the ranking of their school effect values is in some respects arbitrary, and there may not be any material differences among some schools with residual values close to the cut off points separating groups. However, our primary interest is to examine the relationships between the level of school effects and the implementation of individual initiatives or strategies, and to further identify what initiatives or strategies that may separate schools at the top and at the bottom of the school ranking based on effect values.

Ordinal logistic regression was used to test the statistical significance of school attributes in predicting a school's likely NP effect group: low, medium or high. The results are presented in Table 5.4. The estimates for each predictor can be interpreted as meaning that for a one unit increase in the predictor (such as attendance, for example) we expect an increase in the ordered log odds provided in the size of the estimate (0.041) of being in a higher NP effect category, given all of the other variables in the model are held constant.

The results show that:

- Variations in staff experience, age and male-female staff ratio do not appear to be predictive of a school's NP effect outcome. However, staff mobility (measured as proportion of staff turnover over in 2010) appears to be a significant predictor for NP effect in Numeracy, taking into account other school factors. Schools with lower turnover tended to be in the higher impact category, all else equal.

- The concentration of LBOTE students in school appears to be associated with a school's likely effect group outcome for Numeracy, albeit with a weak level of significance. Schools in higher categories of NP effect for Numeracy tend to have higher percentage of LBOTE students, all else equal.

- The attendance rate in a low SES NP school also appears to be associated with the school's likely effect group. Schools in higher categories of NP effect tend to have higher attendance rates, all else equal. For Numeracy, attendance had the strongest independent effect of NP effect category location.

Table 5-4   Ordinal logistic regression model results identifying significant predictors of size of NP school effect on NAPLAN achievement

	NP Effect on Reading		NP Effect on Numeracy	
	Estimate	**p-value**	**Estimate**	**p-value**
School SES-EOI index	0.003	0.01	-0.001	0.58
Percent of LBOTE students	-0.005	0.19	0.006*	0.15
School Location	0.144	0.54	0.077	0.74
Attendance rate	0.047*	0.15	0.064***	0.03
Staff profile				
Staff Mobility (turnover rate)	-0.001	0.79	-0.007	0.10**
Age profile Index	0.008	0.61	-0.009	0.57
Male to female staff ratio	0.002	0.71	0.007	0.21
Length of current position	0.012	0.38	0.011	0.43

***Indicates results are statistically significant at 5% level; ** at 10% level and * at 15% level.

5.4.2   Greatest impact NP initiatives

To identify the sorts of strategies that high impact schools have implemented, and that appear to make a difference, an ordinal logistic regression model was applied estimating the relationship between implementation of NP initiatives and predicted school NP outcome category (low, medium, high impact). The analysis was undertaken in two stages. First, all of the strategies schools had implemented as part of low SES NP (as reported by the principal) were included as explanatory variables (in binary values, 1= Yes and 0=No). From this analysis, because of the large number of initiatives and the limited number of schools for which principal responses were available, initiatives were identified which had probability values less than 0.4 on either Reading or Numeracy. Second, an analysis was conducted on the shorter list of initiatives which were more likely to be associated with impact.

Table 5-5 presents the results of the ordinal regression procedure where the grouping of schools was based on the level of NP effect (low, medium, high). Selected initiatives were included, those suggesting a higher initial estimation of impact.

The results show the effect for each initiative estimated as an increase in the ordered log odds of being in a higher NP effect category, with all of the other variables in the model held constant. The Wald values and probabilities are also reported to identify if the effect is statistically significant. Results are presented for Reading and then Numeracy.

For Reading, schools that have implemented the following initiatives were more likely to show higher impact:

- Provided opportunities for professional learning and development (RF1)
- Provided Individual Learning Plans (ILPs) for students needing assistance (RF4)
- Provided professional learning for teachers on meeting individual learning needs (RF4)
- Used assessment and other data to identify student needs (RF4)
- Engagement with employers (RF6)
- Partnerships with primary schools (RF6)

For Numeracy, schools that have implemented the following initiatives were more likely to show higher impact:

- Provided opportunities for professional learning and development (RF1)
- Provided Individual Learning Plans (ILPs) for students needing assistance (RF4)
- Provided professional learning for teachers on meeting individual learning needs (RF4)
- Used assessment and other data to identify student needs (RF4)
- Made planning and/or reporting processes within the school more publicly available (RF5)
- Engagement with employers (RF6).

