

Local Schools, Local Decisions

Evaluation final report

Centre for Education Statistics and Evaluation



Centre for Education Statistics and Evaluation

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Centre for Education Statistics and Evaluation, December 2020, Sydney, NSW

Please cite this publication as:
Centre for Education Statistics and Evaluation (2020), **Local Schools, Local Decisions Evaluation final report**, NSW Department of Education, cese.nsw.gov.au

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Acknowledgements

CESE would like to thank those who have contributed to this evaluation. This includes the members of the Local Schools, Local Decisions Evaluation Reference Group, and NSW Department of Education staff who provided data and information. We would also like to thank the people who took the time to participate in interviews or complete surveys informing this evaluation.

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Executive summary

Introduction

In 2012, the NSW Department of Education launched the Local Schools, Local Decisions (LSLD) education reform. LSLD aimed to give NSW public schools more authority to make local decisions to best meet the needs of their students. LSLD sought to place student needs at the centre of school decision-making by giving principals and their school communities a greater say over how they allocate and use their available resources. LSLD focused on five interrelated reform areas: making decisions, managing resources, staffing schools, working locally and reducing red tape. In 2014, a new needs-based approach to school funding through the Resource Allocation Model (RAM) was added to the LSLD reform.

This evaluation report contains quantitative and qualitative analyses aimed at identifying changes in student outcomes, school spending, school management and decision-making that can be attributed to LSLD.

The following data sources have been used in this report:

- National Assessment Program – Literacy and Numeracy (NAPLAN) data (2011-2019)
- HSC completion and results data (2011 and 2019)
- Tell Them From Me (TTFM) student survey data
 - positive sense of belonging at school (2015 and 2019)
 - high expectations for success (2015 and 2019)
 - high advocacy from teachers and adults at school (2016 and 2019)
- school system finance data (2018)
- CESE principal survey (2019)
- interviews with school and department staff (2019).

This evaluation focused on the above data sources, and the key reform areas. The evaluation does not attempt to cover every single element of the LSLD reform.

Note also that LSLD was implemented at the same time as many other changes were occurring across schools, meaning that it is difficult to attribute changes solely to the impact of LSLD.

Finally, other changes also occurred during the implementation of LSLD that have sometimes been conflated with LSLD, including a realignment of department structures from 2013 and the parallel implementation of a new Australian curriculum. These changes are likely to have shaped reactions to LSLD despite the fact that they were separate to the reform.

Findings

Evaluation Question 1: What has been the combined impact of LSLD and RAM funding on school and student outcomes?

Since the introduction of LSLD, there has been no overall improvement on those student outcomes measured in this report

- Overall, during the time of LSLD, there has been no substantial improvement in NAPLAN Reading and Numeracy results, HSC completion and performance have worsened, and TTFM student wellbeing outcomes have either not changed or have worsened.
- In most cases, the gap in student outcomes between higher and lower need schools has not reduced, and this gap appears to have increased on some measures.
- While NAPLAN, HSC and TTFM provide important and useful ways of measuring student outcomes, schools work with students on a range of other academic and wellbeing outcomes that are not captured at a system-wide level. Due to the lack of system-wide data on these other outcomes, we have not been able to address whether there has been an impact of LSLD and RAM funding on these outcomes.
- The LSLD policy was not documented thoroughly and what was documented (such as the 2014 LSLD fact sheets) did not contain a clear program logic to articulate the predicted causal links between needs, inputs and activities through to student outcomes. The policy did not document targeted outcomes, criteria for success or any built-in mechanisms for review.
- It may be reasonable to conclude that this reform, as with most other major education programs, was ultimately intended to improve student outcomes. However, the policy documentation did not explicitly ask schools to demonstrate how changes they made under LSLD, or funding decisions they made with their RAM funding, improved student outcomes, nor to report on that improvement.
- Because schools were not explicitly asked to demonstrate the links between their actions and improving student outcomes, there has been a lack of system-wide information to facilitate a more thorough investigation of the causal relationship between program implementation and improved outcomes.

Evaluation Question 2: How have schools spent the additional funding they have received since the implementation of LSLD (including RAM and other funding)?

School system finance data provides limited information on exactly how schools have spent funding

- It is not possible to use current system finance data to identify exactly how schools spent their funding. This is largely because while schools have the opportunity to record specific spending categories for all of their spending, they mostly do not do so, possibly because they are not required to by the department. For example, in 2018, on average, schools recorded 14 per cent of their total expenditure using specific spending categories.

- System finance data is clearer in relation to equity funding. In 2018, schools received approximately \$851 million in equity funding. Schools recorded spending approximately \$789 million against Work Breakdown Structure (WBS) codes, leaving approximately 7 per cent unspent. This was at a time when principals were not supported by effective financial planning tools. This lack of financial clarity may be why principals did not spend all of their funding.
- In the 2019 CESE principal survey, principals indicated that in 2018 they had most commonly spent the funding they had received since the implementation of LSLD on: employing key staff; implementing specific programs; purchasing school resources; providing personalised learning support; and teacher professional learning. Qualitative data also showed that schools often spent this funding on initiatives aimed at improving student wellbeing. Based on interviews with school staff, it was not always clear that strong evidence was made available to schools to guide and support spending decisions.
- Most school staff felt that funding associated with LSLD could be spent flexibly and with greater confidence that the funding would be sustained over time. This was in contrast to the previous system of tied funding which was generally linked to specific point-in-time programs. Principals from higher need schools in particular noted that RAM funding enabled their schools to respond well to student need. However, the NSW Primary Principals' Association and the NSW Secondary Principals' Council have stated that funding has not always been sufficient to meet student need in lower need schools and small schools, and these principal representative bodies note that the base loading is below the Schooling Resource Standard (SRS).

Evaluation Question 3: What has been the impact of LSLD on school management and local decision-making practices?

Reform areas: making decisions and managing resources

LSLD had a positive impact on schools' ability to make local, context-specific decisions

- In interviews, most principals and school staff agreed that LSLD had a positive impact on the extent to which schools make local decisions that best meet their needs. During these interviews, no-one expressed a desire to return to the previous arrangements which they considered to have lacked flexible, predictable and sustained funding. School staff noted that they generally felt a greater sense of authority under LSLD and felt trusted by the department. However, in interviews some school staff said that under LSLD the department still excessively monitored and restricted some actions, such as asset management and staffing.
- School staff generally welcomed the ability for schools to make local decisions in the best interests of their students – a concept that was at the heart of the LSLD reform. School staff also generally felt that the needs-based funding formula as delivered through the RAM was fair and transparent, and would be sustained and predictable into the future.
- However, greater local authority has also come with some challenges. Some school staff wanted clear guidance from the department to support them to make evidence-based decisions for their students. Additionally, school staff felt that common administrative functions to do with finance, staffing and asset maintenance were best handled by the 'centre' (that is, the department), freeing schools to focus on student outcomes.

Reform area: reducing red tape

The administrative burden for schools has increased during LSLD

- While schools have generally welcomed LSLD, for many, the reform was associated with an increased administrative burden. This increased burden negatively coloured many people's perceptions of LSLD as a whole. We estimated that about 90 per cent of principals did not agree that LSLD had simplified administrative processes. School staff – particularly administrative staff – told us in interviews that the tools and processes that came with LSLD, or were associated with LSLD, were complicated, poorly designed and time-consuming.
- New tools and systems were delivered without a clear change management strategy, were poorly supported by the department in the implementation phase, and did not meet school needs.

Reform area: staffing schools

LSLD increased schools' ability to hire targeted staff, but some roles remained hard to fill

- The majority of principals agreed that schools had increased their ability to employ staff to meet their students' needs since the implementation of LSLD. In particular, school staff noted that they were able to hire additional staff, create new roles or restructure existing roles in order to address specific needs within their schools. However, schools still had difficulty hiring particular types of staff, especially those schools that were already hard to staff for geographical or other reasons.

School staff criticised the loss of centralised staff and support systems under LSLD

- Some school staff felt that, under LSLD, the department had reduced its capacity to provide system-wide support to schools due to the loss of centralised positions, particularly curriculum consultants. Some schools filled these gaps with training, advice and/or other initiatives, but noted that this function had previously been carried out by the department and staff generally felt that it would be more effective and efficient if they continued to do so. Some of these losses may not have been due to LSLD per se, but rather to departmental realignments and reduced expenditure, particularly on centralised staff and support systems. Nevertheless, it is clear that the loss of centralised staff and support systems over this time period is regularly associated with LSLD.

LSLD had a limited impact on processes to support teacher performance and development

- We estimated that about 55 per cent of principals agreed that they were better able to support staff in their performance and development since the implementation of LSLD. During interviews, many schools did not associate LSLD with changes to support teacher performance and development.

Reform area: working locally

LSLD funding has enabled increased community engagement in some schools

- School staff told us that funding associated with LSLD had enabled them to fund community-facing positions or community events. This had the effect of increasing their community engagement. However, about 63 per cent of principals did not agree that LSLD had a positive impact on the way schools consult with parents and the school community to inform their local decision-making, and a further 79 per cent did not agree that LSLD had a positive impact on the way schools engage with local businesses and organisations. These results were largely due to the fact that school staff did not feel that LSLD contained concrete advice about mechanisms through which they were able to increase community engagement.

LSLD funding has enabled some schools to collaborate more effectively

- A few schools, particularly small schools in non-metropolitan areas, said they had strengthened local collaboration by creating communities of practice to share resources and pedagogical practice. This provided greater flexibility to work around common barriers faced by small schools in rural and remote areas, such as small teaching staff, high fixed costs, casual cover, and geographical isolation. Schools had often drawn on funding associated with LSLD to collaborate in these ways, in line with the intent of the policy, but again noted the fact that the policy did not suggest specific mechanisms to enable this collaboration and that there might be opportunities for sharing good practice more explicitly.

Conclusions

The evaluation findings provide some insights into how the LSLD reform could be improved.

Ensure that schools are accountable for their decision making

Schools should be subject to appropriate scrutiny and accountability around the decisions they make to target school and student outcomes. The department should require and support schools to report through the school planning tools, particularly the annual report, on how they direct their funding based on evidence and its impact on school and student outcomes, rather than reporting on activities. Mechanisms such as the new school planning process, evidence-based target-setting (for implementation from 2021) and the planned centralised guidance and support may be useful in supporting this aim.

The department needs to take a greater role in providing support to schools to make these local decisions, in order to free schools up to focus on educational leadership and student outcomes. Areas of greatest need include curriculum support, and support for certain universal functions in areas such as finance, information technology, human resources, asset management and procurement.

Provide further guidance for schools on effective ways to improve school and student outcomes

The department should better support schools by continuing to identify what is already known about 'what works best' for school leadership and decision-making, cataloguing ways that schools should spend their funding in the most effective ways to improve student outcomes, and providing firm, clear guidance for schools to do so. This guidance should acknowledge individual school context and include advice on the most effective ways to improve student outcomes within the specifically funded equity groups.

CESE's recently updated 'What works best' paper and its new 'What works best in practice' paper and toolkit for teachers will provide guidance to schools on what works best with respect to student outcomes. The examples provided are already helping schools to implement practical, contextually relevant strategies in classrooms to improve learning. This is a crucial step in providing stronger guidance to schools on effective ways to improve school and student outcomes.

While there is a strong body of evidence on many effective ways to improve school and student outcomes, where there is a lack of evidence on effectiveness, the department should commit to generating this evidence base in order to determine what actions schools should take.

Ensure policies have clear aims and that evaluation is part of policy development

Policy makers should ensure that all policies have a clear definition of success in terms of outcomes; mechanisms in place to achieve this success; suitable data collection; and strong, central coordination to enable agile responses to changes in performance as they arise.

LSLD did not have a program logic that would have provided a clear line of sight between needs, inputs, activities and outcomes. The LSLD policy outlined various actions that would be undertaken in each of the policy reform areas, but lacked a clear articulation of the mechanisms of change and how these actions were expected to lead to improved outcomes.

School staff were also often unsure about the areas over which they had authority to make decisions, and the extent of that authority. While most school staff reported they believe that the department trusts them to make local decisions, the core LSLD policy documentation did not provide clear guidance on where schools' authority began and ended or a coherent framework document that enunciated the balance of authority.

The department should use the department's own evaluation policy and the NSW Government Program Evaluation Guidelines when designing future needs-based policies. These documents emphasise the importance of embedding evaluation in program design, measuring the impact of policies on school and student outcomes, and using evidence iteratively to influence decision-making and future policy development.

Develop and support effective financial and administrative management

The department should ensure that changes to processes and system tools are appropriately piloted, managed and coordinated. Principals and schools have shown resilience in the context of the significant changes to date, which have not been implemented as effectively as possible, suggesting a lack of appropriate piloting and testing before full scale implementation. New tools and systems were delivered without a clear change management strategy, were poorly supported by the department in the implementation phase, and did not meet school needs.

The department should better support school staff in future by ensuring that processes and systems are fit for purpose before wider-scale implementation, and that school staff are provided with targeted training. The department should also take a strategic approach to the implementation of new tools, systems and policies, employing a strong governance model that focuses on school and student outcomes and is coordinated across key administrative areas.

Ensure access to detailed data on schools' decision-making that can be linked to student outcomes

The department should ensure that financial reporting systems allow the department to track expenditure, particularly equity funding, to the level of detail required to ensure that student outcomes are being targeted, and to conduct analyses to determine which uses of funding (particularly in equity groups) lead to improved student outcomes.

The updated School Excellence in Action policy and implementation procedures have been revised to provide explicit guidance to schools in respect to student outcomes. The online tool, SPaRO (School Planning and Reporting Online), has increased functionality to make linking to student outcomes straightforward for principals in the context of overall school planning. These tools will also help the department to more deeply investigate the characteristics of successful schools to understand the reasons for their success and to share this knowledge across the system.

Chapter 1: Introduction

Reform background

In 2012, the New South Wales Department of Education launched the LSLD education reform. LSLD aimed to give NSW public schools more authority to make local decisions about how best to meet the needs of their students¹. LSLD placed student needs at the centre of school decision-making by giving principals and their school communities a greater say over how they allocate and use their available resources. LSLD focused on five interrelated reform areas: making decisions, managing resources, staffing schools, working locally and reducing red tape. A cornerstone element of LSLD was the introduction of a new needs-based approach to school funding through the RAM in 2014.

The RAM consists of three components: targeted funding (for individual students with high levels of need); equity funding (based on four loadings: socio-economic background, Aboriginal background, English language proficiency and low level adjustment for disability); and a base school allocation (operating costs and staffing)².

LSLD evaluation

This is the final evaluation report for LSLD, conducted by CESE. The evaluation commenced in 2016 with an interim evaluation report published in 2018³. The final evaluation report is an outcome evaluation focussing on the impact of the reform on student outcomes, school spending, and school management and decision-making.

LSLD was introduced two years before the RAM was introduced. The RAM was the mechanism by which funding was facilitated for NSW public schools through the National Education Reform Agreement (NERA)⁴. Despite this staggered introduction, the RAM's equity funding model reflects the philosophical intent of LSLD, namely, to provide needs-based funding that schools can spend flexibly. As such, this evaluation has focused on the use and impact of equity funding. In this evaluation, equity funding is used to represent the level of need for a school, with schools that receive more equity funding per student considered to have higher levels of need (Appendix A contains further details about our operationalisation of school need).

1 NSW schools belong to a system of public schools, with this system providing common frameworks and shared values to schools for school operation, curriculum and assessment. LSLD gave schools more authority to make school-based decisions, while conserving schools' ability to draw on support from the department. This is distinct from the notion of 'autonomous' schools, which are considered to be independent or self-governing. For more information, refer to Appendix B.

2 Refer to: <https://education.nsw.gov.au/strategic-schools-resourcing/resource-allocation-model>.

3 Refer to: <https://www.cese.nsw.gov.au/publications-filter/local-schools-local-decisions-lsld-evaluation>.

4 The NERA was replaced by the National School Reform Agreement (NSRA), which commenced on 1 July 2019. Refer to: http://www.federalfinancialrelations.gov.au/content/schools_funding.aspx

Appendix B contains a short literature scan of the history of school devolution nationally and internationally. Existing research provides evidence of a relationship between school autonomy and accountability and improved student outcomes, in instances where autonomy and accountability are appropriately combined (NSW Department of Education and Communities 2012b). This literature scan provides additional contextual information on how school devolution was conceptualised and implemented through LSLD.

Evaluation questions

This evaluation set out to answer three evaluation questions:

1. What has been the combined impact of LSLD and RAM funding on school and student outcomes?
 - What impact have the changes to school-level funding under the RAM had on school and student outcomes?
 - Is there any evidence that LSLD has contributed to a reduction in the gap in student achievement for the identified equity groups?
2. How have schools spent the additional funding they have received since the implementation of LSLD (including RAM and other funding)?
 - What are some of the initiatives that RAM and other funding has enabled in schools, with a particular focus on how the needs of student equity groups have been supported?
 - How has LSLD affected the ability of schools to spend funds as they best see fit?
3. What has been the impact of LSLD on school management and local decision-making practices?
 - What has been the impact of LSLD on the level of authority school leaders have to lead and manage their schools?
 - What support structures do school leaders need to make effective school management decisions?
 - What are the barriers to effective school management and local decision-making under LSLD?

Data sources

The following data sources have been used in this report:

- NAPLAN data (2011-2019)
- HSC completion and results data (2011 and 2019)
- TTFM student survey outcomes
 - positive sense of belonging at school (2015 and 2019)
 - high expectations for success (2015 and 2019)
 - high advocacy from teachers and adults at school (2016 and 2019)
- school system finance data (2018)
- CESE principal survey (2019)
- interviews with school and department staff (2019).

For details on the specific methods used to answer each evaluation question, please refer to Appendices C to H.

In January 2020, CESE sought and received submissions from three external stakeholder organisations: the NSW Primary Principals' Association, the NSW Secondary Principals' Council and the NSW Teachers Federation (Appendix I). These submissions helped inform this report.

Focus of this report and limitations

This report draws on a range of sources, including the results of quantitative analyses of the following school and student outcomes: NAPLAN Reading and Numeracy scaled scores, HSC completion and performance rates, and TTFM student wellbeing outcomes (positive sense of belonging, high expectations for success and high advocacy at school). The report also draws on the results of a survey of school principals relating to school financial information and departmental finance data, and the results of qualitative analyses based on interviews about the impact of LSLD on school management and local decision-making practices.

LSLD was a broad reform that did not contain explicit steps or mechanisms in the core policy documentation (such as the 2014 LSLD fact sheets) by which schools were expected to achieve specific student outcomes. Nevertheless, the department, and all schools, have an overall aim to improve student outcomes. Therefore we selected a range of educationally relevant academic and non-academic outcomes that might reasonably be considered to show changes if the LSLD reform were successful.

It should also be noted that due to the phased rollout of the reform, LSLD was not fully implemented in all NSW Government schools until 2018. As such, the potential impact of the full reform has been uneven across schools, with some schools experiencing more or all aspects of LSLD for considerably longer than other schools. Also, while we have examined changes in outcomes over time, it is likely that these changes are not solely attributable to the influence of LSLD. This is because LSLD was implemented at the same time as other major policy reforms including Great Teaching, Inspired Learning, the Rural and Remote Blueprint, and Early Action for Success.

We explored the possibility of analysing School Excellence Framework (SEF) data as a further measure of the impact of LSLD on school outcomes. However, we were not able to analyse SEF data due to changes over time in the way certain elements of SEF were defined. These changes mean that it would not be possible to correctly attribute the results of any analysis over time to the influence of LSLD and RAM funding.

Notably, other changes also occurred during the implementation of LSLD that have sometimes been conflated by school staff with LSLD, including reduced expenditure, particularly on centralised staff and support systems; departmental realignment; and the parallel implementation of a new Australian curriculum. These changes are likely to have shaped reactions to LSLD despite the fact that they were separate to the reform.

Finally, the department is currently making changes to the LSLD reform, aiming to ensure a stronger focus on improving outcomes for students. The NSW Government has announced a review of Local Schools Local Decisions to ensure the right balance between autonomy, accountability, and support for schools. New initiatives have been developed to support and scale evidence-based best-practice teaching and learning. Also, a new School Excellence in Action policy provides further direction for schools on school planning, ongoing self-assessment, annual reporting and external validation. Examination of these changes are outside of the scope of this evaluation.

Chapter 2:

What has been the impact of LSLD and RAM funding on school and student outcomes?

In this report, we have selected a range of outcomes that it would be reasonable to assume would have been influenced by LSLD and RAM funding, had the reform been successful. NAPLAN data provides a reliable, system-level assessment of students' literacy and numeracy abilities. Similarly, TTFM data is collected across many schools in the NSW Government school system and provides an assessment of student wellbeing. The wellbeing scores that we have included in this report offer a non-academic perspective on student outcomes. We have also analysed HSC completion and performance rates in line with the department's goal for more students to complete senior secondary school. We acknowledge that there are a greater range of important educational outcomes for students than the measures included in this report. However, these outcomes lack system-level data collection and therefore we have not included them in this analysis.

Our analytical approach to investigating this question consisted of estimating outcomes pre- and post-LSLD, investigating whether there had been a change over time, and determining whether this change was related to school level of need. In an ideal scenario, if LSLD and the RAM had completely redressed inequity in need in NSW schools, there would be no relationship between the level of need that a school experiences and school and student outcomes. We would also hope to see an overall improvement in student outcomes.

Specifically, we developed a series of latent growth curve models to estimate NAPLAN Reading and Numeracy scaled scores, HSC completion and performance rates between 2011 and 2019, and student wellbeing outcomes between 2015, 2016⁵ and 2019, for schools with different levels of need. Using latent growth curve models allowed us to relate school-specific changes in outcomes to school need. That is, these models let us investigate whether students from higher need schools showed greater improvements in outcomes than students from lower need schools⁶. (For more technical information about these analyses, refer to Appendices A, C, D, E and F.)

5 These years were selected to represent the pre-LSLD time period as this is when complete data was first available for these wellbeing outcomes.

6 Predicted scores were calculated and are shown over the 10th, 30th, 50th, 70th and 90th percentile values of the measure of school need. For ease of interpretation we refer collectively, where relevant, to the 10th and 30th percentiles as representing lower need schools, the 50th percentile as representing moderate need schools and the 70th and 90th percentiles as representing higher need schools.

Interpretation of results

Since 2013, the Australian Curriculum and Reporting Authority has used effect size measures (Hedge's g) to help interpret differences in NAPLAN results. We present effect sizes and their corresponding descriptive labels in Table 1, as well as an explanation of the meaning of these labels for our results. As our other analyses (HSC and wellbeing outcomes) are presented in terms of percentage point differences, we also present our effect size definition of these percentage point differences using the same descriptive labels and meaning.

Table 1

Definition of effect sizes used to summarise results

Effect size		Meaning	Descriptive label
Range	Percentage point difference		
Between -0.2 and 0.2	Between -2 and 2 percentage points	The score for 2019 is close to the score for 2011, meaning that there has been little change over time.	'Close to'
Between 0.2 and 0.5 / between -0.2 and -0.5	Between 2 and 5 / between -2 and -5 percentage points	The score for 2019 is above/below the score for 2011, meaning that there has been some change over time.	'Above'/'Below'
Greater than 0.5 / less than -0.5	Greater than 5 / less than -5 percentage points	The score for 2019 is substantially above/below the score for 2011, meaning that there has been substantial change over time.	'Substantially above'/'Substantially below'

NAPLAN outcomes have not improved overall

Overall, student NAPLAN Reading and Numeracy outcomes have not improved since the introduction of LSLED, and the gap in performance between higher and lower need schools has remained constant. This means that the performance of students from higher need schools did not change much compared to the performance over time of students from lower need schools, with the exception of an improvement in the Year 9 Numeracy assessment for very high need schools.

We present the effect sizes for each calculated difference in NAPLAN Reading and Numeracy outcomes between 2011 and 2019 in Table 2. Full details are reported in Table 10, Appendix D.

Table 2**Summarised results of NAPLAN Reading and Numeracy outcomes**

Percentile of school need measure					
	Lower need		Moderate need	Higher need	
	10 th	30 th	50 th	70 th	90 th
NAPLAN Reading					
Year 3	Close to	Close to	Close to	Close to	Close to
Year 5	Close to	Close to	Close to	Close to	Close to
Year 7	Close to	Close to	Close to	Close to	Close to
Year 9	Close to	Close to	Close to	Close to	Close to
NAPLAN Numeracy					
Year 3	Close to	Close to	Close to	Close to	Close to
Year 5	Close to	Close to	Close to	Close to	Close to
Year 7	Close to	Close to	Close to	Close to	Close to
Year 9	Close to	Close to	Close to	Close to	Above

These results show that, apart from the Year 9 Numeracy assessment, most of the predicted scores for 2019 were close to those for 2011. That is, the majority of the NAPLAN results suggest there has been little improvement in Reading and Numeracy outcomes between 2011 and 2019. This suggests that LSLD and RAM funding have had little impact on NAPLAN results at a school system level. A single positive exception is the Year 9 Numeracy assessment, where the results show that the predicted scores for 2019 for very high need schools were above those for 2011.

HSC outcomes have not improved overall and in some cases have worsened

Overall, HSC completion and performance rates have not improved or have worsened since the introduction of LSLD. The gap in completion and performance rates between higher and lower need schools appears to be increasing. This is due to the performance of students from higher need schools declining over time compared to the performance over time of students from lower need schools.

Across all schools, from 2011 to 2019, the expected HSC completion rate decreased by between 2 and 6 percentage points. The expected high performance⁷ rate decreased by between 1 and 7 percentage points, while the low performance rate either did not change or increased by between 1 and 3 percentage points.

⁷ Students are defined as high performing if they had more than 1 result in the top 2 HSC bands, while students are defined as low performing if they had more than 1 result in the bottom 2 HSC bands.

We present the effect sizes for each calculated difference in HSC completion and performance rates between 2011 and 2019 in Table 3. Full details are reported in Table 19, Appendix E.

Table 3

Summarised results of HSC completion and performance rates

Percentile of school need measure					
	Lower need		Moderate need	Higher need	
	10 th	30 th	50 th	70 th	90 th
HSC completion rate	Close to	Below	Below	Substantially below	Substantially below
HSC high performance rate	Close to	Substantially below	Substantially below	Substantially below	Substantially below
HSC low performance rate	Close to	Close to	Close to	Close to	Above

These results show that in 2019, the expected HSC completion rate and high performance rate for very low need schools was close to the 2011 rates, while the rates for all other schools decreased between 2011 and 2019. This means that the gap in HSC completion and high performance rates between higher and lower need schools increased. Most of the expected low performance rates for 2019 are close to the rates for 2011. The exception is the low performance rate for very high need schools, where the results show that the expected low performance rate in 2019 is above that in 2011. Overall, this suggests that very high need schools are declining in all HSC outcomes.

Student wellbeing outcomes have not improved overall and in some cases have worsened

We have used three outcomes from the TTFM student survey to assess student wellbeing. These are:

- students' **positive sense of belonging**, defined as whether students feel included and accepted at school, identify and value school outcomes and participate in school activities
- **high expectations for success**, defined as whether school staff value academic achievement and encourage students to work hard and do their best in schoolwork
- **high advocacy at school**, defined as the support (for example, encouragement and advice) that students receive from adults at school.

Overall, student wellbeing outcomes have not improved since the introduction of LSLD, with the exception of an improvement in 'high advocacy at school' for secondary students in lower to moderate need schools. Student wellbeing in **higher** need schools is either not improving or has worsened over time. Student wellbeing in **lower** need schools is more mixed, with different wellbeing outcomes either improving, not improving, or worsening over time. While there is a smaller gap in wellbeing outcomes than academic outcomes between higher and lower need schools, this gap appears to be either unchanging or widening over time for most wellbeing outcomes.

Across all **primary** schools, from 2015 to 2019, the predicted scores on 'positive sense of belonging' decreased by between 4 and 7 percentage points, while the predicted scores on 'high expectations for success' did not change. From 2016 to 2019, the predicted scores on 'high advocacy at school' also did not change.

Across all **secondary** schools, from 2015 to 2019, the predicted scores on 'positive sense of belonging' did not change for very low need schools and decreased for all other schools by between 3 and 6 percentage points. Predicted scores on 'high expectations for success' decreased for all schools by between 4 and 6 percentage points. From 2016 to 2019, predicted scores on 'high advocacy at school' did not change for higher need schools, but increased by between 2 and 4 percentage points for lower to moderate need schools.

We present the effect sizes for each calculated difference in 'positive sense of belonging' and 'high expectations for success' between 2015 and 2019 and 'high advocacy at school' between 2016 and 2019 in Table 4⁸. We report full details in Table 20, Appendix F.

8 2015 and 2016 are the first year of collected TTFM data that is representative of the student population for these measures.

Table 4

Summarised results of TTFM student outcomes

Percentile of school need measure					
	Lower need		Moderate need	Higher need	
	10 th	30 th	50 th	70 th	90 th
Positive sense of belonging					
Primary	Below	Substantially below	Substantially below	Substantially below	Substantially below
Secondary	Close to	Below	Below	Substantially below	Substantially below
High expectations					
Primary	Close to	Close to	Close to	Close to	Close to
Secondary	Below	Substantially below	Substantially below	Substantially below	Substantially below
High advocacy					
Primary	Close to	Close to	Close to	Close to	Close to
Secondary	Above	Above	Above	Close to	Close to

These results show that for **primary** schools in 2019, the predicted scores on 'positive sense of belonging' were below to substantially below these scores in 2015, while the predicted scores in 2019 on 'high expectations for success' and 'high advocacy at school' were close to the scores in 2015 and 2016, respectively. This means that while the gap in wellbeing outcomes between higher and lower need primary schools is not changing, overall primary school student wellbeing outcomes are either not changing or declining.

For **secondary** schools in 2019, most of the predicted scores on 'positive sense of belonging' were below or substantially below the scores in 2015, with the exception of very low need secondary schools where the predicted score in 2019 was close to the score in 2015. All the predicted scores on 'high expectations for success' were below or substantially below the scores in 2015. For lower to moderate need secondary schools in 2019, the predicted scores on 'high advocacy at school' were above the scores in 2016, while the predicted scores for higher need schools in 2019 were close to the scores in 2016. This means that the gap in wellbeing outcomes between higher and lower need secondary schools is either not changing or increasing.

Chapter 3:

How have schools spent the additional funding they have received since the implementation of LSLD (including RAM and other funding)?

School system finance data provides limited information on exactly how schools have spent funding

We analysed 2018 school system finance data to determine how schools spent the additional funding received since the implementation of LSLD. We used 2018 data as it was the most recent year in which complete finance data was available. We found that it is not possible to use this data to identify with any great accuracy how schools have spent their funding⁹. This is largely because schools are not required to use specific spending categories to record their expenditure. That is, it is optional for schools to record what they spent money on, so while we can see the amount that was spent, we have no systematic record of what it was spent on.

