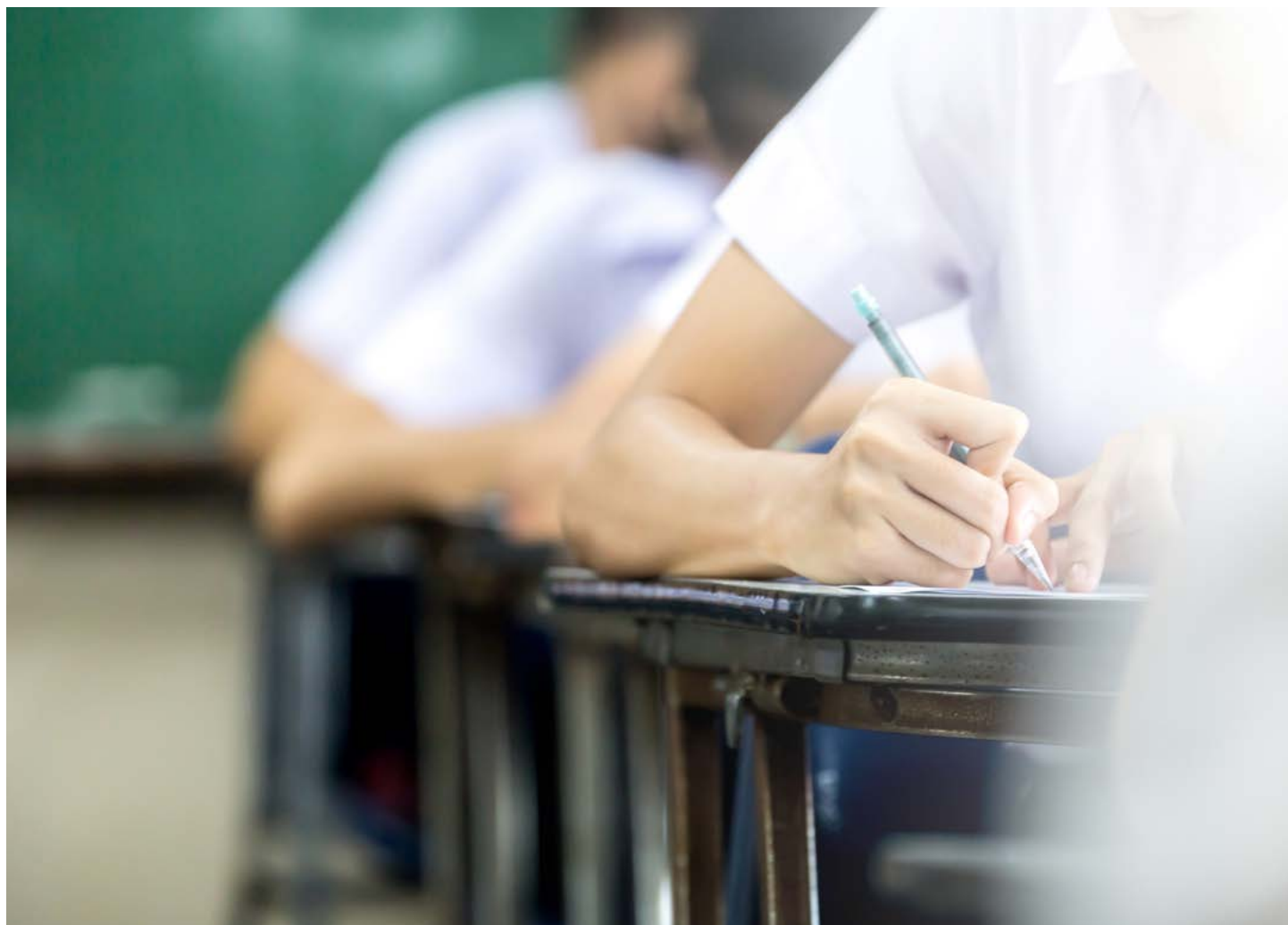


DEPARTMENT OF EDUCATION

Local Schools, Local Decisions Evaluation Interim Report

Centre for Education Statistics and Evaluation



Centre for Education Statistics and Evaluation

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Executive summary

Reform background

In 2012, the New South Wales Department of Education launched the Local Schools, Local Decisions (LSDL) education reform. LSDL aims to give NSW public schools more authority to make local decisions about how best to meet the needs of their students. LSDL focuses on five interrelated reform areas: making decisions, managing resources, staffing schools, working locally and reducing red tape. A cornerstone element of LSDL is the introduction of a new needs-based approach to school funding through the Resource Allocation Model (RAM).

Evaluation

The Centre for Education Statistics and Evaluation (CESE) is conducting an evaluation of LSDL. This evaluation began in mid-2016 and will conclude in mid-2019. The evaluation includes a process evaluation that investigates the implementation of LSDL, and an outcome evaluation focussing on the impact of the reform on school and student outcomes.

Data sources in this report

This interim report includes qualitative and quantitative analyses using the following data sources:

- equity funding data (2016)
- school annual reports (2016)
- CESE principal survey (2017)
- staffing data (2012-2017)
- SEF self-assessment surveys (2016-2017)
- student engagement measures: attendance (2011-16), suspensions (2012-16) and 'Tell Them From Me' survey items on social engagement, institutional engagement and aspirations to complete year 12 (2013-16).

Findings

How have schools spent their RAM equity loadings?

In 2016, schools spent their RAM equity loadings on four main spending categories: employing key staff, enhancing learning support, planning and developing programs, and building staff capacity. There were strong similarities and overlaps between how the four different equity loadings were spent, with a common emphasis on using this funding to improve the overall quality of teaching and learning in each school.

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

In four of the five LSDL reform areas, principals perceive the impact of LSDL to have been positive. In the fifth reform area, reducing red tape, more than two-thirds of principals said that LSDL has not had a positive impact on simplifying administrative processes. Principals in higher-need schools tended to have more positive perceptions of the impact that LSDL has had on their ability to make decisions, manage resources, access suitable staff and work locally, compared to principals in lower-need schools. Principals from both higher- and lower-need schools agreed that LSDL has not had a positive impact on reducing red tape.

It should be noted that this data was collected in early 2017, before the Principal Workload and Time Use Study was conducted and prior to release of the School Leadership Strategy in September 2017. It is anticipated such efforts may improve the impact of LSDL on school management and local decision-making practices.

The next report will investigate whether the perceptions of principals change, using data from early in 2018 and early 2019, when the annual principal surveys take place.

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

The five student engagement measures included in this report (attendance, suspension, social engagement, institutional engagement and aspirations to complete Year 12) showed only very small to small **overall changes** over time.

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.

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.

Research shows that changes in school management can take considerable time to produce a measurable impact upon student outcomes. Additionally, outcome measures for LSLD were not explicitly defined when the policy was initially developed. While a broad reform of this nature could reasonably be expected to have an impact on a wide range of outcome measures, schools will vary in the extent to which they have chosen to spend their RAM funding on initiatives likely to improve the student engagement measures addressed in this report.

Limitations

This interim report is unable to provide a comprehensive assessment of the overall impact of LSLD. Due to the phased rollout of the reform, LSLD was not fully implemented in all NSW government schools until 2018. As such, exposure to the 'full' reform has been uneven across schools. Further, changes in school management can take considerable time – up to six years, according to some analysts – to produce a measurable impact on student outcomes. These factors should be kept in mind when considering the outcomes analysis in this report. Assessing the longer term impact of LSLD would need to take place over an extended evaluation horizon, pushing well past the next report in 2019.

Additionally, for the first evaluation question, due to limitations in financial and systems data, we were unable to determine from this data source exactly what each school's RAM equity loading allocation was spent on by that school. Hence, we primarily derived the findings from a sample of school Annual Reports, which vary in the detail provided.

This interim report analyses only student engagement measures, on which there was no indication of either meaningful overall improvement, nor a closing of the gaps between higher- and lower-need schools. Importantly, this interim report does not include an analysis of educational outcomes which, arguably, are key outcome measures for LSLD. The final report will include such analysis, including in-depth statistical modelling of NAPLAN results from 2012 to 2018. While we are yet to commence this modelling, it is worth noting that preliminary NAPLAN results in 2017 indicated improvement in some areas. Using student performance as a measure of success will provide a more thorough picture of the effectiveness of LSLD. However, such data may be considered preliminary until the changes have had enough time to produce a measurable impact on student outcomes.

1. Introduction

Background

In 2012, the New South Wales Department of Education (“the department”) and the Minister for Education launched the Local Schools, Local Decisions (LSLD) education reform. LSLD aims to give NSW public schools more authority to make local decisions about how best to meet the needs of their students.

The reform was based on eleven original outcomes. In 2011, the department undertook a formal consultation process that sought to collect feedback from the public education community about how best to achieve these outcomes¹. The consultation included 444 face to face meetings and e-forums held across NSW, a moderated online discussion forum, and written submissions received from 4,042 individuals and 14 stakeholder representation groups. These groups included teachers, school leaders, department directorate leaders, the Primary Principals’ Association (PPA), Secondary Principals’ Council (SPC) and NSW Teachers Federation. As a result of the consultation process, the final number of reform areas in LSLD was refined to five². These areas have been identified as key to building a more dynamic public education system:

- 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.
- 2. Staff in our schools.** This reform area provides greater support to increase teacher quality, performance management and increased flexibility over staff mix.
- 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.
- 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.
- 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.

The LSLD reform package encompasses 37 different initiatives across these five key reform areas³. These initiatives have been progressively implemented since 2012, with different schools implementing the initiatives at different times. By the end of 2016, the majority of the elements of LSLD were operating in all NSW public schools. The new school finance system (SAP) and staffing flexibility were not fully available in all schools until January 2018.

¹ Background information adapted from: NSW DEC March 2012, *Local Schools, Local Decisions: Report on the consultation* (unpublished).

² Reform area information adapted from: NSW DEC May 2014, *Local Schools, Local Decisions Fact Sheet*, (unpublished).

³ For more detail on the 37 initiatives, see the LSLD Report Card 2012-2016, at: <https://schoolsequella.det.nsw.edu.au/file/01aaf26c-efc8-4344-b390-517c91460e43/1/LSLDReportCard.pdf>

In 2014, a needs-based funding model was introduced in NSW public schools

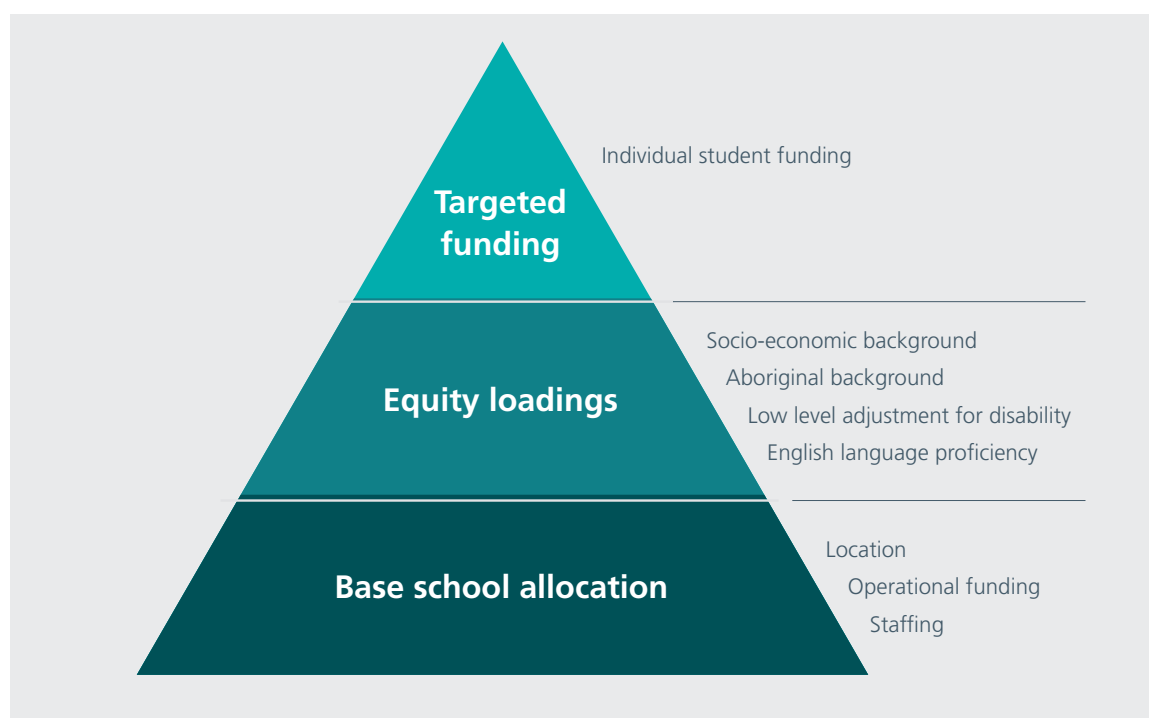
One of the cornerstone elements of LSLD is the introduction of a new needs-based school funding model. The new model facilitates funding through the National Education Reform Agreement (NERA) to be distributed more fairly and transparently across NSW public schools⁴. The Resource Allocation Model (RAM) is the new model used to allocate funding to NSW public schools⁵. The RAM is a simpler, more transparent model than the previous funding model which relied upon a complex series of piecemeal program funding approaches, including a range of different global government funds, tied funds and payment sub-dissections.

The RAM consists of three components: targeted (individual student) funding, equity loadings and a base school location. These components are detailed in Figure 1.

Figure 1:

Components of the Resource Allocation Model (RAM)

Source: <https://education.nsw.gov.au/our-priorities/work-more-effectively/local-schools-local-decisions/resource-allocation-model>



1. Targeted (individual student) funding

Many students have particular learning needs that benefit from targeted individual support. This component of the RAM dedicates funding to support the provision of personalised learning and support for these students. Targeted funding is provided for:

- Refugee students who have been enrolled in an Australian school for less than three years.
- Newly arrived students who speak a language other than English as their first language and require intensive English language tuition.
- Students with moderate to high levels of adjustment for disability who access support through the Integration Funding Support program⁶. This program helps schools to support students attending regular classes and who have moderate to high learning and support needs, as defined by the department's disability criteria. This includes language disorders, physical and/or intellectual disability, hearing and/or vision impairment, mental health problems and autism.

⁴ The National Education Reform Agreement (NERA) outlines needs-based funding arrangements to apply to NSW from 2014 to 2019. For more information, see: <http://exar.nsw.gov.au/exar/wp-content/uploads/2015/09/national-education-reform-agreement-2013.docx>

⁵ For more information, see: <https://education.nsw.gov.au/our-priorities/work-more-effectively/local-schools-local-decisions/resource-allocation-model>

⁶ For more information, see: <https://education.nsw.gov.au/teaching-and-learning/disability-learning-and-support/programs-and-services/integration-funding-support>

2. Equity loadings

Four loadings were developed to support different types of student- and school-based need:

- **Socio-economic background.** This loading is an allocation to support schools to meet the additional learning needs of students from low socio-economic backgrounds. The loading is based on a combination of student and school need, calculated using the Family Occupation and Education Index (FOEI)⁷.
- **Aboriginal background.** This loading is an allocation to support schools to meet the additional learning needs of Aboriginal students. The rate per student is based on the number and percentage of Aboriginal students in the school.
- **English language proficiency.** This loading is a resource allocation for students learning English as an additional language or dialect who are migrants, refugees or humanitarian entrants, or the children of migrants, refugees or humanitarian entrants. The loading is calculated using each school's reported level of English language proficiency need, identified by the English as an Additional Language or Dialect (EAL/D) Learning Progression⁸.
- **Low level adjustment for disability.** This loading is an allocation to support students in regular classes who have additional learning and support needs. The loading comprises both a specialist teacher allocation (adjusted every three years) and a flexible funding allocation (adjusted annually to reflect changes in enrolment and student need).

3. Base school allocation

The base school allocation provides funding for the core cost of educating each student and operating a school. This includes staffing (teaching and administrative support staff) and operational components to reflect school type and location.

The three RAM components have been progressively implemented since 2014

In 2014, the RAM delivered \$300 million to NSW public schools, through the two new equity loadings for Aboriginal and socio-economic backgrounds⁹.

In 2015, the RAM delivered \$664 million in funding to NSW public schools, including the remaining two equity loadings (low-level adjustment for disability and English language proficiency)¹⁰. Eligible schools also received the first element of the base allocation, which was a loading to address additional costs faced by geographically remote or isolated schools.

In 2016, the RAM delivered \$860 million in funding to NSW public schools, including the other three elements of the base allocation¹¹.

In 2017, the RAM delivered just over one billion dollars in funding to NSW public schools¹². This funding included the four equity loadings and the three base elements of the base allocation. Schools now operate within a 'planned and approved cycle', receiving their Planned School Budget Allocation for the upcoming school year in October, and an Approved School Budget Allocation for the current school year in March/April.

7 FOEI is a school socio-economic index that is based on parents' highest level of school education, non-school qualification and occupation. FOEI represents each school's average socio-economic disadvantage relative to other NSW government schools. For more information, see: http://www.cese.nsw.gov.au/images/stories/PDF/CESE_Learning_Curve5_FINAL_FOEI.pdf

8 For information on the EAL/D Learning Progression, see: <https://education.nsw.gov.au/teaching-and-learning/curriculum/multicultural-education/english-as-an-additional-language-or-dialect/planning-eald-support/english-language-proficiency>

9 For more information, see: <https://www.det.nsw.edu.au/media/downloads/about-us/our-reforms/local-schools-local-decisions/reform-agenda/resource-allocation-model/info-sheet-1.pdf>

10 For more information, see: https://www.det.nsw.edu.au/media/downloads/about-us/our-reforms/local-schools-local-decisions/reform-agenda/resource-allocation-model/2015/13896_LSLD_RAM_Narrative_12Nov_V5.pdf

11 For more information, see: https://www.det.nsw.edu.au/media/downloads/about-us/our-reforms/local-schools-local-decisions/reform-agenda/resource-allocation-model/2015/RAM_2016_Funding_Table.pdf

12 For more information, see: <https://data.cese.nsw.gov.au/data/dataset/resource-allocation-model/resource/6630cd17-f221-4b4b-9205-9557199e7a71>

LSLD evaluation

The LSLD evaluation includes two components: a process component that investigates how schools have responded to the implementation of LSLD, and an outcome component focussing on the impact of the reform on school and student outcomes. The evaluation commenced in mid-2016 and is being conducted over three years, concluding in mid-2019 with a final report.

While LSLD is a very broad reform, both components of the evaluation focus on school funding, i.e. local decision-making about how funding is spent and the impact of this on school staff and students. LSLD gives principals and their school communities a greater say over how they allocate and use their available resources to best meet the needs of their students. Schools now manage more than 70 per cent of the state's public school education budget; an increase from 10 per cent in 2013¹³.

The fundamental aim of LSLD is to give NSW public schools more authority to make local decisions to best meet the needs of their students. This is enacted through the five reforms areas: staff in our schools, managing resources, reducing red tape, working locally and making decisions. The RAM was developed to ensure a fair, efficient and transparent allocation of the state public education budget for every school. Both the 'managing resources' and 'reducing red tape' reform areas identify the RAM as a key component of their implementation¹⁴. Given that the introduction of needs-based funding through the RAM has created significant changes in how schools manage their budget and resources, this evaluation includes a focus on the RAM. Our focus on the equity loadings also reflects the fact that schools receive approximately 90 per cent of their overall RAM funding via the equity loadings.