Table 5-5 NP strategies associated with NP effect impact category (low, medium, high) in Reading and Numeracy

	Reading				Numeracy			
	Estimate	Wald	Prob		Estimate	Wald	Prob	
Reform Area 1: Attract high performance teachers								
Established leadership and strategic positions	-0.829	3.684	0.055	**	0.072	0.027	0.869	
Provided mentoring support to teachers	-0.120	0.088	0.766		-1.319	9.099	0.003	*
Provided attractive terms/conditions outside standard entitlements	-0.306	0.223	0.637		-1.643	5.977	0.014	*
Provided opportunities for professional learning and development	0.371	0.773	0.379		0.471	1.152	0.283	
Reform Areas 2-3: Staffing and performance management								
Employed additional paraprofessionals in learning support roles	0.314	0.564	0.453		0.285	0.439	0.507	
Employed additional paraprofessionals in other support roles	-0.521	1.622	0.203		0.520	1.519	0.218	
Adopted team-based approaches to teaching and planning	0.338	0.795	0.373		-0.571	2.155	0.142	*
Introduced increased flexibility in timetabling and/or school's hours	-1.078	8.557	0.003	***	-0.076	0.042	0.838	
Introduced greater cooperation with other schools to share resources	0.174	0.205	0.651		0.381	0.949	0.330	
Provided quality professional learning for school-based teams of staff	0.267	0.474	0.491		-0.279	0.488	0.485	
Implemented relevant and appropriate professional learning for staff	-0.500	0.870	0.351		-0.184	0.112	0.738	
Provided professional development on a range of behaviour management theories and approaches	-0.696	2.669	0.102	*	-0.666	2.410	0.121	*
Engaged staff through professional dialogue on behaviour management	0.303	0.489	0.485		0.511	1.367	0.242	
Reform Area 4: Student Learning opportunity								
Used assessment and other data to identify student needs	0.708	2.761	0.097	**	0.699	2.121	0.145	*
Implemented differentiated teaching methods to better meet the needs of all students	-0.414	1.022	0.312		-0.403	0.904	0.342	
Provided professional learning for teachers on meeting individual learning needs	0.551	2.194	0.139	*	0.569	2.222	0.136	*
Provided students with access to learning support services	-0.469	1.348	0.246		-1.073	6.343	0.012	*
Provided ILPs for students needing assistance	0.675	2.418	0.120	*	1.633	12.750	0.000	*
Reform Area 5: Strengthening school accountability								
Made planning and/or reporting processes within the school more publicly available	-0.006	0.000	0.986		0.691	3.677	0.055	*
Expanded the range of school activities that are evaluated	-0.050	0.017	0.897		0.432	1.181	0.277	
Reform Area 6: External partnerships								
Parents and carers generally in the school community	0.103	0.062	0.803		-0.372	0.783	0.376	
Employers	1.334	6.200	0.013	***	0.777	2.111	0.146	*
One or more TAFEs and training providers	0.586	1.403	0.236		-0.692	1.812	0.178	
One or more secondary schools	-0.583	2.182	0.140	*	-0.204	0.256	0.613	
One or more primary schools	0.678	3.245	0.072	**	-0.118	0.095	0.758	

Note *** P<.05 ** p<.10 * p<.15

For Reading, schools that implemented the following initiatives were more likely to show lower impact:

- Established leadership and strategic positions (RF1)
- Introduced increased flexibility in timetabling and/or school's hours (RF2/3)
- Provided professional development on a range of behaviour management theories and approaches (RF2/3)
- Partnerships with one or more secondary schools (RF6)

For Numeracy, schools that implemented the following initiatives were more likely to show lower impact:

- Provided mentoring support to teachers (RF1)
- Provided attractive terms/conditions outside standard entitlements (RF1)
- Adopted team-based approaches to teaching and planning (RF2/3)
- Provided professional development on a range of behaviour management theories and approaches (RF2/3)
- Provided students with access to learning support services (RF4)

In looking at the initiatives negatively associated with NP impact, there is for Numeracy a significant difference linked to strategies attempting to attract or develop high performing teachers. Possibly reflecting greater stability in staffing, high impact schools were less likely to provide mentoring support or establish attractive terms and conditions to recruit teachers. Higher impact schools did, however, have a significantly higher likelihood of implementing strategies to provide opportunities for professional learning and development of staff.

While in terms of Reading scores, higher impact schools were more likely to have implemented strategies around partnerships with primary schools, they were less likely to implement strategies associated with staffing and performance management. Again, this may reflect the challenges faced by low impact schools around staffing and management.

The differences in focus and emphasis among NP schools may well reflect the challenges that they face and to which they are responding, rather than the effects of the strategies themselves. For example, schools that show low NP impact on student NAPLAN results have placed greater emphasis on attracting high performing teachers and improving the staffing and performance management role of the principal. They may have issues in staffing and management practices that need (and the schools recognise that need) to be addressed. High impact schools, on the other hand, may have more stable staffing profiles, and it is their staffing and management stability that has enabled these schools to target areas of

improvement in teaching practice and in addressing student needs that has delivered real traction from the NP initiatives.

Finally, many other contextual factors that are not captured by the data may have an influence on the effectiveness of NP implementation in NP schools. For example, there seems to be difference in specific approaches and operational practices in NP implementation across NP schools. In the following section we present case studies of schools that provide further contextual insights and understanding of results from the quantitative analyses.