In 2018, at most, schools assigned specific spending categories to only 50 per cent of their total expenditure. Some schools did not assign any specific spending categories to their expenditure. On average, 14 per cent of a school's total expenditure for 2018 was assigned to specific spending categories.

Based on interviews with school and department staff, we found that policy and guidelines related to accounting and finance processes were not prescriptive, and that the relevant systems and tools were complicated and unsuitable for schools' financial reporting requirements. For example, the current tool allows users to enter data that will result in errors such as negative expenditure values, without providing a warning to the user. As a result, finance data is currently inconsistent and incomplete.

Under LSLD, school staff also broadly report their use of funds through both their school plan and annual report. However, these tools are not meant to be used as a detailed explanation of expenditure, nor are schools required to provide a detailed explanation through these tools. During interviews, one director, educational leadership (DEL) spoke about the variation in accounting and reporting across schools due to the discretion allowed by the system.

⁹ Schools are asked to report budget plans. However, these are prospective, and while this may be how schools actually end up spending their funding, this spending is not necessarily recorded under current financial systems, as discussed.

“Whether you use cost centres, general ledgers, work breakdown structures – you can present your money any way you want, as long as it makes sense to you. Whereas, shouldn’t we be mandating certain cost centres against those equity areas so that we know, we can go into Aboriginal loading and see actually the destination of most of that money?”

(Director, Educational Leadership)

In 2018, schools received approximately \$851 million in equity funding. Schools recorded spending approximately \$789 million. This \$62 million difference may not be all unspent funding, as it likely includes some uncategorised equity spending. The data shows that as uncategorised total spending increases, spending categorised as equity funding decreases. Unfortunately, it is not possible to determine how much of this difference is due to unspent funds and how much was simply not assigned to the relevant equity funding categories. However, given that approximately 93 per cent of equity funding is accounted for, it appears that schools have attempted to assign specific spending using the equity funding categories to a greater extent than they have using all spending categories.

Schools have spent funding in a variety of areas

In the 2019 CESE principal survey¹⁰, we asked principals to select the areas in which they had spent the funding they had received since the implementation of LSLD in 2018. Respondents could select multiple areas. Principals selected the following top five areas:

1. employing key staff (about 91%; 95% CI [89.8, 91.7] of principals selected this area)
2. implementing specific programs (about 82%; 95% CI [80.8, 83.2] of principals selected this area)
3. purchasing school resources (about 80%; 95% CI [78.2, 80.8] of principals selected this area)
4. providing personalised learning support (about 73%; 95% CI [71.1, 73.9] of principals selected this area)
5. teacher professional learning – in school (about 72%; 95% CI [70.6, 73.4] of principals selected this area).

Appendix G, Figure 30, contains a list of all areas selected by principals.

Except for purchasing school resources¹¹, these areas were very similar to those reported in the interim evaluation report.

¹⁰ Refer to Appendix G for technical details of the principal survey. Estimated proportions of principals' responses to the LSLD survey questions are presented in Figure 19 to Figure 30.

¹¹ This could be an additional main area that schools spent funding on in 2018, or the result of differences in methods of data collection. In 2019, schools were asked how they had spent the additional funding they received since the implementation of LSLD (including RAM and other funding). For the interim report, schools' annual reports were analysed to determine the main areas where they had spent their equity funding. The interim report found that schools spent their equity loadings in four main categories: employing key staff, enhancing learning support, planning and developing programs, and building staff capacity.

Given the limited information available in school system finance data, we cannot determine the relationship between the most commonly cited areas and the amount of expenditure in those areas. Overall, school principals may have more frequently selected one area than another, but this does not necessarily mean that they spent a greater amount of funding on that area than one that was less frequently selected in 2018.

The main types of above-establishment staff that schools hired were:

- student learning and support officers
- instructional leaders
- assistant principals
- English as an Additional Language / Dialect teachers
- Aboriginal education officers
- community liaison officers
- ICT support roles.

Schools have spent funding on increasing the wellbeing of disadvantaged students

In the absence of strong guidance from the department around how to spend funding to improve academic outcomes, some school staff told us that they directed funding towards areas of student health and wellbeing¹². Such spending typically targets areas of immediate need on the premise that doing so will have positive flow-on effects for student academic outcomes. For example, schools have funded mental health initiatives; speech therapy; occupational therapy; and funding for essential needs including excursions, clothing, and food. These are areas where changes in outcomes may not have been captured by the TTFM student survey, as efforts have been directed towards: (a) students who might be less likely to participate in the survey and/or (b) wellbeing outcomes that are not the subject of the survey.

Most school staff felt that the RAM funding could be spent flexibly to meet student need

Most school staff agreed that RAM funding provided flexibility for schools to manage resources to meet student needs. We estimated that only about 10 per cent (95% CI [8.7, 10.6]) of principals disagreed with this statement¹³. During our interviews, many principals from high need schools noted that substantial increases in funding, and greater predictability in that funding, enabled their schools to be more flexible and responsive to student need. Several principals also commented that the RAM was less prescriptive than the previous tied funding arrangement, which allowed schools to utilise funding more strategically and to focus on broader school needs.

12 Student wellbeing is described as the quality of a person's life and includes spiritual, cognitive, social, emotional and physical strategies within the NSW Department of Education Wellbeing Framework. Refer to: <https://education.nsw.gov.au/student-wellbeing/whole-school-approach/wellbeing-framework-for-schools>.

13 We conducted an analysis into five characteristics (school location, school type, school size, principal tenure and level of need) that could be related to responses to the principal survey questions. No single characteristic emerged as a predictor of responses to the survey. Therefore the results of this analysis are not reported here.

“I think the movement from the old tied budgets where you had no control over your money to a more flexible funding under the Resource Allocation Model, it has meant things like we can run strategic projects and initiatives in the school, employ staffing against that.”

(Principal, metropolitan secondary school)

The department allowed schools to use funding in ways that they saw best met need, rather than tying it to the source of that funding, for example to the RAM equity funding pool from which it was derived. Many principals appropriately combined equity funding into a single pool to be spent against need. Several school staff commented that being able to access a ‘single bucket’ of funding, rather than separate funding pools based on projects or specific cohorts of students, added to the increased flexibility of LSLD.

The predictability of the likely quantum of funding, through the RAM, also added to school certainty and enhanced their ability to plan over a longer timeframe than was the case with the previous model of tied program funding.

Chapter 4:

What has been the impact of Local Schools, Local Decisions on school management and local decision-making practices?

This section contains most of the data from the CESE principal survey, as well as interviews with school and departmental staff.

We asked participants in the principal survey to respond to statements about LSLD by selecting from the following five response options: strongly disagree, disagree, neither disagree nor agree, agree or strongly agree. To ease interpretation, we then summarised these responses into the following categories indicating:

- agreement or lack of agreement: agree (agree or strongly agree) vs did not agree (neither disagree nor agree, disagree or strongly disagree), or
- disagreement or lack of disagreement: disagree (disagree or strongly disagree) vs did not disagree (neither disagree nor agree, agree or strongly agree).

We have attempted to make survey responses as meaningful as possible by presenting them in terms of either agreement (or lack of agreement) or disagreement (or lack of disagreement), based upon the content and context of each statement. The summarised and full range of response options for each statement is presented in Figure 19 to Figure 29, Appendix G.

Reform areas: making decisions and managing resources

LSLD had a positive impact on schools' ability to make local, context-specific decisions

The 'Making Decisions' reform area of LSLD was intended to enable school leaders to respond directly to the learning needs of their students. In the principal survey, we estimated that about 63 per cent (95% CI [61.8, 64.8]) of principals agreed that LSLD had a positive impact on the extent to which schools could make local decisions that best meet the needs of schools. In interviews, schools staff echoed this view, with several principals saying they felt a greater sense of authority under LSLD and believed they had the trust of the department to make important decisions based on the context of their school. Many staff from higher need schools also said that they were now better placed to meet the wellbeing needs of their students, which they felt was critical to improving educational outcomes. However, a few school staff felt that they were still working in a largely restrictive environment, in which the department offered them a veneer of independence but ultimately remained in control of their actions.

Department tools did not support effective financial and administrative management

School staff described the finance tools associated with LSLD as difficult to use, often counterintuitive, and much more complicated than previous tools. The department did not adequately prepare SASS for the changes to these finance tools, which led to many of them being overwhelmed by the increase in the complexity of their role that was a direct result of these new tools.

In particular, school staff consistently mentioned encountering issues with LSLD's financial and administrative tools, particularly in the early years of the policy. Issues included poor implementation, insufficient training and support, lack of integration with other systems and school processes, unreliability of information, and poor user-experience design. Some school staff told us that they were unable to actually see reliable, real-time finance data in SAP. Several principals also said that they would need support or further training to manage their school's finances under the new systems and processes.

School staff also said that department support for system tools such as Quick Reference Guides and online training sessions had often been unhelpful or ineffective. While some SASS praised the support they had received from EdConnect, others were frustrated by the inefficiency of logging constant support requests for system tools.

Having said this, school staff also noted that both the functionality of the system tools and the support for those tools had improved significantly since they were originally introduced.

With regard to asset management and procurement, school staff said that they lacked clarity about when they should consult with the Asset Management Unit. They were also frustrated with the time that maintenance work took to get approved or carried out, and the lack of transparency around maintenance and procurement processes.

“So if you've got a job over a certain amount of money it has to be managed by the department. It has to go through tender. I understand all of that. But I'm frustrated that we are left so long before they act on it. It's not good enough. I had three meetings with the same team, going through the same information before they finally did something about it.”

(SASS member)

Most school staff felt that the RAM was fair and that funding was adequate

Through the principal survey, we estimated that about 9 per cent (95% CI [7.8, 9.6]) of principals disagreed that the RAM methodology is transparent. Most school staff agreed in interviews that the RAM predictably and transparently distributes funding¹⁴.

14 Note, the majority of schools visited were higher need schools that were entitled to a higher RAM funding load due to their sociodemographic characteristics. A description of how schools were selected for interview is outlined in Appendix H.

In terms of perceptions around equitable distribution, we estimated that about 18 per cent (95% CI [16.6, 19.0]) of principals disagreed that the RAM has distributed funding equitably to schools in direct relation to the needs of students. Some of this disagreement can be attributed to the fact that, as mentioned in the interviews, some school staff felt that their funding had not increased commensurately with the increase in their administrative burden. The NSW Primary Principals' Association and the NSW Secondary Principals' Council have stated that funding in lower need schools and small schools has not always been sufficient to meet student need (Appendix I).

Reform area: reducing red tape

The administrative burden for schools has increased during LSLD

The 'Reducing Red Tape' reform area of LSLD was intended to allow schools to focus on the priority of teaching and learning by reducing the administrative burden. However, we estimated that most principals (about 90%; 95% CI [89.2, 91.1]) did not agree that LSLD has simplified administrative processes for principals.

LSLD came with – or school staff associated LSLD with – many tools and processes such as the School Excellence Framework, the Learning Management Business Review (LMBR) system, the SAP finance system, and the new School Budget Allocation Report (SBAR). School staff, particularly principals and administrative staff, considered many of these tools and systems to be cumbersome, time-consuming, and complicated. For schools, the problem was twofold as LSLD had been introduced in parallel with multiple other large-scale reforms and policies, each with their own set of tools and departmental expectations. Furthermore, the department failed to communicate a consistent and cohesive narrative around LSLD's policies and tools, what actually constituted LSLD, and why these tools were important.

“For principals, the language wasn't clear for some things. So there's LSLD, there's LMBR, there's RAM, there's SBAR. We could have tightened up the language and kept communicating really, really well.”

(Department of Education stakeholder)

Several principals identified a need for clear, consistent information and guidelines to navigate and effectively carry out the expanding managerial scope of their role. These principals noted that implementation of LSLD did not include appropriate support around core functions they were now expected to perform, particularly financial management and administration.

“I'm certainly not an accountant... So, yes, I find it challenging, absolutely. I'm hoping, in a couple of years' time, once I've done it for a year or two and I'm getting better and better at it...I would like more time and probably more training on it and having more support around that. Certainly, I know for my [school administrative manager] as well.”

(Principal, non-metropolitan primary school)

LSLD lacked policy clarity, effective guidelines and adequate support

One of the reasons that LSLD struggled to achieve its aims was because of deficiencies in policy implementation. In addition to poorly designed tools, school staff told us that LSLD lacked policy guidelines that would have enabled schools to make decisions with greater confidence, and that they wanted stronger guidance from the department around which measures would lead to improved outcomes. Schools were also unsure about which areas they had authority over, and the extent of that authority, due to inconsistent messaging and policy guidelines from the department.

“I don't think, as an organisation, we focussed very much on the narrative, the big picture that we wanted to deliver. And what we didn't focus on is the detail of co-ordinating the implementation of all those things.”

(Department of Education stakeholder)

“So we went out with a great story and implementation, but we didn't have the systems and the policy – and even the internal communication around some of those things as tight and as co-ordinated as it needed to be. We didn't actually have a policy position. There were lots of little policies developed and refined and got rid of, but the LSLD policy – what does it mean to have greater local authority to make decisions in your school? We didn't have that.”

(Department of Education stakeholder)

Reform area: staffing schools

School staff criticised the loss of centralised staff and support systems under LSLD

Some school staff felt that, under LSLD, the department had reduced its capacity to provide system-wide support to schools. A few staff members were particularly concerned about the loss of central- or regional-level support such as curriculum consultants. Several teaching staff said that the loss of curriculum consultants had led to a deficit of guidance around pedagogy and programming. Non-metropolitan school staff said that they felt this loss particularly keenly as it was harder for them to access these staff and resources without departmental assistance.

Some schools were able to fill these gaps with training, advice or initiatives. For example, several schools employed instructional leaders to provide their staff with pedagogical guidance. However, these functions were previously carried out by the department and staff generally felt that it would be more effective and efficient if they continued to do so.

“We are now paying for positions that previously came to us automatically because of our disadvantage. So we no longer have the literacy teacher because we couldn’t afford to fund another body because of those other decisions that are made as to how we spend our money. Whereas before that position was an entitlement.”

(Instructional Leader, non-metropolitan secondary school)

LSLD increased schools’ ability to hire targeted staff, but some roles remained hard to fill

LSLD aimed to increase flexibility over the staffing mix in schools. In the principal survey, we estimated that about 88 per cent (95% CI [86.6, 88.7]) of principals did not disagree that schools had increased opportunities to employ staff to meet their students’ needs since the implementation of LSLD. In contrast, about 12 per cent (95% CI [11.3, 13.4]) of principals disagreed.

In interviews, schools leaders said they were able to hire additional staff, create new roles or restructure existing roles in order to address specific need within their schools. For example, some had created positions such as a stage-based deputy principal role, or an assistant principal wellbeing, to provide targeted support to specific cohorts of students.

However, the system still does not meet the staffing needs of schools. In interviews, principals often said they were not able to hire staff to meet specific student needs, as LSLD was intended to allow, as suitable candidates were simply not available; or that the flexibility that the policy promoted was not matched by adequate practical measures. For small and non-metropolitan schools in particular, specialist staff, such as counsellors or specialised subject teachers in particular, remained very difficult to access.

“Staffing itself hasn’t kept pace with innovation in the school space. So you go talk to a secondary teacher about trying to find someone from the pool who can teach a STEM class and we want generalist codes as opposed to physics. The department and the system needs to keep up with the innovation that LSLD has put into the workplace.”

(Director, Educational Leadership)

Some school staff also noted that the creation of above-establishment limited-duration positions, as well as a perception that an increasing number of staff were performing higher duties and therefore leaving their substantive positions to be filled by temporary staff members, had led to an increase in the number of temporary staff in schools.

LSLD had a limited impact on processes to support teacher performance and development

The 'Staff in Our Schools' reform area was intended to provide greater support to schools in enhancing performance management, professional development and teaching quality. We estimated that about 55 per cent (95% CI [53.0, 56.1]) of principals agreed that they were better able to support staff in their performance and development since the implementation of LSLD. However, during interviews, many school staff said that they did not associate LSLD with changes to support teacher performance and development.

Many schools had spent a substantial proportion of their RAM funding on professional learning for staff. However, school staff noted significant challenges associated with providing professional learning opportunities, including:

- limited ability to participate in professional learning due to a significant undersupply of appropriate casual cover, particularly in the context of complex needs students and regional and remote schools
- increasing casualisation of the teaching workforce
- high staff turnover in some schools, with teachers upskilling and then taking their expertise with them
- long travel distances and high costs for some non-metropolitan schools.

Performance and development plans (PDPs), while not implemented as part of LSLD, are intended to be linked to the school plan and professional standards, providing a benchmark for goal-setting and performance expectations. Although school staff generally spoke positively about using the PDP to identify professional development goals, principals said that the PDP was an ineffective tool when it came to managing staff performance. As one principal said, the 'support approach' to managing performance under the PDP framework was highly stressful and resource-intensive, and rarely resulted in an effective outcome. There are other reforms and programs that the department is implementing that more directly target performance and development, most notably the Teacher Performance Management and Improvement (TPMI) trial, currently under evaluation by CESE.

Reform area: working locally

LSLD funding has enabled increased community engagement in some schools

LSLD, through the 'Working Locally' reform area, was intended to support schools to strengthen consultation with local communities and to work in partnership to make a positive contribution to student learning. We estimated that about 63 per cent (95% CI [61.6, 64.7]) of principals did not agree that LSLD had a positive impact on the way schools consult with parents and the school community to inform their local decision-making, and about 79 per cent (95% CI [77.2, 79.8]) of principals did not agree that LSLD has had a positive impact on the way schools engage with local businesses and organisations.

School staff told us that funding associated with LSLD had enabled them to fund community-facing positions or community events which had had the effect of increasing their community engagement. For example, schools had used this funding to hire Community Liaison Officers or Aboriginal SLSOs in order to address the needs of their students. However, during interviews, school staff told us that they did not feel that LSLD contained concrete mechanisms through which they were able to increase community engagement, and that they would like more guidance and access to expertise in relation to increasing community engagement.

LSLD funding has enabled some schools to collaborate more effectively

The 'Working Locally' reform area also stated that strengthened local consultation would create opportunities for schools to share resources, including curriculum delivery, facilities and staff. A few schools, particularly small schools in non-metropolitan areas, said they had done this by creating communities of practice to share resources and pedagogical practice, often through the use of funding associated with LSLD. This provided greater flexibility to work around common barriers faced by small schools in rural and remote areas, such as small teaching staff, high fixed costs, casual cover, and geographical isolation. However, again, where such collaborative activities had occurred, schools had been encouraged to do so by the intent of the policy rather than with the assistance or the guidance of specific mechanisms within the policy.

“There’s 11 small schools joining together to program now and we’re looking at assessment across the school. I’m one of the two that are a two-teacher school. We all get together. We plan. We’ve done scope and sequence. We plan units. We plan assessment. We meet together and we’re doing moderating together now.”

(Principal, remote primary school)

Appendix A: Technical details of the measure of school need

With regard to LSLD, the concept of school need is best operationalised through the four RAM equity loadings. These loadings were intended to target those students who require additional support to perform at their best; thus schools that received more money through the four equity loadings were considered to have students with higher levels of need than schools of the same size that received less money through the equity loadings.

To operationalise school need, we summed the dollar values of the four RAM equity loadings for each year to create five composite measures of need for each school (one measure for each year where the four equity loadings were delivered in full to each school). We then fit a two-way mixed-effects model to the data to determine the absolute agreement between the five measures. This model can be written as:

$$y_{st} = \mu + r_s + c_t + e_{st}$$

where y_{st} represents the observed composite value for school s in calendar year t ; μ represents the overall mean; r_s represents the effect of school s ; c_t represents the effect of year t ; and e_{st} represents random error. While the r_s s and e_{st} s are assumed to be independent and identically distributed, the c_t s were fixed such that $\sum_t c_t = 0$ with variance $\theta_c^2 = \sum_t c_t^2 / 4$. This implies that the observed calendar years were the only time periods of interest. The absolute agreement intra-class correlation coefficient (ICC) is then given by:

$$ICC(AA) = \frac{\sigma_r^2}{\sigma_r^2 + \theta_c^2 + \sigma_e^2}$$

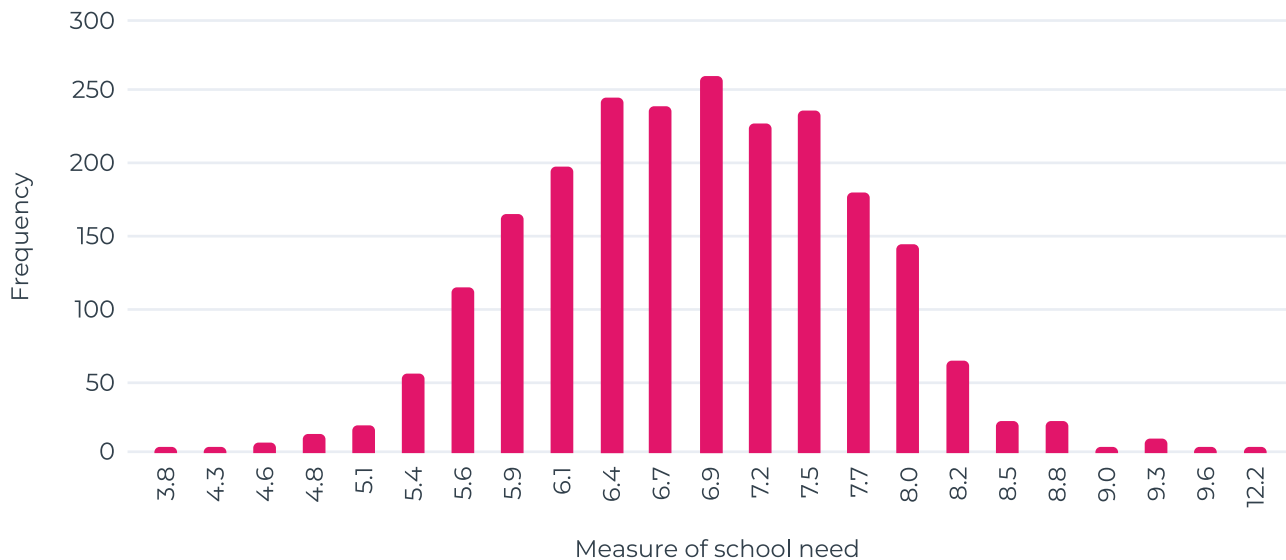
The individual ICC(AA) for the school need measures was .96, indicating a high level of agreement across calendar years. Given this result, the values for each school were averaged to create a single measure of school need. The scores were then standardised by the mean enrolment counts (ICC(AA) = .98) to make the scores comparable across schools of different sizes. A visual inspection of the scores revealed that the distribution had a large amount of positive skew, so we took the natural logarithm of each score to normalise the distribution. The final measure of school need is given by:

$$school\ need_s = \ln \left(\frac{\left(\frac{1}{5} \left(\sum_{t=2015}^{2019} \left(\sum_{k=1}^4 RAM\ equity\ loading_{stk} \right) \right) \right)}{\left(\frac{1}{5} \left(\sum_{t=2015}^{2019} \left(\frac{1}{4} \left(\sum_{c=1}^4 enrolment\ count_{stc} \right) \right) \right) \right)} \right)$$

where subscript s represents the school, subscript t represents the calendar year, subscript k represents the type of equity loading, and subscript c represents the scholastic term. We present the distribution of the final scores of the measure of need in Figure 1. A school at the 10th percentile received about \$320 per student per year while a school at the 50th percentile received about \$953 per student per year. A school at the 90th percentile received about \$2,729 per student per year.

Figure 1

Histogram of school need values



Appendix B: History of school devolution (national and international)

In this literature scan, we provide an overview of the history of school devolution in Australian public education, and the relevant history of school devolution internationally (with a focus on the United Kingdom (UK) and the United States (US) in particular). We also briefly outline how school devolution is conceptualised and implemented within the context of the LSLD education reform. This is not a comprehensive review, but rather outlines relevant developments in school devolution nationally and internationally.

What is school devolution?

The term 'school devolution' has no fixed, singular definition. That multiple definitions are used is reflective of its complexity, both conceptually and in practice, and the range of views and practices that are attributed to the term (UNESCO 1999, Sugget 2015).

'School devolution' is one of many terms used to describe the act of giving schools more responsibility for decision-making. There are subtle differences in meaning between some of these terms, arising from differences in the degree and nature of decision-making powers granted to schools. However, these terms are also used interchangeably at times (Sugget 2015). Terms used in place of 'school devolution' include: school-based management; site-based management; school-based decision-making; site-based management; school-site management; self-managing school; school-based budgeting; local management of schools; administrative decentralisation; decentralisation (UNESCO 1999; Moradi, Bin Hussin & Barzegar 2012; NSW Teachers Federation n.d.; Hopkins 2015; The University of Melbourne 1993).

In this literature scan we will largely use the term, 'school-based management' (SBM). We will reserve the use of the following definition:

‘[SBM]...refers to the management of resources at the school level rather than at a system or centralized level... Through SBM, schools are provided with more control over the direction that the organization will pursue. Both its goals and strategies for reaching them are primarily determined at the school level.’

(UNESCO 1999, p. 35)

Broadly, the resources being managed at the school level may include: finance (decisions on budgeting); technology (decisions on the methods of teaching and learning); material (decisions on facilities, supplies and equipment); people (decisions on allocating staff); power (the authority to make decisions); time (decisions on the allocation of time); knowledge (decisions relating to the curriculum) (Bullock & Thomas 1997, p. 7). The types of decision-making powers given to schools differ from country to country (Townsend 1996; Flinders University 2001).

Autonomy vs. authority

The NSW Department of Education (2012a) makes a distinction between school authority and school autonomy. Autonomous schools are independent or self-governing. In contrast, NSW schools belong to a system of public schools, with this system providing to schools common frameworks and values for school operations, curriculum and assessment (Education Council, 2007). Schools in NSW are therefore not self-governing. LSLD gives schools more authority to make school-based decisions, while conserving schools' ability to draw on support from the state-wide public education system (NSW Department of Education 2012a).

What is the history of school devolution?

In the context of education reform, the aim of transferring decision-making power from the national/central levels of education systems to the local levels began in the early 1980s (OECD 2018a, p. 408). SBM had become the hallmark for restructuring public education by the early 1990s (Caldwell and Spinks 1988; Caldwell and Spinks 1992; David 1989; Dimmack 1993a; Dimmack 1993b; O'Donoghue & Dimmack 1998; Townsend 1997, as cited by UNESCO 1999). The restructure movement was reflective of an international trend (Bullock & Thomas 1997; Beare 1991), and featured in many English-speaking countries including the UK, the US, New Zealand and Canada (UNESCO 1999; The University of Melbourne 1993; Flinders University 2001).

OECD countries pursued the restructure movement with the same broad aim of better managing education so that it was:

- ...more efficient, more accountable, and more responsive to government policies, to introduce corporate management approaches from the business sector, to devolve more responsibility to regions and schools, and to place much greater emphasis on educational outputs.!

(Harman 1991, p. 3)

What is the history of school devolution in Australian public education?

Public schools in Australian states and territories operated under highly centralised arrangements for longer than a century (Flinders University 2001). Decentralisation of public education systems began in the 1970s (Flinders University 2001), but the 1980s saw 'major and often simultaneous' restructuring of public schools across Australian government education departments and agencies (Harman 1991). Schools were given 'a significant amount of authority and responsibility' to make decisions about resource allocation, though decision-making took place within a context of 'centrally determined goals, policies, standards and accountabilities' (Salokangas & Alnscow 2018, p. 7). By 1998 all states and territories had introduced SBM in their school systems with the help of legislation (Zadja & Gamage 2009).

New South Wales (NSW)

Historically, the public schools system in NSW was considered to be 'one of the most centralised systems in Australia' (Educational Transformations 2007; Swan & Winder 1991), with schools having little authority (The University of Melbourne 1993). Though a degree of decentralisation took place in the late 1980s, this reverted to more centralised management from the early 1990s (Educational Transformations 2007). 'Professional caution'; changes in government; resistance to scrutiny from policymakers and the federal government; strong teacher unionisation; and a degree of conservatism in the teaching and administrative workforces are some factors that have been cited as explanations for the historically high degree of centralised management in the NSW public school system (Martin & Macpherson 2015, p. 39)

Victoria (VIC)

Like the ACT and South Australia, Victorian schools had established governing bodies at schools by 1976 (Zadja & Gamage 2009). The Education and Training Reform Act 2006 clarified school councils' functions, powers and governance responsibilities. School council responsibilities include establishing the direction and vision for the school, making resource arrangements (goods, services, facilities, equipment) and ensuring school funds are used appropriately (Gamage 2009). School councils also have the authority to employ teaching or non-teaching staff on fixed-term or sessional bases, but the school principal bears responsibility for recruitment and staff performance assessment and professional development. The principal is an executive officer of the school council (Education Council 2007). The Victorian school system is cited to be the most devolved system in Australia (Victorian Competition & Efficiency Commission 2013).

Queensland (QLD)

Queensland's public schools system was characterised by high degrees of centralisation and bureaucracy until the 1980s (Lingard, Hayes & Mills 1999). In the 1990s three key reports and documents guided progressive developments in SBM in Queensland: Focus on Schools (Department of Education 1990, as cited by Lingard, Hayes & Mills 1999), Leading Schools (Education Queensland 1997, as cited by Lingard, Hayes & Mills 1999) and Future Directions for School Based Management in Queensland State Schools (Education Queensland, 1998, as cited by Lingard, Hayes & Mills 1999).

Most recently, the Independent Public Schools (IPS) initiative was introduced in Queensland in 2013, and is based on Western Australia's IPS program (Heffernen 2019). The aims of the initiative were to provide QLD public schools with greater autonomy for making local decisions, and increase the capability for working in ways that would maximise student learning outcomes (The Department of Education, Queensland 2018).

Western Australia (WA)

In the 1980s two reviews of the WA education system introduced 'unprecedented change' to the WA education system (Wilson & Smart 1991, p. 253). The report from the first review, The Beazely Report (1984), led to changes in the school curriculum. The report from the second review, the Better Schools Report (1984), led to major changes in the management of Western Australian schools (Wilson & Smart 1991). Schools were given more decision-making powers and administrative and financial responsibilities. In the interest of decentralisation there was a reduction in the number of positions in the central office and changes to roles (Wilson & Smart 1991).

WA's IPS initiative was introduced in 2009. The aim of the initiative was to give schools more control, reduce bureaucracy, improve schools' efficiency and effectiveness, and by doing so, improve student outcomes (The Department of Education, Western Australia 2013). Schools that apply for IPS status and qualify are given some mandatory responsibilities, while other responsibilities are optional. For example, IPS are required to select and appoint staff and manage a one-line budget; however, they can choose whether or not they wish to offer different curricula (The Department of Education, Western Australia 2013). On the whole, responsibilities cover curriculum, student support, HR, management and financial management and procurement. Independent schools still belong to a system of schools (Gobby 2019) and continue to draw on support from the WA Department of Education (The Department of Education, Western Australia 2013).