Evaluation questions

The evaluation addresses three questions:

1. How have schools spent their RAM equity loadings?

- What are some of the initiatives that RAM funding has enabled in schools, with a particular focus on how the needs of student equity groups have been supported?

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

- What has been the impact of LSLD and RAM funding 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?

The intention of this aspect of the evaluation is to explore the broad impact of the LSLD reform package on school management and local decision-making practices across the five key LSLD reform areas: managing resources, staff in our schools, working locally, reducing red tape and making decisions.

This aspect of the evaluation also includes an explicit focus on the impact of LSLD on the administrative and workload burden for school leaders, as they have gone through a complex change management process.

3. What has been the 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?
- Has LSLD contributed to a reduction in the gap in student achievement for the identified equity groups? (i.e. students with either a low socio-economic background, Aboriginal background, EAL/D learning need or low level adjustment for disability).

¹³ For more information, see: <https://education.nsw.gov.au/our-priorities/work-more-effectively/local-schools-local-decisions/the-reform>

¹⁴ For a description of the LSLD reform areas and progress against them, see the LSLD Report Card 2012-2016: <https://schoolsequella.det.nsw.edu.au/file/01aaf26c-efc8-4344-b390-517c91460e43/1/LSLDReportCard.pdf>

The evaluation measures school outcomes using the annual School Excellence Framework (SEF) self-assessment surveys. We base student outcomes on a range of student engagement measures, as well as both NAPLAN and HSC/ATAR results.

This interim report addresses all three questions but on the third question, it includes only student engagement measures (attendance, suspensions, social engagement, institutional engagement and aspirations to complete year 12). This report does not include educational outcomes (NAPLAN and HSC/ATAR).

Scope of this report

This report provides interim findings for each of the three evaluation questions using the following data sources:

1. How have schools spent their RAM equity loadings?

- equity funding data 2016
- annual reports 2016 (representative sample of 100 schools)

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

- CESE Principal Survey 2017
- staffing data (2012-17)

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

- student engagement measures:
 - attendance (2011-16)
 - suspensions (2012-16)
 - social engagement (2013-16). The Tell Them From Me survey measures this as the extent to which a student is involved in the life of their school.
 - institutional engagement (2013-16). The Tell Them From Me survey measures this as the extent to which a student strived to meet the formal requirements for school success.
 - aspirations to complete year 12 (2013-16)
- SEF self-assessment surveys (2016-17)

2. How have schools spent their RAM equity loadings?

This section of the report details how schools spent each of the four RAM equity loadings in 2016, the latest year of data available at the time of writing.

Method

We have drawn on two information sources for this section of the report: school funding data and school annual reports.

We obtained school funding data from the department's Leadership and High Performance Directorate. We used this data to show both the size and variation in funding across all schools.

We investigated the possibility of using data from school Annual Financial Statements. However, limitations in financial and systems data meant that we were unable to determine exactly what each school's RAM equity loading allocation was spent on. CESE will re-examine the possibility of using this data for the final report when all schools will be using the new SAP finance system.

We therefore used a random sample (n = 100) of school annual reports. Annual reports are publicly available on each school's website. See Appendix A for a list of which schools' reports were included. This report draws on information from the 'key initiatives' section of each annual report. Schools use this section of their annual report to describe how they spent any funding received for each equity loading, as well as funding received for any other key initiatives.

It is important to note that schools provide this information for the purposes of school planning and reporting, rather than for evaluative purposes. Annual report information is not always provided in a standardised format and contains varying levels of detail and clarity.

Where we have included quotes, we have identified the individual school whose report the quote was drawn from. This gives the reader a sense of context within which to understand the quote. Again, this information is publicly available online.

Due to data accessibility issues, we were unable to access annual reports from the School Planning and Reporting Online (SPaRO) online system. Instead, we manually extracted data from 100 annual reports from school websites and reconfigured this to make it suitable for analysis. In 2018, additional functionality in the SPaRO system is likely to enable annual report information to be gathered through SPaRO, and we therefore anticipate that the final report in 2019 will contain information from all schools.

Total equity funding in 2016

This section presents important contextual information about the overall quantum of equity funding, helping the reader understand how the equity loadings have been spent.

The first evaluation question focuses solely on one component of the RAM – the four equity loadings. This interim report focuses on funding for the 2016 school year because this is the most recent year for which we could access annual reports. This also allows us to match funding data to annual report data.

In 2016, the department delivered more than \$667 million in funding for the four equity loadings, distributed across 2,189 schools. Schools received a median funding amount of \$189,000. The funding may combine components for staffing and flexible funding. Not all schools are eligible for all loadings. Table 1 summarises the funding data.

Table 1:

Summary of RAM equity loadings in 2016

Source: NSW DoE, Leadership & High Performance Directorate

RAM Equity Loadings 2016	Aboriginal background	English language proficiency	Low level adjustment for disability	Socio-economic background	Total
Total funding per loading	\$52,400,000	\$115,400,000	\$246,400,000	\$252,700,000	\$667,000,000
Number of schools funded (total = 2,189)	1,997	1,368	2,074	2,184	2,189
Mean funding amount per school	\$26,000	\$84,000	\$119,000	\$116,000	\$305,000
Median funding amount per school	\$8,000	\$28,000	\$101,000	\$31,000	\$189,000
Highest funding amount received per school	\$510,000	\$612,000	\$597,000	\$1,300,000	\$2,300,000

Note: Funding amounts have been rounded to the nearest thousand.

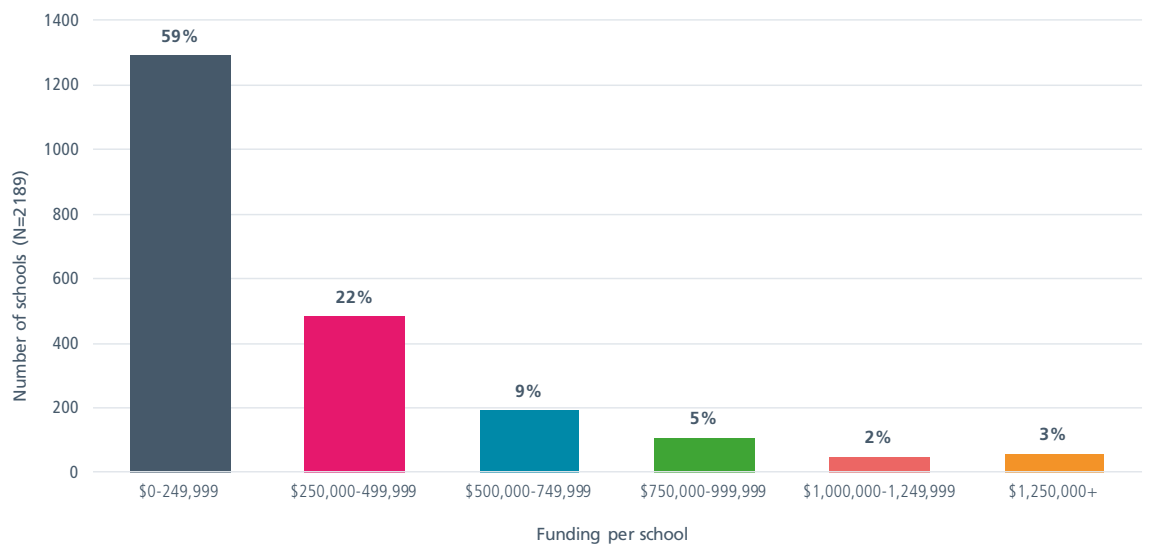
Figure 2 shows the distribution of equity funding in 2016, divided into brackets of \$250,000¹⁵. This figure shows that:

- The majority of schools (59%) received less than \$249,999 in total equity funding.
- Just over one-third of schools (36%) received between \$250,000 and \$999,999 in total equity funding.
- A small number of schools (5%) received \$1,000,000 or more in total equity funding.

Figure 2:

Total equity funding per school in 2016

Source: NSW DoE, Leadership & High Performance Directorate



The distribution of funding dollars through the RAM is heavily skewed to the left, with a long right tail, reflecting the fact that a small proportion of schools with very high levels of need receive relatively large amounts of equity funding but the bulk of the overall funding goes to the majority of schools that receive lesser amounts of funding.

It is also important to note that schools receive their RAM funding as part of their total School Budget Allocation (SBA). While RAM funding makes up a significant portion of the SBA, there are additional loadings that also vary between schools¹⁶. Evidence suggests that schools may not spend their full allocation of RAM funding each year. While this report considers the equity loading funding received by schools through the RAM, it does not examine whether or not schools have actually spent their equity funding. CESE will examine any potential differential between equity loading allocations and equity loading spending in the final report.

¹⁵ Please note that the range of the funding brackets varies for each of the following five graphs.

¹⁶ In 2018, the seven RAM loadings make up \$1.09 billion of the total \$8.6 billion SBA for all schools. For details, see the 2018 Planned School Budget Allocation Report: A guide for schools at: <https://schoolsequella.det.nsw.edu.au/file/d2c3caf7-85c8-4f94-bd0f-f5b6a0851b1f/1/2018%20Planned%20SBA%20-%20A%20guide%20for%20schools.pdf>

In 2016, schools spent their equity loadings on employing key staff, enhancing learning support, planning and developing programs, and building staff capacity

Schools consistently spent their equity loadings in four major spending categories across all four equity loadings:

- employing key staff
- enhancing learning support
- planning and developing programs
- building staff capacity.

Schools also used the Aboriginal background loading for:

- embedding Aboriginal language and culture
- tailored support and opportunities for individual Aboriginal students.


Schools also used the socio-economic background loading for:

- tailored support and opportunities for individual students
- purchasing school resources.

Schools varied in the extent to which they prioritised each of these spending categories for each equity loading. Table 2 summarises how frequently schools reported using funding in each spending category. The frequency with which categories were reported decreases as you move down each column. Rows are not indicative of any equivalent frequency between categories

Table 2:
Summary of spending categories for each equity loading in 2016

Source: Annual reports 2016 (representative sample of 100 schools)

Frequency of spending categories	Aboriginal background	English language proficiency	Low level adjustment for disability	Socio-economic background
Most  Least	Planning and developing programs	Enhancing learning support	Employing key staff	Employing key staff
	Embedding Aboriginal culture and education	Employing key staff	Enhancing learning support	Enhancing learning support
	Employing key staff	Planning and developing programs	Planning and developing programs	Planning and developing programs
	Enhancing learning support	Building staff capacity	Building staff capacity	Building staff capacity
	Tailored support and opportunities for Aboriginal students			Tailored support and opportunities for individual students
	Building staff capacity			Purchasing school resources

We note two additional points here. Several schools reported combining different equity loadings for particular purposes:

'Socio-economic funding and low level adjustment for disability funding were combined for initiative programs'. (Como West Public School)

This suggests that schools make pragmatic local decisions to pool their loadings to maximise the impact of their funding within their local school context.

Secondly, there are strong similarities and overlaps between how schools spent their equity loadings for English language proficiency, disability and socio-economic background. Schools primarily used all three loadings to implement specific literacy or numeracy interventions, to employ additional teachers or School Learning Support Officers (SLSOs) and to release teachers from class to engage in collaborative programming, planning, curriculum design and mentoring. There was a strong emphasis on using these loadings to improve the overall quality of teaching and learning in schools.

How did schools spend their Aboriginal background equity loading?

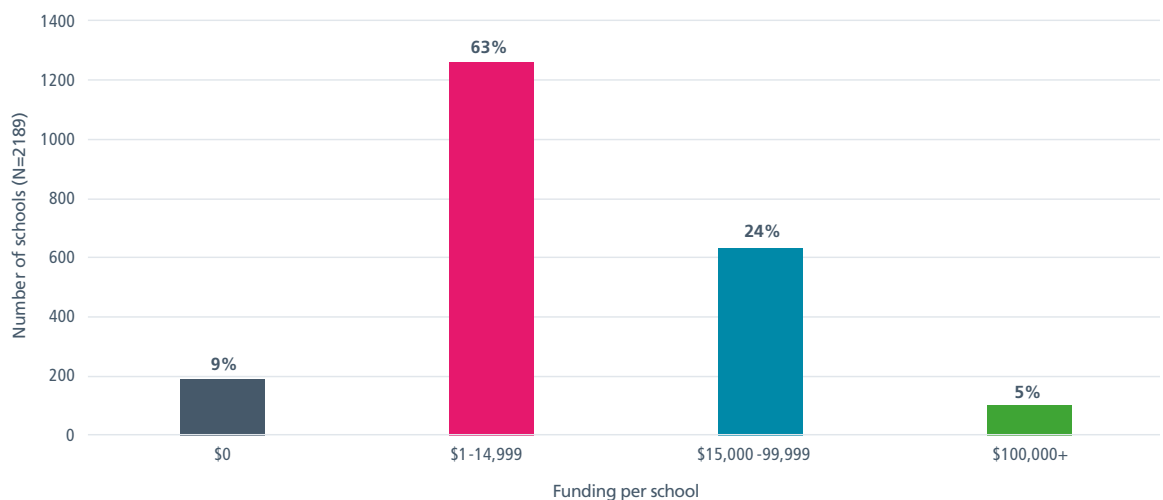
In 2016, the department delivered \$52 million in Aboriginal background funding to 1,997 schools. The median funding received per school was \$7,984. Figure 3 summarises the distribution of Aboriginal background equity funding. This figure shows that:

- A small number of schools (9%) did not receive any Aboriginal background funding because they did not have any Aboriginal students.
- The majority of schools (63%) received less than \$15,000 in Aboriginal background funding.
- Almost one-quarter of schools (24%) received between \$15,000 and \$100,000 in Aboriginal background funding.
- A small number of schools (5%) received \$100,000 or more in Aboriginal background funding.

Figure 3:

Aboriginal background equity loading per school in 2016

Source: NSW DoE, Leadership & High Performance Directorate



Schools reported allocating their Aboriginal background loading across six spending categories. These categories are discussed below, in order from the most frequently reported to the least frequently reported.

Note that we have identified individual schools in the quotes below because these quotes come from publicly available school annual reports.

Planning and developing programs

Schools most frequently reported using Aboriginal background funding to release teachers from class to meet with Aboriginal students and their families to develop their Personalised Learning Pathways (PLPs)¹⁷. Schools see the PLP as an “active process” which requires consultation with families and ongoing reflection and review:

‘PLPs were developed in consultation with our Aboriginal families, focusing on addressing specific learning strategies in literacy and numeracy. The PLPs were implemented and regularly monitored by all classroom teachers . . . this engaged parents and community in the individual learning plan development and monitoring processes’. (Hebersham Public School)

Embedding Aboriginal language and culture

Schools also frequently used Aboriginal background funding to support a range of Aboriginal cultural programs, language classes, and incursions and excursions. Many schools also used the funding to participate in NAIDOC (National Aborigines and Islanders Day Observance Committee) week activities.

¹⁷ Personalised Learning Pathways (PLPs) are an active process developed in consultation between students, parents/carers and teachers, to identify, organise and apply personal approaches to learning and engagement. It is recommended that all Aboriginal students have a PLP that includes tailored short and long term goals and is regularly reviewed and updated. For more information, see: <https://education.nsw.gov.au/teaching-and-learning/aec/media/documents/PersonalisedLearningPathways16.pdf>

Schools also reported using these funds to develop curriculum resources that support culturally appropriate teaching and embed Aboriginal perspectives across the curriculum:

'An Aboriginal Elder was employed 1 day per week to provide Aboriginal cultural and language classes. All Aboriginal students K-6 participated in weekly lessons to further understand the importance of their identity, culture and extended family connections. This initiative also provided teachers with support and advice to provide a culturally relevant curriculum using local expertise'. (Woongarra Public School)

Employing key staff

Schools reported using Aboriginal background funding to either employ new staff, or to increase the numbers of hours per week for which existing staff were employed. The most commonly reported staffing categories were: SLSO, Learning and Support Teacher (LaST), Aboriginal Education Officer (AEO) and Aboriginal School Learning Support Officer. These staff were used to provide additional learning support for Aboriginal students and to build relationships with Aboriginal families and community members:

'One successful initiative was the employment of an additional Aboriginal Education Officer to provide targeted support to students in Kindergarten to Year 2. This Officer instigated improved relationships with parents, students and staff and worked actively in classrooms supporting students' learning'. (Ross Hill Public School)

Enhancing learning support

Schools reported using their funding to provide Aboriginal students with specific programs aimed at improving literacy and/or numeracy. The most frequently reported programs were: Language, Learning & Literacy (L3), Focus on Reading, MiniLit or MultiLit, and QuickSmart¹⁸. These programs often require one-on-one or small group instruction, facilitated by a LaST or SLSO. Schools also reported using funding to provide both greater in class support and additional tutoring or coaching outside of school hours:

'Senior Aboriginal students were provided with tutorial assistance as part of an HSC assessment support program. Students received individual and small group assistance with a particular focus on understanding and completing assessment and coursework requirements'. (Pendle Hill High School)

Tailored support and opportunities for Aboriginal students

Schools used funding in this spending category to ensure that all Aboriginal students were able to access and engage in the full range of school activities. For example, schools funded financial support with paying for excursions, camps and school fees, as well as providing additional services such as health screening checks, transition to school programs and help with accessing post-school programs and scholarships.

Building staff capacity

Finally, schools reported using funding to build staff capacity through participation in teacher professional learning, and purchasing resources to support the quality teaching of Aboriginal education (e.g. books, yarnning mats and art supplies).

¹⁸ For more information on each of these programs, see:
 L3: <https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/literacy/Language,-Learning-and-Literacy>
 Focus on Reading: <https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/literacy/new-focus-on-reading>
 MultiLit: <http://www.multilit.com/programs/minilit-program/>
 QuickSmart: <https://simerr.une.edu.au/quicksmart/pages/index.php>

How did schools spend their English language proficiency loading?