6. Case study schools

Previously, as part of the agreed work program for the evaluation of NP initiatives, a number of case studies of schools were undertaken to examine more in-depth the adoption and operation of low SES reform initiatives. These were presented in a series of reports (CIRES, 2012; CIRES, 2013; UoC, 2012, UoC, 2013) focusing on two different NP reform areas respectively: evaluation of School Staffing, Management and Accountability and evaluation of school External Partnerships. The case studies provide a snapshot of what specific strategies/actions have been implemented in schools and how these strategies/actions have worked in different school settings. They are useful to re-examine in the context of this report because some are high impact schools in terms of NP effects on NAPLAN student learning outcomes, some are medium impact, and others low impact. Subsequent analyses will draw further on case study data to illustrate the complexity of schools' planning and implementation considerations in arriving at strategies that will be both locally-appropriate and effective. What can we learn from these schools that can help our understanding of differential effects?

In this report, we have linked some of the case study schools with their NP effect data and, therefore, are able to provide further contextual insights on what initiatives have worked well and in what context they are effective or not effective in improving student NAPLAN performance.

In this section, we present four schools as examples of differences in context and effect outcomes. These schools differ in terms of their school settings, the challenges they face, and the focus of the NP strategies and initiatives that they implemented.

Table 6.1 provides a general profile of the schools. As in earlier reports the names of the schools have been changed to remain consistent with the original guarantees of confidentiality given to schools.

The profiles in Table 6.1 reveal that both *Valley Public School* and *South Coast High School* show a high level NP effect on NAPLAN outcomes and a high level of effectiveness in the impact of their NP strategies and initiatives, with one being a primary school and the other a secondary school. No school with low impact on both Reading and Numeracy have been matched to the case study schools.

Western Public School shows an average result on NP effect in both Reading and Numeracy. The school entered the Low SES National Partnerships program at a point of instability in its leadership arrangements. Essentially the Low SES NP funding and processes provided the school with opportunities and space to focus on establishing, implementing and continually reviewing its immediate organisational change management model. Interviews with school leadership and teachers revealed a range of reforms and initiatives applied by the school as

part of its participation in National Partnerships. However survey responses and other data suggest that these processes and strategies have not been effective and have not been translated into improved NAPLAN outcomes.

Table 6-1   Profiles of case study schools

		Western High	South Coast High	Valley Public	Western Public
School profile	School Type	Secondary	Secondary	Primary	Primary
	School Location	Metropolitan	Provincial	Provincial	Metropolitan
	School SES (SES EOI Index)	Low (Q4)	Low (Q4)	Medium (Q3)	Medium (Q2)
Funding programs	NP participation	2010	2010	2010	2010
	Priority School Program 2010	Yes	No	Yes	Yes
Staff profile (2010)	Male staff (proportion)	Medium (35%)	High (65%)	Medium (16%)	Medium (7%)
	Age index	Medium (Q3)	High (Q4)	High (Q4)	Medium (Q2)
	<30	13%	2%	4%	21%
	30-49	57%	23%	60%	57%
	50+	30%	75%	36%	21%
	Staff Mobility	High (32%)	Medium (8%)	Medium (10%)	Low (0%)
Student profile	Aboriginal Concentration	High (13%)	High (10%)	High (25%)	Medium (4%)
	LBOTE Concentration	High (44%)	Medium (3%)	Low (1%)	High (40%)
	Attendance rate 2011	Low (82%)	Low (89%)	Low (90%)	Medium (94%)
	Attendance 2013	Low (83%)	Medium (89%)	Low (92%)	Medium (94%)
NP Effect on NAPLAN	Numeracy	Medium	High	High	Medium
	Reading	Low	High	High	Medium

Western High School shows a low level of NP effect in Reading and an average NP effect in Numeracy. *Western High School* provides a good example of the complexity of the challenges confronting many schools in planning and acting on school improvement. The School's planned response developed under the NP initiative focused on lifting the school's performance. A suite of strategies and initiatives were implemented covering a broad range of NP reform areas, including building leadership and staff capacity, utilising quality data management systems and learning methods for students and building community and parent partnerships. However, evidence suggests that the planned strategies and activities failed to translate through to substantial improvements on student NAPLAN outcomes within the timeframe of the evaluation. As discussed below the case demonstrates the challenges and the time required to shift school outcomes in a very challenging environment.