South Australia (SA)

In the 1970s, South Australia established school advisory councils and increased principals' authority (The University of Melbourne 1993).

Each South Australian school has a governing council or school council. School principals work with the councils to govern their schools (South Australia Department of Education n.d. a). In the case of governing councils, the council and the principal have joint responsibility for managing the school (South Australia Department of Education n.d. b). Joint responsibilities include setting the school's broad direction and vision, determining the school policies (for example, regarding safety, welfare and behaviour, and deciding on appropriate resource allocation and reviewing the school budget (South Australia Department of Education, Training and Employment 2014). School councils provide advice to the principal on the school's direction and goals, but do not have any governing powers (South Australia Department of Education, n.d. c). The powers of the governing council and school council are conferred under the Education Act 1972 (South Australia Department of Education n.d. d, South Australia Department of Education n.d. e).

The Education Act 1972 has been replaced by the Education and Children's Services Act 2019 (South Australia Department of Education n.d. f).

Tasmania (TAS)

In contrast to the 'turbulence' (Caldwell 1991, p. 212) and 'dislocating changes' (p. 207) induced by the move to SBM in some other Australian states, the 1980s was largely a period of relative stability for Tasmanian schools (Caldwell 1991). At the start of the decade, Tasmanian schools had more decision-making powers in resource allocation than other states, and thereafter made only incremental changes towards SBM until 1989 (Caldwell 1991). A review of the school system in 1989 led to a major restructure in 1990 and 1991, which resulted in dramatic cuts in staff at the central level, the dismantling of regional structures into smaller district units, and a push for self-management in schools (Caldwell 1991; The University of Melbourne 1993).

More recently, Tasmania's Student at the Centre Plan (2006-07) has given schools increasing levels of authority over resources and school management via four Learning Services (Education Council 2007). Learning Services provide regional support to schools in areas such as curriculum, professional learning, assessment, HR, finance and facilities (Education Council 2007; Educational Transformations 2007).

Australian Capital Territory (ACT)

Public schools in the ACT are managed directly by the ACT Department of Education and Training. SBM has been in place in ACT schools since 1976, when the ACT Schools Authority Act was established. In accordance with the Act, school boards became the governing bodies for schools and made decisions on educational policies; resources (staff, facilities, equipment etcetera); and expenditure (Gamage & Zajda 2009). In 1997 ACT schools were given direct powers over school budgets and management of school facilities under the Enhanced School-Based Management policy (Educational Transformations 2007). Since then, schools have also been given more power to make staffing decisions (ACT Department of Education and Training 2004).

Northern Territory (NT)

Public schools in the NT passed to the control of the NT Government in 1976. In 1979 the Education Act incorporated school councils, which are responsible for governing individual schools. School councils are also responsible for the school budget, which finances everything apart from the salary costs of continuing staff (Education Council 2007; The University of Melbourne 1993). In non-incorporated school councils, budgeting responsibilities are handled by the principal who is designated as the school management council (Education Council 2007). The large number of remote schools with high proportions of Indigenous students accounts for the high degree of decentralisation in the NT (Educational Transformations 2007).

What is the relevant history internationally?

The levels at which decisions about schools are made differ from country to country. Depending on the degree of decentralisation, decisions can take place at the central/national level, the regional/state level, the local level or the school level (OECD 2018a).

In the USA and Canada, SBM has taken place at the school-district level. In England and Wales, two models existed: one model comprised Locally Managed Schools (LMS), in which schools were attached to a Local Education Authority (LEA); the second model consisted of Grant Maintained Schools (GMS), which were fully funded by the federal government. Having abolished their LEAs, individual schools in New Zealand also manage schools in partnership with the federal government. In Australia, depending on the degree of decentralisation in the various states, some decisions are made at the state level and others at the school level (Townsend 1996).

United Kingdom (UK)

There is said to be 'a strong degree of decentralisation' for school systems in England, Northern Ireland, Scotland and Wales (Arnone, 2013 p. 205). The development of SBM in the UK, particularly England and Wales¹⁵, was heavily influenced by the Education Reform Act 1998. A 'local management of schools' scheme was one of the major reforms introduced by the Act, with schools given power over budget (determined by a resource-allocation model) and staffing decisions (hiring and firing decisions, made by a board of governors at each school) (Wirt 1991).

15 The differences in the education legislation between England and Wales are minor. The legislation in Scotland and Northern Ireland is different from the legislation in England and Wales (Levinson, Cookson & Sadovnik 2002).

Schools in England were traditionally funded by the local authority in their area, with 152 local authorities across the country. A more recent development is the academies program. Academies are funded by the national government and their operating terms are set out in individual funding agreements. Academies are 'self-governing non-profitable charitable trusts', and operate in accordance with the terms of individual funding agreements (p. 4).

Introduced in 2001, academies originally replaced 'failing' low-performing urban secondary schools (Salokangas & Ainscow 2018, p.5). Since 2010, the program has faced 'rapid expansion' and spread beyond these schools to introduce system-wide structural change across all English schools (p. 4). New schools opening in England are now required to be 'free schools' and legally operate under the academies legislation (p. 5). This restructuring is considered to be one of the 'most radical and encompassing programs' to take place in advanced countries more recently (p. 5).

United States (US)

SBM gained its foothold in the US because of growing concern over school productivity (Wirt 1991). In 1983, a report ('A Nation at Risk: The Imperative for Education Reform') was published that warned of a crisis in public education and advocated reform and restructuring to address this crisis (Wilkinson, Niesche & Eacott 2019).

In the mid-1980s, almost all states introduced a set of reforms that sought to address the quality of education. In the 1990s, a second wave of reforms introduced school-level decision-making by way of targeting choice (for example, the choice for students to attend schools of their parents' choosing or a school that was outside of their LEA) (Wirt 1991). Since the 1980s, the range of educational reforms implemented in the US to incentivise education include the introduction of charter schools; private management of schools; school vouchers and tax credits; and other market mechanisms (Lubienski & Lubienski 2014; Ravitch, 2014, as cited by Wilkinson, Niesche & Eacott 2019 p. 5). Some critics have argued that these reforms have increased poverty and inequity and that students in private schools perform worse than students in public schools (Wilkinson, Niesche & Eacott 2019).

Other international evidence

The OECD (2018b) has examined the design and implementation of education policies and practices across 70 countries over a 20-year span. They underpin this work in the context of how best to build a 21st century school system.

The OECD (2018b) makes the following recommendations for embedding school autonomy more effectively. While they specifically refer to autonomy rather than authority, nonetheless, some of the same lessons would appear to apply.

- For autonomy to lead to improvements in school performance, schools must first set clear expectations for students. Schools must then have enough power to determine the best way to achieve those expectations within individual school contexts.
- For autonomy to lead to innovation, schools should be free to work flexibly with many partners. Partners could include schools' local school communities and other schools within individual principal networks.
- For autonomy to lead to good student outcomes, teachers across schools should share knowledge about their work. Autonomy is more beneficial for school outcomes when teachers learn from their peers and work within a culture of accountability. For example, teachers could share knowledge about what works, for whom, and in what circumstances.

How does LSLD fit into this?

Policy context

The NSW Government made a commitment to increasing local decision-making in schools when it came to power in 2011. Given the global trend of investing schools with more authority to make (local) decisions, there was a drive to align NSW public schools with schools in high-performing education systems internationally (NSW Department of Education and Communities 2012b).

OECD research provides evidence of a relationship between school autonomy and accountability and improved student outcomes, in instances where autonomy and accountability are 'intelligently combined' (OECD 2010, as cited by NSW Department of Education and Communities 2012b, p. 26). The report on the public consultation on LSLD carried out by the NSW Department of Education (2012b) acknowledged that there is mixed evidence on the impact of SBM on student outcomes (NSW Department of Education and Communities 2012b).

Financial context

NSW Treasury (2011) first announced its plans for public-school reform in the 2011-2012 Budget Statement, under the heading, 'Delivering on structural fiscal and economic reform' (p. 14). Treasury noted that Government consultations on the reform had begun, and included discussions about giving schools more flexibility for managing resources, and cutting red tape so that teachers could focus on teaching and learning (p. 15).

In 2012, the NSW Commission of Audit highlighted that devolution of services in Education (and Health) would not necessarily result in 'a significant change in expenditure in aggregate' (p. 90), but would likely involve a 'reallocation of existing funding' (pp. 90-91). In other words, it was expected that the '[expenditure] increases at a school level' should be offset by 'expenditure decreases at the centre', such that the 'aggregate budget will be generally stable' (p. 91).

LSLD implementation

In 2011, in setting out the LSLD policy direction, the Minister for Education proposed 11 reform outcomes, which included: making local decisions to improve teaching and learning; schools directly managing a percentage of the total education budget; funding allocations based on school and student need; and schools having more authority on school maintenance and purchases (NSW Department of Education and Communities 2012b). The reform outcomes fell into five reform areas: making decisions, managing resources, staffing schools, working locally and reducing red tape.

LSLD, introduced in 2012, aimed 'to give NSW Government schools more authority to make local decisions about how best to meet the needs of their students' (Centre for Education Statistics and Evaluation 2018, p. 8). LSLD also introduced a needs-based school funding model as a key element of the reform (NSW Department of Education and Communities 2012b).

Appendix C: Our statistical approach – significance testing vs estimation

When assessing the effects of a policy or intervention, the true effects of that policy or intervention are impossible to know with absolute certainty. While it is often possible to estimate the true effects with some degree of precision, uncertainty necessarily arises when a finite number of observations (for example, a particular group of school principals) are sampled from a larger population (for example, all possible school principals). To account for this inherent bias – commonly known as sampling error – researchers use various statistical techniques.

One way of accounting for sampling error involves null hypothesis significance testing (NHST). This process calculates the probability of a range of results based on an assumption that no true effect exists in the population. When this probability is small, researchers reject the null hypothesis (for example, the intervention did not have an effect) and instead conclude that there is a true effect in the population (for example, the intervention did have an effect).

While NHST has been the preeminent approach to statistical inference, there is mounting evidence that the results from NHST are commonly misinterpreted. Critics argue that NHST promotes dichotomous thinking that simply focuses on whether an observed result is statistically significant or not (Cumming 2014). This thinking can result in statistical significance being incorrectly equated with importance or practical significance on a policy level.

In recent years, some researchers have begun to move away from NHST and towards the notion of estimation. In contrast to NHST, which relies on the calculation of p values, estimation relies on the calculation of point and interval estimates, emphasising the magnitude of the estimated effect and the precision with which it has been estimated. Advocates of this approach claim that a focus on estimation promotes a greater appreciation of the practical significance of research findings, rather than just a narrow focus on whether or not findings are statistically significant.

The distinction between practical significance and statistical significance is particularly important for the type of work at CESE. Working with large datasets can allow us to estimate certain effects with a high degree of precision. Under NHST, these effects are almost always statistically significant, even when they have little or no practical significance. Conversely, there are times when our estimates contain a large amount of uncertainty, yet we still need to provide clear guidance about the effectiveness of a policy or intervention.

We contend that, for the purposes of our work, NHST does not best support evidence-based decision-making. For this report we have used estimation thinking rather than NHST when making inferences. To this end, we interpret the results of our analyses using point estimates and 95 per cent confidence intervals (CIs). While we consider a point estimate to be the best estimate of the true value under investigation, we consider any value within an interval as a plausible value for the true effect, with the upper limit representing the best case scenario and the lower limit representing the worst case. We consider any value outside the interval as relatively implausible, although not impossible. We consider this range of plausible values in our analyses, and find substantively similar results. Therefore we do not discuss these ranges in the body of the report.

Appendix D: Technical details of NAPLAN analysis

We used data from NAPLAN to investigate whether student academic performance changed after the introduction of the LSLD reforms. Specifically, we investigated whether students from higher need schools showed greater improvements on NAPLAN assessments than students from lower need schools. The technical details of the measure of school need are presented in Appendix A.

Our analysis included data from the 2,066 New South Wales (NSW) Government schools that had at least one valid NAPLAN observation for each calendar year in the time series (2011 to 2019). We selected these calendar years as they captured the period immediately before the introduction of the LSLD reforms up until the most recent assessment data. We present the number and percentage of students participating in the NAPLAN Reading and Numeracy assessments each calendar year in Table 5.

Of the NAPLAN assessments that measure literacy skills, we selected the Reading domain for analysis. We chose this domain because it measures more strands of literacy than the Spelling and Grammar and Punctuation domains and because results from the Writing domain are not considered as reliable, due to additional bias such as marking differences between states and territories and potential prompt effects. We used scaled scores because they represent the most granular level of measurement produced by NAPLAN assessments.

We used latent growth curve models to estimate school-specific changes in academic performance across calendar years. These models allowed us to relate school-specific changes in scaled scores to school need. By smoothing year-to-year changes, these models also helped minimise the impact of any test effects that may not have been fully accounted for in the test equating process.

Our model building procedure involved four stages of model selection. In each stage, we compared the fit of several candidate models, with the preferred models taken forward into the next stage of analysis. The first stage aimed to find the most appropriate way to partition the total variance in the different outcomes while the second stage aimed to find the set of parameters that best captured the average change across the time series. The third stage aimed to find the set of parameters that best captured the collection of school-specific changes across time, and finally the fourth stage aimed to compare the growth trajectories for higher need schools to those for lower need schools. We present the estimated parameter values from all our different model specifications at the end of this appendix in Table 11 to Table 18. The following sections provide detailed information and results regarding each stage of our analysis.

Table 5

Number and percentage of students participating in NAPLAN Reading and Numeracy assessments each calendar year

	Scholastic year							
	Year 3		Year 5		Year 7		Year 9	
	n	%	n	%	n	%	n	%
Reading								
2011	57851	95.8	58363	96.2	49783	95.2	50142	92.2
2012	58363	95.4	56903	95.5	48772	94	48606	90.4
2013	59303	95.8	57427	96	48673	95	48216	91.2
2014	62047	95.7	58331	95.8	47564	94.2	47589	90.5
2015	64778	95.6	59001	95.7	47679	94.1	47318	90.1
2016	66372	95.7	61596	95.8	48436	94.3	46488	89.9
2017	65597	95.3	64235	95.6	48925	94.4	47298	91.6
2018	65558	95.1	65668	95.9	50957	93.8	47179	90
2019	66157	99.1	64744	99.3	52997	98.3	47020	97.2
Numeracy								
2011	57703	95.6	58120	95.8	49384	94.4	49572	91.1
2012	58136	95	56675	95.2	48437	93.4	47878	89
2013	59120	95.5	57217	95.7	48237	94.1	47622	90.1
2014	61914	95.5	58187	95.6	47292	93.6	47015	89.4
2015	64515	95.2	58805	95.4	47235	93.3	46705	88.9
2016	66148	95.4	61370	95.5	47990	93.4	45864	88.7
2017	65367	95	64048	95.3	48651	93.8	46969	91
2018	65214	94.6	65197	95.2	50484	92.9	46493	88.7
2019	65749	98.5	64303	98.6	52274	96.9	46145	95.3

Model building – stage one

The first stage of our model building process involved comparing three unconditional models, each with different random-effect structures. We used these models to determine the most appropriate way to partition the total variance in the different NAPLAN outcomes. The first model in this stage can be written as:

$$\text{Model 1: } \textit{scaled score}_{is} = \beta_{00} + v_s + e_{is}$$

where *scaled score*_{is} represents the relevant NAPLAN scaled score for student *i* in school *s*. This model has a classic two-level structure with students nested within schools. The errors in the model are assumed to be normally distributed with constant variance ($v_s \sim N(0, \sigma_v^2)$ and $e_{is} \sim N(0, \sigma_e^2)$). Furthermore, as the errors are hierarchical, they are assumed to be uncorrelated with one another ($Cov(v, e) = 0$).

While Model 1 accounts for overall school-effects, it effectively ignores the time component of the data. To incorporate time-effects, the second model in stage one nested students within calendar year-school clusters. This model can be written as:

$$\text{Model 2: } \textit{scaled score}_{it} = \beta_{00} + u_t + e_{it}$$

where *scaled score*_{it} represents the relevant NAPLAN scaled score for student *i* in calendar year-school cluster *t*. The calendar year-school clusters represent groups of students who took the relevant assessment at the same school in the same calendar year. We created these clusters by crossing the school and calendar year codes. Students who took the relevant assessment at the same school but in different calendar years belong to different clusters. The assumptions regarding the error components are the same as those for Model 1.

While Model 2 incorporates the time component of the data, it does not account for overall school-effects. To separate overall school-effects from time-effects, the third model in stage one had a three-level structure. This model can be written as:

$$\text{Model 3: } \textit{scaled score}_{its} = \beta_{000} + v_s + u_t + e_{its}$$

where *scaled score*_{its} represents the relevant NAPLAN scaled score for student *i* in calendar year-school cluster *t* in school *s*. In Model 3, students are nested within calendar year-school clusters, which are in turn nested within schools. Like Models 1 and 2, the errors in Model 3 are assumed to be normally distributed with constant variance ($v_s \sim N(0, \sigma_v^2)$, $u_t \sim N(0, \sigma_u^2)$ and $e_{its} \sim N(0, \sigma_e^2)$) and are hierarchically structured ($Cov(v, u) = Cov(v, e) = Cov(u, e) = 0$). This random-effects structure has been proposed by Fairbrother (2014) as the most appropriate specification for repeated cross-sectional data.

To determine which model best partitioned the total variance in the different outcomes, we estimated each model using full maximum likelihood. We then used two types of information criteria (Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC)) and likelihood ratio tests (Raudenbush and Bryk 2002) to compare the fits of the different models. We present the model comparison results from stage one in Table 6. These results showed that the more complex three-level model was preferred for each outcome.

Table 6
Model comparison results from stage one

	AIC	BIC	$X^2_{(d)}$		(p)
NAPLAN Reading					
Year 3					
Model 1	6640252	6640286	2457	vs. Model 3	<.005
Model 2	6652284	6652317	14489	vs. Model 3	<.005
Model 3*	6637797	6637842	–	–	–
Year 5					
Model 1	6289897	6289931	2075	vs. Model 3	<.005
Model 2	6303549	6303583	15727	vs. Model 3	<.005
Model 3*	6287825	6287870	–	–	–
Year 7					
Model 1	4965980	4966013	919	vs. Model 3	<.005
Model 2	4974682	4974715	9621	vs. Model 3	<.005
Model 3*	4965062	4965106	–	–	–
Year 9					
Model 1	4793799	4793832	1544	vs. Model 3	<.005
Model 2	4800887	4800920	8632	vs. Model 3	<.005
Model 3*	4792257	4792301	–	–	–
NAPLAN Numeracy					
Year 3					
Model 1	6448922	6448956	3219	vs. Model 3	<.005
Model 2	6460169	6460203	14467	vs. Model 3	<.005
Model 3*	6445705	6445750	–	–	–
Year 5					
Model 1	6167849	6167883	2126	vs. Model 3	<.005
Model 2	6182943	6182977	17221	vs. Model 3	<.005
Model 3*	6165725	6165769	–	–	–
Year 7					
Model 1	4927630	4927663	2053	vs. Model 3	<.005

	AIC	BIC	$X^2_{(d)}$		(p)
Model 2	4935923	4935956	10345	vs. Model 3	<.005
Model 3*	4925579	4925623	–	–	–
Year 9					
Model 1	4726677	4726709	4271	vs. Model 3	<.005
Model 2	4731713	4731746	9308	vs. Model 3	<.005
Model 3*	4722407	4722451	–	–	–

Once we determined the preferred random-effects structures, we used the estimated variance components from the preferred models to calculate level-2 intra-class correlation coefficients. The level-2 intra-class correlations represent the proportion of the total variance that occurs between calendar years and can be calculated using the following formula (Hedges, Hedberge & Kuyper 2012):

$$\rho_2 = \frac{\hat{\sigma}_u^2}{\hat{\sigma}_v^2 + \hat{\sigma}_u^2 + \hat{\sigma}_e^2}$$

We present the estimated standard deviations and intra-class correlations from the preferred models in Table 7. These results showed that there was only a very small amount of variation across calendar years for each outcome. This means that knowledge of the calendar year in which a particular student took an assessment provides some (albeit only a little) information about their expected score, and that some of the variation across time may be explained by either time-varying or time-invariant school-level information.

Table 7

Estimated standard deviations and intra-class correlations from the preferred models from stage one

	Reading				Numeracy			
	Year 3	Year 5	Year 7	Year 9	Year 3	Year 5	Year 7	Year 9
Level-1 intercept ($\hat{\sigma}_e$)	84.2	75.6	64.7	63.4	72.6	69.3	64.8	62.7
Level-2 intercept ($\hat{\sigma}_u$)	11.5	9.7	5.7	6.8	10.6	8.7	7.3	9.3
Level-3 intercept ($\hat{\sigma}_v$)	37.4	35.3	45.7	42.5	32.5	33.7	53.6	50.8
Level-2 intra-class correlation (ρ_2)	.015	.013	.005	.008	.017	.013	.008	.013

Model building – stage two

Once we determined the most appropriate random-effects structure in the first stage of the model building process, the second stage involved determining the most appropriate functional form for the average growth curve (Curran, Obeidat & Losardo 2010). In other words, the second stage aimed to find the set of parameters that best captured the average change across time for each outcome. Building on the preferred models from stage one, the three growth models assessed in stage two had different fixed-effects specifications. These three different specifications represented linear, quadratic and cubic growth curves, respectively. The first model in stage two can be written as:

$$\text{Model 4: } \textit{scaled score}_{its} = (\beta_{000} + v_s + u_t + e_{its}) + (\beta_{010}) \cdot \textit{time}_{its}$$

where \textit{time}_{its} represents a linear predictor for time (taking the value 0 for the initial calendar year and increasing by 1 for each subsequent calendar year). With the above specification, the estimate of β_{000} represents the expected mean school-specific starting value while the estimate of σ_v^2 represents the variability across the school-specific starting values. More importantly, the estimate of β_{010} represents the fixed linear effect of time, which is assumed to be the same for each school. That is, the estimate of β_{010} represents the average growth that occurred each calendar year.

While Model 4 captures the average growth that occurred each calendar year, the model specification does not allow the growth rate to change across time. Importantly, it may be the case that the growth rate was higher (or lower) earlier in the time-series. To allow the growth rate to vary across time, the second model in stage two included a quadratic growth component. This model can be written as:

$$\text{Model 5: } \textit{scaled score}_{its} = (\beta_{000} + v_s + u_t + e_{its}) + (\beta_{010}) \cdot \textit{time}_{its} + (\beta_{020}) \cdot \textit{time}_{its}^2$$

where \textit{time}_{its}^2 represents the quadratic growth component. With the above specification, the estimate of β_{010} represents the initial growth rate while the estimate of β_{020} represents the change to the growth rate for each additional calendar year.

While Model 5 allows the growth rate to vary across time, the model does not allow the rate of change to vary. In other words, the growth curve is restricted to one inflection across the time-series. To allow the growth curve to have a second inflection, the third model in stage two included a cubic growth component. This model can be written as:

Model 6:

$$\textit{scaled score}_{its} = (\beta_{000} + v_s + u_t + e_{its}) + (\beta_{010}) \cdot \textit{time}_{its} + (\beta_{020}) \cdot \textit{time}_{its}^2 + (\beta_{030}) \cdot \textit{time}_{its}^3$$

where \textit{time}_{its}^3 represents the cubic growth component. With the above specification, the estimate of β_{010} still represents the initial growth rate, but the estimate of β_{020} now represents the initial change to the growth rate for each additional calendar year. The estimate of β_{030} represents the degree to which the change in the growth rate changes with each additional calendar year.

We restricted our search for the most appropriate average growth curve to a curve with two inflections. This restriction served to maintain parsimony and avoid overfitting. Also, there were no good theoretical reasons to suggest that the average growth curve would have more than two inflections across the time-series. We present the model comparison results from stage two in Table 8. The results showed that the average growth curve for each outcome was cubic in nature.

Table 8**Model comparison results from stage two**

	AIC	BIC		$X^2_{(d)}$	(p)
NAPLAN Reading					
Year 3					
Model 4	6637334	6637391	45	vs. Model 6	<.005
Model 5	6637302	6637369	10	vs. Model 6	<.005
Model 6*	6637293	6637372	–	–	–
Year 5					
Model 4	6287584	6287640	103	vs. Model 6	<.005
Model 5	6287585	6287652	103	vs. Model 6	<.005
Model 6*	6287484	6287563	–	–	–
Year 7					
Model 4	4965064	4965119	59	vs. Model 6	<.005
Model 5	4965065	4965131	58	vs. Model 6	<.005
Model 6*	4965009	4965086	–	–	–
Year 9					
Model 4	4792233	4792288	15	vs. Model 6	<.005
Model 5	4792233	4792299	13	vs. Model 6	<.005
Model 6*	4792222	4792298	–	–	–
NAPLAN Numeracy					
Year 3					
Model 4	6445521	6445577	210	vs. Model 6	<.005
Model 5	6445339	6445407	26	vs. Model 6	<.005
Model 6*	6445315	6445394	–	–	–
Year 5					
Model 4	6165718	6165774	262	vs. Model 6	<.005
Model 5	6165522	6165590	65	vs. Model 6	<.005
Model 6*	6165460	6165538	–	–	–
Year 7					
Model 4	4925265	4925320	49	vs. Model 6	<.005

	AIC	BIC	$X^2_{(d)}$		(p)
Model 5	4925241	4925307	23	vs. Model 6	<.005
Model 6*	4925220	4925297	–	–	–
Year 9					
Model 4	4722218	4722273	20	vs. Model 6	<.005
Model 5	4722213	4722279	13	vs. Model 6	<.005
Model 6*	4722202	4722279	–	–	–

Model building – stage three

Once we determined the most appropriate fixed-effects specifications for each outcome, we altered the specifications such that the different growth components were allowed to vary across schools. That is, the third stage aimed to find the set of parameters that best captured the collection of school-specific growth trajectories over time. The first model in stage three allowed the linear growth component to vary across schools. This model can be written as:

$$\text{Model 7: } \textit{scaled score}_{its} = (\beta_{000} + v_{0s} + u_t + e_{its}) + (\beta_{010} + v_{1s}) \cdot \textit{time}_{its} + (\beta_{020}) \cdot \textit{time}_{its}^2 + (\beta_{030}) \cdot \textit{time}_{its}^3$$

where the estimate of $\sigma_{v_1}^2$ represents the variability across the school-specific linear growth rates. We estimated the models with unstructured covariance matrices such that:

$$e_{its} \sim N(0, \sigma_e^2), u_t \sim N(0, \sigma_u^2) \text{ and } v_s \sim MN \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{v_0}^2 & \sigma_{v_0 v_1} \\ \sigma_{v_1 v_0} & \sigma_{v_1}^2 \end{pmatrix} \right]$$

In addition to allowing the linear growth component to vary across schools, the second model in stage three also allowed the quadratic component to vary across schools. While we attempted to estimate models where the cubic growth component varied across schools, we encountered difficulties with convergence due to very high correlations between the random effects. This can occur when one of the random-effects has very little variance and lies on the boundary of the parameter space. Given this, we decided to omit the results from these models. The second model in stage three can be written as:

$$\text{Model 8: } \textit{scaled score}_{its} = (\beta_{000} + v_{0s} + u_t + e_{its}) + (\beta_{010} + v_{1s}) \cdot \textit{time}_{its} + (\beta_{020} + v_{2s}) \cdot \textit{time}_{its}^2 + (\beta_{030}) \cdot \textit{time}_{its}^3$$

where the estimate of $\sigma_{v_2}^2$ represents the variability across the school-specific quadratic growth component. We estimated all models with unstructured covariance matrices. We present the model comparison results from stage three in Table 9. These results showed that Model 8 was the preferred model for most of the outcomes. For the Year 3 and Year 5 Reading scores, however, Model 7 was the preferred model.

Table 9**Model comparison results from stage three**

	AIC	BIC		$X^2_{(d)}$	(p)
NAPLAN Reading					
Year 3					
Model 6	6637293	6637372	254	vs. Model 8	<.005
Model 7*	6637028	6637129	-15	vs. Model 8	1
Model 8	6637048	6637171	–	–	–
Year 5					
Model 6	6287484	6287563	230	vs. Model 8	<.005
Model 7	6287286	6287387	28	vs. Model 8	<.005
Model 8*	6287264	6287399	–	–	–
Year 7					
Model 6	4965009	4965086	242	vs. Model 8	<.005
Model 7*	4964772	4964871	1	vs. Model 8	0.6
Model 8	4964775	4964896	–	–	–
Year 9					
Model 6	4792222	4792298	135	vs. Model 8	<.005
Model 7	4792114	4792213	23	vs. Model 8	<.005
Model 8*	4792097	4792228	–	–	–
NAPLAN Numeracy					
Year 3					
Model 6	6445315	6445394	317	vs. Model 8	<.005
Model 7	6445076	6445177	74	vs. Model 8	<.005
Model 8*	6445008	6445143	–	–	–
Year 5					
Model 6	6165460	6165538	265	vs. Model 8	<.005
Model 7	6165221	6165322	22	vs. Model 8	<.005
Model 8*	6165205	6165339	–	–	–
Year 7					
Model 6	4925220	4925297	320	vs. Model 8	<.005

	AIC	BIC	$X^2_{(d)}$		(p)
Model 7	4924912	4925011	8	vs. Model 8	0.04
Model 8*	4924910	4925042	–	–	–
Year 9					
Model 6	4722202	4722279	623	vs. Model 8	< .005
Model 7	4721768	4721866	184	vs. Model 8	< .005
Model 8*	4721590	4721721	–	–	–

Model building – stage four

The final stage in our model building process involved adding the school need measure to the preferred model specifications from stage three. With regard to LSLD, the concept of school need is best operationalised through the four RAM equity loadings (Appendix A). To determine the most appropriate functional form for the measure of school need, we locally regressed the Best Linear Unbiased Predictors (BLUPs) of the random effects (intercepts and slopes) from the preferred stage three models on the measure of school need.