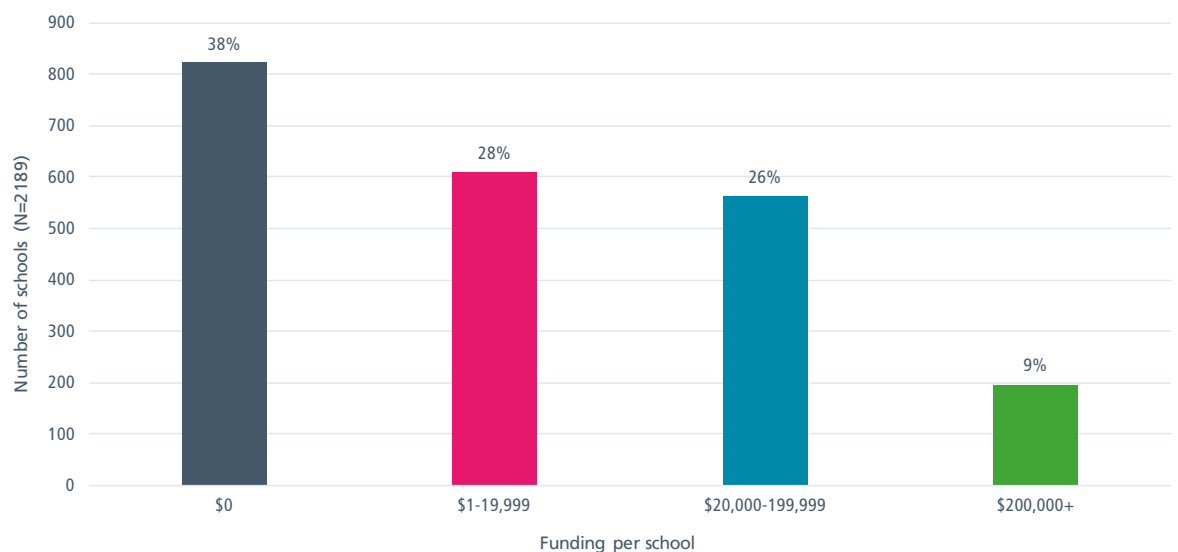
In 2016, the department delivered \$115 million in English language proficiency funding to 1,368 schools. The median funding received per school was \$28,116. Figure 4 summarises the distribution of English language proficiency funding. This figure shows that:

- More than one-third of schools (38%) did not receive any English language proficiency funding because they did not have any eligible EAL/D students.
- About one-quarter of schools (28%) received less than \$20,000 in English language proficiency funding.
- Another one-quarter of schools (26%) received between \$20,000 and \$200,000 in English language proficiency funding.
- A small amount of schools (9%) received \$200,000 or more in English language proficiency funding.

Figure 4:

English language proficiency equity loading per school in 2016

Source: NSW DoE, Leadership & High Performance Directorate



This funding supports students who are identified as both having EAL/D and requiring additional English language learning support. Schools reported allocating their English language proficiency loading across four spending categories. These categories are discussed below, in order from the most frequently reported to least frequently reported.

Enhancing learning support

Schools most frequently used English language proficiency funding to enhance learning support through providing EAL/D students with additional in-class support¹⁹ or through withdrawal for intensive small group or one-on-one activities. Several schools provided their students with additional after school tutoring. There was also a strong emphasis on assessing students against the ESL (English as a Second Language) scales and EAL/D Learning Progression, and monitoring their progress across the school year to ensure they continued to receive the appropriate level of support²⁰.

Employing key staff

To facilitate this additional learning support, schools used funding to either employ new staff, or to increase the numbers of hours per week for which existing staff were employed. The most commonly reported staffing categories were: EAL/D teacher, SLSO, LaST and Community Liaison Officer (CLO). As well as supporting students in class, schools also reported using the funding to enhance their engagement with parents of EAL/D students:

'A community liaison officer (CLO) was employed to assist the parents and carers of our students to communicate and engage with our school and staff . . . the CLO was utilised extensively to provide information to parents and initiate the development of translated documents'. (Griffith High School)

¹⁹ For example during group work or through team teaching

²⁰ For information on the ESL scales and EAL/D Learning Progression, see: <https://education.nsw.gov.au/teaching-and-learning/curriculum/multicultural-education/english-as-an-additional-language-or-dialect/planning-eald-support/english-language-proficiency>

Planning and developing programs

Schools reported using this funding to develop teaching and learning programs for their EAL/D students, including providing release time for classroom teachers and EAL/D staff to collaborate. Schools also used this funding to provide particular literacy and/or numeracy programs for EAL/D students. Commonly reported examples included: Reading Eggs, Mathletics, Targeted Early Numeracy (TEN) and Number Club²¹. Schools also focused on using digital resources to support EAL/D learners:

'Technology within the EAL/D setting continues to be a focus when utilising the schools iPads during teaching activities. These iPads allowed EAL/D students to access a variety of highly educational and interactive applications and tools to enhance their English proficiency'. (Oatley Public School)

Building staff capacity

Finally, schools reported using this funding to enhance the capacity of their staff through both participation in teacher professional learning and using EAL/D teachers as in-school experts to provide classroom teachers with mentoring and ongoing support:

'The EAL/D teacher mentor provided in-class support which included observations and feedback, demonstration lessons and team teaching. In addition, each EAL/D teacher received one hour per week of team support, which included collegial discussions regarding whole school strategic planning, additional professional learning and analysis of student assessment data'. (Canley Heights Public School)

How did schools spend their low level adjustment for disability loading?

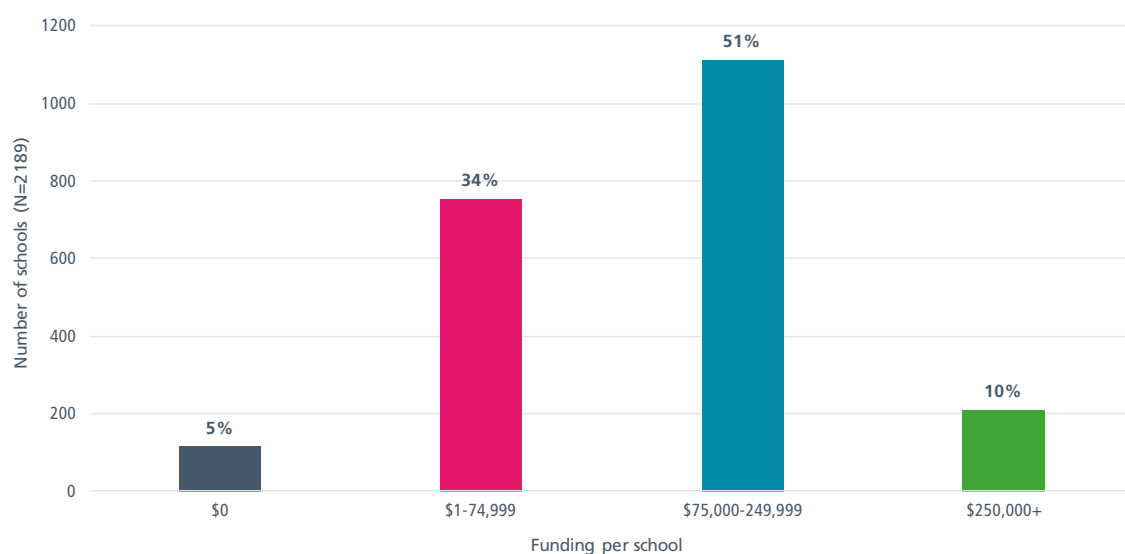
In 2016, the department delivered \$246 million in low level adjustment for disability funding to 2,074 schools. The median funding received per school was \$101,412. Figure 5 summarises the distribution of adjustment for disability funding. This figure shows that:

- A small amount of schools (5%) received no low level adjustment for disability funding because they did not have any students who required this support.
- About one-third of schools (34%) received less than \$75,000 in low level adjustment for disability funding.
- Half of schools (51%) received between \$75,000 and \$250,000 in low level adjustment for disability funding.
- One in every ten schools (10%) received \$250,000 or more in low level adjustment for disability funding.

Figure 5:

Low level adjustment for disability equity loading per school in 2016

Source: NSW DoE, Leadership & High Performance Directorate



Schools reported spending their low level adjustment for disability loading across four spending categories. These categories are discussed below, in order from the most frequently reported to least frequently reported.

²¹ For more information on these programs, please see:
 Reading Eggs: <https://readingeggs.com.au/>
 Mathletics: <http://au.mathletics.com/>
 TEN: <https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/numeracy/building-blocks-for-numeracy>
 Number Club: <https://sites.google.com/site/octmcorestandardsresources/number-clubs/number-club-overview>

Employing key staff

Schools most frequently used low level adjustment for disability funding to either employ new staff or to increase the numbers of hours per week for which existing staff were employed. The most commonly reported staffing categories were: SLSO, LaST, classroom teacher and speech therapist. As well as providing in-class support, these staff delivered targeted instruction for students with specific learning needs.

'This year saw the employment of a speech pathologist . . . to provide support one day per week. This support involved identifying students at risk, assessing and evaluating students' abilities, goal development for identified students, individual speech therapy sessions, professional development for staff and support for families'. (Blairmount Public School)

Enhancing learning support

Schools also frequently used their funding to enhance learning support for students referred to a school's learning support team, for example, to assess each student's learning needs, differentiate teaching programs, provide in-class and withdrawal support for intensive instruction, and provide ongoing monitoring of student progress. Schools also reported using funding to support with collecting student data in alignment with the new requirements for national data collection on students with disability (NCCD)²². There was also an emphasis on supporting students' behavioural needs, including additional support in the playground and the provision of social skills programs to explicitly teach and practice social skills.

Planning and developing programs

Schools reported using funding to release teachers from class to provide time to plan and review programs for students with identified needs. This included developing Individual Education Plans (IEPs) or PLPs in consultation with parents, school counsellors and learning support staff²³. Funding allowed these plans to be monitored through regular review meetings with parents and teachers during the year. Additionally, schools also used funding to purchase specific literacy or numeracy programs for use with identified students. These were usually the same programs reported above as being used with Aboriginal and EAL/D students (particularly L3, MiniLit, MultiLit, QuickSmart, TEN and Reading Eggs).

Building staff capacity

Finally, schools reported using this funding to enhance the capacity of their staff. As well as providing teacher professional learning, funding was used to create time for classroom teachers to collaborate and gain expertise from their school's learning support team:

'Considerable liaising by LaST teachers with class teachers was carried out in discussing goals for IEPs and PLPs for individual students; strategies for working towards; and achieving learning goals for individual students not on IEP or PLP. LaST teachers provided support and advice to class teachers in preparing learning, behaviour and crisis management plans for students'. (Urunga Public School)

²² National Disability Data Collection: <https://education.nsw.gov.au/teaching-and-learning/disability-learning-and-support/personalised-support-for-learning/national-disability-data-collection>

²³ An Individual Education Plan (IEP) sets out specific learning needs and goals for each identified student and describes the supports a school uses to address these. Further information on personalised learning and support is available at: <https://education.nsw.gov.au/teaching-and-learning/disability-learning-and-support/personalised-support-for-learning/personalised-learning-And-support>

How did schools spend their socio-economic background loading?

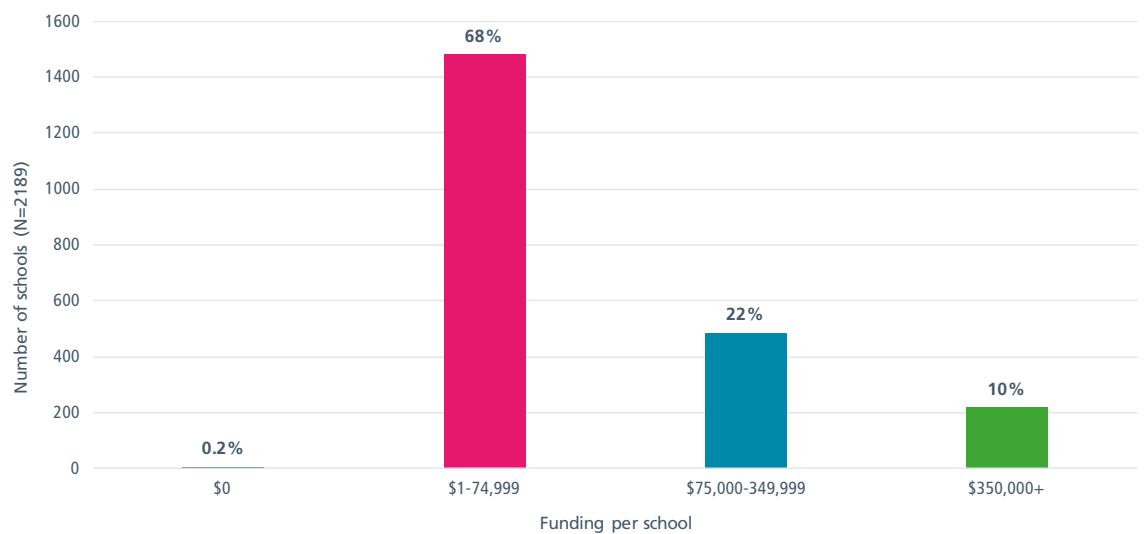
In 2016, the department delivered \$252 million in socio-economic background funding to 2,184 schools. The median funding received per school was \$30,626. Figure 6 summarises the distribution of socio-economic background funding. This figure shows that:

- Very few schools (0.2%) did not receive any funding for socio-economic background because they did not have any students who were eligible for this support.
- About two-thirds of schools (68%) received less than \$75,000 in socio-economic background funding.
- Almost one-quarter of schools (22%) received between \$75,000 and \$350,000 in socio-economic background funding.
- One in ten schools (10%) received \$350,000 or more in socio-economic background funding.

Figure 6:

Socio-economic background equity loading per school in 2016

Source: NSW DoE, Leadership & High Performance Directorate



Schools reported spending their socio-economic background loading across six spending categories. These categories are discussed below, in order from the most frequently reported to least frequently reported.

Employing key staff

Schools most frequently reported using their socio-economic background funding to either employ new staff, or to increase the numbers of hours per week for which existing staff were employed. The most commonly reported staffing categories were: SLSO, additional classroom teacher, speech therapist, LaST and Instructional Leader. As well as supporting students in the classroom, schools used additional staff to improve the overall quality of teaching and learning in their schools.

'The major initiative in 2016 to address the educational needs of students from differing socio-economic backgrounds has been the Instructional Leader model of teacher development. Teachers are now utilising strategies of greater effect size in their classroom instruction'. (Narranga Public School)

Enhancing learning support

Schools also frequently reported using socio-economic background funding to enhance learning support. The emphasis here was on identifying students not meeting expected literacy and/or numeracy outcomes, and providing either in-class support or withdrawal for targeted small group instruction:

'Programs implemented supported targeted students in literacy and numeracy who required additional assistance to achieve grade expectations. Teaching instruction varied from individual to small group. Reading programs focused on phonemic awareness and decoding. Pre-test and post-test work samples reflected an average growth of 50% per student'. (Como West Public School)

Schools also used funding to focus on student wellbeing, often through the Positive Behaviour for Learning (PBL) program²⁴.

*'A Positive Behaviour for Learning and Student Wellbeing Mentor was employed three days per week to deliver high quality professional learning to staff and community, provide support for targeted students, revise policy and deliver high level coaching across the school for PBL'.
(Coerwull Public School)*

Planning and developing programs

Schools reported using funding to release staff from class to create time for programming and planning. As was reported for all equity loadings, schools used this funding to purchase specific literacy and/or numeracy interventions and programs. These were usually the same programs reported above for use with Aboriginal students, EAL/D students and students with identified learning needs. Additionally, schools used funding to provide a range of extra programs for students, including programs for music, transition to school, student leadership and gifted and talented learners.

Building staff capacity

To support the above three spending categories, schools used socio-economic background funding to build staff capacity. This most commonly took the form of teacher professional learning and teacher mentoring and collaboration. There was an emphasis on improving the quality of teaching and learning programs and assessments:

'Our Instructional Leader and Deputy Principal Curriculum continued to support teachers to effectively plan and deliver learning programs that reflect quality teaching practices in the classroom . . . They have focused on assessment and consistent teacher judgement. This has resulted in improved consistency with student reporting'. (Bourke Public School)

Tailored support for individual students

Similar to the use of Aboriginal background funding, schools reported using socio-economic background funding to provide financial support for individual students as needs arose. Schools most commonly reported using this financial support for excursions and camps, school uniforms, school fees, program costs (e.g. sports, performing arts), learning resources (e.g. textbooks) and transport costs.

Purchasing school resources

Finally, schools reported using this funding to purchase specific resources for their school. Schools most commonly reported making purchases related to technology (e.g. provision of laptops/tablets for students enable to participate in Bring Your Own Device), improvements to the school's physical amenities (e.g. furniture, library refurbishment, school gardens) and providing food to students (e.g. breakfast club, lunch supplies).

'Our first wellbeing 'Grounded Day' saw a number of activities funded around the school with a focus on school beautification'. (Armidale High School)

'A Breakfast Club was introduced to ensure students had access to a healthy breakfast. Teacher feedback indicates participating students were more alert and engaged in classroom learning'. (Pendle Hill High School)

²⁴ For information on Positive Behaviour for Learning, see: <http://www.pbl.schools.nsw.edu.au>

Summary – how have schools spent their RAM equity loadings?

In 2016, the department delivered more than \$667 million in equity loading funding, distributed across 2,189 schools. The median funding amount received per school was \$189,397.

In summary, in 2016 schools reported spending their equity loadings across four main spending categories: employing key staff, enhancing learning support, planning and developing programs, and building staff capacity.

Schools also used the Aboriginal background loading to support Aboriginal language and culture teaching and to provide tailored support and opportunities for individual Aboriginal students. Schools also used the socio-economic background loading for tailored support and opportunities for individual students and to purchase school resources.

Overall, there were very strong similarities and overlaps between how schools spent their equity loadings, particularly for English language proficiency, disability and socio-economic background. Schools primarily used these three loadings to implement specific literacy or numeracy interventions, to employ additional teachers and/or classroom support staff and to release teachers from class to engage in collaborative programming, planning, curriculum design and mentoring. There was a strong emphasis on using these loadings to improve the overall quality of teaching and learning in schools.

There are several important limitations to this analysis. As mentioned, schools did not provide the annual report information for evaluation purposes but rather as part of the mandatory school reporting cycle. Further, while our random sample of 100 schools is broadly representative (see Appendix A), a larger sample may provide greater detail and insight into how different types of schools spend their funding (e.g. differences according to school type, size or location). Finally, limitations in financial and systems data meant that we were unable to determine exactly what each school's RAM equity loading allocation was spent on. CESE will explore ways to overcome these limitations for the final report in 2019.

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

This section of the report focuses on the impact of LSLD on school management and decision-making practices. Our analysis focuses on the five LSLD reform areas.

Method

We draw on two information sources in this section of the report: the 2017 CESE Principal Survey and department staffing data.