6.1 Valley Public School

NP effect on NAPLAN achievement: High on both Reading and Numeracy

School Profile
Valley Public School is a provincial Government public school that caters for over 400 kindergarten to Year 6 students. Located in the Hunter Central Coast, the school has a teaching team of over 20 staff and boasts a small but active Parent and Citizen Association (P&C) and active interest from local Elders and the Aboriginal Education Consultative Group (AECG). In 2013 the school's ICSEA value was 855, which is markedly below the state mean and similar to the school's ICSEA value in 2010. In 2013 the school was made up of 26 percent indigenous students, and four percent of students were from a language background other than English (LBOTE). Valley Public School had an attendance rate of 92 percent and the school offers a number of programs for gifted students as well as students with learning disabilities.

Main Challenges and areas for improvement
Valley Public School faced a number of challenges due to a level of parental dissatisfaction in home and school communication; access to teachers; input into decision making; as well as the transition program to secondary school. The school had become aware of a number of concerns raised by the Parents and Citizens Committee (P&C), including perceived inconsistency in the provision and approach to homework, poor attitudes to teachers towards parents, and inadequate communication around what the school offers and how it makes decisions.

Effective Actions/Initiatives
Valley Public School pursued a number of strategies to address the challenges highlighted by parents and the community. As part of the NP reform effort, the school:

1. Established a strategic focus on parent partnerships through the employment of a Community Education Officer (CEO)

This position was funded by the Low SES NP Program, and supported teachers, parents and students to establish relationships within the school and community. The CEO helped create a cultural change within the school by mediating and addressing matters between parents and teachers. This was accomplished by the CEO's implementation of regular parent surveys, parent focus group meetings, attendance to P&C meetings and participation in action research projects. Staff reported that these positive links with parents benefited the teacher-parent relationship, which led to better collaboration on student learning. Due to the success of the CEO, the P&C has offered to raise funds to maintain the position beyond its current funding.

2. Tried to establish a better process of communicating with parents through active engagement in dialogue with parents

A number of initiatives successfully improved the dialogue between the school and parents. The presence of the Principal in the playground during mornings and after school created an informal space for parents to interact with the Principal and school staff. Additionally the school's newsletter was used as a communication tool to promote positive conversations with a new format that included student achievements, learning journeys and individual stories. Overall, parent's appraisal of the school shifted to a positive one, evident in survey results.

3. Increased parent participation through measures that improved the effectiveness of the P&C and encouraged parents to provide feedback and to make suggestions

The school reported that the P&C operated more effectively and new people joined as the cultural change encouraged more parent participation. Around eight parents attended each P and C meeting in 2012 compared with substantially more scant or unreliable attendances in earlier years. Additionally, a number of parents volunteered in the school canteen. Furthermore, prompted by the school's efforts to create a better dialogue, parents provided feedback and made suggestions via informal contact with staff, attendance to focus group meetings and teacher forums or participation in school surveys. Parent surveys undertaken at the end of 2012, indicated that 67 per cent of parents reported that the provision of regular communication is adequate compared to 50 per cent in 2011.

4. Developed parent knowledge about student learning through the provision of parent information sessions and workshops

The school implemented parent information sessions and workshops. These were designed to facilitate parent's knowledge about their child's learning. From these experiences parents highlighted the desire for additional opportunities to observe teaching and learning in the classroom.

5. Facilitated home-school collaboration through the improvement of Three-Way Conferences and engagement of parents in student discipline, as well as their transition to high school

The implementation of the Three-Way Conference between teacher, parents and student was successful. After altering it so that parents and teacher meet prior to meeting the student, the Three-Way Conference became a tool to create constructive dialogue, acknowledge achievements, find solutions, make commitments and plans for the future. Additionally, the school ran meetings for parents to discuss strategies for improving student behaviours. Along with increased parent attendance to assemblies that celebrate student achievements and awards, the school noted a drop in the suspension rate. Furthermore, the school ran meetings for parents with children who are transitioning to Year 7 in an effort to discuss transition strategies and how both the school and parents could better support their children.

Reflection on results

The Valley Public School's effort to create a sustainable, open dialogue with parents created a positive cultural change that benefitted the students, staff and community at large. Parents responded well to the school's incorporation of parent partnerships to its overall operation, evident in the positive feedback from parent surveys, increased communication with staff and attendance to forum, meetings and workshops. Additionally, the work of the CEO paved the way for further development of relationships between parents, the P&C, the Principal, school leaders and teachers. The school and P&C acknowledged the importance of the CEO's work and explored strategies to continue the work after the Low SES NP Program. The CEO has been the cornerstone to the positive cultural changes that have led to improved parent partnerships within *Valley Public School*.

6.2 South Coast High School

NP effect on NAPLAN achievement: High on both Reading and Numeracy

School Profile

South Coast High School is a co-educational government secondary school in the Illawarra and South East Region with just under 690 enrolments in 2013 (the key year for analysis). Student numbers have remained fairly stable since the early 2000s.

Three distinct types or groups of largely English-speaking families were identified by school leaders as making up the school. While the majority of families are low-income and often single parent households, there is a relatively small group of families in which both parents are employed. In addition a significant Aboriginal community within the town and its surroundings means that the proportion of Aboriginal students within the school has sat at around 12 per cent for many years.