Based on the observed relationships between the BLUPs and the measure of need, we added linear predictors for the measure of school need to the equations for the varying intercepts and time slopes. This gave our final model specification, written as:

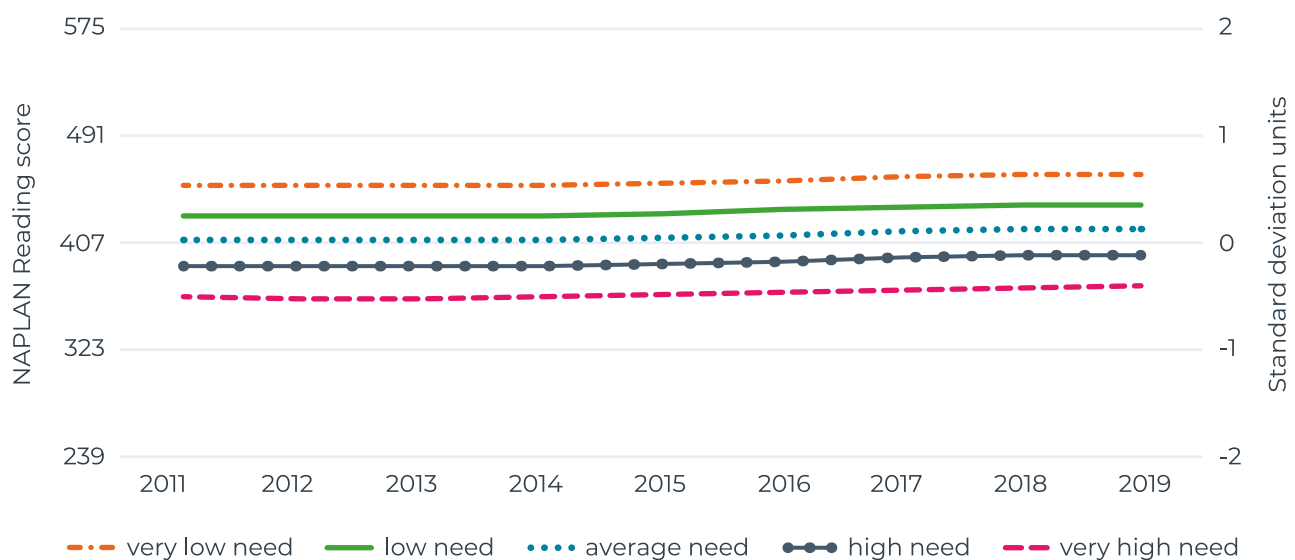
$$\begin{aligned}
 \text{Model 9: } scaled\ score_{its} &= (\beta_{000} + \beta_{001} \cdot school\ need_s + v_{0s} + u_t + e_{its}) \\
 &+ (\beta_{010} + \beta_{011} \cdot school\ need_s + v_{1s}) \cdot time_{its} \\
 &+ (\beta_{020} + \beta_{021} \cdot school\ need_s + v_{2s}) \cdot time_{its}^2 \\
 &+ (\beta_{030}) \cdot time_{its}^3
 \end{aligned}$$

To check that we had accurately captured the functional relationship between the intercepts, time slopes and the measure of need, we used the BLUPs from the final models to examine whether there was any residual relationships between the conditional random-intercepts, time slopes and the measure of need. The visual inspection of these plots suggested that the final models for the Year 3 and Year 5 outcomes were sufficient. For the Year 7 and Year 9 outcomes, however, the intercepts for some of the very low need schools had higher than expected residuals. Further analysis revealed that these schools were either fully selective or partially selective schools. While we tried other models to accommodate these schools (polynomial terms and linear splines for the measure of need), we decided that the linear model was sufficient given the aim of the analysis.

Due to the complexity of our final models, we wanted to visualise how the modelled growth trajectories for higher need schools differed from those for lower need schools. To this end, we used the estimated parameter values from our final models to predict growth trajectories for schools with different values of the measure of need. We varied our calculations across the decile cut points of the measure to generate predicted growth trajectories.¹⁶ We present the modelled growth trajectories from Figure 2 to Figure 9. In these plots, the y-axis values are scaled such that the tick marks range from two standard deviations below the mean to two standard deviations above the mean for the relevant assessment (pooled across calendar years). The predicted growth trajectories are shown for the 10th percentile value (very low need), the 30th percentile value (low need), the 50th percentile value (average need), the 70th percentile value (high need), and the 90th percentile value (very high need).

Figure 2

Modelled growth trajectories for Year 3 Reading



¹⁶ For example, to calculate the predicted growth trajectory for a school at the 10th percentile of the measure of need, we first calculated the predicted score for 2011 using the following formula: $\hat{y} = (\hat{\beta}_{000} + \hat{\beta}_{001} \cdot P_{10}(\text{school need})) + (\hat{\beta}_{010} + \hat{\beta}_{011} \cdot P_{10}(\text{school need})) \cdot 0 + (\hat{\beta}_{020} + \hat{\beta}_{021} \cdot P_{10}(\text{school need})) \cdot 0 + (\hat{\beta}_{020}) \cdot 0$. We then calculated the predicted score for each subsequent year in the time series, ending with the predicted score for 2019, given by: $\hat{y} = (\hat{\beta}_{000} + \hat{\beta}_{001} \cdot P_{10}(\text{school need})) + (\hat{\beta}_{010} + \hat{\beta}_{011} \cdot P_{10}(\text{school need})) \cdot 8 + (\hat{\beta}_{020} + \hat{\beta}_{021} \cdot P_{10}(\text{school need})) \cdot 64 + (\hat{\beta}_{020}) \cdot 512$.

Figure 3

Modelled growth trajectories for Year 5 Reading

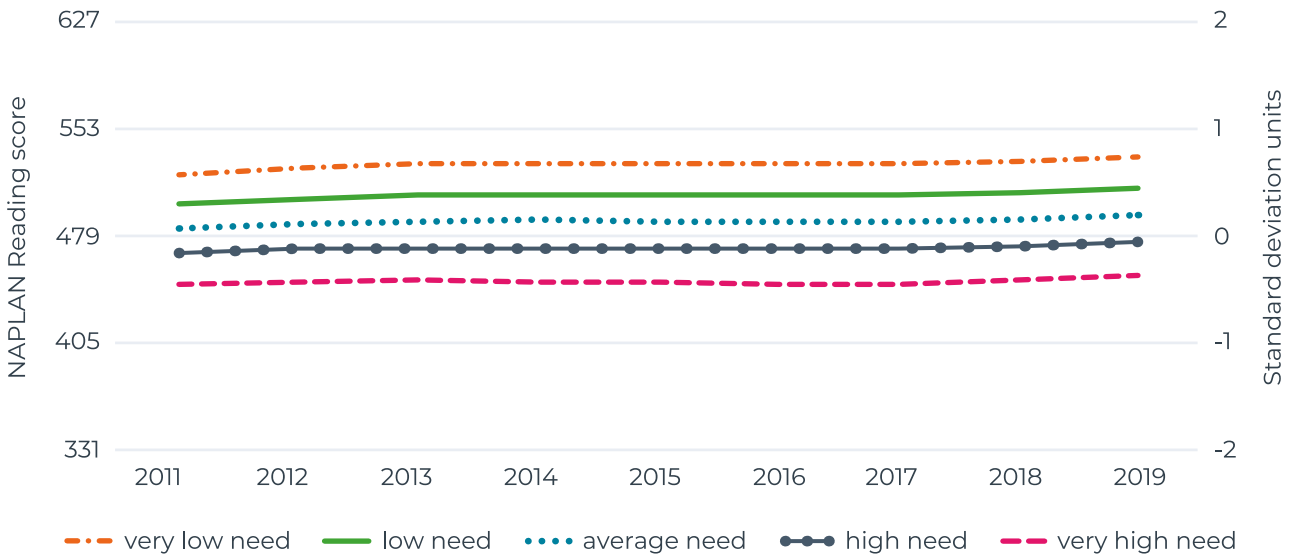


Figure 4

Modelled growth trajectories for Year 7 Reading

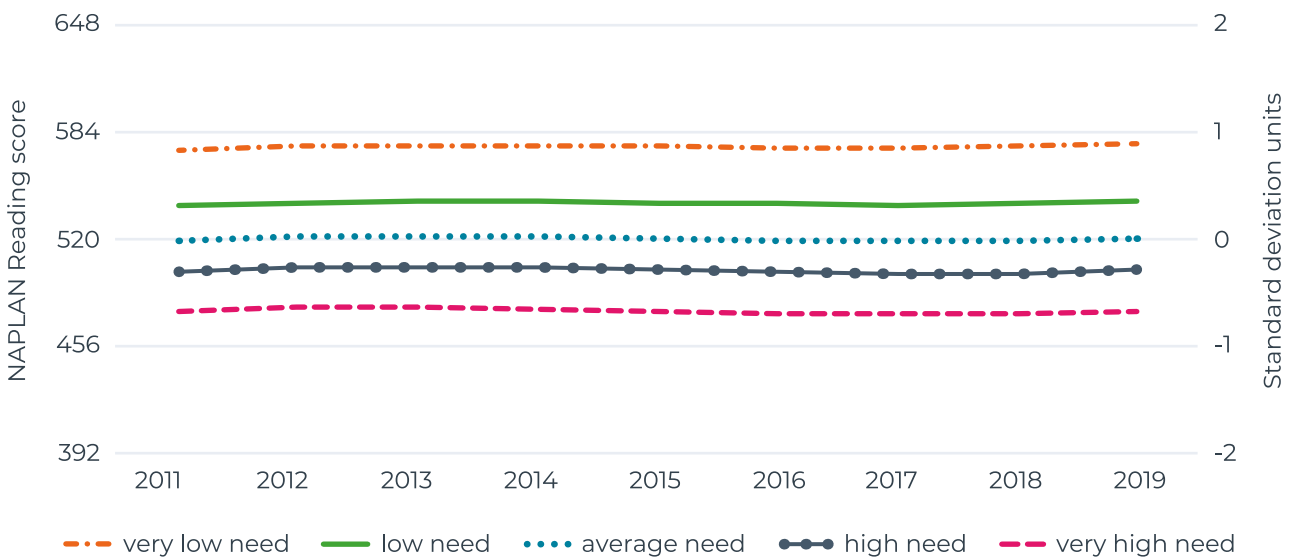


Figure 5

Modelled growth trajectories for Year 9 Reading

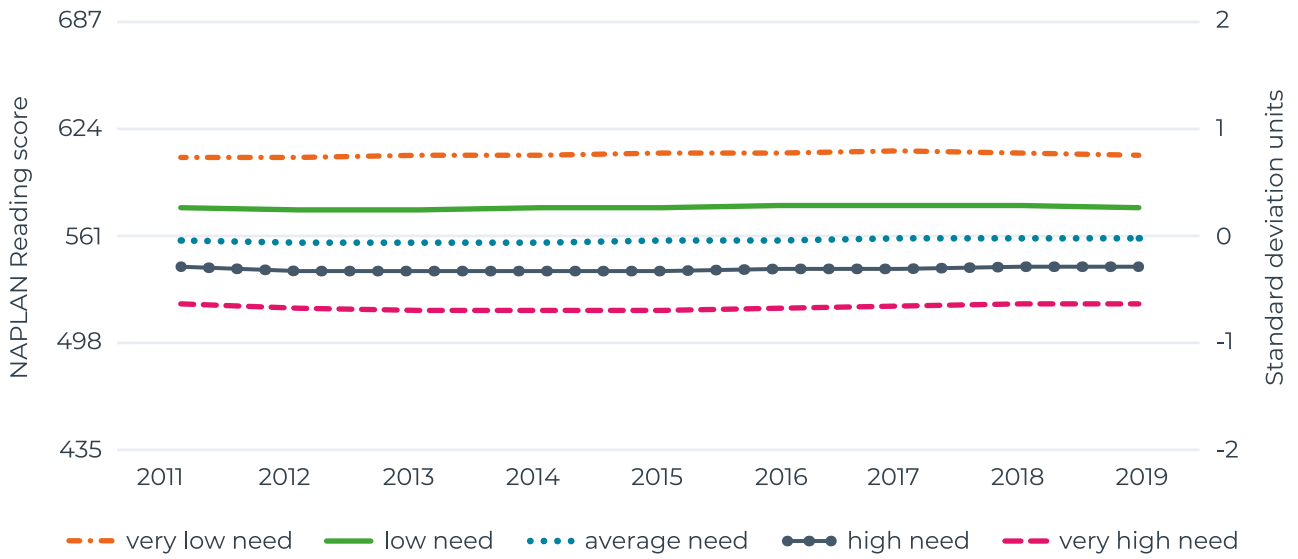


Figure 6

Modelled growth trajectories for Year 3 Numeracy

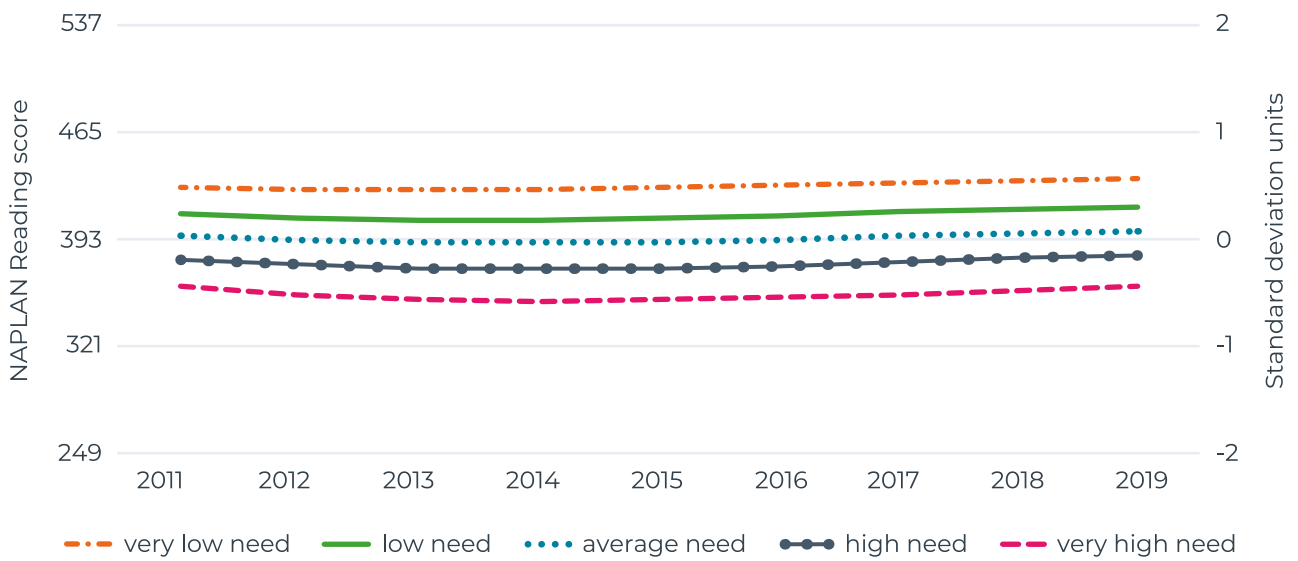


Figure 7

Modelled growth trajectories for Year 5 Numeracy

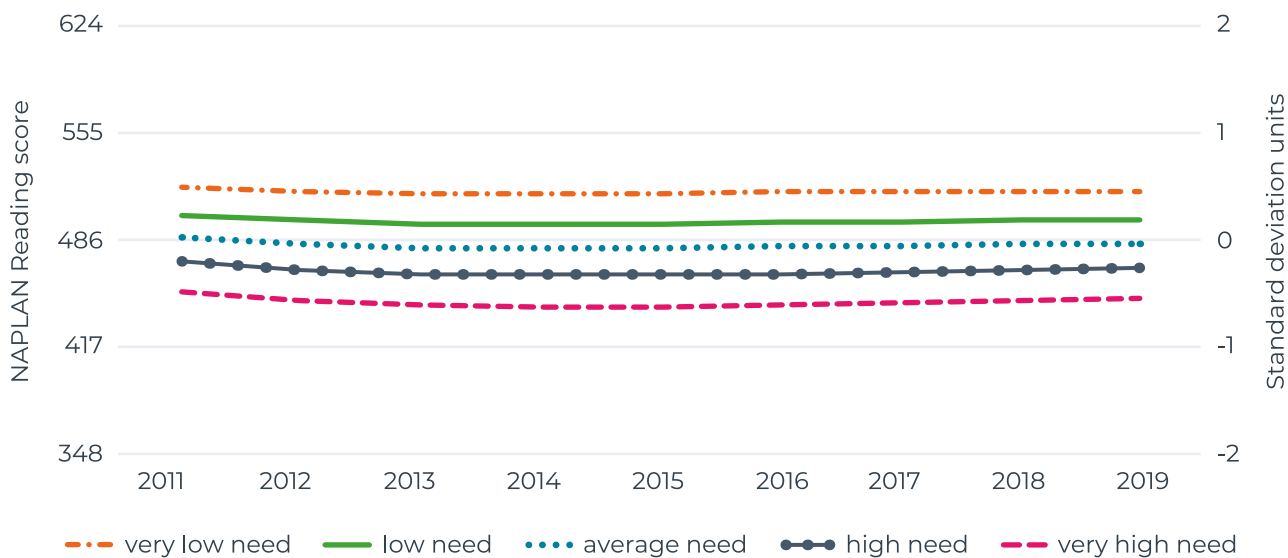


Figure 8

Modelled growth trajectories for Year 7 Numeracy

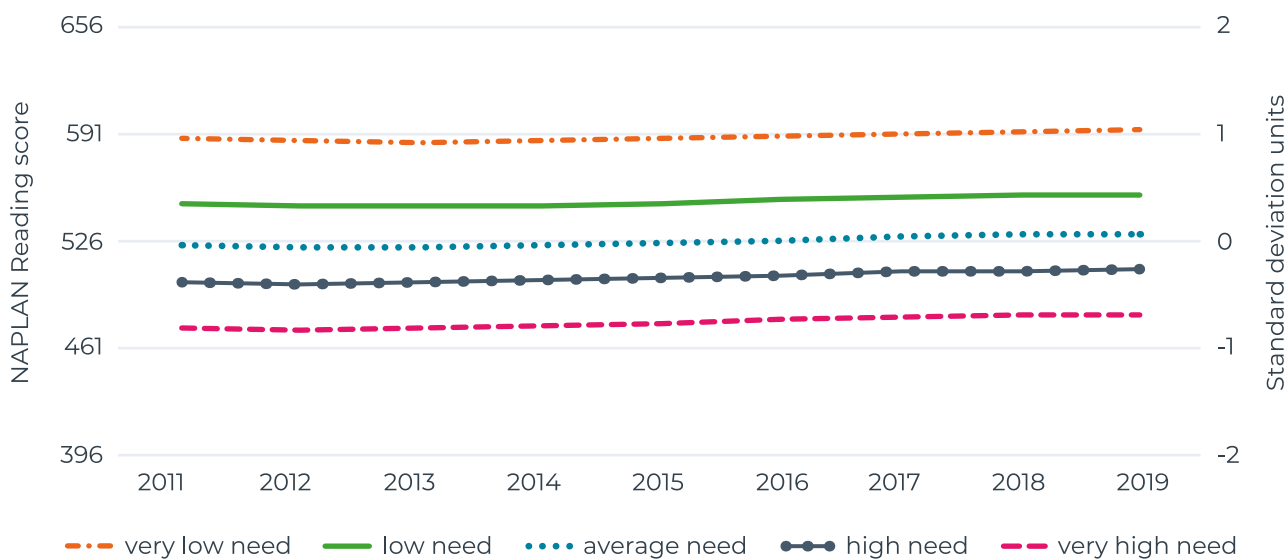
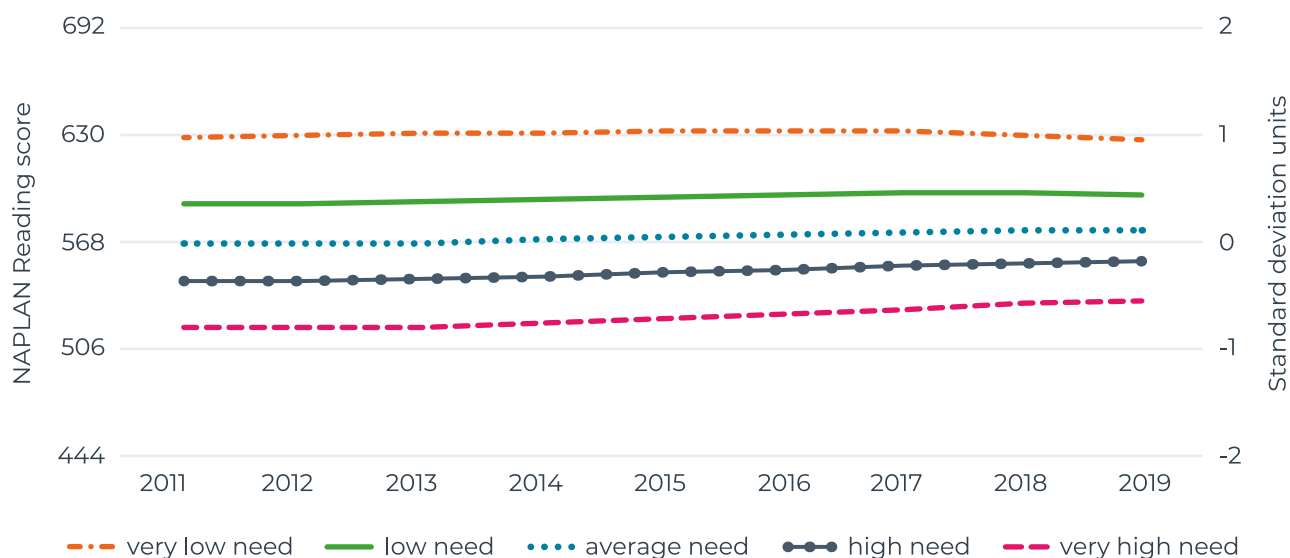


Figure 9

Modelled growth trajectories for Year 9 Numeracy



While the results from our final models indicated that there were some differences in terms of how the performance of students from higher need schools changed across the time series than students from lower need schools, the majority of the differences were very small. Since 2013, the Australian Curriculum and Reporting Authority has published effect size measures to help interpret differences in NAPLAN results (ACARA 2019, p. viii). The effect sizes are reported as follows:

- 'substantially above/below' refers to effect sizes greater than 0.5/less than -0.5;
- 'above/below' refers to effect sizes between 0.2 and 0.5/between -0.2 and -0.5; and
- 'close to' refers to effect sizes less than 0.2 but greater than -0.2.

In our analysis, we used the following formula to compute effect sizes¹⁷ for each modelled growth trajectory:

$$ES_{school\ need} = \frac{(\hat{Y}_{school\ need}^{2019} - \hat{Y}_{school\ need}^{2011})}{\hat{\sigma}_e}$$

where $\hat{Y}_{school\ need}^{2019}$ represents the predicted score for a student who completed the relevant NAPLAN assessment in 2019 and attended a school with a specific level of need and $\hat{Y}_{school\ need}^{2011}$ represents the predicted score for a student who attended the same school but completed the relevant NAPLAN assessment in 2011. The estimated variances were taken from the final models. We present the effect sizes for each modelled growth trajectory in Table 10. The results showed that, apart from the Year 9 Numeracy assessment, most of the predicted scores for 2019 were close to those for 2011. For the Year 9 Numeracy assessment, however, the results showed that the predicted scores for 2019 for very high need schools were above those for 2011.

¹⁷ While this is not the exact same method used by ACARA, it produces results that scale in a similar way, in that the results represent differences between two point values expressed in standard deviation units. We believe that the effect size cut-points used by ACARA are suitable heuristics for our results.

Table 10

Effect sizes for each modelled growth trajectory of NAPLAN Reading and Numeracy

Percentile of school need measure									
	10 th	20 th	30 th	40 th	50 th	60 th	70 th	80 th	90 th
NAPLAN Reading									
Year 3	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.1	0.1
Year 5	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.1	0.09
Year 7	0.08	0.06	0.05	0.04	0.03	0.02	0.01	0	-0.01
Year 9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0
NAPLAN Numeracy									
Year 3	0.08	0.07	0.07	0.06	0.05	0.04	0.03	0.03	0.01
Year 5	-0.05	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06	-0.07	-0.07
Year 7	0.08	0.09	0.09	0.1	0.1	0.11	0.12	0.12	0.13
Year 9	-0.02	0.03	0.07	0.1	0.13	0.16	0.18	0.21	0.25

Table 11

Parameter estimates from the different model specifications for Year 3 Reading

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	412.1	413.7	412	406.6	408.1	408.8	408.9	409.1	407.6
Time ($\hat{\beta}_{010}$)	–	–	–	1.3	0.1	-1.4	-1.5	-1.6	-1.5
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0.2	0.6	0.7	0.7	0.7
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	0	0	0	0
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-32.7
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	0
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	–
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	84.9	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.3
Level-2 intercept ($\hat{\sigma}_u$)	37.7	39.6	11.5	10.8	10.7	10.7	9.3	9	9.2
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	37.4	37.4	37.4	37.4	37.8	37.2	18.5
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	2	3.3	2.1
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.3	–
Corr (v_0, v_1)	–	–	–	–	–	–	-0.2	0	-0.3
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.2	–
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.8	–

Table 12

Parameter estimates from the different model specifications for Year 5 Reading

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	488.8	489.9	488.8	485.3	485.2	483.3	483.6	483.8	482.8
Time ($\hat{\beta}_{010}$)	–	–	–	0.8	1	5.1	5	4.8	4.8
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0	-1.4	-1.3	-1.3	-1.3
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	0.1	0.1	0.1	0.1
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-27.7
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	-1.2
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	0.1
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6
Level-2 intercept ($\hat{\sigma}_u$)	35.5	36.5	9.7	9.3	9.3	9.1	8.1	8.1	8.1
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	35.3	35.3	35.3	35.3	34.3	33.1	17.5
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.5	2.7	2.4
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.2	0.1
Corr (v_0, v_1)	–	–	–	–	–	–	0.1	0.4	1
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.8	-0.8
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.9	-0.3

Table 13

Parameter estimates from the different model specifications for Year 7 Reading

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	522.4	525.1	522.4	522.2	522	520.6	521	521.1	521.4
Time ($\hat{\beta}_{010}$)	–	–	–	0	0.2	3.3	3.2	3.1	3.2
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0	-1	-1	-1	-1
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	0.1	0.1	0.1	0.1
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-36.8
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	-0.3
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	–
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	64.9	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7
Level-2 intercept ($\hat{\sigma}_u$)	45.7	42.4	5.7	5.7	5.7	5.6	4.5	4.4	4.5
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	45.7	45.7	45.7	45.7	44.1	43.8	20.9
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.3	1.6	1.3
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.1	–
Corr (v_0, v_1)	–	–	–	–	–	–	0.3	0.4	0.2
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.3	–
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.5	–

Table 14

Parameter estimates from the different model specifications for Year 9 Reading

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	561.3	563.8	561.3	560.1	560.4	561.2	561.4	561.6	561.8
Time ($\hat{\beta}_{010}$)	–	–	–	0.3	0	-1.6	-1.6	-1.8	-1.8
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0	0.6	0.6	0.6	0.6
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	0	0	0	0
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-33.6
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	-1
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	0.1
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	63.7	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4
Level-2 intercept ($\hat{\sigma}_u$)	42.5	40.1	6.8	6.7	6.7	6.7	5.9	5.8	5.8
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	42.5	42.5	42.5	42.5	42.2	41	21.5
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.2	2.1	1.8
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.2	0.1
Corr (v_0, v_1)	–	–	–	–	–	–	0	0.5	1
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.7	-0.8
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.8	-0.2

Table 15

Parameter estimates from the different model specifications for Year 3 Numeracy

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	393.4	394.6	393.3	390.3	393.4	394.4	394.4	394.7	393.8
Time ($\hat{\beta}_{010}$)	–	–	–	0.8	-1.9	-3.9	-4	-4.2	-4.2
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0.3	1	1	1	1
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	-0.1	-0.1	-0.1	-0.1
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-24.5
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	-1.5
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	0.2
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	73.3	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6
Level-2 intercept ($\hat{\sigma}_u$)	32.8	34.8	10.6	10.4	10.2	10.1	9.1	8.7	8.7
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	32.5	32.5	32.5	32.5	32.3	30.6	18
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.7	3.6	3.3
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.4	0.3
Corr (v_0, v_1)	–	–	–	–	–	–	-0.1	0.3	-0.8
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.5	-0.8
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.9	-0.7

Table 16

Parameter estimates from the different model specifications for Year 5 Numeracy

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	482.2	483.7	482.2	482.8	485.7	487.1	487	487.3	486.8
Time ($\hat{\beta}_{010}$)	–	–	–	-0.1	-2.6	-5.6	-5.6	-5.7	-5.8
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0.3	1.3	1.3	1.3	1.3
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	-0.1	-0.1	-0.1	-0.1
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-25
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	-1.1
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	0.1
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	69.8	69.2	69.3	69.3	69.3	69.3	69.3	69.3	69.3
Level-2 intercept ($\hat{\sigma}_u$)	33.8	35.5	8.8	8.8	8.5	8.5	7.4	7.2	7.2
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	33.7	33.7	33.7	33.7	34.9	34.2	23.3
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.5	3.2	3.1
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.3	0.3
Corr (v_0, v_1)	–	–	–	–	–	–	-0.3	0	-1
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.2	0.5
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.9	-0.6

Table 17

Parameter estimates from the different model specifications for Year 7 Numeracy

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	528.5	531	528.4	524.2	525.4	526.3	526.2	526.2	526.5
Time ($\hat{\beta}_{010}$)	–	–	–	1.1	0	-2.1	-2	-2.1	-1.9
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	0.1	0.8	0.8	0.8	0.8
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	-0.1	-0.1	-0.1	-0.1
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-44.9
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	0.6
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	-0.1
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	65.2	64.8	64.8	64.9	64.9	64.9	64.8	64.8	64.9
Level-2 intercept ($\hat{\sigma}_u$)	53.7	52.6	7.3	6.7	6.6	6.6	5.2	4.9	4.9
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	53.6	53.6	53.7	53.7	55.7	55.3	31.3
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.5	2.4	2.3
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.3	0.3
Corr (v_0, v_1)	–	–	–	–	–	–	-0.4	-0.1	1
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.1	-1
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.8	-0.4

Table 18

Parameter estimates from the different model specifications for Year 9 Numeracy

	Stage 1			Stage 2			Stage 3		Stage 4
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Fixed-effects									
Intercept ($\hat{\beta}_{000}$)	573.6	575.6	573.6	569.7	569	569.9	569.2	569.7	569.7
Time ($\hat{\beta}_{010}$)	–	–	–	1	1.6	-0.2	0	-0.5	-0.4
Time ² ($\hat{\beta}_{020}$)	–	–	–	–	-0.1	0.5	0.5	0.6	0.6
Time ³ ($\hat{\beta}_{030}$)	–	–	–	–	–	-0.1	-0.1	0	0
School-need ($\hat{\beta}_{001}$)	–	–	–	–	–	–	–	–	-42.4
Time · school-need ($\hat{\beta}_{011}$)	–	–	–	–	–	–	–	–	-0.7
Time ² · school-need ($\hat{\beta}_{021}$)	–	–	–	–	–	–	–	–	0.2
Random-effects									
Level-1 intercept ($\hat{\sigma}_e$)	63.3	62.7	62.7	62.7	62.7	62.7	62.7	62.7	62.7
Level-2 intercept ($\hat{\sigma}_u$)	50.9	50.7	9.3	8.9	8.9	8.9	7.4	6.9	6.9
Level-3 intercept ($\hat{\sigma}_{v_0}$)	–	–	50.8	50.8	50.8	50.8	55.9	52.6	31
Time ($\hat{\sigma}_{v_1}$)	–	–	–	–	–	–	1.7	2.7	2.6
Time ² ($\hat{\sigma}_{v_2}$)	–	–	–	–	–	–	–	0.4	0.3
Corr (v_0, v_1)	–	–	–	–	–	–	-0.8	0.5	1
Corr (v_0, v_2)	–	–	–	–	–	–	–	-0.9	-1
Corr (v_1, v_2)	–	–	–	–	–	–	–	-0.8	-0.6

Appendix E: Technical details of HSC analysis

In this analysis, we aimed to investigate how three HSC outcomes have changed since the introduction of the LSLD reforms:

1. HSC completion rates
2. high performance rates
3. low performance rates.

For each outcome, we wanted to see whether school-specific changes across time were related to school need (Appendix A for more information about our measure of school need).