The 2017 CESE Principal Survey was undertaken during Term 2, 2017. Of the 1,197 principals invited to complete the survey, 834 responded to each of the nine closed response LSLD questions (described in more detail below). The survey also included two open-ended questions: *'What ongoing support does the Department need to provide to school leaders with regard to LSLD?'* and *'How does LSLD help your school strive for excellence?'*

Survey items were designed to map to the five LSLD reform areas:

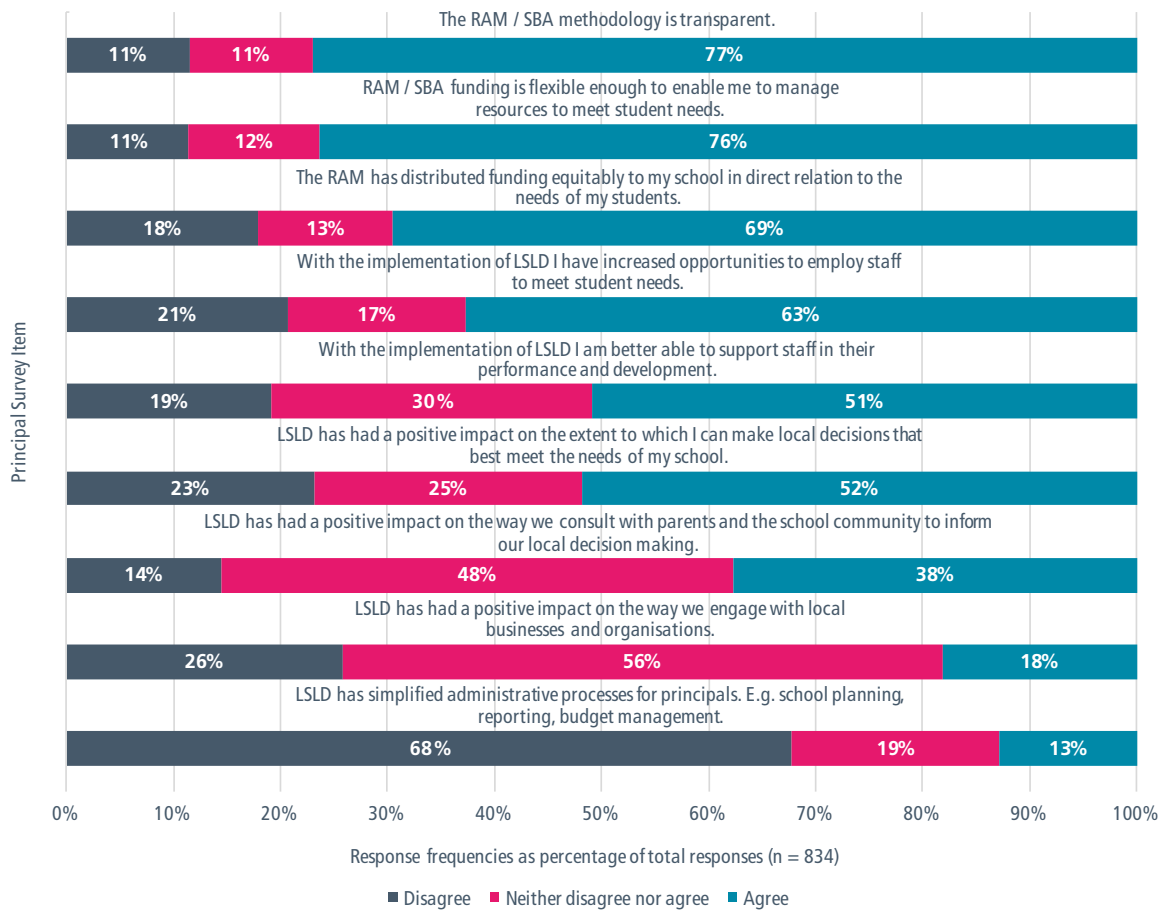
- making decisions: item 1
- managing resources: items 2-4
- staff in our schools: items 5-6
- working locally: items 7-8
- reducing red tape: item 9.

The wording of each question was designed to reflect the wording used in the LSLD documentation, and was also refined in consultation with departmental staff, an Evaluation Reference Group and an informal focus group of Principals, School Leadership (PSLs).

Figure 7 shows how principals responded to the survey statements on a five-point scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). For the purpose of analysis and interpretation, we combined 'strongly disagree' responses into the 'disagree' category and 'strongly agree' responses into the 'agree' category'. See Appendix B for a brief profile of the principals who responded to the 2017 CESE Principal Survey.

Figure 7:
Response frequencies to the CESE Principal Survey 2017

Source: CESE Principal Survey 2017



CESE also obtained staffing data from the department's Human Resources Directorate. This data provides a high-level description of trends in staffing patterns for both teaching staff and School Administrative and Support Staff (SASS). We have included this information in relation to the 'staff in our schools' reform area.

Principals in higher-need schools perceive that LSLD has had a greater impact on their ability to make decisions, manage resources, access appropriate staff and work locally, compared to principals in lower-need schools

Under LSLD, we expect that schools with higher levels of need may benefit more from LSLD than schools with lower levels of need. Level of need was determined by the total amount of equity funding per student, with higher-need schools receiving more equity funding per student than lower-need schools.

We have designed a statistical model which allows us to predict how schools with certain levels of need would be expected to respond to each survey question. The figures below show how these responses would be expected to vary as the RAM equity loadings increase from the 10th percentile (low need) to the 90th percentile (high need). We have presented more information about this statistical model in Appendix C and have outlined the technical details of the Principal Survey analysis in Appendix D.

For each of the nine survey questions, we used the RAM equity loadings to investigate whether the responses of principals from higher-need schools differed from those from lower-need schools. Overall, the results indicated that principals from higher-need schools tended to have more positive perceptions of LSLD.

We have included direct quotes from the open-ended questions where possible to provide illustrative examples that relate to each survey question. As these quotes come from de-identified survey responses, each quote is given a broadly descriptive label reflecting school type and location, rather than being attributed to an individual principal. We have also included a more in-depth discussion of the open-ended responses later in this section of the report.

Principals from higher-need schools tended to have more positive perceptions about how LSLD has helped them make local decisions in their school

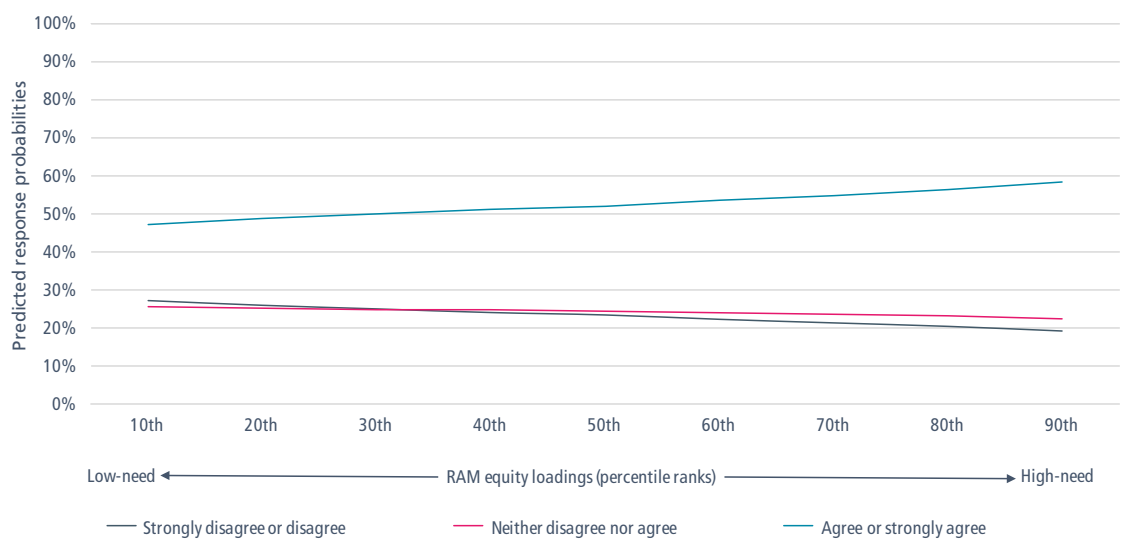
Question 1: LSLD has had a positive impact on the extent to which I can make local decisions that best meet the needs of my school.

Our analysis indicated that around 23 per cent (95% CI [20, 26]) of all principals in NSW public schools were expected to strongly disagree or disagree with the above statement, 25 per cent (95% CI [22, 28]) were expected to neither disagree nor agree and 52 per cent (95% CI [49, 55]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was statistically significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about the impact of LSLD on the extent to which they can make local decisions that best meet the needs of their school. Figure 8 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

'LSLD allows our school to better identify the needs of our students within our context. The flexibility in resourcing and decision making allows our school to identify our needs in our context and develop strategies and programs to support student growth'. (Principal, Secondary, Provincial)

Figure 8:

Predicted response probabilities by levels of need for the question: 'LSLD has had a positive impact on the extent to which I can make local decisions that best meet the needs of my school'



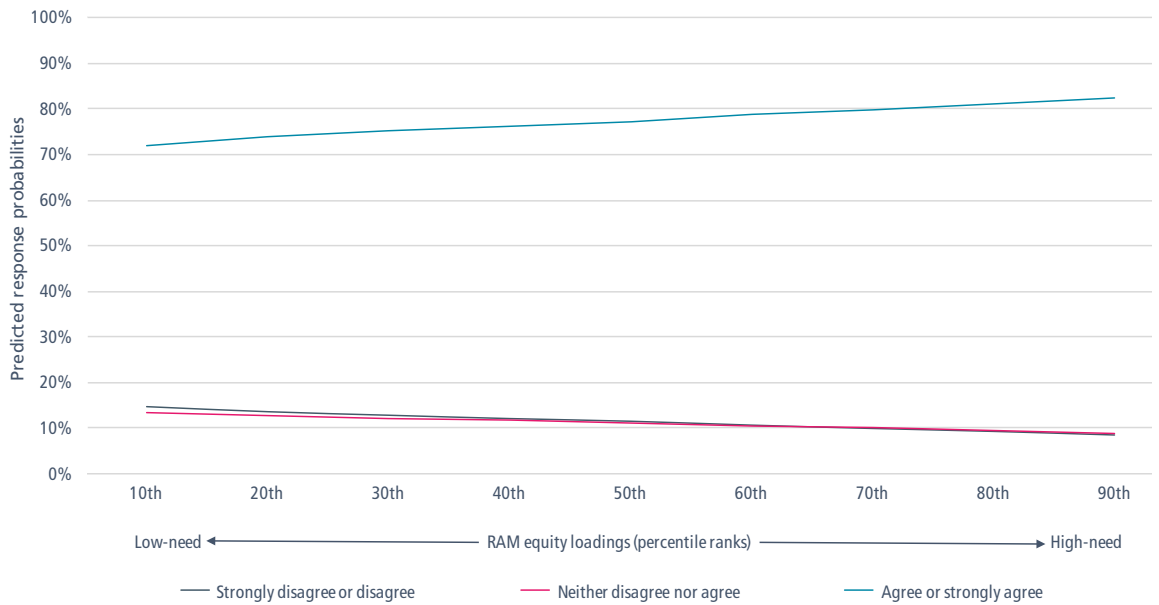
Principals from higher-need schools tended to have more positive perceptions about the transparency, equity and flexibility of the RAM

Question 2: The RAM/SBA methodology is transparent.

Our analysis indicated that 12 per cent (95% CI [10, 14]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 11 per cent (95% CI [9, 14]) were expected to neither disagree nor agree and 77 per cent (95% CI [74, 80]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about the transparency of the RAM/SBA methodology. Figure 9 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

Figure 9:

Predicted response probabilities by levels of need for the question: 'the RAM/SBA methodology is transparent'



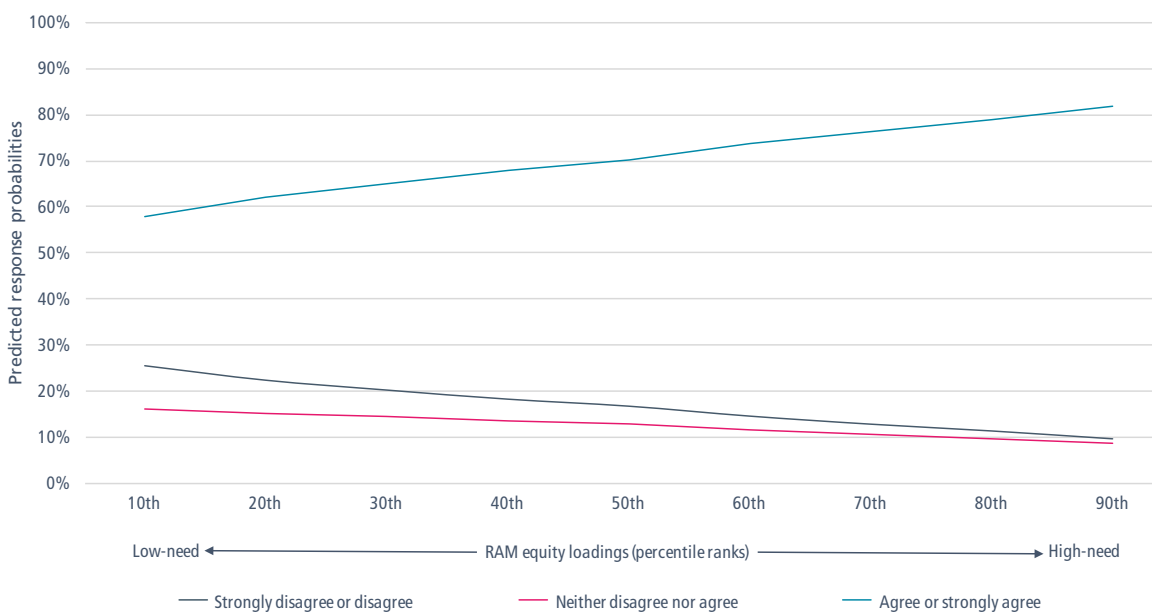
Question 3: The RAM has distributed funding equitably to my school, in direct relation to the needs of my students.

Our analysis indicated that 18 per cent (95% CI [15, 21]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 12 per cent (95% CI [10, 15]) were expected to neither disagree nor agree and 70 per cent (95% CI [66, 73]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about the equitability of the RAM. Figure 10 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

'The equity funding support package ensures focused and strategic support for groups of students using targeted funding that we didn't have access to in the past. The allocation model is so much fairer for schools like [ours]'. (Principal, Primary, Metro)

Figure 10:

Predicted response probabilities by levels of need for the question: 'the RAM has distributed funding equitably to my school, in direct relation to the needs of my students'



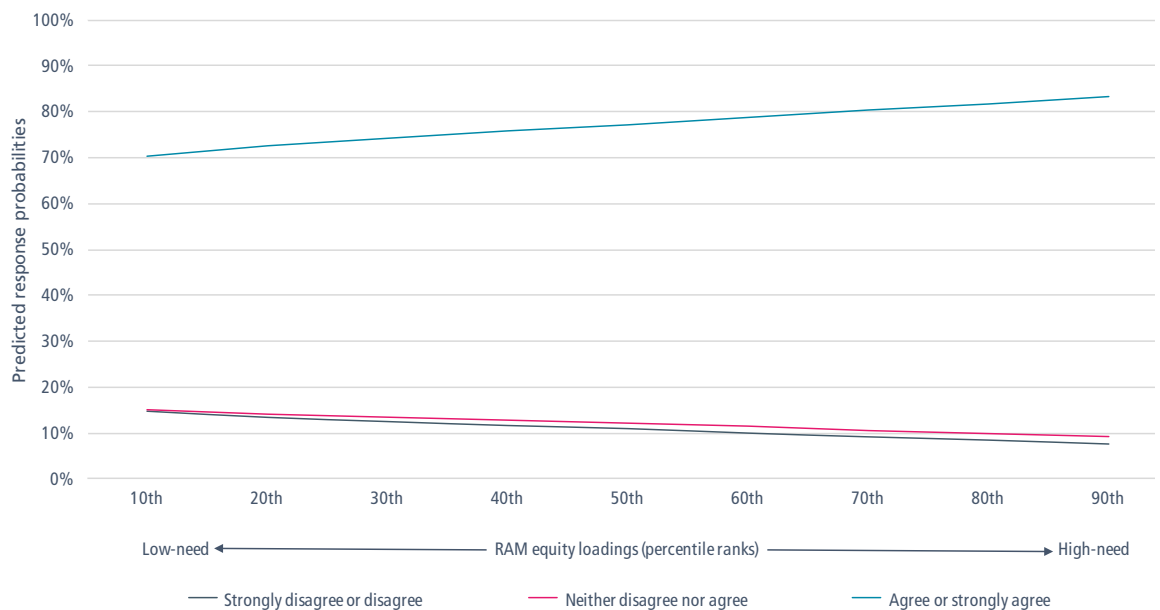
Question 4: RAM/SBA funding is flexible enough to enable me to manage resources to meet student needs.

Our analysis indicated that 11 per cent (95% CI [9, 14]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 12 per cent (95% CI [10, 15]) were expected to neither disagree nor agree and 77 per cent (95% CI [73, 79]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about the flexibility of the RAM/SBA funding. Figure 11 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

'The most valuable thing is the flexibility that it gives us. This allows greater communication and at times interaction from the parents and school community members. It allows for the taking up of opportunities that present themselves at short notice... it allows for greater opportunity to work collectively as a staff when the need arises'. (Principal, Primary, Provincial)

Figure 11:

Predicted response probabilities by levels of need for the question: 'RAM/SBA funding is flexible enough to enable me to manage resources to meet student needs'



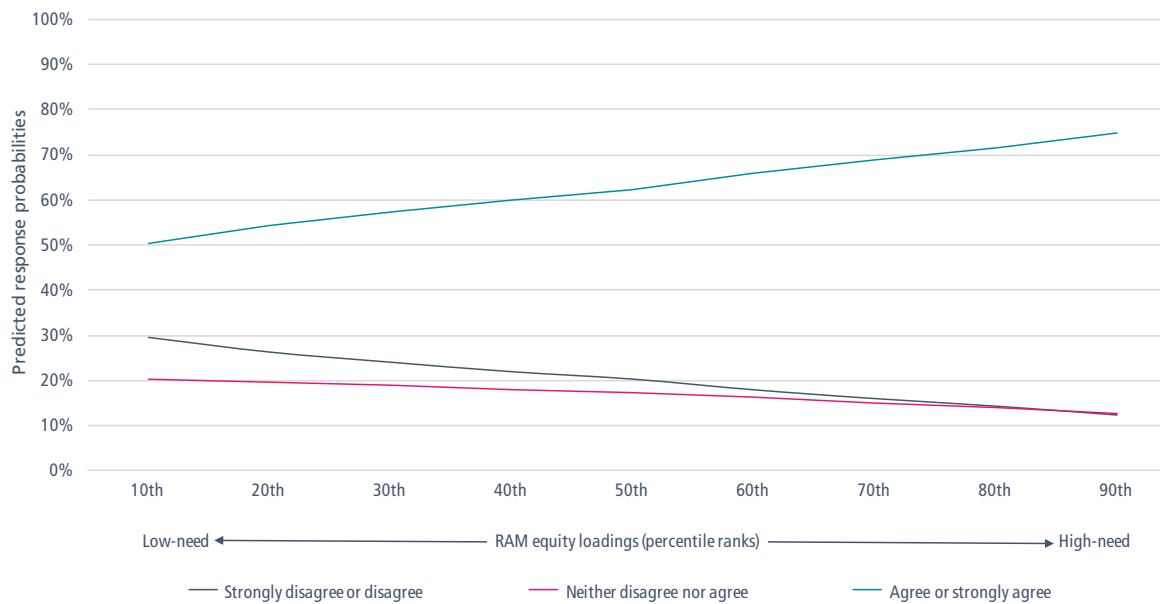
Principals from higher-need schools tended to have more positive perceptions of staffing changes under LSLD

Question 5: With the implementation of LSLD, I have increased opportunities to employ staff to meet student needs.