Key Challenges

Improved parental engagement was viewed as a key area of need, particularly for the indigenous population using the school. Critical to this was working out how to better accommodate the needs of Aboriginal families. There were specific challenges in doing this, challenges associated with better communicating with these families, in particular with regard to the role of the home in students' education. Linked to this, the school faced a number of challenges in increasing the number of parents involved in the school generally. Initial strategies explicitly addressed outreach approaches to "hard to reach" parents.

Effective actions/initiatives

South Coast High School's Low SES NP plan aimed to lift the attendance, retention and performance of students through a whole-of-school and community engagement reform

approach. The approach reflected the priorities of a regional comprehensive secondary school catering to the needs of a diverse school community. Partnerships with families were fundamental to its strategic focus and a parent engagement strategy was considered as a leading driver to improvements in school-home relationships. The strategy included:

- *Enhanced communication with parents including regular newsletters, regular email contacts with parents, changed use of school website (updated regularly and increasingly the information conduit for teachers, parents, students and community).* As a result of the extensive promotion of the parent and teacher meetings in newsletters and SMS messaging, the school reported that in 2013 there was a more than 30 per cent increase in the number of parents attending parent and teacher meetings compared to previous years.

- *To assist parents to take on a stronger role in their children's learning, information sessions were provided to offer parents opportunities to learn about the school system and the school's own strategies aimed at supporting children to improve their performance.* Regular workshop sessions were scheduled for this purpose and actively promoted. Parents were explicitly encouraged to volunteer at the school and invited in follow up contacts to identify areas where they could be best called on to assist – such as in Reading support, language teaching support and assistance with excursions. These sessions, designed to assist parents to engage more fully with their children's learning at school and at home were increasingly well-attended. Sessions and workshops covered themes such as: family Reading; writing and Numeracy; positive parenting; understanding reports and student data; student pathways and career options; and student wellbeing and mental health.

- *Effectively engaging a priority group by working directly with Aboriginal families in revitalisation of the Personalised Learning Plan (PLP) processes.* The school's new approach to PLPs, which aimed to increase the level of student engagement, enlisted direct support from parents and families. A local coach was employed to redevelop the PLPs to build their utility as a plan for families and students that "enabled them to learn". The new approach shifted emphasis from a teacher-directed approach to one that highlighted student and parent ownership of the process. Aboriginal parents were encouraged to engage with the school in a more positive way. According to feedback form the school, for many parents it marked a departure from coming into the school only as a result of misbehaviours or expulsions. The PLP meeting with parents was designed to give parents a "positive reason to come to the school", and enabled them to provide input into their child's learning plans.

Reflection on results

An important early outcome from improved and targeted communication between the school and the home, according to the school, was a significant improvement in the student

attendance rate. A head teacher (welfare) was employed to coordinate a whole- of-community welfare support service, and NP funding also supported the employment of a specialist school administrative support (SAS) staff member to provide administrative assistance for NP initiatives associated with student engagement and attendance.

Within two years of initial implementation the school was able to identify some indications that the parent engagement strategy had led to changes in parent expectations of the school and in their connection with their children's learning.

School personnel reported that parent engagement had shifted from a limited group of parents of high performing students to a more representative body with a more informed and focussed interest on how the school viewed student learning and achievement: "their interest was evident through their questions about student learning and school expectations" (principal).

The school reported that strengthened parent and community engagement enabled the school to take a more rigorous approach to working with families in an effort to support productive student learning and extended opportunities available to students. For example, engagement of parents in the School Based Apprenticeship and Traineeships program was cited as an example of something that had increased the success of the program. Parents supported the establishment, implementation and review of program. In particular, many parents were instrumental in assisting students to locate suitable employers and workplaces.

6.3 Western Public School

NP effect on NAPLAN achievement: Medium in both Reading and Numeracy

School Profile

Western Public School is a preschool to Year 6 school with around 210 students in the primary school and 40 pre-school students. The school is located in the Western Sydney Region. Its 2013 enrolment of 223 and attendance rate of 94 per cent are both slightly higher than those of earlier years. The school's Aboriginal population is growing (8 per cent in 2013) and 53 per cent of students are reported to be from families of a language background other than English.

Key Challenges

Western Public entered the Low SES NP program at a point of instability in its leadership arrangements. Between 2007 and 2012 the school had seen four principals; at the time of initial interview in 2012 the then principal had been in the school less than a term.

Key Strategies and initiatives

Partly as a result of this extended period of instability, and in line with the school's own assessment of immediate needs, its NP plan and strategies focussed on improvement of the quality of its teaching, school planning and accountability processes. In consequence, the school established a new executive leadership model to improve leadership effectiveness in the school. The executive team was expanded to include stage and learning area coordinators. Members of the new executive team, including the principal, had access to mentors and also had opportunities to participate in team based leadership training programs.