HSC completion

To estimate school-specific HSC completion rates, we first needed to define the potential population of students who could have completed their HSC at each school. For 2011, the cohort of interest for a particular school included all the Year 9 students who were enrolled at the school in 2008. For 2019, the cohort of interest for a particular school included all the Year 9 students who were enrolled at the school in 2016. We selected these calendar years as they capture the outcomes for the year prior to the introduction of the LSLD reforms (2011) and the most recent outcome data (2019). Comparison of HSC completion rates across these two time periods allowed us to assess change across the longest period of time the data can accommodate.

To identify the in-scope students, we extracted the 120,829 Year 9 enrolment records for 2008 and 2016. We then identified the last enrolment record for each student and took that school as their home school¹⁸. We then linked the selected DoE enrolment records to course information held by NESA to find out which students went on to complete their HSC¹⁹. For each student included in the cohorts of interest for school, the outcome variable was coded such that:

$$HSC\ completion_{is} = \begin{cases} 1 & \text{if student } i \text{ in school } s \text{ completed the HSC within 3 years} \\ 0 & \text{otherwise} \end{cases}$$

While students can normally complete their HSC program over 5 years (starting in Year 11), we needed to restrict the window for completion to 3 years (starting in Year 10) so that we could observe the outcomes for the Year 9 students who were enrolled in 2016. Of the 114,136 Year 9 students, 66,320 (58.81%) completed the HSC within three years.

18 There were 1,086 students with two home schools, 72 students with three home schools, and 2 students with 4 home schools. All students were weighted by the inverse of their number of home schools.

19 There were 1,819 HSC completion records without unique student identifiers for the years of interest.

High and low performance in the HSC

For each HSC course that is externally examinable, a student will receive a band result. For 2 unit courses, there are 6 bands, ranging from band 1 (0-49 marks) to band 6 (90-100 marks). For extension courses, there are 4 bands, ranging from E1 to E4. Student and school performance on the HSC may be assessed by examining patterns of performance at the high and low ends of the achievement scales. In this analysis, we define:

$$\text{high performance}_{is} = \begin{cases} 1 & \text{if student } i \text{ in school } s \text{ had more than 1 result in the top 2 bands} \\ 0 & \text{otherwise} \end{cases}$$

$$\text{low performance}_{is} = \begin{cases} 1 & \text{if student } i \text{ in school } s \text{ had more than 1 result in the bottom band} \\ 0 & \text{otherwise} \end{cases}$$

As this analysis focuses on band results, it was necessary to restrict the analysis to students who completed a minimum of four ATAR eligible courses that provide band results. Of the 66,320 students who completed the HSC in 2011 or 2019, 57,210 (86.26%) met our inclusion criteria. Of these students, 23,234 (40.61%) had high performance in the HSC and 2,000 (3.50%) had low performance.

Modelling strategy

To estimate school-specific changes in the HSC outcomes, we first fit unconditional growth models to the data. These models allowed both the intercepts and time slopes to vary across schools and can be written as:

$$\text{Model 1: } Pr(y_{is} = 1) = F(\beta_0 + v_{0s} + (\beta_1 + v_{1s}) \cdot \text{time}_{is})$$

where y_{is} represents the relevant outcome for student i in school s and time_{is} represents a dummy coded indicator variable taking the value 1 when the outcome for student i in school s was observed in 2019 and 0 otherwise.²⁰ Given the above specification, β_0 represents the expected outcome (in logit units) for a student in an average school in 2011, β_1 represents the mean school time slope (the mean school change in logit units from 2011 to 2019), v_{0s} represents the variance of the school-specific outcomes for 2011, and v_{1s} represents the variance of the school-specific time slopes. We estimated the model with an unstructured covariance matrix such that:

$$\mathbf{v}_s \sim MN \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{v_0}^2 & \sigma_{v_1 v_0} \\ \sigma_{v_0 v_1} & \sigma_{v_1}^2 \end{pmatrix} \right]$$

²⁰ $F(z) = e^z / (1 + e^z)$ is the cumulative density of the standard logistic distribution.

The next step in the modelling strategy involved adding the measure of school need (Appendix A) to the equations for the varying intercepts and time slopes. To determine the most appropriate functional form for the measure, we used lowess smoothers to visualise the relationships between the BLUPs of the random-effects and the measure of school need. Based on the observed relationships between the BLUPs and the measure school need, we added linear predictors for the measure of school need to the equations for the varying intercepts and time slopes, giving the final model specification:

$$\text{Model 2: } Pr(y_{is} = 1) = F(\beta_{00} + \beta_{01} \cdot \text{school need}_s + v_{0s} \\ + (\beta_{10} + \beta_{11} \cdot \text{school need}_s + v_{1s}) \cdot \text{time}_{is})$$

To check that we had accurately captured the functional relationships between the intercepts, time slopes and the measure of need, we used the BLUPs from the final models to examine whether there was any residual relationships between the conditional random-intercepts, time slopes and the measure of need. For the HSC completion and low performance outcomes, the residual plots showed that linear predictors were sufficient. While the fully selective and partially selective schools had unusually positive residuals in the analysis of the high performance outcomes, this misspecification was considered minor and did not substantially change the findings from the analysis.

Results

HSC completion

In Model 1, the fixed intercept was estimated as 0.15 (95% CI [0.07, 0.24]), indicating that about 53.83 per cent of the students in an average school were expected to complete the HSC in 2011.²¹ Furthermore, the variance across the school-specific intercepts was estimated as 1.04 (95% CI [0.82, 1.32]). This means that schools had a large amount of variability across the 2011 completion rates, with the predicted 2011 completion rate for students in a school at the 70th percentile of the random intercept distribution (61.01%) about 16.11 percentage points higher than the predicted completion rate for students in a school at the 30th percentile (44.91%).²²

The fixed time slope was estimated as -0.21 (95% CI [-0.25, -0.17]), indicating that the completion rate for students in an average school decreased by about 5.17 percentage points from 2011 to 2019.²³ Furthermore, we estimated the variance across the school-specific time slopes as 0.11 (95% CI [0.07, 0.15]). This means that schools had a moderate amount of variability across the time slopes, with the predicted change in the HSC completion rate for students in a school at the 70th percentile of the random slope distribution (-2.68%) about 4.74 percentage points higher than the predicted change for students in a school at the 30th percentile (-7.85%).²⁴

21 The transformation is given by $F(\hat{\beta}_0)$.

22 To calculate expected 2011 completion rates for a given percentile rank value of the random intercept distribution, we first calculated the posterior means (empirical Bayes predictions) of the random intercepts (\hat{v}_{0j}). We then added the selected percentile rank value ($P_x(\hat{v}_{0j})$) to the estimated fixed intercept, written as $F(\hat{\beta}_0 + P_x(\hat{v}_{0j}))$.

23 The transformation is given by $F(\hat{\beta}_0 + \hat{\beta}_1) - F(\hat{\beta}_0)$.

24 To calculate expected changes in completion rates for a given percentile rank value of the random slope distribution, we first calculated the posterior means (empirical Bayes predictions) of the random slopes (\hat{v}_{1j}). We then added the selected percentile rank value ($P_x(\hat{v}_{1j})$) to the estimated fixed intercept and fixed time slope, written as $F(\hat{\beta}_0 + \hat{\beta}_1 + P_x(\hat{v}_{1j}))$. The random intercept value was set at its theoretical mean (0).

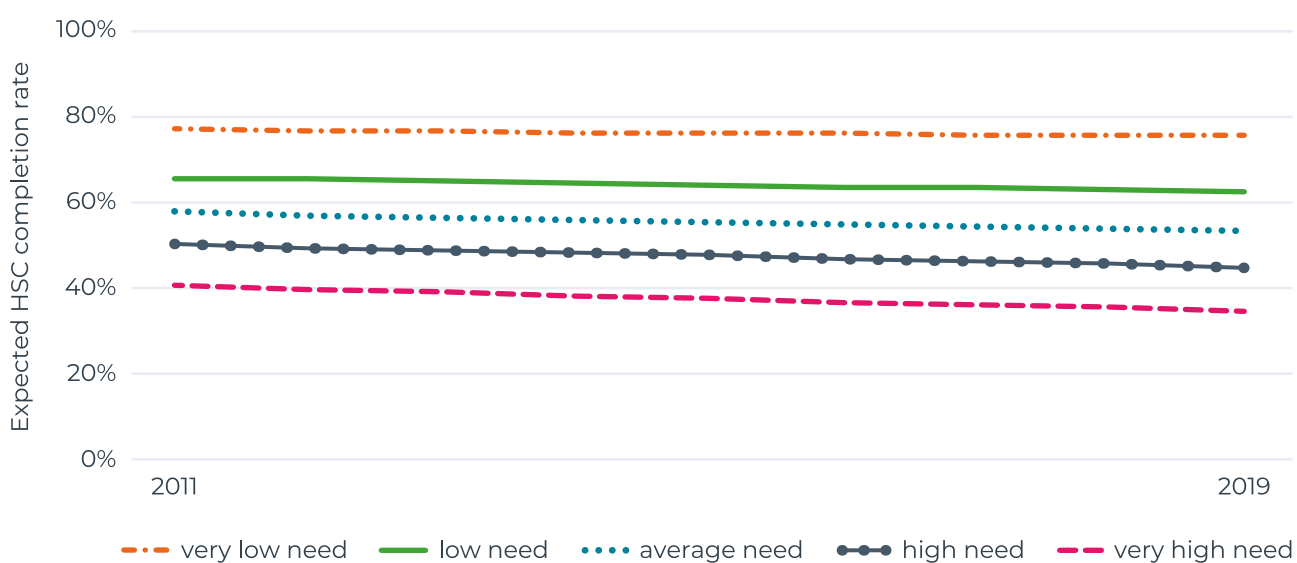
In Model 2, we estimated the coefficient for the fixed intercept as 0.36 (95% CI [0.30, 0.42]), indicating that about 58.98 per cent of the students in a school with average need were expected to complete the HSC in 2011. Furthermore, we estimated the coefficient for the measure of need as -0.62 (95% CI [-0.70, -0.53]), indicating that the odds of HSC completion in 2011 decreased by a factor of about 0.54 for each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as -0.17 (95% CI [-0.21, -0.13]) while we estimated the cross-level interaction as -0.06 (95% CI [-0.11, -0.02]). This means that the odds of HSC completion for students in a school with average need were expected to decrease by a factor of about 0.84 from 2011 to 2019, with the rate of change reduced by a factor of about 0.94 with each standard deviation increase in the measure of need. These results suggest that the gap between high and low need schools was slightly greater in 2019 than 2011.

To make these results more concrete, we used the estimated model parameters to predict growth curves for schools with different values of the measure of need (Appendix A for more information). As shown in Figure 10, the expected HSC completion rate for students in a very low need school (10th percentile) decreased by about 1.54 percentage points from 2011 (76.93%) to 2019 (75.39%) while the expected HSC completion rate for students in a very high need school (90th percentile) decreased by about 5.86 percentage points from 2011 (40.48%) to 2019 (34.61%).

Figure 10

Expected HSC completion rates for schools with different levels of need



High performance

In Model 1, we estimated the coefficient for the fixed intercept as -0.79 (95% CI [-0.89, -0.69]), indicating that about 31.20 per cent of the students in an average school had high performance in the HSC in 2011. Furthermore, we estimated the variance across the school-specific intercepts as 1.27 (95% CI [0.95, 1.68]). This means that schools had a large amount of variability across the 2011 high performance rates, with the predicted 2011 rate for students in a school at the 70th percentile of the random intercept distribution (35.09%) about 12.06 percentage points higher than the predicted rate for students in a school at the 30th percentile (23.03%).

We estimated the coefficient for the fixed time slope as -0.34 (95% CI [-0.41, -0.26]), indicating that the high performance rate for students in an average school decreased by about 6.71 percentage points from 2011 to 2019. Furthermore, we estimated the variance across the school-specific time slopes as 0.23 (95% CI [0.17, 0.31]). This means that schools had a moderate amount of variability across the time slopes, with the predicted change in the high performance rate for students in a school at the 70th percentile of the random slope distribution (26.36%) about 4.88 percentage points higher than the predicted change for students in a school at the 30th percentile (21.48%).

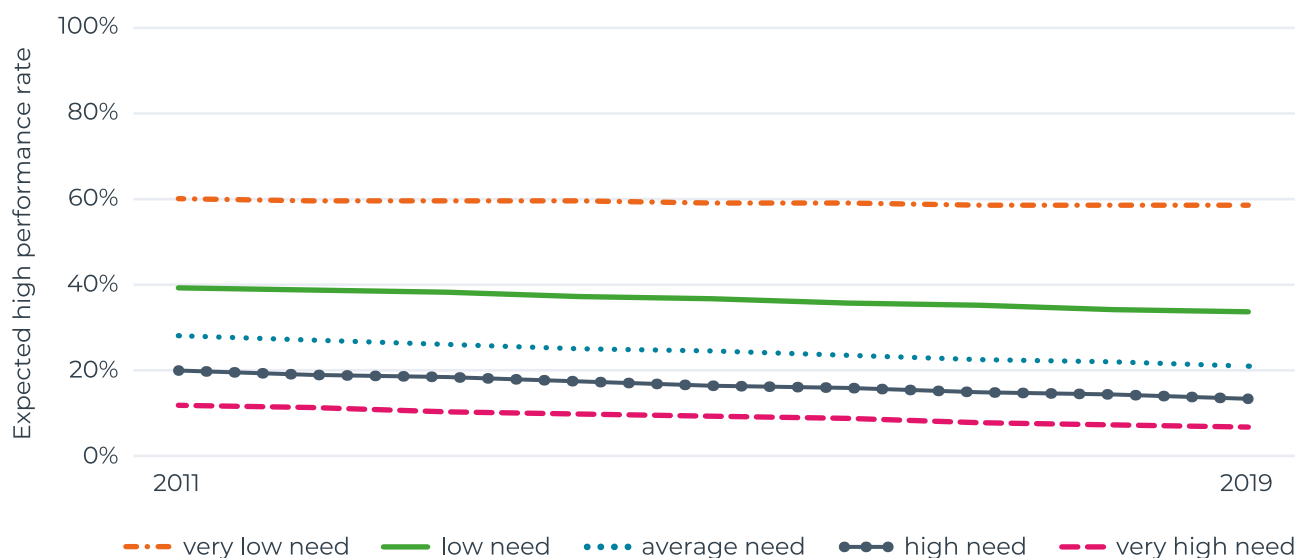
In Model 2, we estimated the coefficient for the fixed intercept as -0.89 (95% CI [-0.95, -0.82]), indicating that about 29.18 per cent of the students in a school with average need were expected to have high performance in 2011. Furthermore, we estimated the coefficient for the measure of need as -0.94 (95% CI [-1.06, -0.82]), indicating that the odds of high performance in 2011 decreased by a factor of about 0.39 for each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as -0.36 (95% CI [-0.44, -0.29]) while we estimated the cross-level interaction as -0.22 (95% CI [-0.29, -0.15]). This means that the odds of high performance for students in a school with average need were expected to decrease by a factor of about 0.70 from 2011 to 2019, with the rate of change decreasing by a factor of about 0.80 with each standard deviation increase in the measure of need. These results suggest that the gap between high and low need schools was slightly greater in 2019 than 2011.

As shown in Figure 11, the expected high performance rate for students in a very low need school (10th percentile) decreased by about 1.41 percentage points from 2011 (59.69%) to 2019 (58.29%) while the expected rate for students in a very high need school (90th percentile) decreased by about 5.12 percentage points from 2011 (11.68%) to 2019 (6.56%).

Figure 11

Expected HSC high performance rates for schools with different levels of need



Low performance

In Model 1, we estimated the coefficient for the fixed intercept as -3.86 (95% CI $[-4.04, -3.68]$), indicating that about 2.07 per cent of the students in an average school had low performance in the HSC in 2011. Furthermore, we estimated the variance across the school-specific intercepts as 1.94 (95% CI $[1.55, 2.42]$). This means that schools had a small amount of variability across the 2011 low performance rates, with the predicted 2011 rate for students in a school at the 70th percentile of the random intercept distribution (3.12%) about 1.81 percentage points higher than the predicted rate for students in a school at the 30th percentile (1.30%).

We estimated the coefficient for the fixed time slope as 0.25 (95% CI $[0.09, 0.42]$), indicating that the low performance rate for students in an average school decreased by about 0.58 percentage points from 2011 to 2019. Furthermore, we estimated the variance across the school-specific time slopes as 0.69 (95% CI $[0.45, 1.04]$). This means that schools had a very small amount of variability across the time slopes, with the predicted change in the high performance rate for students in a school at the 70th percentile of the random slope distribution (3.00%) about 0.48 percentage points higher than the predicted change for students in a school at the 30th percentile (2.52%).

In Model 2, we estimated the coefficient for the fixed intercept as -3.66 (95% CI $[-3.80, -3.52]$), indicating that about 2.51 per cent of the students in a school with average need were expected to have low performance in 2011. Furthermore, we estimated the coefficient for the measure of need as 1.03 (95% CI $[0.89, 1.16]$), indicating that the odds of low performance in 2011 increased by a factor of about 2.79 for each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as 0.30 (95% CI $[0.14, 0.46]$) while we estimated the cross-level interaction as 0.04 (95% CI $[-0.11, 0.19]$). This means that the odds of low performance for students in a school with average need were expected to increase by a factor of about 1.35 from 2011 to 2019, with the rate of change increasing by a factor of about 1.04 with each standard deviation increase in the measure of need. These results suggest that the gap between high and low need schools was slightly greater in 2019 than 2011.

As shown in Figure 12, the expected low performance rate for students in a very low need school (10th percentile) increased by about 0.18 percentage points from 2011 (0.63%) to 2019 (0.81%) while the expected rate for students in a very high need school (90th percentile) increased by about 2.99 percentage points from 2011 (8.20%) to 2019 (11.19%).

Figure 12

Expected HSC low performance rates for schools with different levels of need

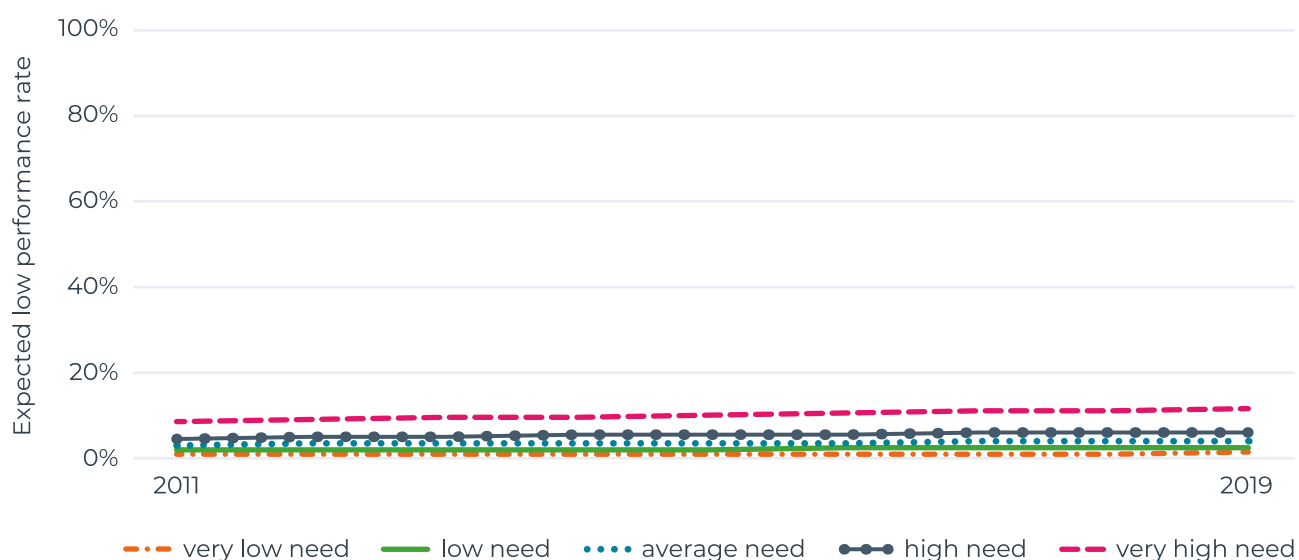


Table 19

Effect sizes for each modelled growth trajectory of HSC completion and performance rates

	Percentile of school need measure				
	Very low need	Low need	Average need	High need	Very high need
	10 th	30 th	50 th	70 th	90 th
HSC completion rate	-0.02	-0.03	-0.04	-0.05	-0.06
HSC high performance rate	-0.01	-0.06	-0.07	-0.07	-0.05
HSC low performance rate	0.00	0.00	0.01	0.02	0.03

Appendix F: Technical details of student wellbeing analysis

In this analysis, we aimed to investigate how three student wellbeing outcomes have changed since the introduction of the LSLD reforms:

1. positive sense of belonging at school
2. high expectations for success
3. high advocacy from teachers and adults at school.

For each outcome, we wanted to see whether school-specific changes across time were related to school need (Appendix A for more information about our measure of school need). As these student outcomes are assessed differently in primary and secondary schools, we examined changes across time separately for each type of school.

Student wellbeing outcomes

The student wellbeing outcomes in this analysis are derived from the TTFM student survey administered in NSW public schools. These outcomes are derived from Likert scale type questions where students are presented with a series of statements and asked to rate their agreement with each statement on a 5-point scale. For each relevant aspect of wellbeing, student responses are first numerically coded and then averaged (and then rescaled to a 10-point scale). These average scores are then used to classify students as either having positive wellbeing or not for each area. Students who score 6 or more on the TTFM scale are reported to have positive (high) outcomes, while those who score less than 6 are reported to have negative (low) outcomes.

For the analysis of positive sense of belonging and high expectations for success, we used the 2015 and 2019 TTFM student survey Term 1 data. We used the 2015 TTFM data as it was the first year with representative data. While 2015 is three years into the phased roll out of the LSLD reforms, we were still able to estimate changes in student wellbeing over four calendar years. For the analysis of high advocacy at school, we used 2016 and 2019 TTFM student survey Term 1 data. Once again, while 2016 is four years after the implementation of the LSLD reforms, the outcome data was only comparable from 2016 onwards. For the analysis of positive sense of belonging and high expectations for success, we only included schools that were open in 2019 that had also been open in 2015, while for the analysis of high advocacy at school, we only included schools that were open in 2019 that had also been open in 2016.

The TTFM primary school survey includes primary and central/community school students in Years 4, 5, and 6 whereas the TTFM secondary school survey includes secondary and central/community school students in Years 7 to 12. To ensure that students had adequate exposure to their school environment, we limited our analysis to those students who had attended their school for at least one year prior to responding to the TTFM survey. Therefore, the results of secondary and primary school analyses are valid for the students that satisfy the above criteria and may not generalise to other students.

In total, we included 132,262 students from 585 (33%) NSW primary and central/community schools in the primary school analysis of positive sense of belonging and high expectations for success and 183,704 students from 825 (47%) NSW primary and central/community schools in the primary school analysis of high advocacy at school. We included 175,340 students from 253 (45%) NSW secondary and central/community schools in the secondary school analysis of positive sense of belonging and high expectation for success, and 187,778 students from 283 (50%) NSW secondary and central/community schools in the secondary school analysis of high advocacy at school.

Modelling strategy

To estimate school-specific changes in student wellbeing outcomes, we used the same analytical approach described in Appendix D. For each outcome measure, we estimated the following growth model that included cluster mean-centered scholastic year indicators to account for differences in student response composition across the years of interest:

$$\text{Model 1: } Pr(y_{is} = 1) = F(\beta_0 + v_{0s} + (\beta_1 + v_{1s}) \cdot time_{is} + \sum_n \alpha_n \cdot Year\ n_{is})$$

where y_{is} represents the binary TTFM wellbeing outcome for student i in school s , $time_{is}$ represents a binary variable, coded 1 for 2019 and 0 otherwise, $Year\ n_{is}$ is the school mean-centered indicator for scholastic year n (Year 4 and Year 8 were used as the baseline), and $v_0 \sim N(0, \sigma_{v_0}^2)$ and $v_1 \sim N(0, \sigma_{v_1}^2)$ are school random effects. We estimated the model with an unstructured covariance matrix such that:

$$v_s \sim MN \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{v_0}^2 & \sigma_{v_1 v_0} \\ \sigma_{v_0 v_1} & \sigma_{v_1}^2 \end{pmatrix} \right]$$

The next step in our modelling strategy involved adding the measure of school need to the equations for the varying intercepts and time slopes. To determine the most appropriate functional form for the measure, we used lowess smoothers to visualise the relationships between the BLUPs of the random effects and the measure of need. These plots showed that linear predictors were likely to be sufficient for a positive sense of belonging and high expectations for success in the primary school analyses, giving the following model specification:

$$\text{Model 2: } Pr(y_{is} = 1) = F(\beta_{00} + \beta_{01} \cdot school\ need_s + v_{0s} + (\beta_{10} + \beta_{11} \cdot school\ need_s + v_{1s}) \cdot time_{is} + \sum_n \alpha_n \cdot Year\ n_{is})$$

We also found that there was a likely curvilinear relationship between the measure of need and the school-specific intercepts for all wellbeing outcomes in the secondary school analyses and high advocacy at school in the primary school analysis, giving the following model specification:

$$\text{Model 3: } Pr(y_{is} = 1) = F(\beta_{00} + \beta_{01} \cdot school\ need_s + \beta_{02} \cdot school\ need_s^2 + v_{0s} + (\beta_{10} + \beta_{11} \cdot school\ need_s + v_{1s}) \cdot time_{is} + \sum_n \alpha_n \cdot Year\ n_{is})$$

To check that we had accurately captured the functional relationship between the intercepts, time slopes and the measure of need, we used the BLUPs from the final models to examine whether there was any residual relationships between the conditional random intercepts, time slopes and the measure of need. These plots showed that the final models were sufficient.

Results

Positive sense of belonging

In Model 1, we estimated the fixed intercepts as 1.49 (95% CI [1.46, 1.53]) for primary schools and 0.49 (95% CI [0.45, 0.53]) for secondary schools. These estimates indicate that in 2015 the expected proportion of students with a positive sense of belonging was around 82 per cent for an average primary school and 62 per cent for an average secondary school. We estimated the variance across the school-specific intercepts as 0.07 (95% CI [0.06, 0.09]) for primary schools and 0.10 (95% CI [0.09, 0.12]) for secondary schools. The difference in predicted proportions at the 70th percentile of the random intercept distribution and the 30th percentile was about 2.82 percentage points for primary schools and 8.22 percentage points for secondary schools. This means that primary schools had a small amount of variability and secondary schools had a moderate amount of variability across the proportions of students with a positive sense of belonging in 2015.

We estimated the fixed time slope as -0.33 (95% CI [-0.36, -0.30]) for primary schools and -0.15 (95% CI [-0.18, -0.12]) for secondary schools. The proportion of students with a positive sense of belonging decreased by about 5.45 percentage points in an average primary school and by about 3.52 percentage points in an average secondary school from 2015 to 2019. We estimated the variance across the school-specific time slopes as 0.05 (95% CI [0.03, 0.07]) for primary schools and 0.04 (95% CI [0.03, 0.05]) for secondary schools. This means that primary and secondary schools had a small amount of variability across the time slopes. The predicted change in the proportion of the students with a positive sense of belonging for a primary school at the 70th percentile of the random slope distribution (-4.53%) was 1.90 percentage points higher than the predicted change for a primary school at the 30th percentile (-6.43%). The predicted change in the proportion of students with a positive sense of belonging for a secondary school at the 70th percentile of the random slope distribution (-1.89%) was 3.35 percentage points higher than the predicted change for a secondary school at the 30th percentile (-5.24%).

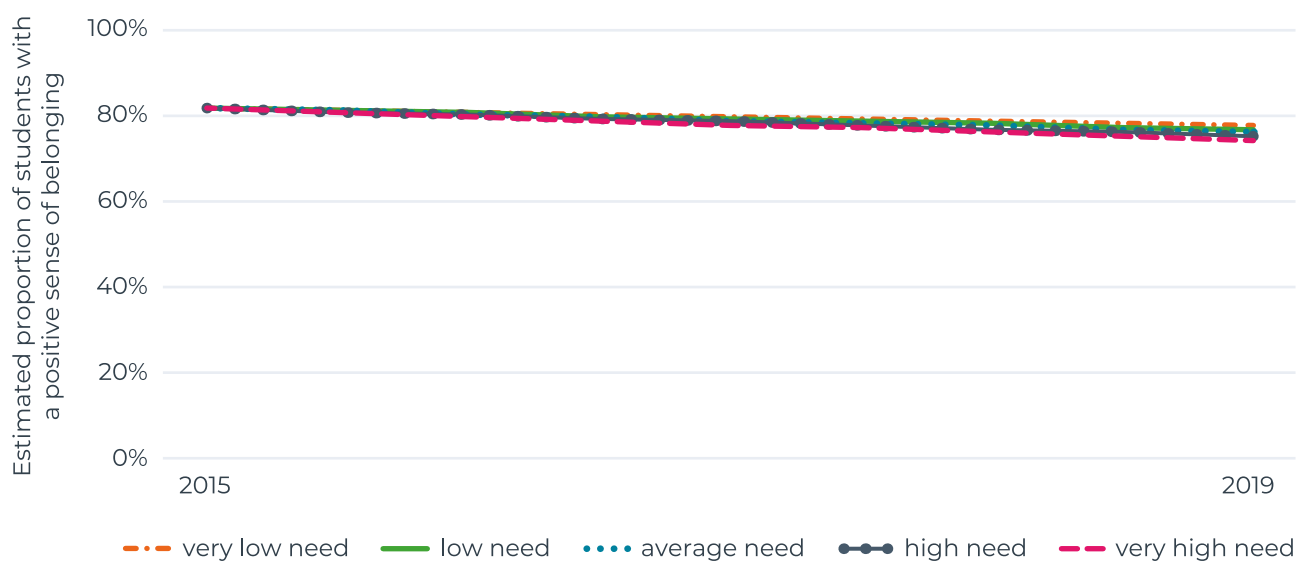
In Model 2 (primary schools), we estimated the coefficient for the fixed intercept as 1.49 (95% CI [1.46, 1.53]), indicating that about 82 per cent of the students in a school with average need were expected to have a positive sense of belonging in 2015. Furthermore, we estimated the coefficient for the measure of need as -0.01 (95% CI [-0.04, 0.03]), indicating that the odds of a positive sense of belonging in 2015 decreased by a factor of about 0.99 for each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as -0.34 (95% CI [-0.38, -0.31]) while we estimated the cross-level interaction as -0.06 (95% CI [-0.09, -0.02]). This means that the odds of a positive sense of belonging for students in a school with average need were expected to decrease by a factor of about 0.71 from 2015 to 2019, with the rate of change decreasing by a factor of about 0.94 with each standard deviation increase in the measure of need. These results suggest that the gap between high and low need schools was slightly greater in 2019 than 2015.