Our analysis indicated that 21 per cent (95% CI [18, 24]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 17 per cent (95% CI [14, 19]) were expected to neither disagree nor agree and 62 per cent (95% CI [59, 66]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about how LSLD has increased their opportunity to employ staff to meet their students' needs. Figure 12 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

Figure 12:

Predicted response probabilities by levels of need for the question: 'with the implementation of LSLD, I have increased opportunities to employ staff to meet student needs'

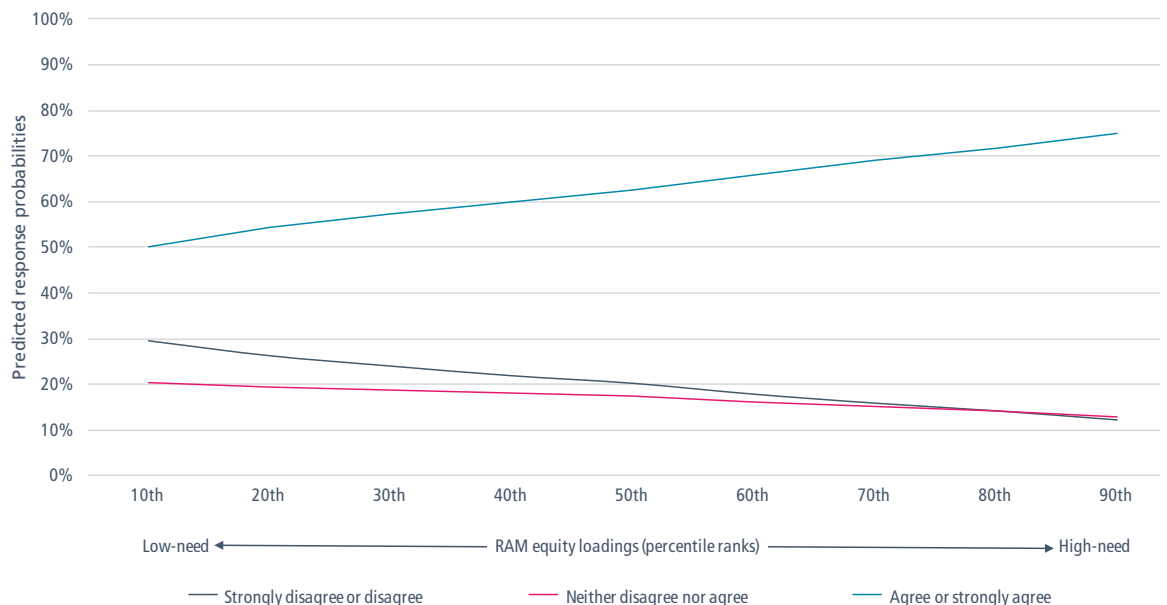


Question 6: With the implementation of LSLD, I am better able to support staff in their performance and development.

Our analysis indicated that 19 per cent (95% CI [17, 22]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 30 per cent (95% CI [27, 33]) were expected to neither disagree nor agree and 51 per cent (95% CI [47, 54]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about how LSLD has enabled them to improve teacher performance and development. Figure 13 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

Figure 13:

Predicted response probabilities by levels of need for the question: 'with the introduction of LSLD, I am better able to support staff in their performance and development'



Principals from higher-need schools tended to have more positive perceptions about the impact of LSLD on community engagement and consultation

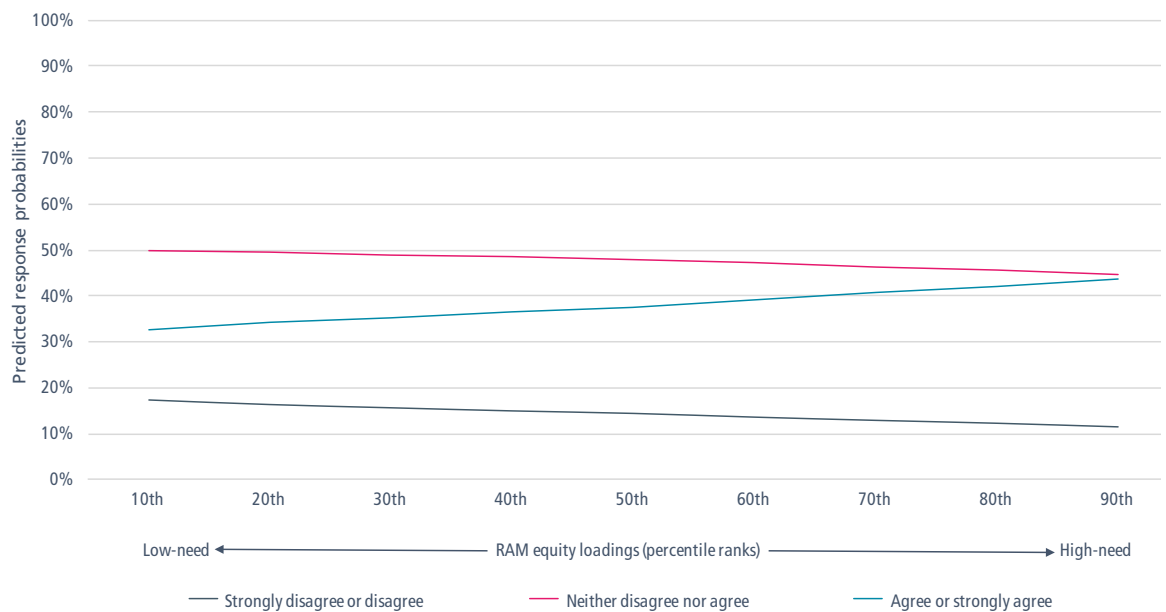
Question 7: LSLD has had a positive impact on the way we consult with parents and the school community to inform our local decision making.

Our analysis indicated that 14 per cent (95% CI [12, 17]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 48 per cent (95% CI [45, 51]) were expected to neither disagree nor agree and 38 per cent (95% CI [34, 41]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about how LSLD has impacted on their ability to consult with their school community. Figure 14 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

*'LSLD allows me to use funding to support the students in the best way as decided by the parents, community and staff of the school. It has allowed us to employ more staff, create smaller class groups and this has had a corresponding impact on the success of our students'.
(Principal, Central, Remote)*

Figure 14:

Predicted response probabilities by levels of need for the question: 'LSLD has had a positive impact on the way we consult with parents and the school community to inform our local decision making'



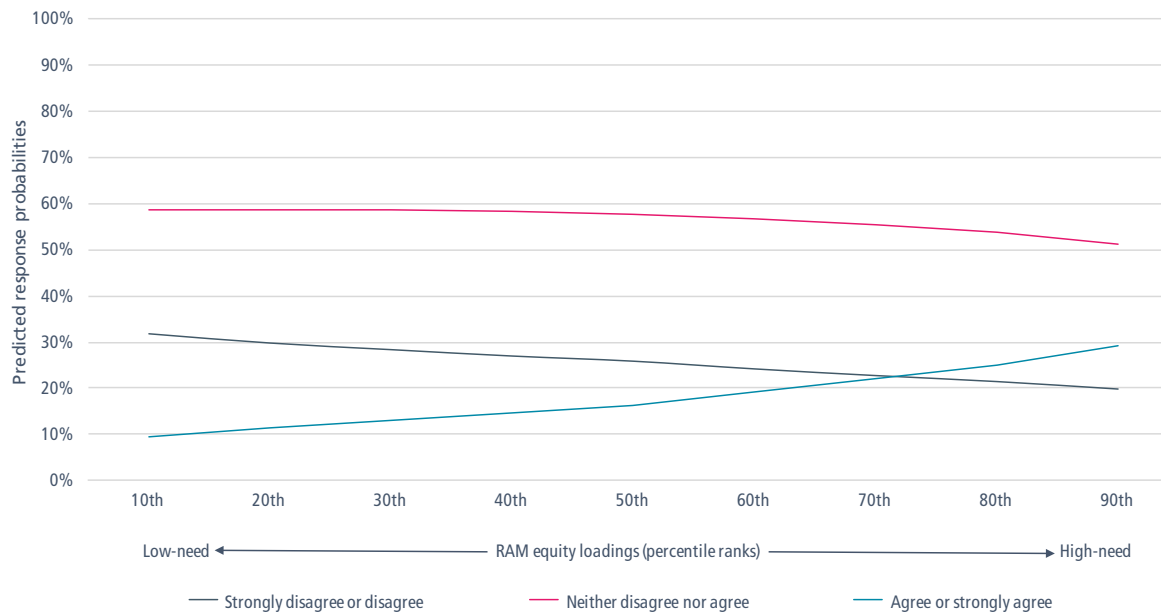
Question 8: LSLD has had a positive impact on the way we engage with local businesses and organisations.

Our analysis indicated that 26 per cent (95% CI [23, 29]) of all principals of NSW public schools were expected to strongly disagree or disagree with the above statement, 56 per cent (95% CI [53, 59]) were expected to neither disagree nor agree and 18 per cent (95% CI [16, 21]) were expected to agree or strongly agree. When we included the RAM equity loadings in the analysis, the results indicated that the measure was significantly related to the response probabilities: principals in schools with higher levels of need tend to have more positive perceptions about how LSLD has impacted on their capacity to engage with local organisations. Figure 15 shows how the response probabilities for each category are expected to change as levels of need increase from low to high.

'Once a school has determined its directions and plan, LSLD allows the plan to be actioned through ease of making choices around resourcing of programs and interventions with staffing, physical resources and professional learning. The freedom to bring community and business partners in to work does strengthen programs'. (Principal, Secondary, Metropolitan)

Figure 15:

Predicted response probabilities by levels of need for the question: 'LSLD has had a positive impact on the way we engage with local businesses and organisations'



Most principals disagree that LSLD has reduced red tape

Question 9: LSLD has simplified administrative processes for principals. E.g. school planning, reporting, budget management.

This is the only question from the CESE Principal Survey that did not find a relationship between principal responses and school levels of need.

While the LSLD reform includes “reducing red tape” as one of its five reform areas, we used the phrase “administrative processes” in the survey in order to phrase the question in neutral language and to be more specific. Nevertheless, principals often used the term “red tape” in their responses to the survey question.

Our analysis indicated that 68 per cent (95% CI [65, 71]) of all principals of NSW public schools were expected to either strongly disagree or disagree with the statement, 19 per cent (95% CI [17, 22]) were expected to neither disagree nor agree and 13 per cent (95% CI [11, 15]) were expected to either agree or strongly agree with the statement. When we included the RAM equity loadings in the analysis, the results indicated that the RAM equity loadings were not significantly related to the response probabilities.

Principals also frequently highlighted administrative burden issues in the open response questions:

‘The flexibility in RAM funding has allowed us to direct funds where they are required, but the red tape attached often counters the benefit. This is particularly the case regarding assets. I see very little local decisions when weighed against the increased accountability and compliance. Rather than being able to strive for excellence we spend an inordinate amount of time on compliance’.
(Principal, Secondary, Provincial)

‘Cutting red tape is rubbish. There is more red tape and convoluted knots than ever before’.
(Principal, Primary, Metropolitan)

Trends in staffing patterns between 2012 and 2017

Table 3 displays trends in staffing patterns for teaching staff between 2012 and 2017. This table shows that:

- The number of principals, assistant principals, head teachers and classroom teachers has remained steady.
- There has been a small increase (9%) in the number of deputy principals.
- There has been a moderate increase (%) in the number of LaSTs.
- From a very low starting point, there has been a large increase (331%) in the number of assistant principals specifically employed to lead learning and support programs²⁵.
- From a very low starting point, there has been a very large increase (7,480%) in the number of Instructional Leaders.

Table 3:

Change in number of FTE teaching staff 2012 - 2017

Source: NSW DoE, Human Resources Directorate

Position	Total substantive FTE at 30 June 2012	Total substantive FTE at 30 June 2017	Raw difference 2012-2017
Principal	2,146	2,128	-21
Deputy Principal	1,057	1,157	100
Assistant Principal	3,779	3,818	39
Head Teacher	3,857	3,890	32
Instructional Leader*	5	379	374
Assistant Principal - Learning and Support	29	125	96
Learning and Support Teacher (LaST)	713	1043	330
Classroom teacher	35,721	35,653	-68
Total	47,310	48,192	882

* Through phase 2 of the Action Plan, the department funded 408 FTE Instructional Leader positions. However, some of these positions were not filled at 30 June 2017. Further, many non-Action Plan schools have employed staff in informal Instructional Leader roles, which are not captured in HR records.

The increase in Instructional Leaders is a direct consequence of the department's Early Action for Success strategy, which implements the NSW government's State Literacy and Numeracy Plan²⁶.

Table 4 displays trends in staffing patterns for SASS between 2012 and 2017. This table shows that:

- The numbers of school administrative managers and school administrative officers has remained relatively steady.
- There has been a small increase (7%) in the number of AEOs.
- There has been a small decrease (10%) in the number of general assistants.
- There has been a moderate increase (18%) in the number of SLSOs.
- From a relatively low starting point, there has been a large increase (94%) in the number of business managers

²⁵ This also relates to a change in titles – Assistant Principals Behaviour were changed in 2013 to be called Assistant Principals Learning and Support.

²⁶ For information on Instructional Leaders and Early Action for Success, see: <https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/early-action-for-success>

Table 4:

Change in number of FTE SASS 2012 – 2017

Source: NSW DoE, Human Resources Directorate

Position	Total substantive FTE at 30 June 2012	Total substantive FTE at 30 June 2017	Raw difference 2012-2017
School Administrative Manager (SAM)	2,052	1,998	-54
School Administrative Officer (SAO)	4,764	4,815	52
Business Manager*	31	60	29
School Learning Support Officer (SLSO)	2,837	3,352	516
Aboriginal Education Officer (AEO)*	366	392	26
General Assistant	1,088	985	-103
Total	11,137	11,602	465

* Only data on permanent employees was available; therefore data on temporary employees for both business managers and AEO positions is not included here. CESE will seek to access data that includes temporary employees for the final report.

It is important to note that the number of business managers and AEOs reported here may under-represent the true figures, as this data does not include temporary employees. The increase in business managers may be the result of principals taking advantage of the LSLD measures that create greater hiring flexibility.

It is also important to note that during the period 2012 to 2017, the numbers of FTE student enrolments grew from 760,741 to 800,246 – an increase of 5 per cent. It is likely that some of the increase in teaching and SASS is related to this increase in student numbers.

What has been the impact of LSLD upon principal authority, support structures and school management?

The CESE Principal Survey also included two open-ended questions: *'What ongoing support does the Department need to provide to school leaders with regard to LSLD?'* and *'How does LSLD help your school strive for excellence?'* These questions map to the three research sub-questions in the evaluation plan related to:

- the impact of LSLD and RAM funding on the level of authority school leaders have to lead and manage their schools
- the support structures school leaders need to make effective school management decisions
- the barriers to effective school management and local decision-making under LSLD.

We undertook a qualitative analysis of these responses to identify common themes. These themes are discussed below.

Principals felt that LSLD supported them to meet student and staffing needs, but some questioned the nature of their increased authority

LSLD supports principals to tailor school programs to meet student needs

The majority of principals reported that LSLD had enabled them to better meet the diverse learning needs of their students.

*'LSLD has had its most visible and strongest impact in maintaining and extending learning support programs and processes. It has also enabled us to assist individuals and groups of students with high need to participate in aspects of school life and school activities that will be enriching and sustaining, enabling them to grow in confidence, sense of belonging and in their goal-setting and ambitions'.
(Principal, Secondary, Metropolitan)*

LSLD supports principals to employ additional staff and to increase professional learning opportunities for their staff

Many principals also reported that LSLD had allowed them to hire additional staff and to increase release time for collaboration and professional learning.

'It has given us the flexibility to have additional staffing so that leaders are more able to support and mentor teachers, teachers are more able to work collaboratively and professional learning can be accessed and be tailored to suit needs'. (Principal, Primary, Provincial)

LSLD has not increased authority in all areas that principals would like it to

In contrast, some principals felt that increased red tape had diminished their ability to make local decisions, particularly related to assets, procurement and employing local tradespeople. There were also areas where principals now have authority, but they believe these would be better managed centrally by the department (e.g. tree audits).

Survey responses also indicated that some principals were confused about the scope of LSLD. For example, some principals incorrectly believed that certain changes in the department's compliance inspection practices, including tree audits, emergency management equipment and bushfire management, were part of the LSLD reform package. This confusion highlights the fact that some elements have been added (or perceived to have been added) to LSLD since its inception without explicit agreement by all key stakeholders.

Some principals did not feel that LSLD or the RAM had provided sufficient funding to make an impact in their school.

*'LSLD has changed nothing in my role as principal and leading my school... LSLD can only offer my school flexibility if I have the money to do the things I would like to do, which I haven't'.
(Principal, Primary, Metro)*

Principals wanted better administrative support, more useable tools and improved departmental communication

Principals need greater administrative support to meet the demands of LSLD

Principals said that they wanted support with the budgeting, planning and business management aspects of LSLD. Some principals wanted a dedicated bursar or business manager, whilst others wanted a mentor or coach to help guide them through the changes.

'In an ideal situation an 'expert' in the reforms would be placed in a group of schools to be able to help facilitate the introduction of the reforms. They would be able to work one on one with the principal and other staff as required to upskill them'. (Principal, Central, Provincial)

Principals need functional tools to manage their responsibilities under LSLD

Principals often said that accountability and reporting tools were not fully tested or functional before being rolled out to schools. Principals wanted these tools to be updated, along with adequate training in how to use them (face-to-face rather than online).

'I would love more face-to-face training. I am really tired of being directed to QRGs [quick reference guides] when making an enquiry for assistance with something. I find the support using Ed Connect is frustrating. The LSLD support team is significantly under-resourced and frankly it takes a very long time to get any feedback from someone in that team'. (Principal, Primary, Metropolitan)

Principals need improved communication from the department to help them understand and implement LSLD

Principals wanted the department to provide more information about:

- how to use systems and tools
- what they need to do to meet their accountability requirements
- effective and creative ways to use RAM funding (including exemplars and case studies)
- how departmental reforms work together towards an overall vision.

Principals cited increased red tape, tight timeframes and the rapid pace of change as the main challenges of LSLD

Red tape continues to be a barrier for principals under LSLD

Principals reported that the increase in accountability and reporting requirements associated with LSLD reduced their ability to focus on teaching and learning. Ideally, they wanted less bureaucracy, less paperwork and less duplication of reporting requirements.

'We are required to write and produce reports and evidence for accountability. It is getting to the point where I cannot keep up. There needs to be a better system for reporting our data, one report, rather than many'. (Principal, Primary, Very Remote)

Tight timeframes and the rapid pace of ongoing change continues to be a barrier for principals under LSLD

Some principals felt overwhelmed by the LSLD implementation process.

'There are so many changes within a very short timeframe... Principals need time now to consolidate new learning and systems without the pressure of adding more and more to their workload'. (Principal, Primary, Metropolitan)

In many instances, principals reported that the added workload from accountability and reporting measures were compounded by their inexperience with budget and business management, and exacerbated by poorly-functioning tools.

Summary – what impact has LSLD had on school management and local decision-making practices?

In four of the five LSLD reform areas, principals perceive the impact of LSLD to have been positive overall. In the fifth reform area, reducing red tape, more than two-thirds of principals said that LSLD has not had a positive impact.

In summary, principals in higher-need schools tended to have more positive perceptions that:

- LSLD has had a positive impact on their ability to make local decisions that best meet the needs of their school.
- RAM funding is transparent, equitable and flexible enough to enable them to manage resources to meet student.
- Principals have increased opportunities to employ staff to meet student needs and to support staff performance and development.
- LSLD has had a positive impact on their ability to consult with parents and the school community to inform local decision making.

Conversely, principals in lower-need schools tended to have more negative perceptions about the impact of LSLD on their ability to make decisions, manage resources, access suitable staff and to work locally.

Principals from both higher- and lower-need schools agreed that LSLD has not had a positive impact on reducing red tape.