A further key goal of the school was to build teacher capacity by implementing a whole of school approach to professional learning. Data associated with student achievement outcomes were used to inform the design of staff professional learning activities. It linked its staff professional learning with school plan development, with a focus on the improvement of student programs. For example, teachers were required to ensure that they use reflective journals or learning logs which incorporate relevant Low SES SSNP professional learning activities.

Reflection on the results

Essentially, the Low SES NP funding and processes provided the school with opportunities and space to focus on establishing, implementing and continually reviewing its immediate organisational change management model. These were subject to change over the life of the program. For example, teachers and leaders regarded their review processes as initially not usefully linked to the broader context of the school, restricting the capacity of the process to contribute strategically to achieving school goals. A more explicit link to the school plan as required was subsequently implemented.

These elements – consolidating effective leadership and implementation of whole school change in teaching practice —served as immediate and pressing priorities for this school in its engagement with the Low SES NP.

At the point of interview in 2012 there was a perception from school leadership and staff that the professional dialogue in the school had improved. Staff members were described as more willing to discuss and debate and in so doing able to better address issues.

Western Public School, where planned activity failed to translate through to the objective of substantial improvements on student test scores, demonstrates the need for understanding of the time required to make the cultural shifts that underpin enhanced school outcomes.

6.4 Western High School

NP effect on NAPLAN achievements: Low in Reading and Medium in Numeracy

School Profile

Western High School is a coeducational government secondary school (Years 7-10) with an enrolment of 575 in 2013, down from 630 in 2012. It serves the curricular and social needs of a very disadvantaged and high needs population in the Western Region of Sydney. Nearly half its student population report language backgrounds other than English and many of these are from Pacific Islander families. A further 15 per cent of the student population report Aboriginal or Torres Strait Islander backgrounds. Parent employment is primarily in unskilled or low skilled work; unemployment is also high and significant numbers of parents, including many single parents, are not in the labour force. In the first year of NAPLAN testing, the school reported 94 per cent of its student population to be drawn from the lowest SES quartile.

Attendance in initial years of the Low SES NP was reported at 81 per cent and the school's initiatives included a significant direction of NP funding toward improving these rates. My School reports reflect rising rates of attendance, to 85 per cent in 2014:

Year	2010	2011	2012	2013	2014
Student Attendance Rate (%)	81	83	82	83	85

Source: My School

 Challenges

The school's Low SES NP Program responded to an initial situational analysis undertaken in 2009 that identified a number of distinct concerns to be addressed through NP initiatives.

- First, students' learning and engagement outcomes were lower than state averages on a range of key measures such as NAPLAN scores, attendance data and student retention.
- Second, staffing issues presented further concerns — attrition among teachers was high with a comparatively high turnover of staff and the proportion of comparatively inexperienced staff was also a concern. The school wanted to hold energetic young staff and better support all staff in working more effectively with their peers; sustained professional support and development was needed to help teachers better meet students' complex needs.

- Third, the school identified community perceptions of the school as problematic; parents' engagement with the school was very low and particularly low for certain groups (such as Aboriginal students) within the school community.

Key Strategies/initiatives

The planned response developed under the initiative therefore focused on lifting the school's performance on several linked but distinct fronts. Nothing short of a cultural shift within the school – in areas of building leadership and staff capacity, utilising quality data management systems and learning methods for students and building community and parent partnerships – was regarded as required to effect the desired changes in students' literacy and numeracy achievement levels.

Activities associated with the NP were accordingly spread across several key areas of activity with a strong focus on leadership and staff improvement. An Assistant Principal position was created to oversee the complex program associated with the NP strategies. At the leadership and staff level, for example, several key initiatives were reported to be integral to the school's plans for improved outcomes. In 2012 these initiatives were described as:

- *Focus on performance management and staff mentoring*, which had already led to "positive change" in the school's staffing profile. Long-time staff who had been resistant to reforms had left the school while others, energised by the new activities, not only wanted to remain but had taken on educational leadership challenges and were actively encouraging like-minded colleagues to join the school community. Young staff in particular had served as "attractors" to other similarly-motivated staff within their networks. Being regarded as an "employer of choice" was a new and welcome experience for this school and a great morale booster.
- *Sharing of practice*: the building of learning teams and professional relationships was a key focus of the NP initiatives and fundamental to reforms within the school and resources of time and program funding were allocated to supporting this initiative.
- *Strategic use of technology*: a classroom-based digital recording system allowed teachers to share and comment on their teaching practice, building a more collegial and team based approach to practice. The system was described as "constantly" utilised and very popular with staff. Other schools drew on this school's example in setting up similar systems. A factor in its acceptance had been involvement of the whole staff in development of professional protocols and safeguards surrounding the program – leadership emphasised from the outset that the purpose of the program was not oversight and control but the sharing and encouragement of innovative practice.
- *Teachers as researchers undertook projects on research topics associated with their practice* –these projects were regularly reviewed by peers and awards given for

strong practice. The process played an important role in changing staff culture through opening up classrooms, collaborating on activities and sharing information.