To make these results more concrete, we used the estimated model parameters to predict growth curves for schools with different values of the measure of need (Appendix A for more information). As shown in Figure 13, the expected proportion of students with a positive sense of belonging in a very low need primary school (10th percentile) decreased by 4.32 percentage points from 2015 (81.83%) to 2019 (77.51%). However, the expected proportion of students with a positive sense of belonging in a very high need primary school (90th percentile) decreased by about 7.24 percentage points from 2015 (81.51%) to 2019 (74.27%).

Figure 13

Expected proportion of primary school students with a positive sense of belonging for schools with different levels of need



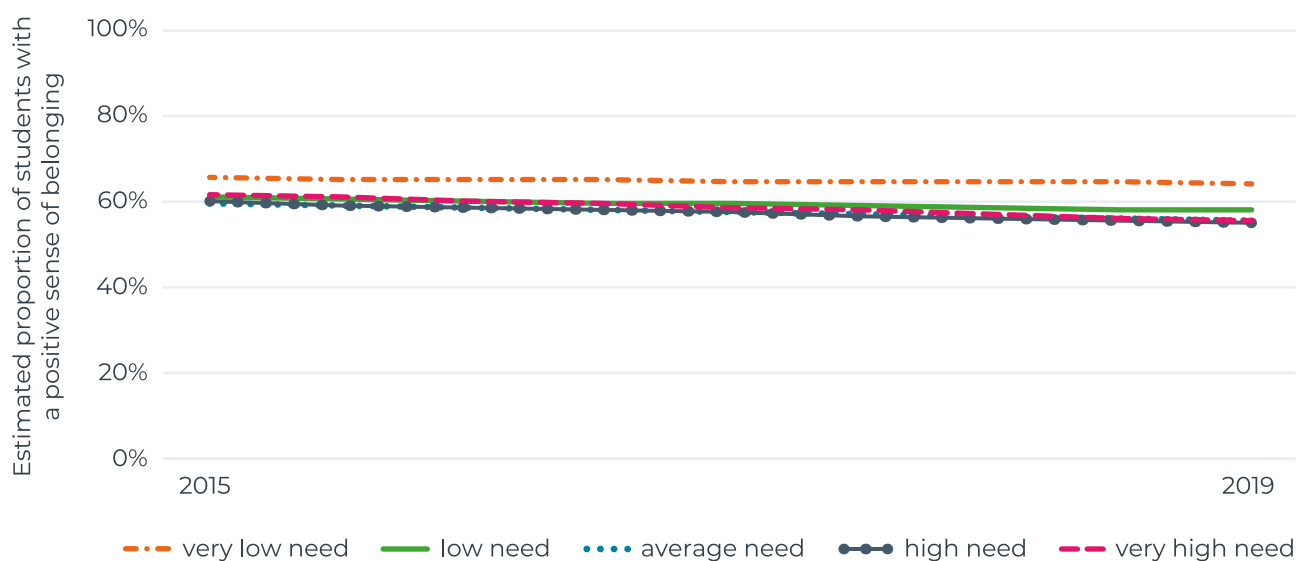
In Model 3 (secondary schools), we estimated the coefficient for the fixed intercept as 0.39 (95% CI [0.35, 0.44]), indicating that about 60 per cent of the students in a school with average need were expected to have a positive sense of belonging in 2015. Furthermore, we estimated the coefficient for the linear component of the measure of need as -0.05 (95% CI [-0.10, -0.01]) while we estimated the coefficient for the quadratic component as 0.10 (95% CI [0.07, 0.12]). This means that the initial rate of change in the odds of a positive sense of belonging for an average need school in 2015 was about 0.95, with the rate of change accelerating by 1.10 with each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as -0.16 (95% CI [-0.19, -0.13]) while we estimated the cross-level interaction as -0.08 (95% CI [-0.12, -0.05]). This means that the odds of a positive sense of belonging for students in a school with average need were expected to decrease by a factor of about 0.85 from 2015 to 2019, with the rate of change decreasing by a factor of about 0.92 with each standard deviation increase in the measure of need.

As shown in Figure 14, the expected proportion of students with a positive sense of belonging in a very low need secondary school (10th percentile) decreased by 1.20 percentage points from 2015 (65.30%) to 2019 (64.10%). However, the expected proportion of students with a positive sense of belonging in a very high need secondary school (90th percentile) decreased by about 6.28 percentage points from 2015 (61.56%) to 2019 (55.28%).

Figure 14

Expected proportion of secondary school students with a positive sense of belonging for schools with different levels of need



High expectations for success

In Model 1, we estimated the fixed intercepts as 3.27 (95% CI [3.21 3.33]) for primary schools and 1.23 (95% CI [1.17, 1.28]) for secondary schools. These estimates indicate that in 2015 the expected proportion of students who reported high expectations for success was around 96 per cent for an average primary school and 77 per cent for an average secondary school. Furthermore, we estimated the variance across the school-specific intercepts as 0.23 (95% CI [0.17, 0.31]) for primary schools and 0.16 (95% CI [0.13, 0.20]) for secondary schools. The difference in predicted proportions at the 70th percentile of the random intercept distribution and at the 30th percentile was 1.11 percentage points for primary schools and 6.96 percentage points for secondary schools. This means that primary schools had a small amount of variability and secondary schools had a moderate amount of variability across the proportions of the students who reported high expectations for success in 2015.

We estimated the fixed time slope as -0.26 (95% CI [-0.33, -0.19]) for primary schools and -0.27 (95% CI [-0.33, -0.22]) for secondary schools. The proportion of the students who reported high expectations for success reduced by about 1.03 percentage points in an average primary school and by about 5.17 percentage points in an average secondary school from 2015 to 2019. Furthermore, we estimated the variance across the school-specific time slopes as 0.21 (95% CI [0.14, 0.32]) for primary schools and 0.12 (95% CI [0.09, 0.15]) for secondary schools. This means that primary schools had a small amount of variability and secondary schools had a moderate amount of variability across the time slopes. The predicted change in the proportions of the students who reported high expectations for success for a primary school at the 70th percentile of the random slope distribution

(-0.55%) was about 0.95 percentage points higher than the predicted change for a school at the 30th percentile (-1.51%). The predicted change in the proportions of the students who reported high expectations for success for a secondary school at the 70th percentile of the random slope distribution (-2.33%) was about 5.39 percentage points higher than the predicted change for a school at the 30th percentile (-7.72%).

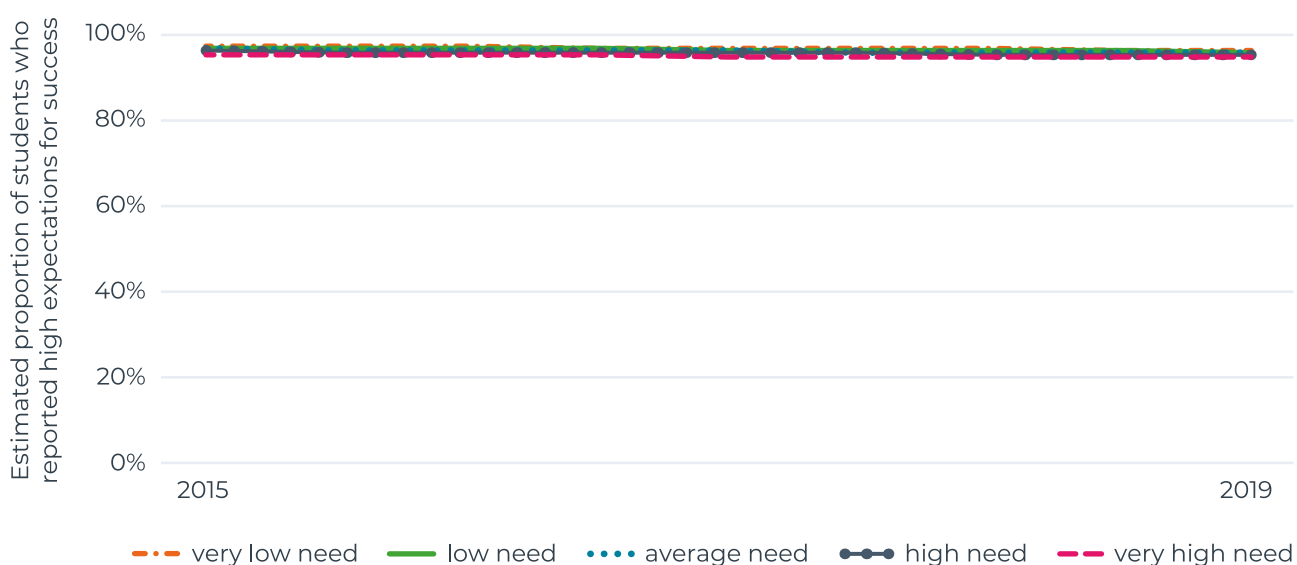
In Model 2 (primary schools), we estimated the coefficient for the fixed intercept as 3.24 (95% CI [3.18, 3.30]), indicating that about 96 per cent of the students in a school with average need were expected to report high expectations for success in 2015. Furthermore, we estimated the coefficient for the measure of need as -0.18 (95% CI [-0.24, -0.13]), indicating that the odds of reporting high expectations for success in 2015 decreased by a factor of about 0.83 for each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as -0.25 (95% CI [-0.32, -0.18]) while we estimated the cross-level interaction as 0.04 (95% CI [-0.03, 0.11]). This means that the odds of reporting high expectations for success for students in a school with average need were expected to decrease by a factor of about 0.78 from 2015 to 2019, with the rate of change increasing by a factor of about 1.04 with each standard deviation increase in the measure of need.

As shown in Figure 15, the expected proportion of students who reported high expectations for success in a very low need primary school (10th percentile) decreased by 1.00 percentage point from 2015 (97.02%) to 2019 (96.02%). The expected proportion of students who reported high expectations for success in a very high need primary school (90th percentile) decreased by about 0.97 percentage points from 2015 (95.15%) to 2019 (94.18%).

Figure 15

Proportion of primary school students who reported high expectations for success for schools with different levels of need



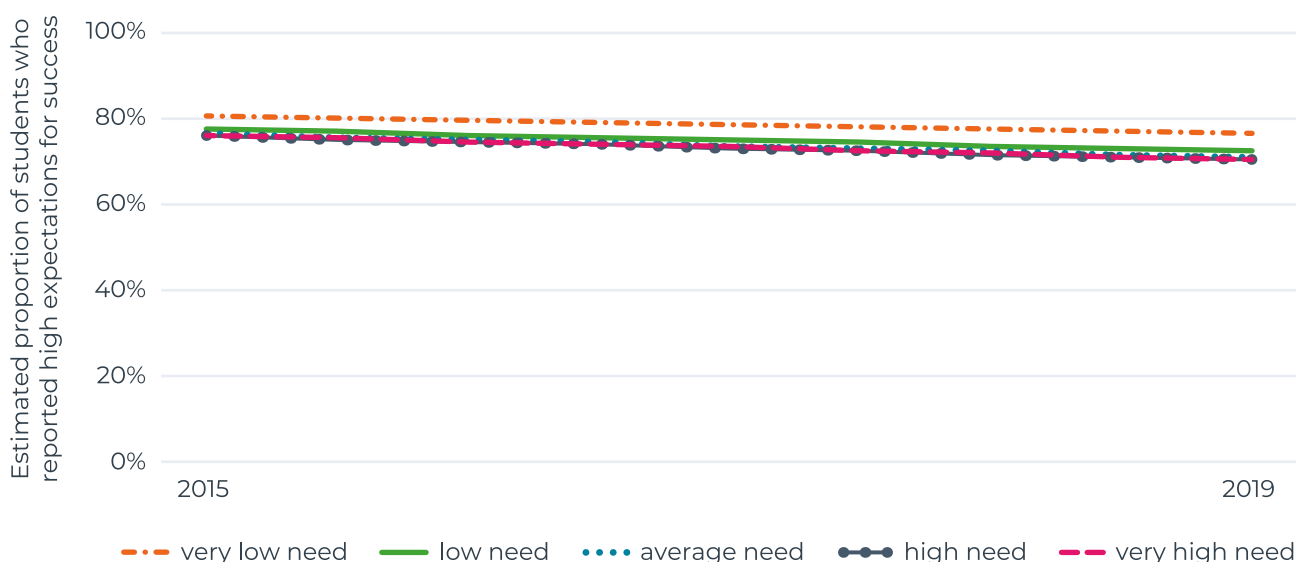
In Model 3 (secondary schools), we estimated the coefficient for the fixed intercept as 1.16 (95% CI [1.10, 1.22]), indicating that about 76 per cent of the students in a school with average need were expected to report high expectations for success in 2015. Furthermore, we estimated the coefficient for the linear component of the measure of need as -0.09 (95% CI [-0.15, -0.04]) while we estimated the coefficient for the quadratic component as 0.07 (95% CI [0.04, 0.10]). This means that the initial rate of change in the odds of reporting high expectations for success for an average need school in 2015 was about 0.91, with the rate of change accelerating by 1.07 with each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as -0.27 (95% CI [-0.33, -0.22]) while the cross-level interaction was estimated as -0.02 (95% CI [-0.07, 0.02]). This means that the odds of reporting high expectations for success for students in a school with average need were expected to decrease by a factor of about 0.76 from 2015 to 2019, with the rate of change decreasing by a factor of about 0.98 with each standard deviation increase in the measure of need.

As shown in Figure 16, the expected proportion of students who reported high expectations for success in a very low need secondary school (10th percentile) decreased by 4.11 percentage points from 2015 (80.27%) to 2019 (76.16%). The expected proportion of students who reported high expectations for success in a very high need secondary school (90th percentile) decreased by about 5.96 percentage points from 2015 (75.86%) to 2019 (69.90%).

Figure 16

Proportion of secondary school students who reported high expectations for success for schools with different levels of need



Advocacy at school

In Model 1, we estimated the fixed intercepts as 1.86 (95% CI [1.83, 1.90]) for primary schools and -0.02 (95% CI [-0.06, 0.02]) for secondary schools. These estimates indicate that in 2016 the expected proportion of students who reported high advocacy at school was around 87 per cent for an average primary school and 50 per cent for an average secondary school. Furthermore, we estimated the variance across the school-specific intercepts as 0.15 (95% CI [0.12, 0.18]) for primary schools and 0.07 (95% CI [0.05, 0.09]) for secondary schools. The difference in predicted proportions at the 70th percentile of the random intercept distribution and at the 30th percentile was 3.43 percentage points for primary schools and 6.77 percentage points for secondary schools. This means that primary schools had a small amount of variability and secondary schools had a moderate amount of variability across the proportions of the students who reported high advocacy at school in 2016.

We estimated the fixed time slope as 0.01 (95% CI [-0.3, 0.05]) for primary schools and 0.10 (95% CI [0.07, 0.14]) for secondary schools. The proportion of the students who reported high advocacy at school increased by about 0.11 percentage points in an average primary school and by about 2.53 percentage points in an average secondary school from 2016 to 2019. Furthermore, we estimated the variance across the school-specific time slopes as 0.17 (95% CI [0.14, 0.22]) for primary schools and 0.04 (95% CI [0.03, 0.05]) for secondary schools. The predicted change in the proportions of the students who reported high advocacy at school for a primary school at the 70th percentile of the random slope distribution (1.59%) was about 3.11 percentage points higher than the predicted change for a school at the 30th percentile (-1.52%). The predicted change in the proportions of the students who reported high advocacy at school for a secondary school at the 70th percentile of the random slope distribution (4.39%) was about 3.46 percentage points higher than the predicted change for a school at the 30th percentile (0.93%).

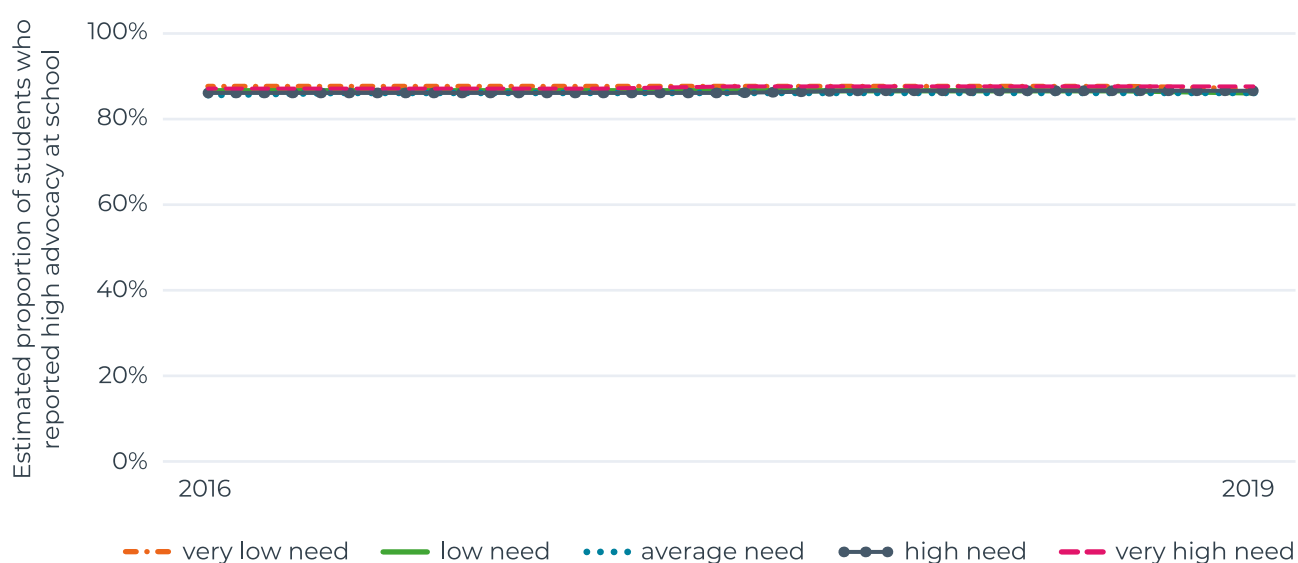
In Model 3 (primary schools), we estimated the coefficient for the fixed intercept as 1.80 (95% CI [1.75, 1.84]), indicating that about 86 per cent of the students in a school with average need were expected to report high advocacy at school in 2016. Furthermore, we estimated the coefficient for the linear component of the measure of need as -0.03 (95% CI [-0.07, 0.01]) while the coefficient for the quadratic component was estimated as 0.06 (95% CI [0.04, 0.09]). This means that the initial rate of change in the odds of reporting high advocacy was about 0.97, with the rate of change accelerating by a factor of 1.07 with each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as 0.16 (95% CI [-0.03, 0.06]) while the cross-level interaction was estimated as 0.04 (95% CI [-0.01, 0.08]). This means that the odds of reporting high advocacy for students in a school with average need were expected to increase by a factor of about 1.02 from 2016 to 2019, with the rate of change increasing by a factor of about 1.04 with each standard deviation increase in the measure of need.

As shown in Figure 17, the expected proportion of students who reported high advocacy at school in a very low need primary school (10th percentile) decreased by 0.33 percentage point from 2016 (87.45%) to 2019 (87.12%). The expected proportion of students who reported high advocacy at school in a very high need primary school (90th percentile) increased by about 0.74 percentage points from 2016 (86.71%) to 2019 (87.45%).

Figure 17

Proportion of primary school students who reported high advocacy at school for schools with different levels of need



In Model 3 (secondary schools), we estimated the coefficient for the fixed intercept as -0.08 (95% CI [-0.13, -0.04]), indicating that about 48 per cent of the students in a school with average need were expected to report high advocacy at school in 2016. Furthermore, we estimated the coefficient for the linear component of the measure of need as 0.09 (95% CI [0.05, 0.13]) while we estimated the coefficient for the quadratic component as 0.08 (95% CI [0.05, 0.10]). This means that the initial rate of change in the odds of reporting high advocacy for an average need school was about 1.10, with the rate of change accelerating by 1.08 with each standard deviation increase in the measure of need.

We estimated the coefficient for the fixed time slope as 0.09 (95% CI [0.06, 0.12]) while we estimated the cross-level interaction as -0.06 (95% CI [-0.09, -0.03]). This means that the odds of reporting high advocacy for students in a school with average need were expected to increase by a factor of about 1.09 from 2016 to 2019, with the rate of change decreasing by a factor of about 0.94 with each standard deviation increase in the measure of need.

As shown in Figure 18, the expected proportion of students who reported high advocacy at school in a very low need secondary school (10th percentile) increased by 4.25 percentage points from 2016 (48.18%) to 2019 (52.43%). The expected proportion of students who reported high advocacy at school in a very high need secondary school (90th percentile) increased by about 0.40 percentage points from 2016 (53.27%) to 2019 (53.67%).

Figure 18

Proportion of secondary school students who reported high advocacy at school for schools with different levels of need



Table 20

Effect sizes for each modelled growth trajectory of student wellbeing outcomes

	Percentile of school need measure				
	Very low need	Low need	Average need	High need	Very high need
	10 th	30 th	50 th	70 th	90 th
Positive sense of belonging					
Primary	-0.04	-0.05	-0.06	-0.06	-0.07
Secondary	-0.01	-0.03	-0.04	-0.05	-0.06
High expectations					
Primary	-0.01	-0.01	-0.01	-0.01	-0.01
Secondary	-0.04	-0.05	-0.05	-0.06	-0.06
High advocacy					
Primary	0.00	0.00	0.00	0.00	0.01
Secondary	0.04	0.03	0.02	0.01	0.00

Appendix G: Technical details of the CESE principal survey analysis

Background of the principal survey

Since 2016 CESE has invited around half of all principals of NSW Government schools to participate in an annual survey. We typically invite half of the principals each year to minimise survey fatigue. These annual surveys aim to measure principal perceptions of certain policies and programs to inform CESE evaluations.

2019 principal survey

Sampling frame

In 2019 there were 2,214 NSW Government schools. We divided these schools into two groups: those participating in the Intensive Support to Schools Program (ISSP schools) and those not participating in the program (non-ISSP schools). We invited all ISSP schools (n = 166) to participate in the 2019 survey because we had specific questions about this program and wanted to decrease the expected margin of error for this group. We then randomly selected half of the non-ISSP schools (n = 1,024) to be invited to participate in the survey. In total we invited 1,190 principals to participate in the 2019 principal survey (53.7% of the population).

Response rate

We invited each principal in the sampling frame to take part in the survey by sending them an online link. Of the 1,190 principals who were invited to participate, 734 (61.7%) completed the survey²⁵. We acknowledge that this response rate indicates the possibility of non-response bias occurring, meaning that some principals who have specific perspectives on LSLD may not have responded to the survey²⁶.

Representativeness of participants

We used a logistic regression model (Model 1) to investigate whether schools with certain characteristics were more or less likely to respond to the survey. We used only the data from the schools that were invited to participate in the survey to investigate differences in response probabilities. We included the following inputs in the model:

1. ISSP status (ISSP vs. non-ISSP)
2. Operational Directorate (Metropolitan North vs. Metropolitan South vs. Regional North vs. Regional South vs. Rural North vs. Rural South and West)
3. school type (Primary vs. Secondary vs. Combined vs. Schools for Specific Purposes (SSP) vs. Other)
4. Index of Community Socio-educational Advantage (ICSEA) values²⁷.

25 This means that the final sample included 33.2% of the population of interest.

26 However, as demonstrated in the conclusion of this appendix, the sample appears to be representative across our observable characteristics of interest. This indicates that none of these characteristics appears to be related to the probability of responding to the survey. We are not aware of any additional characteristics that might seriously influence the probability of response to these questions that could reasonably be included in this analysis.

27 Of the 1,190 schools that were invited to participate in the survey, 88 (7.4%) did not have valid ICSEA values. To investigate whether schools with missing values were more or less likely to participate in the survey, we created an indicator variable for the missing values and included it in the model. The missing ICSEA values were replaced with a constant so as to include the cases with missing values in the estimation.

The results from Model 1 (Table 21) show that the response probabilities did not meaningfully vary across the modelled school characteristics (AUC = 0.55²⁸). This means that certain schools were no more or less likely to respond to the survey.

Calculating design weights

As we used a stratified sample frame to intentionally over-sample ISSP schools, we needed to calculate design weights to reconfigure our sample so that it represented the population of interest (all principals of NSW Government schools). We used the following formula to calculate the design weight for school j :

$$\text{design weight}_j = \frac{1}{\text{selection probability}_j} \quad (1)$$

Using this formula, the design weights for ISSP schools were all 1 (all ISSP schools were invited to participate, thus their selection probabilities were all 1) whereas the weights for non-ISSP schools were all 2 (only half of the non-ISSP schools were invited, thus their selection probabilities were all 0.5)²⁹. The design weights were then rescaled so that they summed to the population count.

To ensure that the final sample adequately represented the population, we fit another logistic regression model to the data (Model 2). This model regressed a sample indicator (taking the value 1 for the 734 schools in the final sample and 0 for the 2,214 schools in the whole population) against the same inputs described earlier in this document. The design weights for the schools in the final sample were calculated using (1) while the weights for the schools in the whole population were set to 1. The results from Model 2 (Table 21) show that the modelled school characteristics (AUC = 0.52) did not discriminate between the final sample and the population.

28 The area under a receiver operating characteristic curve captures the extent to which the linear combination of predictors discriminates between cases with the event of interest and those without. A value of 0.5 indicates that a model did not discriminate at all while a value of 1 represents perfect discrimination.

29 Design weights represent the number of cases each sample observation represents in the population.

Table 21**Results from logistic regression models**

	Model 1		Model 2	
	Estimate	Odds Ratio	Estimate	Odds Ratio
ISSP status	0.10	1.11	0.09	1.10
Operational directorate				
Metro South	-0.07	0.94	-0.08	0.92
Regional North	0.09	1.09	-0.09	0.91
Regional South	0.16	1.18	-0.05	0.95
Rural North	-0.08	0.92	-0.07	0.93
Rural South & West	-0.04	0.96	-0.05	0.95
School type				
Combined	0.51	1.67	0.22	1.25
Other	-0.40	0.67	-0.52	0.60
Secondary	0.09	1.10	-0.04	0.96
SSP	-0.49	0.61	-0.32	0.72
ICSEA_MISS	0.28	1.32	0.14	1.15
ICSEA	-0.08	0.93	-0.03	0.97
CONSTANT	0.43	1.54	0.06	1.06

Calculating a finite population correction

When a sample set contains an appreciable proportion of the population set, typical inferential statistics tend to overestimate standard errors. When working with finite populations, standard errors should be adjusted according to the amount of the population that was sampled. As our final sample included 33.2 per cent of the population, we used the following formula to calculate a finite population correction:

$$((N - n)/(N - 1))^{0.5} \quad (2)$$

LSLD analyses

The results from our analysis of the principal survey suggest that the data from the 2019 principal survey likely produces unbiased and consistent estimates of population parameters. That is, the sample data adequately represents the population of interest. We therefore used the calculated design weights and the finite population correction when analysing the sample data to produce estimated proportions of responses to the LSLD survey questions.

Estimated proportions of principals responses to the LSLD survey questions

Principals were asked to respond to 9 questions about LSLD by selecting from five response options (strongly agree, agree, neither disagree nor agree, disagree, strongly disagree). We present the estimated proportions of summarised responses in Figure 19 and Figure 20, and the full range of responses in Figure 21 to Figure 29. When responding, principals were asked to consider how the LSLD reforms impacted upon the day to day operation of their school, rather than the broader impact of LSLD upon the school system in general.