In order to make effective school management decisions, principals wanted greater support with administration (particularly financial planning and management) and improved functionality of school management tools (particularly SPaRO, A-Z tool, MyPL, Business Intelligence and LMBR²⁷). Principals also wanted more information and training from the department on how to use the new systems and tools, how schools can best make use of their RAM funding (e.g. case studies, illustrations of best practice) and a clearer understanding of how the different elements of LSLD work together towards a larger overall vision.

Principals reported that the main barriers to effective school management and local-decision making are the lack of authority to make decisions in areas where they feel constrained (particularly assets and compliance), excessive departmental red tape and the overwhelming pace of change and associated increases in workload.

Limitations

It should be noted that this data on the impact LSLD has had on school management and local decision-making practices was collected in early 2017, before the Principal Workload and Time Use Study (detailed below) was conducted and prior to release of the School Leadership Strategy in September 2017. It is anticipated such efforts may improve the impact of LSLD on school management and local decision-making practices. The next report will investigate whether the perceptions of principals change, using data from early in 2018 and early 2019, when the annual principal surveys take place.

New departmental projects and initiatives related to LSLD

In 2017, the department undertook the Principal Workload and Time Use Study in order to understand the nature of principals' workload, how they spend their time, and the issues and challenges they face in their role that impact the manageability of their workload²⁸. Key findings of that study include:

- Principals find it difficult to fulfil their role as educational leaders because they spend a large proportion of their time on administration. On average, principals spend 40 per cent of their time on leading the management of the school, but only 30 per cent of their time on leading teaching and learning.
- Principals support greater authority for school decision-making but this, coupled with higher community expectations, has led to an increase in workload.

²⁷ While many principals associate LMBR with LSLD, it is important to note that LMBR was originally conceived as a replacement for legacy finance systems in 2006 and, as such, predates LSLD. Having said this, full functionality of all components of LMBR would support the implementation of LSLD by encouraging local decision making for finance and HR transactions. As of January 2018, the SAP finance component of LMBR was available in all schools but the new HR payroll system was not. See also: <http://www.dec.nsw.gov.au/about-us/news-at-det/news/lmbr-statement>

²⁸ Full report available at: <https://education.nsw.gov.au/media/schools-operation/Principal-workload-and-time-use-report.pdf>

- The main barriers to managing principal workload include limited training and preparation for leadership roles, insufficient administrative support and lack of access to quality support services, tools and systems.
- Seventy five per cent of principals reported that their workload was 'difficult to achieve' or 'not at all achievable'. Seventy seven per cent reported that their workload was 'difficult to sustain' or 'not at all sustainable'.
- Principals could better manage their workloads if there was better coordinated, streamlined and aligned department support tools and communications from the department.

The Principal Workload Time and Use Study provided evidence that the current principal workload is unachievable and unsustainable and unsustainable, and that this workload has increased. This increase has coincided with the period in which LSLD was introduced, but is not necessarily linked to this policy. As noted above, responses to the CESE Principal Survey indicate that many principals do not perceive that LSLD has reduced their administrative burden. Given that this study reflected the view of principals working under LSLD in 2017, the results were an important indicator of the way that LSLD affects principals' workload. Many of the issues raised in the Principal Workload Study were related to components of LSLD. A brief summary of the study's findings and areas of opportunity is included in Appendix E.

In response to the situation identified in that study, in September 2017 the department announced a new School Leadership Strategy²⁹. The School Leadership Strategy focuses on:

1. quality leadership development and preparation
2. strong collegial support
3. better services and support for school leaders.

The Strategy includes an additional \$50 million in flexible funding from 2018 to provide support to enable principals to focus on instructional leadership. For example, the extra funds may be used by principals to employ business managers or additional administrative support³⁰.

Many elements of the Strategy strongly align with key aspects of LSLD. In 2018, this Strategy is likely to impact on how principals work within the context of LSLD. A brief summary of the Strategy is included in Appendix F.

²⁹ For more information, see: <https://education.nsw.gov.au/our-priorities/strengthen-teaching-quality-and-school-leadership/school-leadership-strategy-at-a-glance>

³⁰ For more information, see: <https://education.nsw.gov.au/media/schools-operation/School-Leadership-Strategy-2017.pdf>

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

This section of the report focuses on the following sub-question from the Evaluation Plan:

What impact have the changes to school-level funding under the RAM had on school and student outcomes?

We have focused on the RAM in this section of the report because this funding model has had a significant effect on how schools manage their budget and resources and can therefore be expected to have an impact on student outcomes. Again, our focus on the equity loadings also reflects the fact that schools receive approximately 90 per cent of their RAM funding through the equity loadings.

It is important to note that research shows that changes in school management can take considerable time to produce a measurable impact upon student outcomes³¹. This should be kept in mind when considering the outcomes analysis in this report. Additionally, outcome measures for LSLD were not explicitly defined when the policy was initially developed. While a broad reform of this nature could reasonably be expected to have an impact on a wide range of outcome measures, schools may vary in the extent to which they have chosen to spend their RAM equity funding on additional initiatives specifically designed to improve student outcome measures such as those listed below.

Student engagement

We have included five measures of student engagement in this report:

- school attendance
- school suspensions
- student social engagement
- student institutional engagement
- student aspirations to complete Year 12.

We have developed two research sub-questions for each engagement measure:

- Has there been any change since the introduction of LSLD?
- Have schools with higher levels of need changed more than those with lower levels of need?

The first sub-question concerns overall changes in the level of each outcome (e.g. has attendance improved since the introduction of LSLD). However, while overall changes may be consistent with an effect of LSLD (e.g. increasing attendance rates), the results should be interpreted with caution. Many other policy initiatives may also drive changes over the years of interest. Thus, overall changes are difficult to attribute solely to the impact of the reform.

The second sub-question concerns differential changes (e.g. has attendance increased more in higher-need schools than lower-need schools). LSLD aims to increase each school's ability to respond to the local needs of their students; therefore we expect higher-need schools to benefit more from the reform than lower-need schools. While overall changes are difficult to attribute to the effect of LSLD, differential changes provide more robust evidence regarding the effectiveness of LSLD.

³¹ See, for example:

Coelli, M & Green, D 2012, 'Leadership effects: School principals and student outcomes', *Economics of Education Review*, vol. 31, no. 1, pp. 92-109.

Miller, A 2013, 'Principal turnover and student achievement', *Economics of Education Review*, vol. 36, no. 1, pp. 60-72.

Day, C, Sammons, P, Hopkins, D, Harris, A, Leithwood, K, Gu, Q & Kington, A 2009, *The impact of school leadership on pupil outcomes: Final report*. London, England: UK Department for Children, Schools and Families Research.

Day, C, Gu, Q & Sammons, P 2016, 'The impact of leadership on student outcomes: How successful school leaders use transformational and instructional strategies to make a difference' *Educational Administration Quarterly*, vol. 52, no. 2, pp. 221-258.

McKinsey & Company 2010, *How the world's most improved school systems keep getting better*, report prepared by M Mourshed, C Chijioke and M Barber, p.11.

Data sets

Attendance and suspensions

CESE had access to school level data for attendance³² and suspensions. Appendix G details the formulas that we used to prepare this data for statistical modelling.

To estimate the change that has occurred in school attendance since the introduction of LSLD, we used time series data from 2011 to 2016. As suspension records were only available from 2012 onwards, we measured change in school suspensions over a slightly shorter time series (from 2012 to 2016). Of the 1,591 primary and 401 secondary schools that were open in 2016, 1,421 primary (89%) and 376 secondary (94%) schools had sufficient information to be included in the current study³³.

Social and institutional engagement

CESE used student engagement data from the Tell Them From Me (TTFM) student survey. This survey includes questions designed to measure institutional engagement and social engagement³⁴.

The TTFM student survey was first administered to secondary school students in 2013. This meant that we collected baseline measures for secondary school students approximately one year into the phased roll out of the LSLD reforms. While this is not ideal, it still allowed us to measure change in student engagement over three calendar years (from 2013 to 2016). However, for primary school students, TTFM was first administered in 2014, meaning that we collected baseline measures for primary school students approximately two years into the phased roll out of the LSLD reforms. Given this limitation, we have only included data for secondary school students in the current study.

It is also important to note that schools and students self-select to participate in the TTFM survey. This means that the secondary schools that participated in 2013 did not necessarily participate in the survey each year thereafter. As such, constructing a complete repeated cross-sectional panel dataset would have excluded too many schools. Instead, to be included in the current study, schools had to have at least one response from a student in each scholastic year across both 2013 and 2016. We excluded Year 7 students from the sample because we felt that they had not spent enough time at secondary school for any changes that they had experienced to be reflected in their engagement levels. In total, we included 62,846 students from 80 secondary schools in the analysis of the institutional engagement data, and 62,794 students from the same 80 secondary schools in the analysis of the social engagement data.

TTFM measures social engagement as the extent to which a student is involved in the life of their school. This includes a sense of belonging at school, participation in sports/clubs and having positive friendships at school. TTFM measures institutional engagement as the extent to which a student strives to meet the formal requirements for school success. This includes valuing schooling outcomes, attendance, positive behaviour and homework and study habits.

Student aspirations to complete Year 12

To measure actual Year 12 completion rates, each student in a clearly defined cohort (e.g. all Year 10 students in 2011) must be tracked until they either finish Year 12 or leave school without completing their Higher School Certificate. In the context of the current study, this meant that CESE only had access to Year 12 completion rates for students who were only partially exposed to LSLD. While the final report will examine actual Year 12 completion rates, in the current study we have examined student aspirations to complete Year 12 as an interim measure.

32 In January 2015, a change to the recording of family holidays came into effect which required approved extended family holidays to be recorded as absences rather than exemption from attendance. This means that the attendance rates in 2015 and 2016 are lower than they would have been had this change not occurred; however we are not able to determine the exact impact of this change in percentage terms.

33 Schools were excluded if they were missing attendance/suspension records, were missing at least one ICSEA value over the years, or had excessively unstable ICSEA values (see Appendix G).

34 TTFM also includes questions designed to measure intellectual engagement, however, before 2015, each block of questions regarding intellectual engagement referenced a particular subject area; either English, Mathematics or Science. As the subject reference was randomly varied within participants, intellectual engagement was not measured consistently across participants (i.e. different participants were asked different sets of questions). As a result, we have only included data regarding institutional and social engagement in the current study.

The TTFM student survey measures student aspirations to complete Year 12. Students are asked to indicate how strongly they agree with the statement “I plan to finish Year 12” using a 5-point scale. In order to simplify the interpretation of the data, we combined the lowest three categories into a single category. This means that we have measured student aspirations to complete Year 12 using a 3-point ordinal scale (neither strongly agree nor agree vs. agree vs. strongly agree). As with the analysis of the student engagement data, we measured change over three calendar years (from 2013 and 2016). In total, we included 59,679 students from the same 80 secondary schools that were included in the analysis of the student engagement data in the analysis of the student aspirations data.

Method

To accurately estimate school-specific patterns of change, we controlled year-to-year fluctuations in levels of need in our statistical analyses. Importantly, by doing this we did not remove any variability in the outcomes due to differences in student composition; rather we removed the variability in the outcomes that was due to within-school changes in student composition over the years of interest. To this end, we included Index of Community Socio-Educational Advantage (ICSEA) values in the models as time-varying predictors. ICSEA was developed by the Australian Curriculum and Reporting Authority (ACARA) and involves a weighted combination of several student- and school-level factors, including: (a) parent background variables (occupation group, school education and non-school education); (b) percentage of Aboriginal enrolments; (c) percentage of disadvantaged students with a language background other than English (LBOTE); and (d) remoteness index³⁵. More detailed information regarding the ICSEA values and their connection to the RAM equity loadings is presented in Appendix G.

2016 was the first year for which we had full RAM equity loading data. We determined that individual schools' year-to-year level of need was highly likely to be related to their level of need in 2016 (see Appendix C). This allowed us to predict changes in student outcomes between these years of interest as they relate to levels of need, despite the fact that the full RAM equity loadings were not introduced until 2016.

To investigate the first research sub-question (has there been overall change in the level of each outcome), we used mixed-effects regression models. We used these models to estimate the extent to which within-school patterns of change varied across schools. To investigate the second research sub-question (has there been a differential change over time, such that schools with higher levels of need changed more than those with lower levels of need), we added RAM equity loadings to the various models to predict the within-school patterns of change. We present more detailed information about the statistical models in Appendix G.

³⁵ For more information on ICSEA see: https://acaraweb.blob.core.windows.net/resources/Guide_to_understanding_ICSEA.pdf

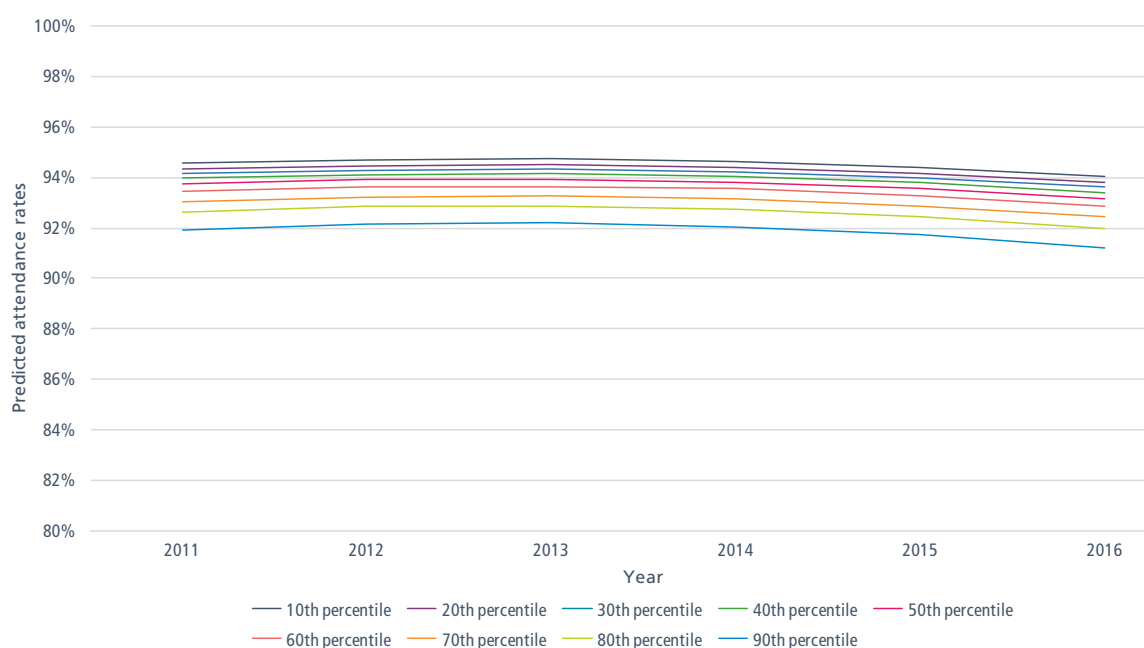
In primary schools, there was a very small decrease in attendance rates from 2011 to 2016, while school-specific changes were not related to levels of need

The results indicated that the expected attendance rate for an average NSW primary school in 2011 was around 94 per cent (95% CI [93, 94]). The results also indicated that there was a small amount of variation across the school-specific attendance rates for 2011. These small between-school differences were largely maintained (i.e. most primary schools had similar patterns of change from 2011 to 2016), with most primary schools showing a very small amount of positive change in the first few years and a very small amount of negative change in the last few years.

When we included the RAM equity loadings in the analysis, the results indicated that primary schools with higher levels of need had significantly lower attendance rates in 2011 than those with lower levels of need. While the RAM equity loadings accounted for 37 per cent of the variation across the attendance rates for 2011, the loadings were not significantly related to the school-specific patterns of change. This means that primary schools with different levels of need had similar patterns of change. Figure 16 shows the predicted attendance rates for primary schools with different levels of need.

Figure 16:

Predicted attendance rates for primary schools with different levels of need



Note: 10th percentile = low need/low equity funding; 90th percentile = high need/high equity funding.

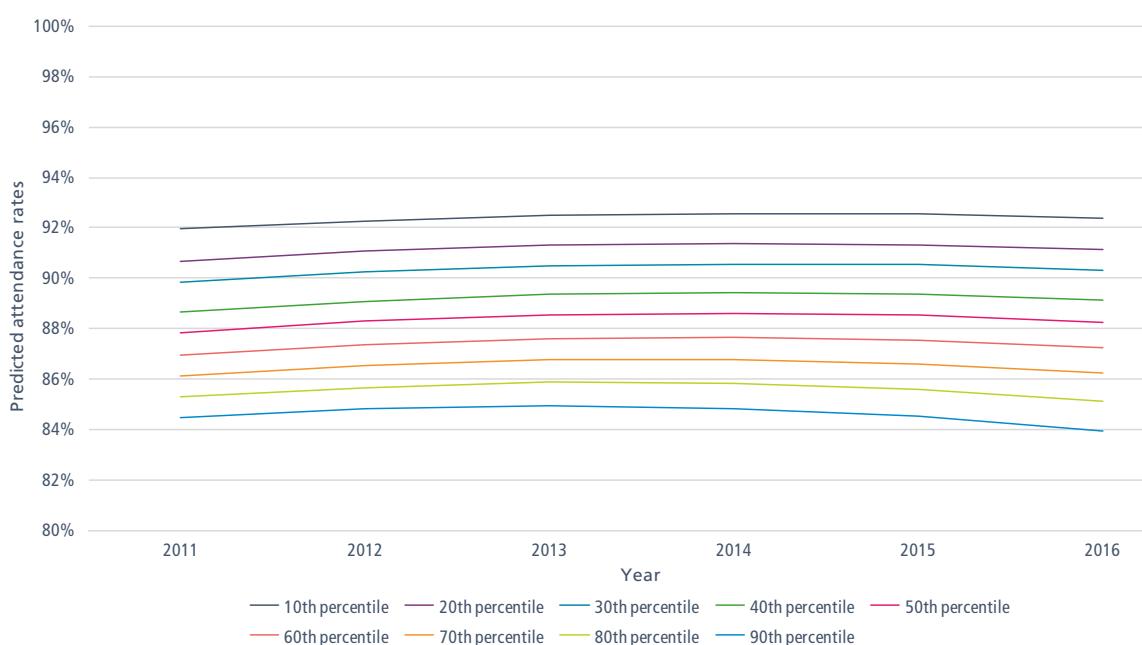
In secondary schools, there was a very small increase in attendance rates 2011 to 2016, while school-specific changes showed a very small relationship to levels of need

The results indicated that the expected attendance rate for an average NSW secondary school in 2011 was around 88 per cent (95% CI [88, 89]). The results also indicated that there was a moderate amount of variation across the school-specific attendance rates for 2011. These moderate between-school differences were largely maintained (i.e. most secondary schools showed similar patterns of change from 2011 to 2016), with most secondary schools showing a very small amount of positive change in the first few years and a very small amount of negative change in the last few years.

When we included the RAM equity loadings in the analysis, the results indicated that secondary schools with higher levels of need had significantly lower attendance rates in 2011 and significantly less change than those with lower levels of need. While the RAM equity loadings were significantly related to the school-specific patterns of change, the magnitude of the relationship was quite small. This means that secondary schools with different levels of need tended to have similar patterns of change. Figure 17 shows the predicted attendance rates for secondary schools with different levels of need. This plot shows that attendance in a low need school (10th percentile) increased by around 0.43 percentage points while in a high need school (90th percentile) attendance decreased by around 0.52 percentage points.