- *A teacher-based review committee was established to oversee new staffing appraisal arrangements and students and parents had regular opportunities to provide feedback on teachers (three times a year).* This information and associated reflections played a role in Teacher Annual Assessment reviews. These new processes were described as "evaluative and reflective processes" of great importance in contributing to changes in teachers' professional approaches.

As noted a significant focus of WHS' initiative also involved improvement of attendance rates through a mix of engagement strategies and substantial teacher allocations for the monitoring and following up of student absences. Work studies classes, for example, proved successful in turning around attendance and completion rates for at-risk Year 9 and 10 students. While attendance rates remained lower than state averages improvements were seen annually since the introduction of these measures:

Year	2012	2013	2014
Student Attendance Rate	82	83	85

Source: My School

An abiding concern for WHS was that parent engagement in the school was very low. The concern to enhance parent and community partnerships constituted a final strategic focus for the school's Low SES NP plan: If there was one thing we could fix that would be it, the parent engagement (Community engagement coordinator).

- *The school allocated Low SES NP funds to develop and implement a parent and community engagement strategy.* Two part-time positions were created in 2009: a Parent Education coordinator; and a Community Education Officer. Parents were encouraged to channel their requests for assistance on specific concerns or questions to these staff in the first instance to promote a "triaging" that would ensure their issues were addressed in ways that were timely and effective. Another teacher was allocated a fractional load to improve content and delivery of the newsletter as a means of communicating more effectively with the school community.
- *The school experimented with its organisation of parent and teacher meetings and forums, always very poorly attended in the past.* It was successful in staging some community evenings attended by many parents and community members and sought to build on the success of such positive events. More targeted activities for specific community groups were also organised, such as administration of survey interviews and focus group meetings for Aboriginal families. In consequence a range

of opportunities were identified for teachers to facilitate home- school partnerships, especially in making direct contact with parents to encourage their attendance at assemblies, award ceremonies, other celebratory community events, and student extra- curricular activities. Teachers received professional development to build their confidence and skills in working with all parents, in particular with regard to student attendance.

Reflection on results

Western High School provides a good example of the complexity of the challenges confronting many schools in planning and acting on a school improvement plan. In this case, the planned and implemented activities and interventions failed to translate through to the school's objective of substantial improvement on student test scores. The experience of WHS highlights a point made by a number of research studies on improvement interventions in school settings (Lamb and Rice 2009, CDRP 2015): that the interactions between school culture (characterised in terms of staff and student stability, orderly environments and consistency of leadership) and the quality and focus of intervention will impact on effect. The case demonstrates the need for understanding of the time or pre-conditions required to make improvement in school outcomes.

Leaders in this school made reference to "lining up the ducks" for improvement and believed that their NP approaches – which included targeting 1. student attendance and engagement, 2. teacher and leadership capacity and staff renewal and 3. School-parent relations – were setting up the conditions for improvements to be made.

By 2012, teachers and parents were able to make some cautious assessments about the success of this strategy: "there is an increase because it was just so low before. Student attendance has definitely increased albeit remaining lower than state averages. There have been increases in awards handed out for academics, sporting, citizenship, and attendance". There was a sense, too, that staff development strategies had brought a new energy to the school and supported new and more productive ways of working.

For WHS, however, the suite of strategies so painstakingly developed and implemented as part of the school's NP plan showed very little outcome in student performance in NAPLAN. The intractability of poor test outcomes, especially in NAPLAN results, was a source of frustration, disappointment and disbelief among school staff, given that school plans and a range of pedagogical and staff development initiatives had been introduced with the express purpose of addressing and turning around NAPLAN performances.

Essentially the school's planning and activity, especially in its targeting of student engagement and staff development, had centred on cultural change. The strategies focused on the transformation of staff as providing the clearest and most direct way to secure the "runs on the board" required for a stronger, more stable school community with positive

community profiles and a strong interface with parent communities. It was felt that this cultural shift would in turn would lift performance outcomes in long run.

The challenges faced by this school were many. Interim indicators that may have better reflected incremental gains made over the period of the study could have been linked more directly to the factors associated with the preconditions for success rather than with the student outcomes themselves. These could have linked for example to attendance, staff development or parental engagement outcomes, all factors associated with a productive and dynamic school culture. Indicators of change, especially in the context of community experiences and perceptions, could be the quality and incidence of contacts made with parents outside the contexts of conventional parent involvement – such as the parent-teacher evenings, school forums or other contexts that tend to define parental roles in school. Strategies that enlist parent support in building attendance rates or developing individual learning and pathway plans for young people at risk involve parents in ways that connect closely with students' experiences of school; the impact of programs such as the school's Year 10 work studies program in engaging parents in students' programs and thus improving attendance and retention rates is important. Similarly, the initiatives of year level case managers in contacting families as a matter of course has built connections between school and the home. Steps such as these provide a stronger platform for further engagement and their role in shifting parent-teacher relationships to stronger and more positive foundations may be found in parent and teacher perceptions of incremental change.