Figure 19

Estimated proportions of principals who disagreed or did not disagree

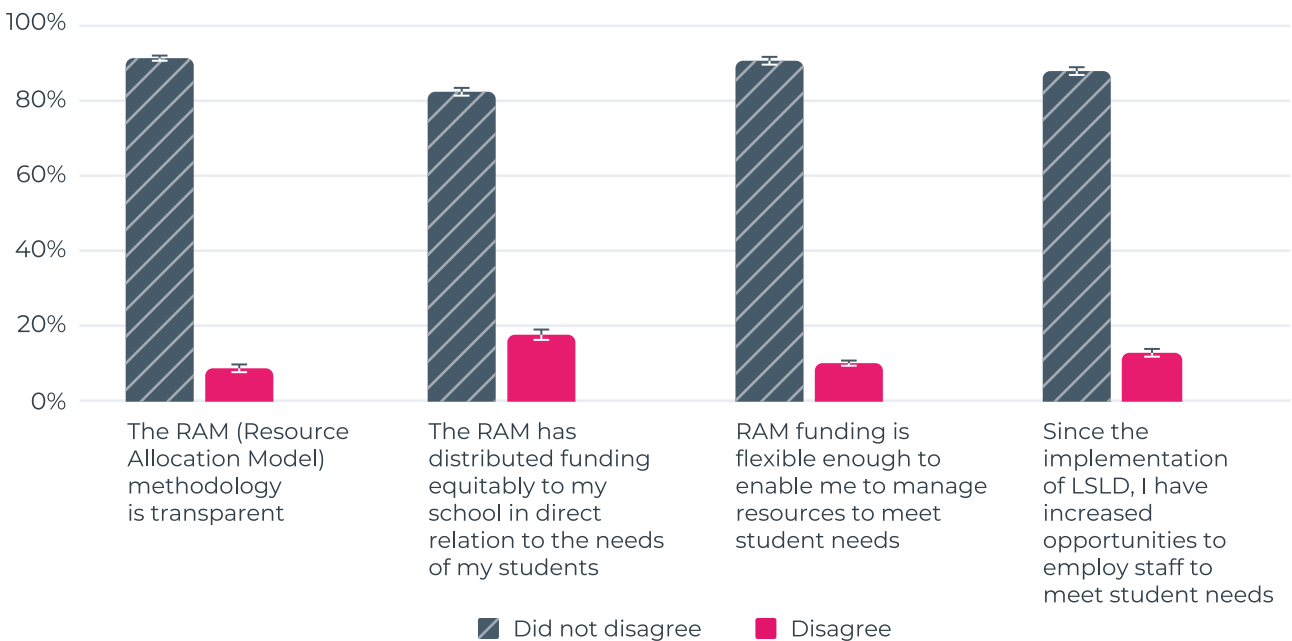


Figure 20

Estimated proportions of principals who agreed or did not agree

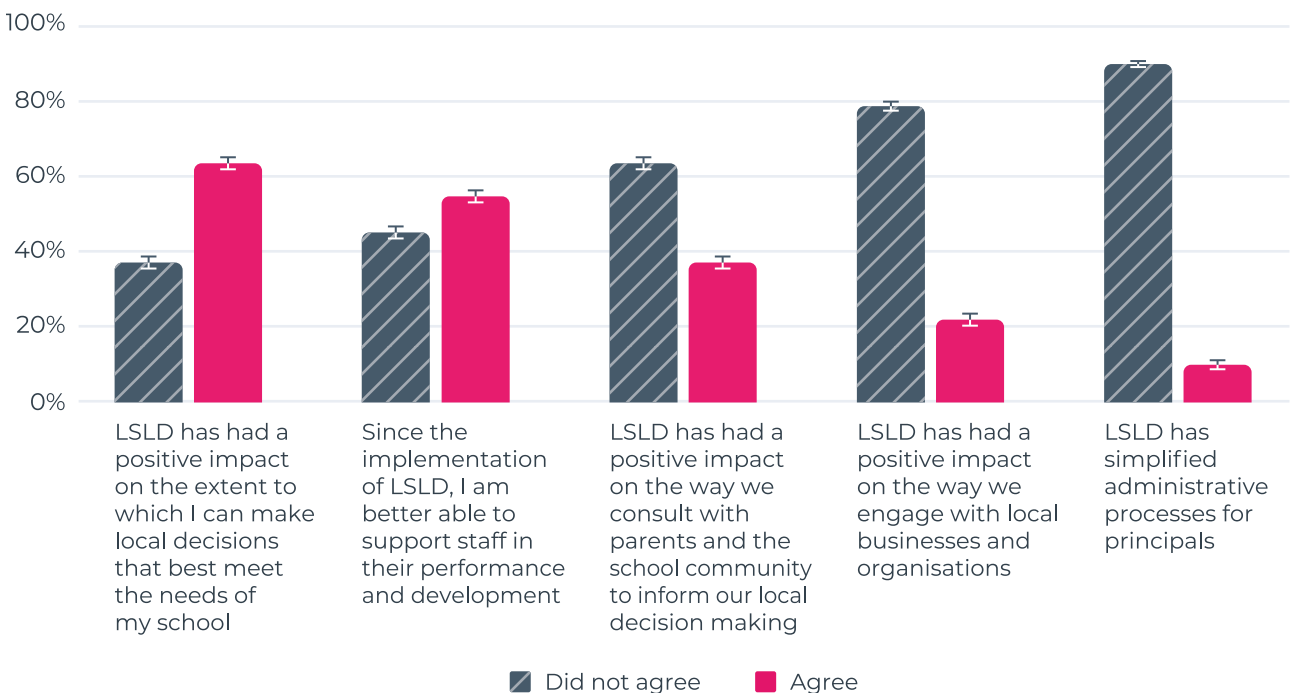
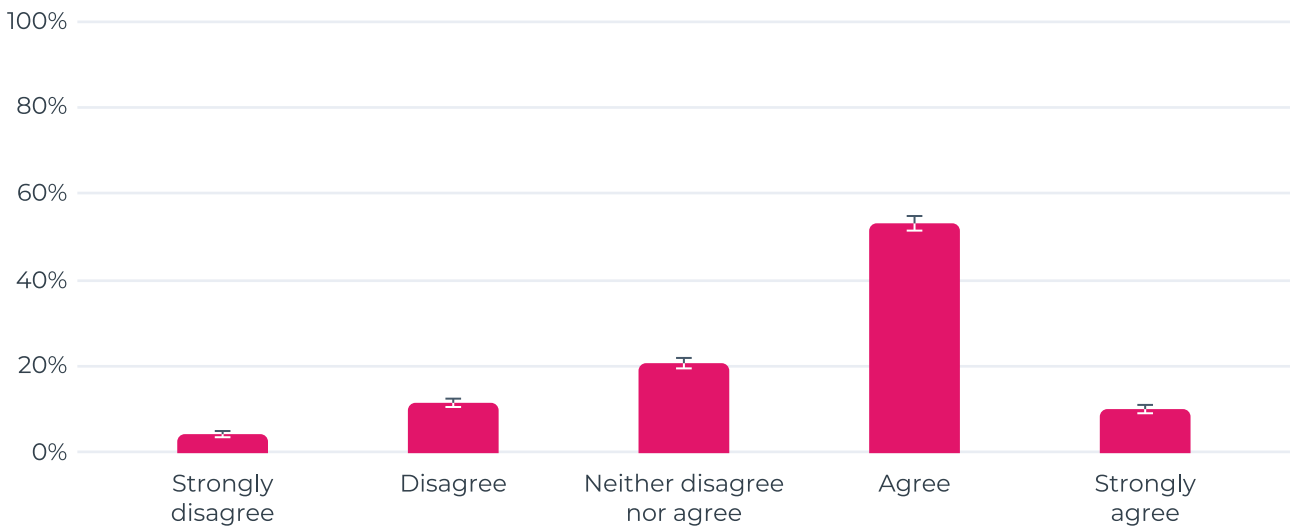


Figure 21

Estimated proportions of responses to the statement, 'LSLD has had a positive impact on the extent to which I can make local decisions that best meet the needs of my school.'

**Figure 22**

Estimated proportions of responses to the statement, 'The RAM (Resource Allocation Model) methodology is transparent.'

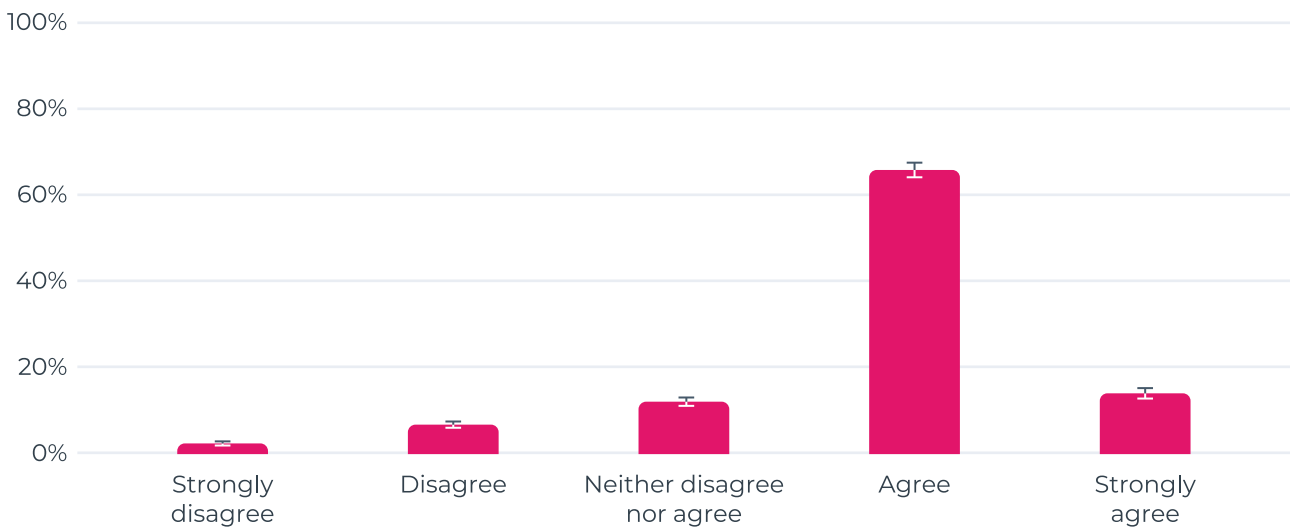
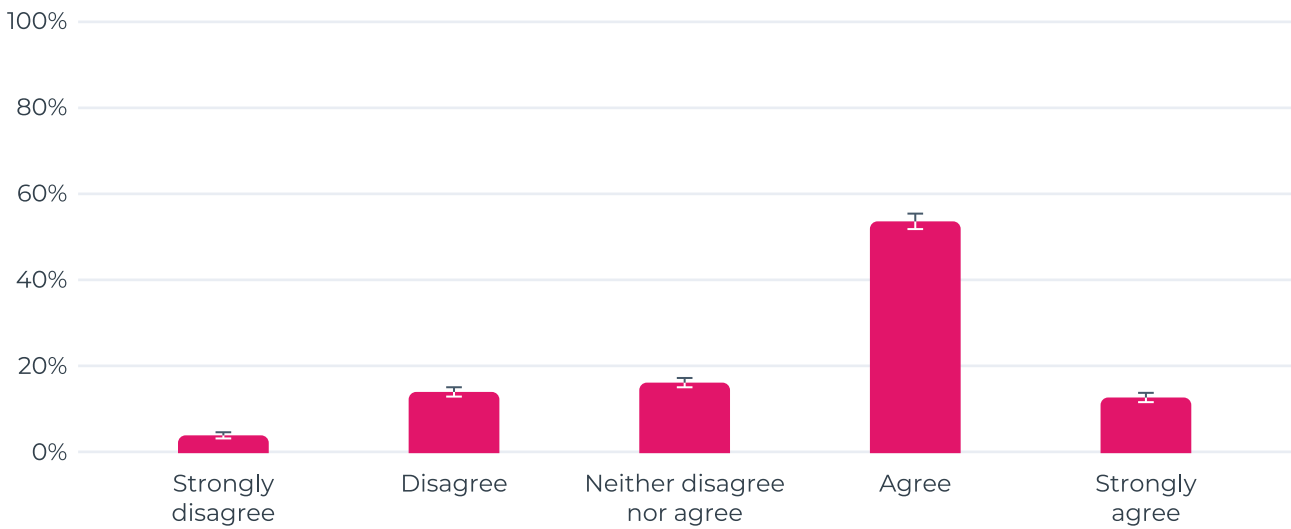


Figure 23

Estimated proportions of responses to the statement, 'The RAM has distributed funding equitably to my school in direct relation to the needs of my students.'

**Figure 24**

Estimated proportions of responses to the statement, 'RAM funding is flexible enough to enable me to manage resources to meet student needs.'

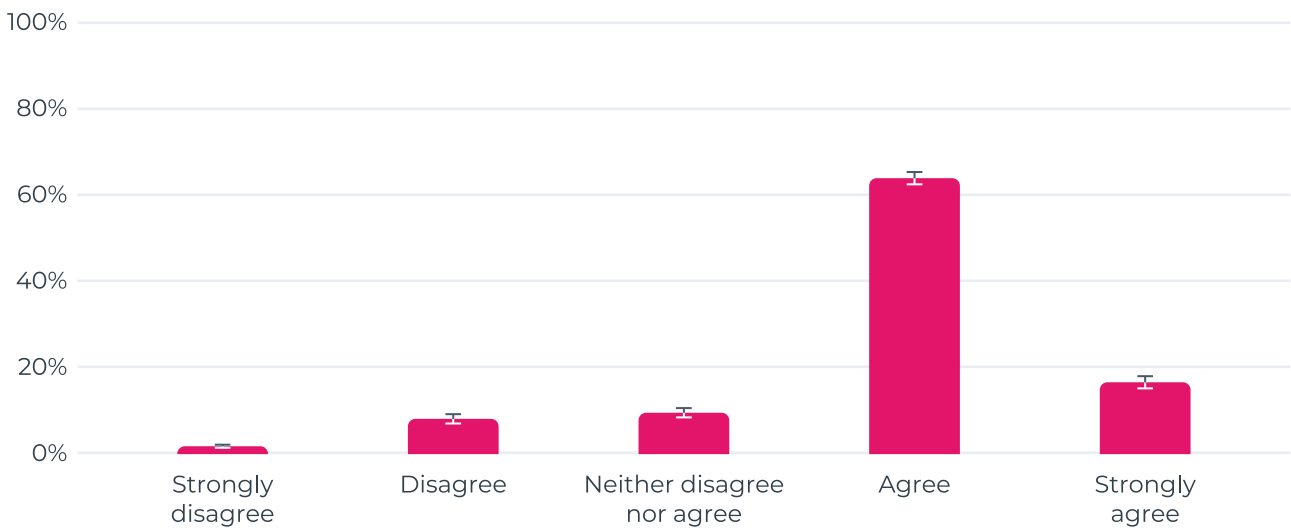
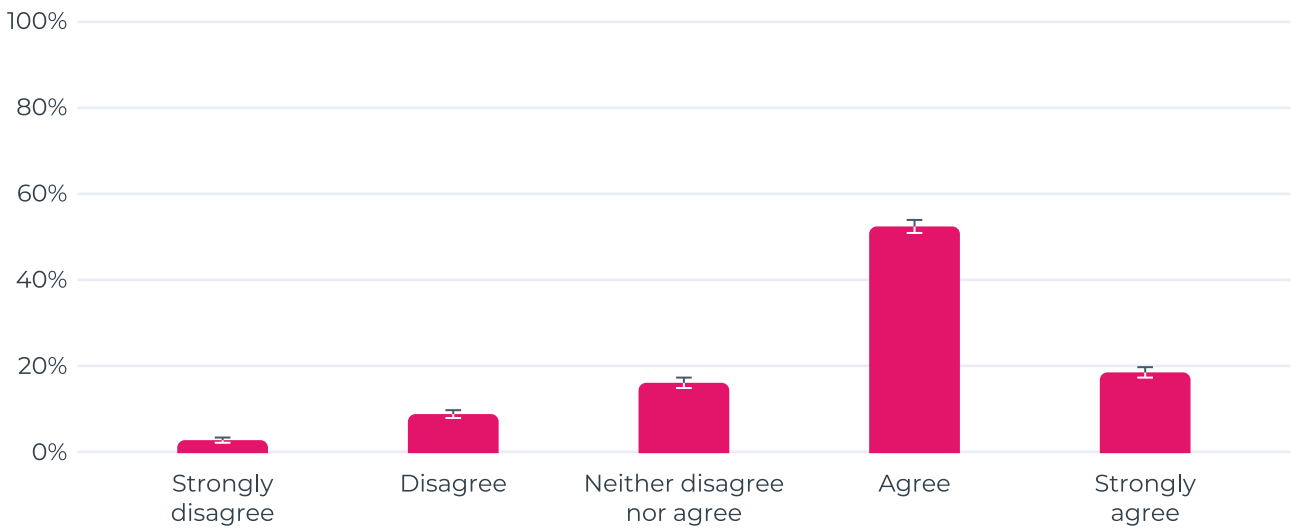


Figure 25

Estimated proportions of responses to the statement, 'Since the implementation of LSLD, I have increased opportunities to employ staff to meet student needs.'

**Figure 26**

Estimated proportions of responses to the statement, 'Since the implementation of LSLD, I am better able to support staff in their performance and development.'

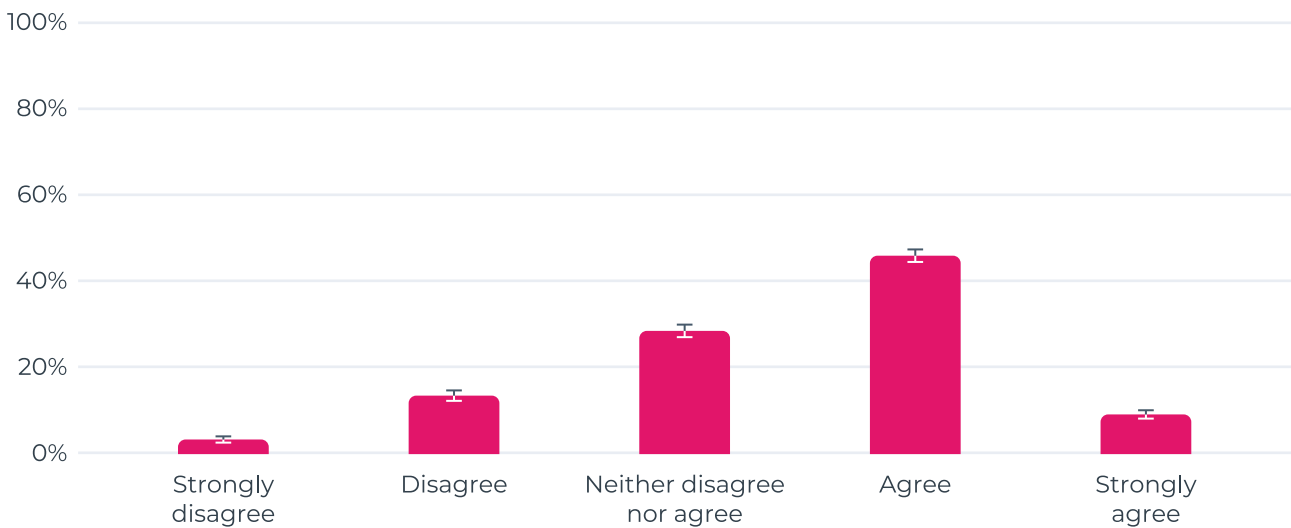
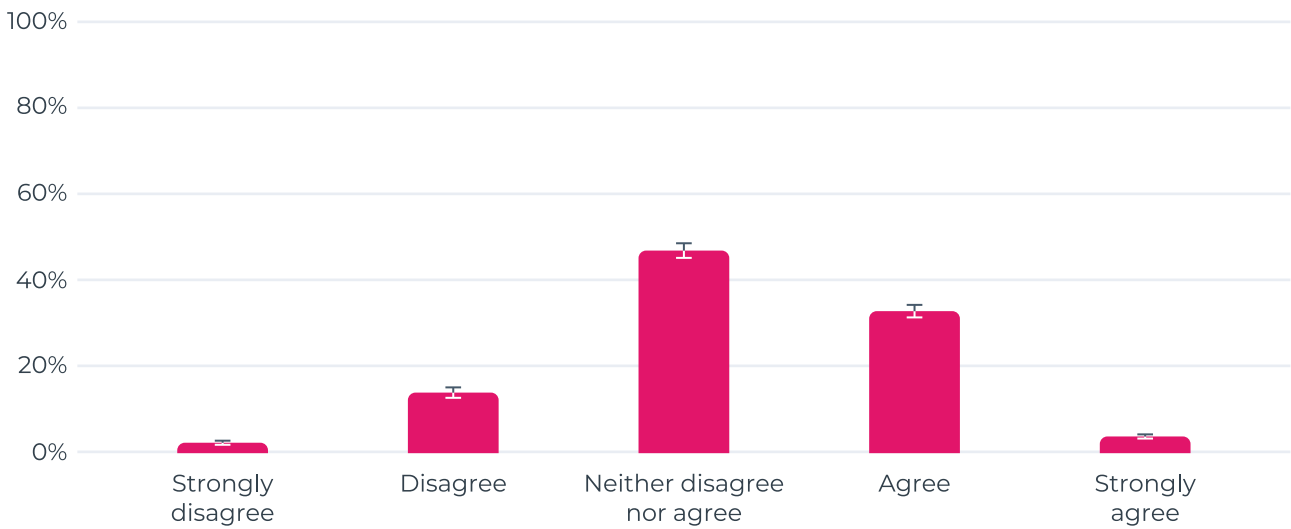


Figure 27

Estimated proportions of responses to the statement, 'LSLD has had a positive impact on the way we consult with parents and the school community to inform our local decision-making.'

**Figure 28**

Estimated proportions of responses to the statement, 'LSLD has had a positive impact on the way we engage with local businesses and organisations.'

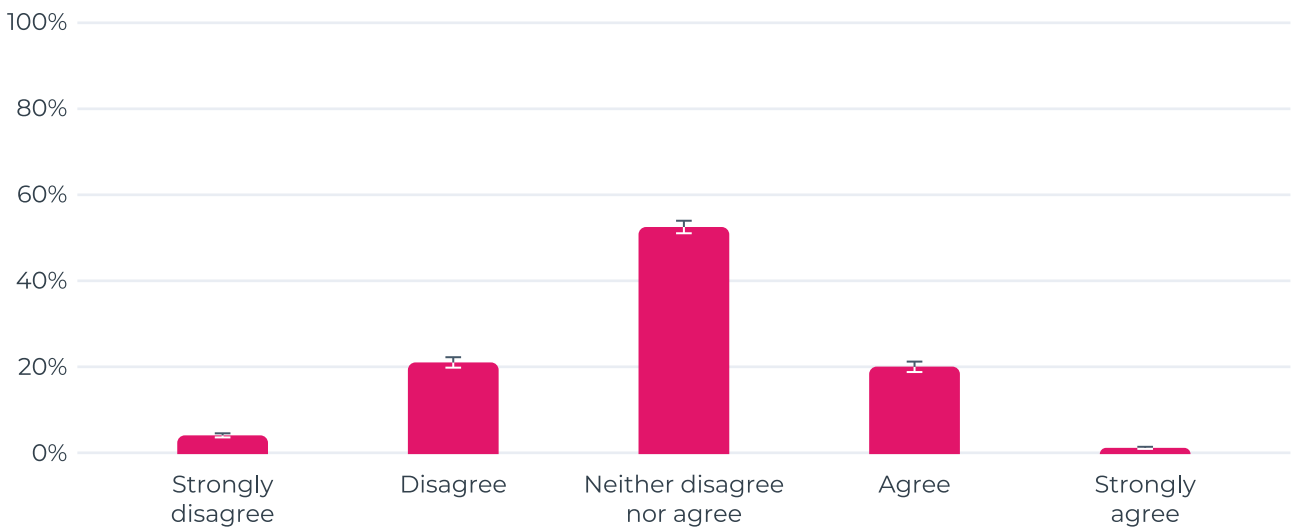
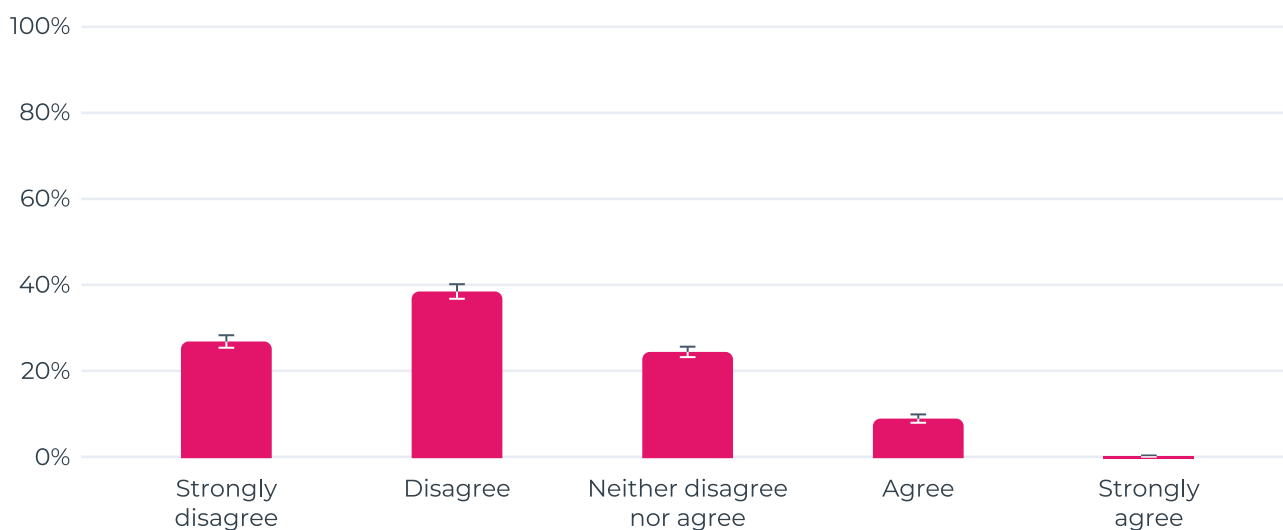


Figure 29

Estimated proportions of responses to the statement, 'LSLD has simplified administrative processes for principals.'



Principals were asked, 'In 2018, which of the following areas did you fund using the additional funding you received since the implementation of LSLD (including RAM and other funding)? Please select all that apply.'

The options were:

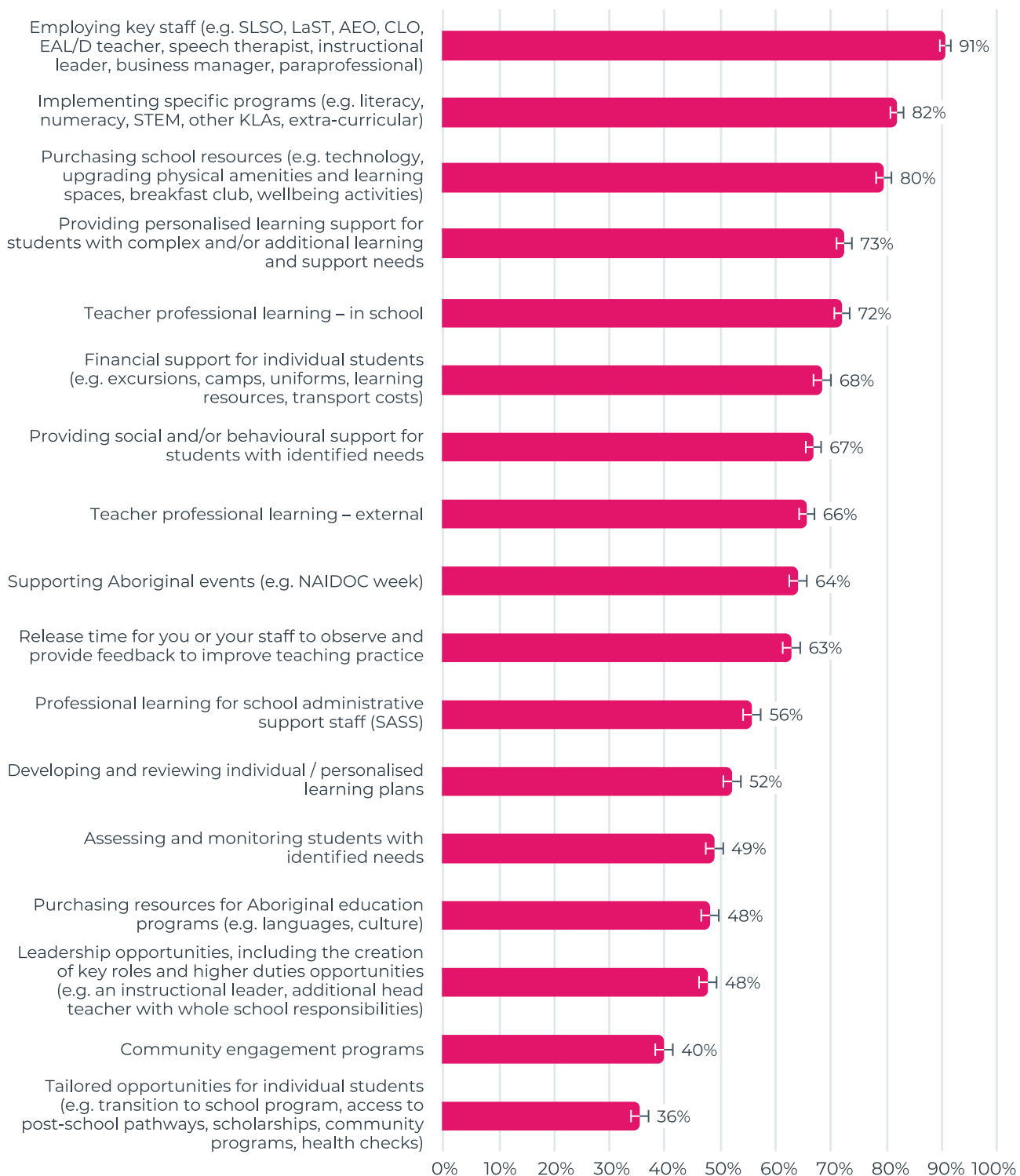
- implementing specific programs (for example, literacy, numeracy, STEM, other KLAs, extra-curricular)
- employing key staff (for example, SLSO, LaST, AEO, CLO, EAL/D teacher, speech therapist, instructional leader, business manager, paraprofessional)
- developing and reviewing individual/personalised learning plans
- providing personalised learning support for students with complex and/or additional learning and support needs
- providing social and/or behavioural support for students with identified needs
- assessing and monitoring students with identified needs
- leadership opportunities, including the creation of key roles and higher duties opportunities (for example, an instructional leader, additional head teacher with whole school responsibilities)
- teacher professional learning – in school
- teacher professional learning – external
- professional learning for SASS
- release time for you and your staff to observe and provide feedback to improve teaching practice
- financial support for individual students (for example, excursions, camps, uniforms, learning resources, transport costs)
- tailored opportunities for individual students (for example, transition to school program, access to post-school pathways, scholarships, community programs, health checks)
- purchasing school resources (for example, technology, upgrading physical amenities and learning spaces, breakfast club, wellbeing activities)
- community engagement programs

- purchasing resources for Aboriginal education programs (for example, languages, culture)
- supporting Aboriginal events (for example, NAIDOC week)
- other (please specify). _____

We present the estimated proportions of principals who selected each response option in Figure 30.

Figure 30

Estimated proportions of principals who selected each additional funding area



Appendix H: Qualitative method and analysis

We conducted face-to-face interviews with individual staff or small groups of staff from 17 schools. We invited three key groups of school staff to be interviewed: senior executive, teaching staff and SASS.

We selected a sample of schools that would broadly represent every school type, based on the following criteria:

1. school need: high need and low need
2. school type: primary, secondary, central/community and Schools for Specific Purpose (SSP) schools
3. school location: Metropolitan, Provincial, Remote and Very Remote³⁰
4. Operational Directorate: Metropolitan South, Metropolitan North, Regional South, Regional North, Rural South and West, Rural North.

We selected 10 high need schools and 7 low need schools, based on the 2018 RAM funding data. The decision to weight towards higher needs schools was made in consultation with the Evaluation Reference Group in the understanding that higher needs schools had experienced a greater impact from the reform.

We invited schools to participate through their principal, who was responsible for inviting school staff to participate. If a school declined to participate, we replaced that school with one that had similar characteristics, as per our sampling frame.

In addition to school staff, CESE also conducted interviews with key departmental staff including Directors, Educational Leadership and policy administrators. We conducted these interviews face-to-face or over video conference.

CESE developed discussion guides for the stakeholder groups and consistently applied these interview questions across all site visits. We recorded all interviews and group discussions with the agreement of interview participants, or took written notes if participants declined to be recorded. We transcribed all of the audio recordings and thematically analysed the qualitative data across the key features of the LSLD reform.

³⁰ Based on the MCEECDYA remoteness classifications.