Figure 17:

Predicted attendance rates for secondary schools with different levels of need



Note: 10th percentile = low need/low equity funding; 90th percentile = high need/high equity funding.

In primary schools, there was a very small increase in suspension rates from 2012 to 2016, while school-specific changes were not related to levels of need

The results indicated that the expected suspension rate for an average NSW primary school in 2012 was around 0.2 per cent (95% CI [0.19, 0.23]). The results also indicated that there was a very small amount of variation across the school-specific suspension rates for 2012. These very small between-school differences were largely maintained (i.e. most primary schools showed similar patterns of change from 2012 to 2016), with most primary schools showing a very small amount of positive change over the years of interest.

When the RAM equity loadings were included in the analysis, the results indicated that primary schools with higher levels of need had significantly higher suspension rates in 2012 than those with lower levels of need. While the RAM equity loadings accounted for 39 per cent of the variation across the school-specific starting values, the measure was not significantly related to the school-specific patterns of change. This means that primary schools with different levels of need tended to have similar patterns of change. The predicted suspension rates for primary schools with different levels of need are not presented due to the small scale of the differences.

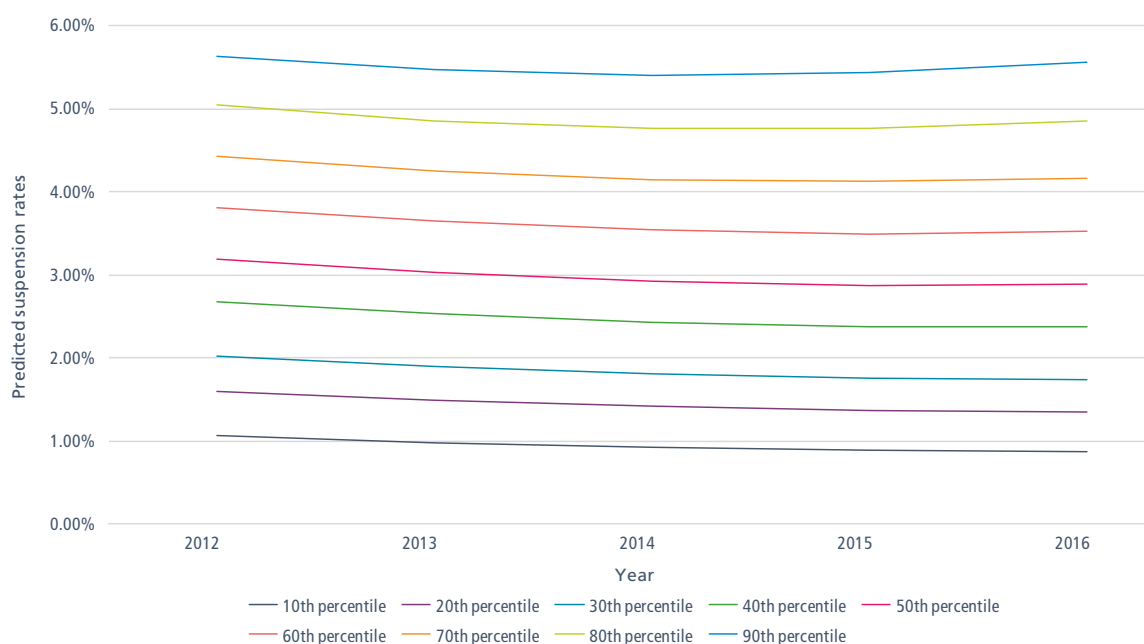
In secondary schools, there was a very small decrease in suspension rates from 2012 to 2016, while school-specific changes showed a very small relationship to levels of need

The results indicated that the expected suspension rate for an average secondary school in 2012 was around 2.7 per cent (95% CI [2.4, 3.0]). The results also indicated that there was a moderate amount of variation across the school-specific suspension rates for 2012. These moderate between-school differences were largely maintained (i.e. most secondary schools showed similar patterns of change from 2012 to 2016), with most secondary schools showing a very small amount of negative change over the years of interest.

When the RAM equity loadings were included in the analysis, the results indicated that secondary schools with higher levels of need had significantly higher suspension rates in 2012 and significantly more change than those with lower levels of need. Importantly, while the RAM equity loadings were significantly related to the school-specific patterns of change, the magnitude of the relationship was quite small. This means that secondary schools with different levels of need tended to have similar patterns of change. Figure 18 shows the predicted suspension rates for secondary schools with different levels of need. This plot shows that suspensions in a low need school (10th percentile) decreased by around 0.19 percentage points while in a high need school (90th percentile) suspensions decreased by around 0.08 percentage points.

Figure 18:

Predicted suspension rates for secondary schools with different levels of need



Note: 10th percentile = low need/low equity funding; 90th percentile = high need/high equity funding.

In secondary schools, there was a very small increase in social engagement from 2013 to 2016. School-specific changes showed a small relationship to levels of need, with higher-need schools showing less change than lower-need schools

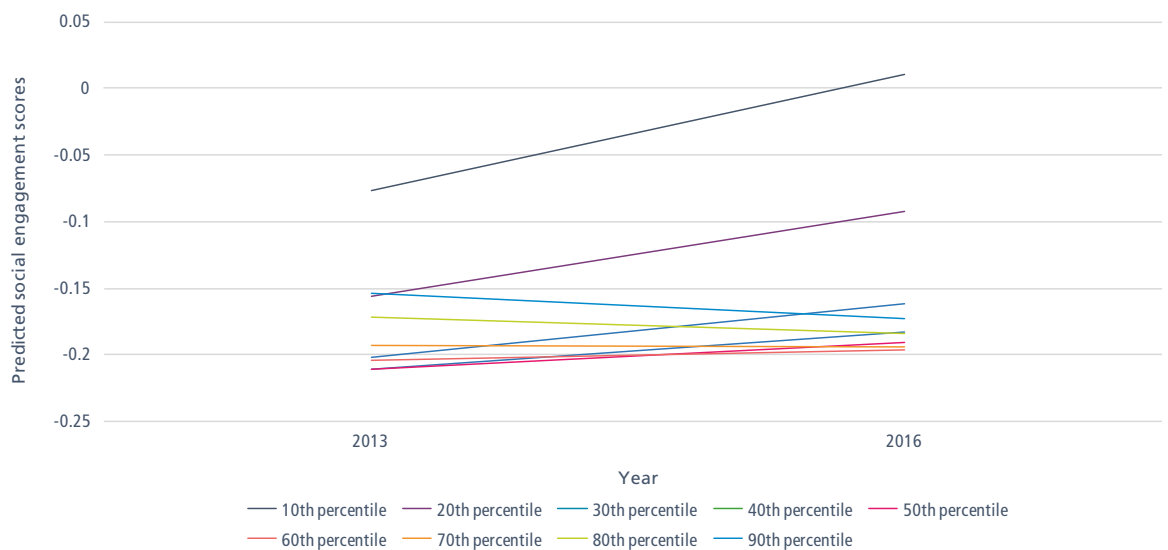
The results from our model indicated that the expected social engagement score for a student who attended an average secondary school in 2013 was around -0.16 (95% CI [-0.19, -0.12]). As the theoretical mean for the social engagement scores is 0 (see Appendix G), this result suggests that students in Years 8 through 12 have slightly lower levels of social engagement than those in Year 7. The results also indicated that there was a moderate amount of variation across the school-specific social engagement scores for 2013.

With regard to growth, the results indicated that social engagement increased by around 0.03 standard deviation units (95% CI [0.01, 0.06]) in an average secondary school, with most schools showing similar patterns of change.

When the RAM equity loadings were included in the analysis, the results indicated that there was a negative relationship for schools with below average values on the measure which moved towards a positive relationship for schools with above average values (i.e. a u-shaped curve; see Figure G1 in Appendix G). The RAM equity loadings were also significantly related to the school-specific patterns of change, with higher-need schools showing less change than lower-need schools. Figure 19 shows the predicted social engagement scores for secondary schools with different levels of need. This plot shows that social engagement in a low need school (10th percentile) increased by around 0.09 standard deviation units while in a high need school (90th percentile) social engagement decreased by around 0.02 standard deviation units.

Figure 19:

Predicted social engagement scores for students who attend schools with different levels of need



Note: 10th percentile = low need/low equity funding; 90th percentile = high need/high equity funding.

In secondary schools, there was a small increase in institutional engagement from 2013 to 2016, while school-specific changes were not related to levels of need

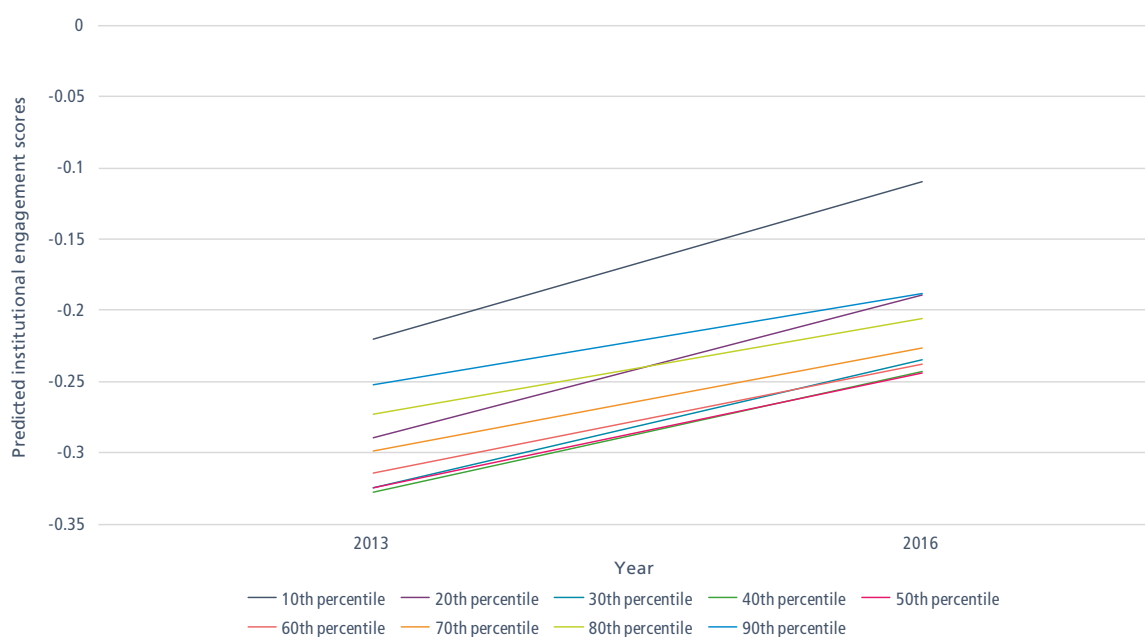
The results indicated that the expected institutional engagement score for a student who attended an average secondary school in 2013 was around -0.27 (95% CI [-0.30, -0.23]). As the theoretical mean for the institutional engagement scores is 0, this result suggests that students in Years 8 through 12 have moderately lower levels of institutional engagement than those in Year 7. The results also indicated that there was a moderate amount of variation across the school-specific institutional engagement scores for 2013.

With regard to growth, the results indicated that institutional engagement increased by around 0.09 standard deviation units (95% CI [0.06, 0.11]) in an average secondary school, with most schools showing similar patterns of change.

When the RAM equity loadings were included in the analysis, the results indicated that there was a negative relationship for schools with below average values on the measure which moved towards a positive relationship for schools with above average values (i.e. a u-shaped curve; see Figure G2 in Appendix G). This is unusual and CESE will investigate this further in 2018. While the RAM equity loadings accounted for 23 per cent of the variation across the school-specific institutional engagement scores for 2013, the measure was not significantly related to the school-specific patterns of change. This means that secondary schools with different levels of need tended to have similar patterns of change. Figure 20 shows the predicted institutional engagement scores for secondary schools with different levels of need.

Figure 20:

Predicted institutional engagement scores for students from secondary schools with different levels of need



Note: 10th percentile = low need/low equity funding; 90th percentile = high need/high equity funding.

In secondary schools, there was a small decrease in student aspirations to complete Year 12 from 2013 to 2016, while school-specific changes were not related to levels of need

The results indicated that, for an average secondary school in 2013, 67 per cent of their students were expected to have a response in the strongly agree category; 18 per cent were expected to have a response in the agree category; and 15 per cent were expected to have a response in neither of these categories. The results also indicated that there was a moderate amount of variation across the school-specific starting values.

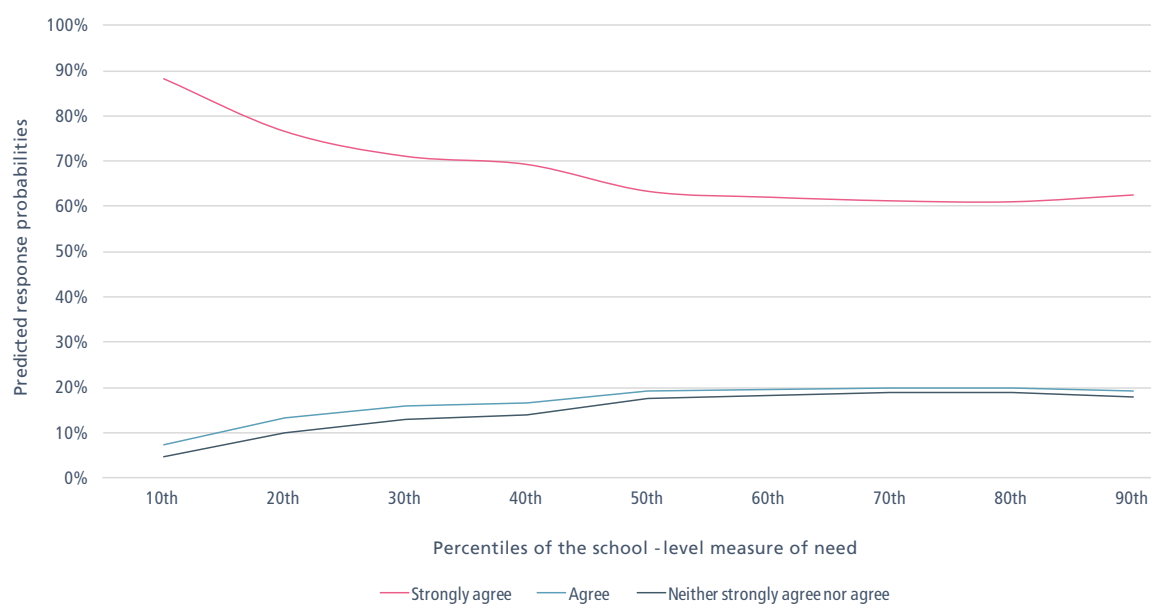
With regard to growth, the results indicated that students who attended an average secondary school in 2016 were slightly less likely to have a response in a higher category than those who attended the same school in 2013 (OR = 0.73, 95% CI [0.69, 0.78]). The results also indicated that there was a small amount of variation across the school-specific patterns of change.

When the RAM equity loadings were included in the analysis, the results indicated that the measure had a significant curvilinear relationship with the school-specific starting values. This complex relationship is illustrated in Figure 21, which shows that students from lower-need schools have higher aspirations to complete Year 12 than students from higher-need schools, but that this relationship tends to only be observed for those students who attend schools with below average levels of need.

While the RAM equity loadings accounted for 63 per cent of the variation across the school-specific starting values, the measure was not significantly related to the school-specific patterns of change. This means that students from secondary schools with different levels of need tended to have similar patterns of change.

Figure 21:

Predicted response probabilities (2013) for schools with different levels of need



Note: 10th percentile = low need/low equity funding; 90th percentile = high need/high equity funding.

The School Excellence Framework and LSLD

The School Excellence Framework (SEF) is a planning tool that is intended to support all NSW public schools in their pursuit of excellence³⁶. Since 2016, all schools have used the SEF to undertake annual self-assessment as part of the school planning cycle³⁷. All schools complete the self-assessment in the first half of the year. The department then conducts an external validation process with about 440 schools in Terms 3 and 4.

The SEF provides a clear description of the key elements of high-quality practice within the three, interdependent domains of Learning, Teaching and Leading. Within these domains, the SEF identifies 14 elements which define the core business of excellent schools. For each element, the SEF contains an overall statement of excellence, as well as more specific descriptors of good practice at four levels of development: Working towards Delivering, Delivering, Sustaining and Growing, and Excelling.

SEF is included in this report because it is a school-level outcome measure which may give a broad indication of the impact of LSLD on areas such as school planning and management.

Method

This report includes an analysis of school responses to the four SEF elements within the Leading domain, as outlined below. Four elements, and the descriptors underneath them, most closely align with the LSLD reform areas.

- **Leadership:** in schools that excel, the school leadership team supports a culture of high expectations and community engagement, resulting in sustained and measurable whole-school improvement.
- **School planning, implementation and reporting:** in schools that excel, the school plan is at the core of continuous improvement efforts, with the school's vision and strategic directions evident in its main activity.
- **School resources:** in schools that excel, resources are strategically used to achieve improved student outcomes.
- **Management practices and processes:** in schools that excel, management systems, structures and processes underpin ongoing school improvement and the professional effectiveness of all school members.

We have analysed responses for all schools based on where they ranked themselves on the four self-assessment categories (i.e. Working towards delivering, Delivering, Sustaining and Growing, and Excelling). To investigate whether higher-need schools changed more than lower-need schools from 2016 to 2017, we modelled the 2017 SEF data as a function of the RAM equity loadings and the 2016 SEF data. See Appendix H for technical details of this analysis.

There are several important limitations to the SEF data. Given that schools only started using the SEF in 2016, their 2017 responses may reflect an evolving understanding of how to use the SEF, and this may be reflected in shifts towards lower categories. Further, as these ratings are subjective, a change in the way schools rate themselves may not reflect any objective shift in progress towards the goal of school excellence. It is also difficult to attribute any changes to LSLD given that the LSLD reforms have been gradually phased in since 2012.