7.   Conclusion

This study was commissioned by the Centre for Education Statistics and Evaluation (CESE) to examine student performance in low-SES schools which participated in the National Partnership Agreements, and the extent to which changes in student performance are related to NP initiatives or other factors. Of particular interest was identifying whether or not school external partnerships and associated NP initiatives lead to improved outcomes for schools and students. To examine this question, a range of analyses were undertaken using available data to evaluate the effectiveness of the Low SES NP in improving NSW student outcomes across a range of measures including NAPLAN results.

The report explores the issue of good practice using data derived from a variety of sources including from administrative data, NAPLAN achievement data, survey results from teacher and principal surveys, and case study materials collected in earlier years from site visits to selected schools. Drawing on information from a variety of data sources helps to gain a better understanding of the effect of the initiatives implemented by schools. Important in this are several earlier reports, many of which provided highly detailed accounts of how specific schools have worked with the NP or how schools and school personnel across NSW have experienced the initiatives over time. These are valuable pieces of work in their own right and their findings inform this report. But the main focus of this report lies with the broad question of outcome and impact.

Previous work, documented in the low SES NP staffing, management and accountability evaluation report, has identified positive effects of the NP program at an aggregate or system level. In particular, the analysis using NAPLAN matched cohort data suggested that low SES NP schools on average have a significant impact on student NAPLAN results over 3 years between 2011 and 2013. What the current report aimed to do was to unpack further the results of the earlier work to identify variations in impact across schools in order to better understand where and in which contexts particular strategies have worked well, and where they seem to have had little effect.

Among NP schools there is a positive relationship between the level of their NP effect outcome and the overall level of effective implementation in two NP reform areas:

- Reform Area 4 — Provide innovative and tailored learning opportunities, and

- Reform Area 6 — Promote external partnerships with parents, other schools, businesses and communities.

The more initiatives related to these two areas implemented in a school, the higher impact of NP in the school. The higher level of effectiveness as perceived by the principal and

teachers, the more likely the school shows a higher NP effect. It suggests that schools that placed more effort in these two reform areas were more likely to show a higher effect on student learning outcomes.

In looking at what separated high impact schools from low impact schools, the analysis revealed that schools with the following characteristics were more likely to show a high impact on their student NAPLAN improvement:

- They had placed greater emphasis than other schools on innovations in teaching practice and addressing student needs
- They had provided stronger welfare and learning support for disadvantaged students through providing teachers with training around individual learning needs, and strengthening the use of ILPs for students
- Stronger use of evidence to identify student learning needs
- Stronger emphasis on developing staff through providing opportunities for professional learning and development

For schools where the NAPLAN achievement effect had been low or negligible, the analysis revealed that schools tended to be characterised by the following:

- Some had a stronger emphasis on strategies to attract and retain teachers, particularly through leadership positions, which may itself reflect greater need in this area and schools struggling to recruit and retain quality teachers and leaders
- Less focus on use of evidence for strategic planning and decision-making
- Less focus on innovation in teaching, addressing student needs, and strengthening school accountability and more on staffing and performance management
- Pursued strategies around teacher and leadership recruitment, retention and development suggesting that staff stability was a major issue for them.

In measuring variations in NAPLAN impact across schools, this report has shown how some schools have improved student outcomes as a result of the NP, while others have been less effective in doing so. The next phase of work for this project will include a closer study of a number of case study schools that have displayed high NP impact, and a number of low impact schools to try to tease out what has contributed to differential impact. This will be complemented through a more extensive analysis based on new and more comprehensive data of the initiatives that have been employed in schools that have added significantly more value to student achievement relative to other schools, and the initiatives of schools that have held ground but not necessarily improved relative to other schools, and the initiatives of schools with declining or negligible performance.

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Appendix

Table A-1   School level covariance statistics (Intra-class Correlation Coefficient)*

	Linear mixed model	
	School variance	ICC
Not adjusted for student and school level factors		
Year 5 Reading	0.18	18%
Year 5 Numeracy	0.19	19%
Year 9 Reading	0.25	25%
Year 9 Numeracy	0.38	38%
Adjusted for student and school level factors		
Year 5 Reading	0.01	4%
Year 5 Numeracy	0.02	8%
Year 9 Reading	0.01	1%
Year 9 Numeracy	0.01	5%

*All results on school level variance are statistically significant at 1% level.