Appendix I: Submissions from the NSWPPA, NSWSPC and NSWTF



NSWPPA

New South Wales Primary Principals Association

Building 10 Level 4 UTS Broadway Campus HAYMARKET www.nswppa.org.au

OVERVIEW:

In our earlier submission we made 26 recommendations to improve the lot of schools under the LSLD banner. Whilst several of these have been put in place e.g. principal role statement based on the AITSL principal standard; Annual Report and School Planning documentation are updated; SMR (Staffing Methodology Review) is currently examining staffing policies & practices, many have yet to materialise.

Overall we are supportive of the locus of school based decision making to be in the schools. As Professor John Fischetti says "...it gives Principals & their school communities a greater say over how they allocate & use their available resources to best meet the needs of their students". Professional Learning, the sharing of best practice and a supportive framework from the Centre are pivotal for the success of this initiative.

How have schools spent the additional funding they have received since the implementation of LSLD (including RAM and other funding)?

- The **RAM methodology** isn't always meeting the needs of schools. There are schools with surplus funds (at least too much to spend effectively due to change/ training fatigue/ inability to employ casuals) and there are schools with such insignificant amounts that they can't do anything effectively.
- The **base rate** needs to be boosted especially for smaller schools and schools that attract little equity funding. It is below the **SRS (Schools Resource Standard)**. We have many schools who therefore have no capacity to change staffing, introduce programs etc so their ability to make local decisions to meet the needs of their students is limited.
- Typically, schools with significant Equity funding have implemented administration or teaching & learning initiatives. Some examples:
 - Hiring a Business manager
 - Hiring additional SASS staff in the office
 - Hiring SLSOs to support targeted groups of students or additional students not funded through Integration support, or topping up support for students on inadequate Integration funding
 - Creating Instructional leaders in schools K-2 for those schools not EaFS (Early Action for Success) schools
 - Increased Professional Learning
 - Freeing up Executive members to support their teams deliver teaching & learning programs
 - Releasing designated teachers for a welfare role/ additional LAST role
- The **70% of funds** in schools gives a false sense - schools have a budget of \$8 million but most of that (\$7.5 mil) is staffing funds that come in and go out without any input from the Principal. Of the remaining \$500 000 a large part is tied to recurrent costs over which the Principal has little control - electricity, waste, maintenance, phones, water etc. And whilst a Principal can "play" a bit, they are certainly limited.



NSWPPA

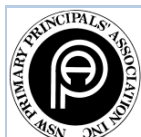
New South Wales Primary Principals Association

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What has been the impact of LSLD on school management and local decision-making practices?

LSLD has significantly increased the school management work load since its introduction. Primary schools, with significantly less administration staff, have struggled with the increased workload. Significantly, the tools to support LSLD have been of poor quality, mostly implemented poorly and required an exponential requirement for Professional Learning and time to embed new practices.

- **Red Tape** hasn't reduced but in fact increased exponentially taking the Principal away from the educational leadership role. Provision of a Business manager may assist. A lot of money has been used to support other staff in managing the workload rather than concentrate on improving learning.
- **Lack of training** - multiple systems implemented with little or limited training and little or limited ongoing support. SAP, EBS4, Synergy, School Website Service, eFPT. Huge waste of time and energy – has distracted people from the real focus of schools.
- Such has been the difficulty with **DoE software**, many schools are paying heavily for 3rd Party software that is intuitive but expensive. The DoE has been slow to accept the poor quality of its software and hence schools have had dilemmas determining whether to hold out and wait for the DoE systems to be “sorted” or to purchase 3rd party software. This dilemma has caused much inefficiency in schools.
 - A key example is schools not knowing their financial balances & a reluctance to spend funds
- The **team in LSLD** has been a strong supporter of schools making decisions, providing back-up and sharing best practice. Their advice has been invaluable in supporting schools make decisions and need to be retained.
- Communities of practice have been established and networking opportunities developed to share ideas, strategies and even staff. This positive direction, caused by a strong need to make the most of the limited opportunities to make school based decisions, is an encouraging sign that LSLD is welcomed by schools.
- There has been little change in respect to **staffing & recruitment** as a result of LSLD. Legacy practices and policies have stymied the school's ability to determine the mix of staff and only now with SMR (Staffing Methodology Review) and HCM (Human Capital Management) initiatives are we seeing possibilities for schools. There is much work to do in this area to ensure schools have a greater say in how their school is staffed.
- **Performance Management**, another key item in the LSLD reform has moved slowly. The PDP (Professional Development Plan) process is hamstrung by some of its conditions and principals have called for a greater degree of control over the process. The Auditor General has made critical comments as to the efficacy of the PDP and the movement by DoE will hopefully assist schools in having a robust PDP process linked to the teaching standards.
- The TPMP (**Teacher Performance Management Initiative**) which started as a pilot, has extended to all Operational Directorates and is seen by principals as the key means to improve teacher quality in schools. The support by trained staff, helps schools lift their performance by supporting identified teachers.



NSWPPA

New South Wales Primary Principals Association

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What has been the impact of LSLD and RAM funding on school and student outcomes?

Schools have mostly been able to use their SEF-SAS to determine their strategic directions based on ongoing evaluations. With the imposition of the Premier's targets on top of school plans, schools have been stretched to somehow meet the school identified improvement targets and focus on the Premier's targets as well. This additional layer of directions, based on questionable NAPLAN data, has often hampered the school's ability to meet the needs of its students.

Dependant on the school's strategic plan, schools, under LSLD, have been able to utilise Equity funds to implement their strategies. They may not have focused on student attendance, nor suspension rates nor engagement, but may have focused their limited funds on one or two strategies to lift student performance of a small cohort, or stage group and the impact may not be seen significantly yet.

There would be system data based on the schools that have used Instructional Leaders to lift both teacher performance and student performance. Non EaFS schools, who self-funded these Instructional leaders, mostly focused on K-2 students, could provide rich data on improved outcomes. Because of LSLD and Equity funding, these schools have been able to focus their energies and resources on the early years and the sustainability of these improvements is the key that needs to be studied longitudinally.

The difficulty in measuring school improvement is that NAPLAN is often touted as a means to determine school performance. NAPLAN, even in its best years, gives an incomplete picture of school performance, whereas devices such as SEF-SAS over time will show improvement or lack of it. The use of the Literacy & Numeracy Progressions is another means which schools could be able to use in the future to show improvement, or the new standards approach mooted by The Master's review of the NSW Curriculum, is also another way that may show growth. Currently we don't have tools that will show the true picture of the impact of RAM funding on school & student outcomes.

Phil Seymour
President NSWPPA

NSW SECONDARY PRINCIPALS' COUNCIL Inc.



LSLD Evaluation: SPC Response

Note: The evaluation questions do not allow for the scope of *Local Schools, Local Decisions*, namely all five reform areas, to be adequately addressed. There was much consultation across the education community which led to the refinement of a broader number of suggested areas for reform into the identified five areas. The evaluation questions appear to disregard the importance of some of these final five areas

How have schools spent the additional funding they have received since the implementation of LSLD (including RAM and other funding)?

Base funding for schools is still below the School Resource Standard (SRS). This is critical, as schools serving relatively high SES communities only reach the SRS if they are able to collect substantial voluntary contributions from their communities – some will, some will not. Schools serving relatively low SES communities need their additional RAM allocations to help them move towards the SRS as they have no chance of gaining these funds through voluntary contributions. To achieve equity, low SES schools need additional funding beyond the SRS if they are to achieve some semblance of equity in student outcomes.

RAM comprises 7 funding elements: per capita; Location; professional learning; socio-economic; Aboriginal; English language proficiency and low level adjustment for disability. Examples of how these funding elements have been used include:

- Per capita additional funding has typically been used to support the operation of the school, including additional SASS/GSE staffing (especially in finance given the significant additional administrative burden placed on schools). Smaller schools have also utilised funding to employ teaching staff to maintain relevant curriculum delivery (this is particularly essential in rural areas as populations shrink and age)
- Location is often used to subsidise student travel for educational excursions. Increased professional learning has enabled greater collegial work within and between schools with the majority of funding used to provide teacher relief – other lesser costs include external experts, travel, accommodation, meals etc.
- The remaining four equity loadings are typically used to provide additional teaching and non-teaching staff, including Aboriginal education officers, school learning support officers, youth workers and para-professionals
- Lesser amounts may also be used to provide some specialist resources, learning programs, or educational software

SPC members have also reported that the increase in the complexity and number of students with mental health and autism diagnoses has not been met with adequate funding and support. This means many schools are using any additional funding to employ additional SLSOs, LASTs and youth workers. Lack of adequate funding is also leading to significant regional variation in the professional learning, relief, and support for teachers in improving their practice. Teachers arriving from high SBAR schools are surprised when they find resourcing/support is not at the level to which they are accustomed.

With the introduction of the RAM, many costs that in the past were met by the system are now passed on to schools. A good example is the management of trees where some schools have incurred costs in the tens of thousands of dollars. The purpose of equity or additionality funding is to improve student outcomes not maintain assets, however the response from the system is that schools now have the funds to meet these costs.



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What has been the impact of LSLD on school management and local decision-making practices?

There has been a significant increase in compliance requirements which have seen the role of principal change to workplace manager. The majority of initiatives have not been focused on student outcomes, rather the ability for the system to monitor what is happening in schools. Schools have been impacted significantly with additional administrative burden. Additional funding has needed to be used to employ additional administrative staff, often Business Managers, at significant extra cost to schools. Combined with other compliance requirements outside LSLD, principal and teacher focus has been moved significantly away from teaching & learning – this must be addressed.

LSLD has significantly increased the level of financial and human resources management aspects of school management. Computerisation of increasing elements of finance and policy has reduced the ability to exercise flexibility and professional judgement which has reduced the ability make some decisions locally. Examples include:

- Minor assets issues now require sign-off approval at director level.
- Above centrally identified positions (ACIP) for staffing appointments need approval at director level.
- Planning for ongoing on-costs with ACIPs including leave is hindered without the school having the ability to implement these financial plans in the current SAP system.

The poor quality of most HR and financial programs/systems, and their lack of system efficiency and efficacy has also dramatically reduced the productivity of managers. Roll-out of software applications that were not fit for purpose, especially given long term contracts, has resulted in schools funding alternative applications from the commercial market at significant additional cost. There has been extremely slow progress in ensuring integration of these products into the DoE system – again leading to significant additional administrative burden for schools, and often requiring the need for further staffing above establishment.

Staffing also remains extremely centralised and inflexible. Combined with a change away from providing a staffing guarantee, many schools now need to advertise in an attempt to find staff. The burden of filling difficult positions has shifted from the system to the individual principal. Many advertised positions receive few or no applications in ever wider areas across the state and across an increasing range of subject areas. Staffing our schools is at crisis point – any proposed local decision making in this area through LSLD has largely not been achieved in many schools and will continue to have a significant impact in most schools in the future

While a positive outcome of LSLD has been that a number of schools have formed communities of schools and are sharing professional learning, projects and resources, a more alarming outcome has been the sense that DoE has become deskilled in professional learning and policy development as a result of LSLD. This loss of corporate knowledge has seen an increase in the number of teaching staff working in corporate DoE which then has significant flow on effects for local school staffing and management.

What has been the impact of LSLD and RAM funding on school and student outcomes?

Given the relatively short timeframe, the phase in of additional funding amounts in the RAM and that schools receiving significant additional equity funding are still not being funded at the SRS, let alone above it, one should expect there to be little change in student outcomes. Nevertheless, in many schools there has been increased attendance, engagement, wellbeing and positive improvement in student growth.

While this suggests that the impact of LSLD and RAM funding on school and student outcomes has been positive, caution needs to be applied in interpreting this as a true reflection of LSLD. The reality is that we have a system which is highly centralised and places increasing administrative burdens on staff operating in an environment where base funding for schools is still below the SRS. Until this is resolved the implementation of LSLD will remain problematic for schools.

Some general comments in relation to the five areas of LSLD:

1. **Managing resources.** This reform area enables a fairer and more transparent funding model (the Resource Allocation Model, or RAM) that drives flexible and responsive decision-making at the local level.

Extremely positive and well received by schools, but we can NOT expect the original planned student outcomes to be achieved until all schools are funded at 100% of the SRS and low SES schools receive funding in excess of their SRS.

2. **Staff in our schools.** This reform area provides greater support to increase teacher quality, performance management and increased flexibility over staff mix.
The intent is NOT reflected in the practical working guidelines used to staff schools. The abandonment of the staffing guarantee is a retrograde step for harder to staff schools. ACIPs require approval beyond the school, and there is no management system which enables schools to plan for ongoing financial liabilities caused by the creation of such positions. The financial management of staffing at the school level creates enormous administrative burden and substantial additional cost which can only be currently funded locally – funds that higher SES schools don't necessarily have (unless parents make substantial voluntary contributions) and funds that lower SES schools should be devoting to improving student outcomes.
3. **Working locally.** This reform area supports schools to strengthen consultation with local communities, working in partnership to make a positive contribution to student learning. This creates opportunities for schools to meet local needs by sharing resources including curriculum delivery, facilities and staff. Additional PL & equity funding has enabled greater sharing between schools and in some cases the formation of strong local learning communities. However, the centralised financial system and restrictive procurement guidelines has made developing stronger commercial relationships with local businesses harder to achieve.
4. **Reducing red tape.** This reform area allows schools to focus on the priority of teaching and learning by reducing the administrative burden. The RAM provides certainty and sustainable funding for schools from year to year.
We have increased red tape under LSLD. Some areas have seen minor reductions in red tape (e.g. school profiles do not need to be completed each year), but there is much additional red tape that has been introduced in other areas. The administrative burden on teachers and especially Principals and SAMs has increased significantly. Compliance training every year, VET requirements, H&S monitoring and management, SAP finance for travel and expense claims, P-Card management, financial monitoring on significantly increased amounts of funding (eg a typical P3 would have had a budget pre-LSLD of \$400 000-\$500 000; now they would manage \$8-9 million). The additional RAM funding does, however, provide an increased level of budget certainty for schools.
5. **Making decisions.** This reform area enables school leaders to respond directly to the learning needs of their students. Schools have the opportunity to develop responsive, evidence-based, local solutions to support their school planning and learning requirements.
There is an increased level of ability to make such decisions. For example, there are local communities of schools that have developed learning alliances, schools have employed external PL support and provided teacher release to enable structured classroom observations, etc. Schools have been able to purchase commercially available software, learning support or gifted and talented programs (many of which are nationally endorsed by research). Nevertheless, the ability to make decisions is limited by increased red tape, centralised curriculum, centralised financial systems, increased administrative burden and significant issues with the staffing of our schools. In many situations, approval from an external authority (Director) is still required. The restrictions placed around assets and maintenance are extremely cumbersome, costly (both financially and in terms of time) and are often the source of much anxiety and stress for principals.

C Petersen
On behalf of NSW Secondary Principals' Council
February 2020



New South Wales Teachers Federation
a branch of the Australian Education Union
AEU NSW Teachers Federation Branch ABN 86 600 150 697



25 February 2020

In reply please quote: 28/2020/AF:bg

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Dear Andrew

RE: Evaluation of *Local Schools Local Decisions*

The Federation welcomes the opportunity to respond to the current evaluation of *Local Schools, Local Decisions (LSLD)* conducted by the NSW Department of Education's Centre for Education Statistics and Evaluation (CESE).

At the outset, it should be stated that the evaluation into *Local Schools, Local Decisions* was underpinned by a serious methodological flaw. Since 2012, two fundamental changes to the NSW public education system have occurred. One was the introduction in March of that year of a policy marketed as *Local Schools, Local Decisions*. Two years later, at the start of 2014, the six-year transition period began during which funding would be lifted so that all public schools would reach an agreed Schooling Resource Standard. This was commonly known as the Gonski Agreement and was brought about because of prolonged and intense campaigning by the Australian Education Union and allies.

Neither of these variables, the system wide change to governance and the increase in Commonwealth and State funding, was dependent on the other. So to conflate them in the one evaluation question where each variable is portrayed as to be interdependent is a serious error, offending a basic tenet of research methodology. It raises the fundamental question as to exactly what is being evaluated. A change to the governance model of the public school system announced in March 2012 or the additional funding achieved two years later through the National Education Reform Agreement (NERA)?

It should be noted that approximately only one-third of the promised Gonski money was ever delivered to NSW public schools between 2014-2017 due to the Commonwealth Government reneging on the original National Education Reform Agreement. NSW public schools are still nowhere near reaching the minimum Schooling Resource Standard. At the time of the signing of the replacement National School Reform Agreement in November 2018, NSW public schools were funded by the NSW Government at 70.73 percent, with the Commonwealth contribution at 17.90 percent. By the end of the 2020 school year, this will only have increased to 71.05 percent (state) and 18.70 percent (Commonwealth), an increase of just 1.12 percent. In contrast, while 99 percent of Australian public schools will not reach the Schooling Resource Standard, almost all private schools will. The question of the impact of this funding inequality is worthy of evaluation but separate to an evaluation of *Local Schools, Local Decisions*.

The other fundamental weakness of the evaluation is that it does not deal with the politics of devolution, which is understandable on one level given the constraints on commentary imposed throughout the NSW public service. However, these constraints have seriously compromised the scope of the evaluation as 'school autonomy' is not a settled, neutral concept but one that is highly contentious and deeply ideological.

The Federation contends that the political context for the introduction of *Local Schools, Local Decisions* should not be so easily ignored.

The issue of 'school autonomy' is hardly new. It has been an article of faith for many politicians and some economists around the world since the 1970s. It has its origins in a neo-liberal economic theory that public provision is wasteful and ineffective, government expenditure should be reduced, taxation should be lowered and that the more competitive the environment in which government services operates, the more efficient they will become. It is a theory that is applied to all aspects of public sector management. It must be emphasised that it is not a policy relating to teaching and learning that was developed by teachers or education theorists. Its origins and purpose are based in economics and finance.

This is why two international corporations were engaged in 2009-2010 to undertake the preliminary scoping work to provide the recommendations that later were to form the basis of the *Local Schools, Local Decisions* policy.

Between October 2009 and January 2010 the Boston Consulting Group (BCG) was contracted "...to undertake a scan of DET [NSW Department of Education and Training] expenditure and to develop a methodology that will allow Treasury to undertake future scans of other agencies." Its purpose was to achieve significant financial savings. The January 2010 document was called *Expenditure Review of the Department of Education and Training (DET) - Initial Scan*.

As the BCG scan states, "We have identified some quick wins, but have focused mostly on identifying the major opportunities to drive significant savings over time." To achieve this the BCG, throughout the review, argued the merits of the devolved school autonomy model of Victoria and, indeed, used Victoria as the benchmark. It noted that "NSW appears to have approximately ~9000 more 'in-school' staff than Victoria", also arguing that "NSW appears to have 13% more school related staff than Victoria", and that "NSW appears to have 12% more non-teaching staff than Victoria" The review goes on to argue that once the model of devolution similar to Victoria is adopted, "DET should aim to capture as much of this gap [in staffing levels] as possible." [pp 188-193]

In essence, the BCG review argued that cost cutting through devolution could provide, "opportunities ... worth \$500-\$700 million in recurrent costs and \$800-\$1000 million in one-off benefits." [p9]

The BCG review even advised how the devolved model could be sold to the public, "Possible to position these initiatives as part of a broader school regeneration or schools for the future program." [p92]

The second corporation engaged at the time to undertake complementary work was PriceWaterhouseCoopers (PWC). Its report, *DET School-based employee related costs review – Interim Report* was prepared for the NSW Cabinet and dated December 11 2009. While the BCG scan dealt with all the operations of the Department, the PWC report dealt specifically with staffing costs. As stated in its objectives the report was to "...review areas of expenditure relating to DET's School-based employees where there is scope for change and recommend actions to reduce DET's expenditure in these areas." [p2]

For this to occur, the emphasis was on ensuring principals delivered the savings. Indeed, one section was labelled, "Empower Principals to act" [p18] where the report states, "We believe that increasing Principal accountability for managing School-based costs should be focused on driving

a positive financial impact in the short to medium term while also maintaining educational outcomes.”

These two reports could easily be dismissed as they were provided to the NSW Cabinet in the final months of the Labor administration. However, they cannot be so easily ignored as both of the reports by these two corporations were to inform, and were referenced in, the incoming NSW Coalition Government’s Commission of Audits, one released as an *Interim Report into Public Sector Management* in late January 2012 and the *Final Report: Government Expenditure* published in May 2012. Indeed, in the latter paper, there are 64 references to the benefits of devolution as a means of achieving efficiencies across the whole of government.

The NSW Commission of Audit *Final Report* of May 2012 states, “For many years financial management in NSW has been confusing, lacking in transparency and below the standards expected of efficient and effective government. This situation is not sustainable.” The answer, it argues, is that, “The devolution of authority and accountability, specifically in the areas of education and health, means expenditure (and power) must move from the centre to more local units.”

“The Commission is generally of the view that devolution **should not increase expenditure** in aggregate though capabilities and systems will need attention at the start. Expenditure in local units should however increase and be offset by **reductions at the centre** [our emphases]. These are exciting reforms that offer a new era for TAFE, more power and responsibility to school principals, and more community and clinician input and responsibility within Health.” [p10]

However, in CESE’s *Local Schools, Local Decisions Evaluation – Interim Report*, in the section labelled “Background”, there is no mention of any of these reports, scans or documents. No mention of the Boston Consulting Group scan of 2010. No mention of the PriceWaterhouseCoopers Report. No mention of the NSW Commission of Audit Reports of 2012 either. This is a serious omission as it perpetuates the myth that *Local Schools, Local Decisions* was a policy developed by educators.

In reality, *Local Schools, Local Decisions* was always going to be about expenditure and the efficiency savings that could be secured, “There is considerable scope in NSW to reallocate expenditure in education and training to improve outcomes, through greater devolution of resource allocation decisions to principals and TAFE Institute Directors. **This can occur within existing expenditure budgets.**” [p71]

So, what did ‘reductions at the centre’, the central feature of *Local Schools, Local Decisions*, mean in practice? It is important to revisit the NSW Treasury’s demand on the Department at the time.

Savings measures had to be identified by the Department in the 2011-12 NSW budget to cover the four year budget period to 2015-16. These measures were implemented as “general expenses in the education and communities portfolio have still outstripped the growth in government revenue” (NSW Department of Education and Communities (2011) *Saving measures to meet our budget*).

The Department needed to find \$201 million in savings from the 2012-13 budget and \$1.7 billion over the four year forward estimates period. The measures also included the 2.5 percent labour expense cap.

The savings demanded of the Department were introduced as *Local Schools, Local Decisions* and were rolled out. In reality the ‘reductions at the centre’ resulted in a significant and unprecedented loss of positions from the Department, both public servant and non-school based teaching positions. And this, not a lift in student outcomes, was the primary objective of *Local Schools, Local Decisions*.

Ken Dixon, the general manager of finance and administration within the NSW Department of Education at the time, later described the policy to give principals more autonomy over school

budgets as being driven by cost savings. In public comments he argued, “The *Local Schools, Local Decisions* policy is just a formula to pull funding from schools over time.” Mr Dixon, in a key senior Departmental position at the time the policy of *Local Schools, Local Decisions* was being developed, also revealed that the loss of at least 1600 jobs in the Department was factored into the business case. (*Sydney Morning Herald*, 14 September 2012).

The ‘reductions at the centre’ included the loss of hundreds of non-school based teachers and support staff from programs throughout NSW involving curriculum support, professional development, staffing, drug and alcohol education, student welfare, student behaviour, community liaison, rural education, assessment and reporting, special education, multicultural education and so on. In essence, the capacity for the Department to fund and support system-wide support for teachers was decimated.

In contrast, the additional funding has been allocated to individual schools untied, with little guidelines, minimal accountability and almost no programmatic system-wide support. Little wonder that the *Local Schools, Local Decisions Evaluation - Interim Report* states “...we were unable to determine...what each school’s RAM equity loading allocation was spent on.” [p8]

Firstly, the devolution model was never designed to make funding information transparent. Indeed, it was designed to do the exact opposite, make funding matters more opaque. This was because the devolution model was expressly designed for twin purposes: deliver savings back to central government and allow governments to shift the responsibility for these savings to local managers. It was only ever intended to give local schools the illusion of control.

Secondly, the model was never designed to distribute and manage significant increases in funding. This goes to the heart of the weakness in the research question which included two variables, “What has been the impact of LSLD and RAM funding on school and student outcomes?” But given the question was asked, the answer is unsurprising, as there now exists no comprehensive systemic and state-wide programmes designed to lift student outcomes across all schools: “In terms of differential change over time, we found no relationship between changes over time in these engagement measures and levels of need, with the notable exception that students in higher-need schools typically showed less positive change over time in levels of social engagement than students in lower-need schools. In other words, **the gap in this measure between higher-need and lower-need schools increased over time, rather than decreased.**” (Our emphasis)

But there is another faulty and serious danger posed by the framing of the question, with its competing variables, as revealed in this comment: “On these limited findings alone, there is not yet any evidence to support the idea that higher-need schools benefit more from the RAM equity loadings than lower-need schools.” Can the conclusion be reached that additional funding makes no impact on student achievement? It can be argued that additional funding is only the first step, and determining what the money is spent on, with the need to harness the advantage of state-wide economies of scale, has not occurred. Could there be a more inefficient funding model than one that allows 2200 schools to determine how public money should be spent? Could this be one of the reasons why there is a serious underspend?

There are a range of reasons as to why student outcomes have not lifted. For instance, the weakening of curriculum delivery, with too many principals not made to account for questionable staffing decisions, is ignored by the Department. Federation has been made aware, due to the lack of accountability around staffing at the school level, of decisions being made at individual schools which are detrimental to quality education provision. This includes, but is not limited to, teachers being appointed in a particular subject area being forced to teach in another area, while their original timetabled load for which they were appointed being taught by teachers unqualified in that particular subject. This widespread practice is also apparent in specialist areas such as EALD, teacher-librarians, and special education as well as in the loss of subject-based Head Teacher positions in secondary schools and replaced with additional non-curriculum administrative and executive positions. This behaviour is often in defiance of industrial agreements. The culture of

'flexible staffing' encouraged under *Local Schools, Local Decisions*, is directly responsible for this but not dealt with in the evaluation.

It is time for the NSW Department of Education to listen to the profession. Even with the CESE evaluation there is no significant input from the teaching profession, apart from a small sample of principals. In 2012, NSW teachers took significant industrial action in opposition to *Local Schools, Local Decisions*. Tens of thousands of teachers participated in the strikes. The warnings sounded at the time by the Federation about devolution, which remain on the public record, were ignored.

Other critical voices have also been ignored:

'School autonomy' was responsible for a "lost decade" in education according to one of New Zealand's leading education researchers Dr Cathy Wylie of the New Zealand Council of Educational Research. In her book, *Vital Connections: Why We Need More Than Self-Managing Schools (2012)*, Wylie argued that schools need more central support.

Plank & Smith 2008 in their paper, *Autonomous Schools: Theory, Evidence and Policy*, argued, "Placing schools at the centre of the policy frame, freeing them from bureaucracy and exhorting them to do better has not by itself generated many of the systemic improvements, innovation, or productivity gains that policy makers hoped for."

In his paper, *The disaster of the 'self-managing school' – genesis, trajectory, undisclosed agenda, and effects*, Professor John Smyth argued that 'school autonomy' in reality is government "...steering at a distance, while increasing control through a range of outcomes-driven performance indicators."

Smyth went on to say, "The argument was that schools would be freed up from the more burdensome aspects of bureaucratic control, and in the process allowed to be more flexible and responsive, with decisions being able to be made closer to the point of learning. Many of these claims have proven to be illusory, fictitious, and laughable to most practising school educators."

He also argued, "Sometimes an educational idea is inexplicably adopted around the world with remarkable speed and consistency and in the absence of a proper evidence base or with little regard or respect for teachers, students or learning."

Dr Ken Boston, one of the members of the *Review of Funding for Schooling* panel chaired by David Gonski, expressed frustration at the continuing promotion of devolution, arguing that "... school autonomy, is an irrelevant distraction. I worked in England for nine years, where every government school . . . has the autonomy of the independent public schools in WA - governing boards that can hire and fire head teachers and staff, determine salaries and promotions, and so on. Yet school performance in England varies enormously from school to school, and from region to region, essentially related to aggregated social advantage in the south of the country and disadvantage in the north."

Professor Steven Dinham from the University of Melbourne decried the lack of evidence for 'school autonomy' models: "The theory that greater school autonomy will lead to greater flexibility, innovation and therefore student attainment is intuitively appealing and pervasive. School autonomy has become something of an article of faith. However, establishing correlation and causation is not so easy." Dinham says, "What is needed above all however, is clear research evidence that the initiative works, and under what conditions, rather than blind enthusiasm for the concept."

Even the OECD was ignored. In its 2009 PISA cross-country correlation analysis, *PISA 2009 Results: What Makes a School Successful? - Resources, Policies and Practices (Volume IV)* the OECD authors argued that "... greater responsibility in managing resources appears to be unrelated to a school system's overall student performance" and that "... school autonomy in resource allocation is not related to performance at the system level."

And yet, this OECD report was released three years before the 2012 NSW Commission of Audit argued enthusiastically for a devolution model sold later as *Local Schools, Local Decisions*.

Eight years later, the catastrophic policy failure of *Local Schools, Local Decisions* is evident:

- "To date, LSLD appears to have had little impact on preliminary outcome measures." [p53]
- "These results suggest that LSLD has not had a meaningful impact on attendance or suspensions." [p51]
- "However, the direction of the relationship was not as we expected: students in higher-need schools showed less growth in social engagement than students in lower-need schools." [p51]

So what has occurred after eight years? No lift in student outcomes, the gap between the advantaged and disadvantaged widening, no improvements in attendance, no improvement in suspension rates, no lessening of 'red-tape' and a dramatic increase in workload.

In 2020 the *Local Schools, Local Decisions* policy has left the NSW Department with no levers; no capacity to develop, fund and implement systemic improvements to lift all schools or to achieve massive economies of scale. Purportedly, 70 percent of education funding is in school bank accounts with the Department unable to determine, let alone enforce, what it is being spent on. Instead, we are left with policy by anecdote as revealed in the comments quoted within the CESE report.

The tragedy of *Local Schools, Local Decisions* is that while ever it remains as policy we will continue to fail our students, including the most vulnerable, each and every day. A lost decade indeed.

Federation would welcome the opportunity to discuss this matter further with the Department.

The contact officers for this matter are Mr. Angelo Gavrielatos, President and Ms. Amber Flohm, Senior Vice President. They can be contacted on 02 9217 2351 and 02 9217 2320 or via email at mail@nswtf.org.au.

Yours sincerely



John Dixon
General Secretary

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Please cite this publication as:

Centre for Education Statistics and Evaluation (2020), Local Schools, Local Decisions Evaluation final report,
NSW Department of Education, cese.nsw.gov.au