³⁶ <http://www.dec.nsw.gov.au/about-the-department/our-reforms/school-excellence-framework>

³⁷ <https://education.nsw.gov.au/teaching-and-learning/school-excellence-and-accountability/sef-evidence-guide>

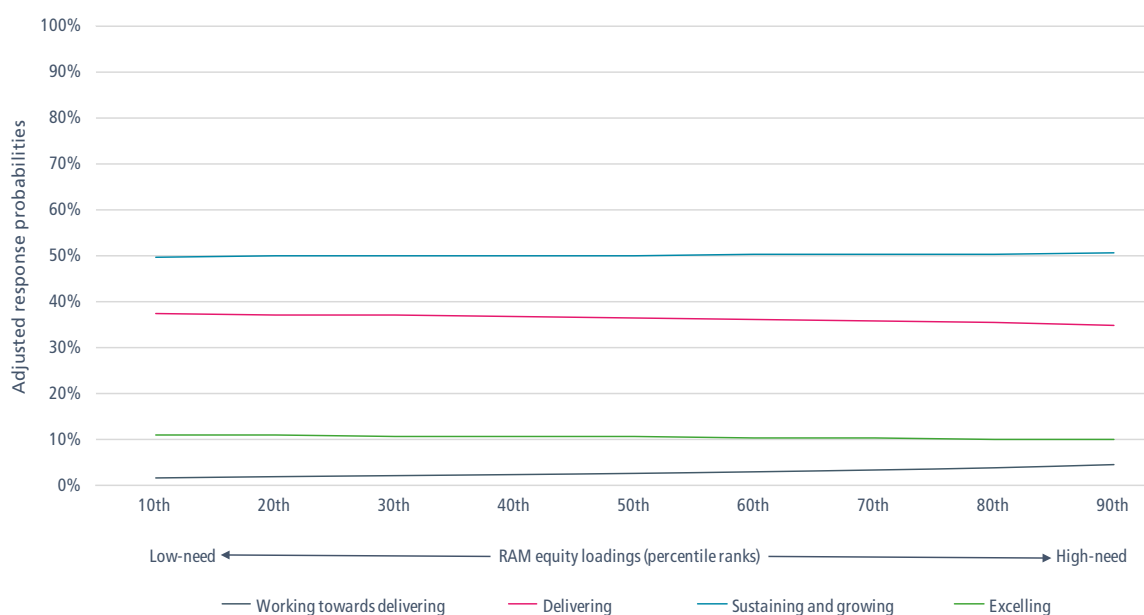
Overall, SEF ratings in the “Leading” domain were higher in 2017 than 2016. However, this increase was driven more by changes in lower-need schools than changes in higher-need schools.

“Leadership”: higher-need schools were slightly more likely to self-report as “working towards delivering”

Our analysis indicated that higher-need schools were significantly more likely to have a self-reported rating in a lower category in this element in 2016 and 2017 than lower-need schools. However, had higher- and lower-need schools had similar SEF ratings for leadership in 2016, schools with higher levels of need were still more likely to have a rating in the lowest category of the SEF in 2017 than schools with lower levels of need. Figure 22 shows how the average predicted response probabilities³⁸ for each category change as levels of need increase from low to high.

Figure 22:

SEF Leadership – adjusted response probabilities by levels of need

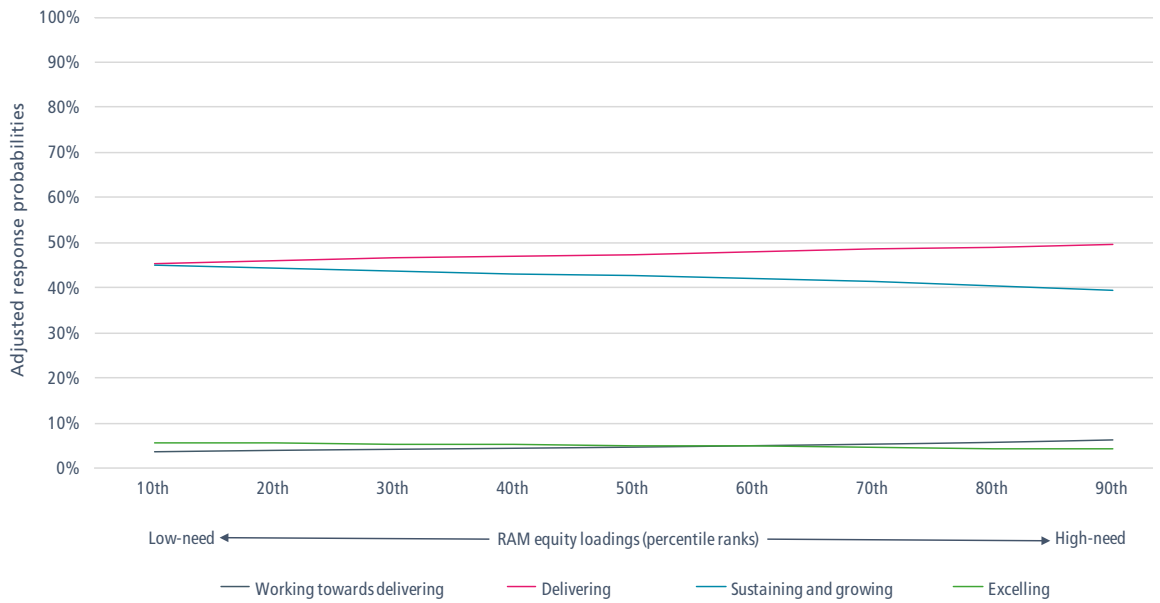


“School planning, implementation and reporting”: higher-need schools were slightly more likely to self-report in a lower category

Our analysis indicated that schools with higher levels of need were significantly more likely to have a self-reported rating in a lower category in this element in 2016 and 2017 than schools with lower levels of need. However, had higher- and lower-need schools had similar SEF ratings for school planning in 2016, schools with higher levels of need were still more likely to have a rating in a lower category of the SEF in 2017 than schools with lower levels of need. Figure 23 shows how the average predicted response probabilities for each category change as levels of need increase from low to high.

³⁸ To determine the average predicted response probabilities, we calculated the probability that each school would report a given SEF rating in 2017 based on their observed 2016 rating and a specific level of RAM funding.

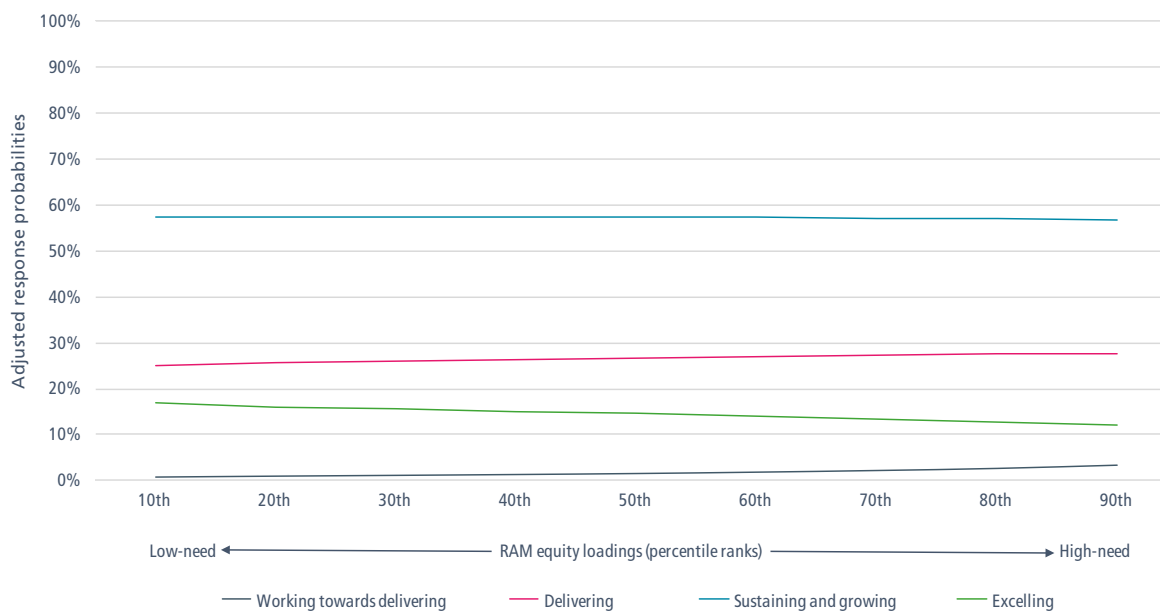
Figure 23:
SEF School planning – adjusted response probabilities by levels of need



“School resources”: higher-need schools were slightly more likely to self-report in a lower category

Our analysis indicated that schools with higher levels of need were significantly more likely to have a self-reported rating in a lower category in this element in 2016 and 2017 than schools with lower levels of need. However, had higher- and lower-need schools had similar SEF ratings for school resources in 2016, schools with higher levels of need were still more likely to have a rating in a lower category of the SEF in 2017 than schools with lower levels of need. Figure 24 shows how the average predicted response probabilities for each category change as levels of need increase from low to high.

Figure 24:
SEF School resources – adjusted response probabilities by levels of need

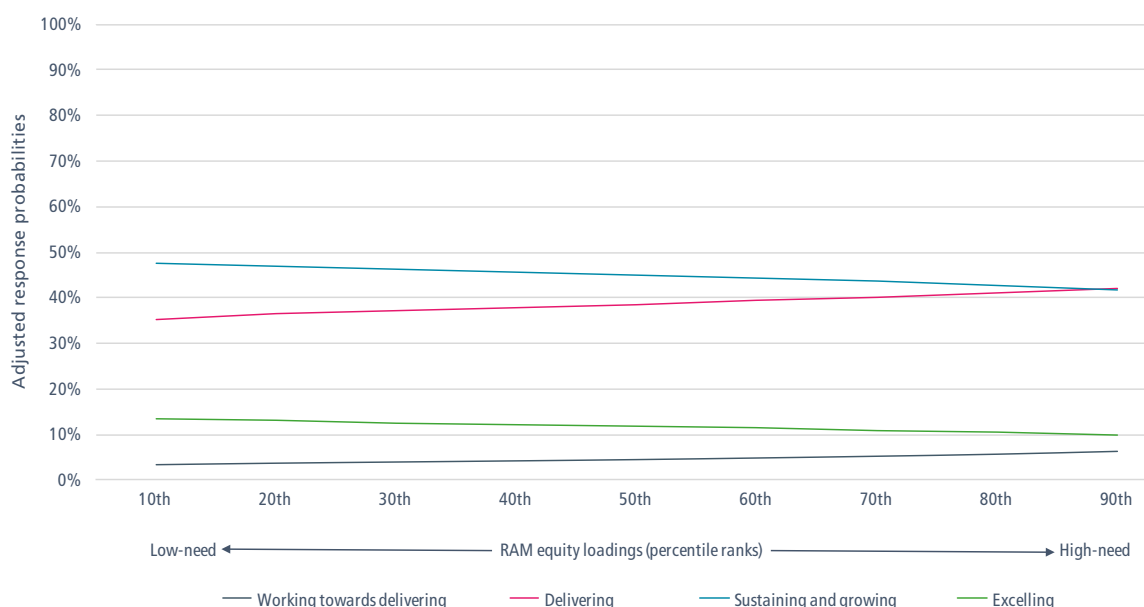


“Management practices”: higher-need schools were slightly more likely to self-report in a lower category

Our analysis indicated that schools with higher levels of need were significantly more likely to have a self-reported rating in a lower category in this element in 2016 and 2017 than schools with lower levels of need. However, had higher- and lower-need schools had similar SEF ratings for management practice in 2016, schools with higher levels of need were still more likely to have a rating in a lower category of the SEF in 2017 than schools with lower levels of need. Figure 25 shows how the average predicted response probabilities for each category change as levels of need increase from low to high.

Figure 25:

SEF management practices – adjusted response probabilities by levels of need



Summary – what impact has LSLD and RAM funding had on school and student outcomes?

Between 2011 and 2016, attendance rates in primary schools decreased slightly while attendance rates in secondary schools increased slightly. Similar changes were observed for school suspensions between 2012 and 2016, with suspension rates increasing slightly in primary schools and decreasing slightly in secondary schools. While higher-need schools tended to have lower attendance and more suspensions than lower-need schools, school-specific changes were not meaningfully related to levels of need (i.e. higher- and lower-need schools tended to have similar patterns of change). These results suggest that LSLD has not had a meaningful impact on attendance or suspensions. Having said this, while a broad, system-level reform of this nature could reasonably be expected to have an impact on a wide range of outcome measures, schools may vary in the extent to which they have chosen to spend their RAM equity funding on additional initiatives specifically designed to improve student attendance or suspensions.

For secondary students, social and institutional engagement increased slightly from 2013 to 2016. While the relationships between these measures of engagement and the levels of need require further investigation, only the changes in student social engagement were meaningfully related to levels of need. 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.

For secondary students, aspirations to complete Year 12 decreased slightly from 2013 to 2016. While students from higher-need schools tended to have lower aspirations to complete Year 12 than students from lower-need schools, this relationship was only observed for schools with below average levels of need. Like the findings for attendance, suspensions and social engagement, school-specific changes in aspirations to complete Year 12 were not significantly related to levels of need (i.e. higher- and lower-need schools tended to have similar patterns of change). At this time, the connection between LSLD and the slight decrease in aspirations to complete Year 12 is unclear.

Overall, SEF ratings in the “Leading” domain were higher in 2017 than 2016. However, this increase was driven more by changes in lower-need schools than changes in higher-need schools. That is, after controlling for 2016 SEF ratings, higher-need schools were more likely to have lower SEF ratings in 2017 than lower-need schools. Given that the implementation of LSLD began in 2012, it is difficult to attribute changes to SEF ratings from 2016 to 2017 to the impact of LSLD.

To date, this evaluation has not analysed student academic outcomes. The final report will include NAPLAN and HSC/ATAR data and any additional available data sources which indicate student progress and achievement.

5. Conclusions

Summary of key findings

How have schools spent their RAM equity loadings?

In 2016, schools spent their RAM equity loadings on four main spending categories: employing key staff, enhancing learning support, planning and developing programs, and building staff capacity. There were strong similarities and overlaps between how the four different equity loadings were spent, with a common emphasis on using this funding to improve the overall quality of teaching and learning in each school.

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

In four of the five LSLD reform areas, principals perceive the impact of LSLD to have been positive overall. In the fifth reform area, reducing red tape, more than two-thirds of principals said that LSLD has not had a positive impact.

Principals in higher-need schools tended to have more positive perceptions of the impact that LSLD has had on their ability to make decisions, manage resources, access suitable staff and work locally compared to principals in lower-need schools. Principals from both higher- and lower-need schools agreed that LSLD has not had a positive impact on reducing red tape.

Principals perceive that LSLD supports them to tailor school programs to meet student needs and employ additional staff. Some principals do not believe that the department has found the right balance between which functions should be the responsibility of the principal and which are better managed by the department. Principals require greater administrative support, improved functionality of tools and improved communication from the department to meet the demands of LSLD. Principals perceive that the main barriers to effective school management and local decision-making under LSLD are increased red tape, tight timeframes and the rapid pace of change.

These findings are closely aligned with the findings of the department's Principal Workload and Time Use Study. In particular, this earlier study found that principals felt a sense of 'reform fatigue' with the implementation of many major reforms simultaneously, potentially colouring their views of LSLD. The Principal Workload Study also showed that principals were unhappy with the functionality of key tools such as LMBR and SPaRO, which may have also affected the way they have perceived LSLD as whole.

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

The five student engagement measures included in this report (attendance, suspension, social engagement, institutional engagement and aspirations to complete Year 12) showed only very small to small **overall changes** over time.

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.

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.

Overall, SEF ratings in the "Leading" domain were higher in 2017 than 2016. However, this increase was driven more by changes in lower-need schools than changes in higher-need schools. That is, after controlling for 2016 SEF ratings, lower-need schools were more likely to have higher SEF ratings in 2017 than higher-need schools. Given this finding, and the fact that the implementation of LSLD began in 2012, it is difficult to attribute these changes to SEF ratings from 2016 to 2017 to the impact of LSLD.

Implications and outcomes of LSLD

LSLD and the RAM funding model has distributed funding based on need

Overall, the findings from this report indicate that, under LSLD, school funding is being distributed based on need, with schools with poorer outcomes attracting higher levels of funding. Principals, particularly those in higher-need schools, perceive that they now have more opportunity and financial capacity to make decisions about how best to manage their resources. Schools have used their resources to support a diverse range of strategies to improve the overall quality of their teaching and learning programs.

LSLD has generally been perceived positively, with a notable exception in the area of reducing red tape

The findings from this report also confirm that the majority of principals have overall positive perceptions of LSLD. Considering the size and scale of the reform, this is in and of itself a significant achievement. Principals concerns focused on the increase in red tape and administrative burden, and the tools and systems designed to support LSLD. The new School Leadership Strategy has been designed to address some of these concerns. Other initiatives may also be required to meet these concerns.

We also know, both from this report and from the Principal Workload and Time Use Study, that schools have experienced 'reform fatigue' due to the overlapping implementation of multiple major reforms. This reform fatigue may colour schools' perceptions of LSLD.

To date, LSLD appears to have had little impact on preliminary outcome measures

We analysed five outcome measures for this report. For these five measures, we found only very small to small changes over time. Furthermore, with the exception of social engagement, schools with different levels of need tended to have similar patterns of change. Where levels of need were meaningfully related to school-specific changes, the direction of the effect was not as we expected: lower-need schools changed more than higher-need schools. These findings do not support the hypothesis that higher-need schools benefit more from the RAM than lower-need schools.

Importantly, however, due to the phased rollout of the reform, LSLD was not fully implemented in all NSW government schools until 2018. As such, exposure to the 'full' reform has been uneven across schools. Further, changes in school management can take considerable time – up to six years, according to some analysts – to produce a measurable impact on student outcomes. These factors should be kept in mind when considering the outcomes analysis in this report. Assessing the longer term impact of LSLD would need to take place over an extended evaluation horizon, pushing well past the next report in 2019.

This interim report also does not include an analysis of educational outcomes. The final report will include such analysis, including in-depth statistical modelling of NAPLAN results from 2012 to 2018. Using student performance as a measure of success will provide a more thorough picture of the effectiveness of LSLD. However, such data may be considered preliminary until the changes have had enough time to produce a measurable impact on student outcomes.

While we are yet to commence this modelling, it is worth noting that preliminary NAPLAN results in 2017 indicated improvement in some areas. Specifically, there was an improvement for numeracy in Year 9 and spelling across all year levels³⁹. In Year 9, the gap between Aboriginal and non-Aboriginal students in the proportion of students at or above the minimum standard has substantially decreased⁴⁰. The NSW Premier's Priority to increase the proportion of NSW students in the top two NAPLAN bands by eight per cent by 2019 has been achieved two years early. These encouraging preliminary findings have been achieved in the context of targeted initiatives such as Bump It Up⁴¹ and Early Action for Success⁴².

39 For further information, see: <https://education.nsw.gov.au/news/media-releases/strong-nsw-naplan-performance>

40 For further information, see: <https://education.nsw.gov.au/news/secretary-update/preliminary-naplan-results>

41 For further information, see: <https://education.nsw.gov.au/our-priorities/improve-student-outcomes/bump-it-up-at-a-glance>

42 For further information, see: <https://education.nsw.gov.au/our-priorities/improve-student-outcomes/early-action-for-success-at-a-glance>

Next steps

Over the next year, we intend to gather and analyse the following additional data sources:

- SPaRO and/or SCOUT and/or SAP data on school funding and spending
- 2018 CESE Principal Survey (term 1)
- interviews and focus groups with principals and directors (terms 3-4)
- NAPLAN and HSC/ATAR results 2012-2018.

We are currently also investigating ways to incorporate teachers' perspectives on LSLD. This may include a teacher survey and interviews or focus groups with teachers in 2018.

The final report will be delivered in mid-2019.

Appendix A: Random sample of 100 schools with annual reports included in this evaluation

A random sample of 100 annual reports were analysed in order to answer the question: *how have schools spent their RAM equity loadings?* This sample included 74 primary schools, 15 secondary schools, seven central schools and four schools for specific purposes.

Table A1:

Summary of schools included in annual report analysis

School	Principal Network
Argentton Public School	Lake Macquarie West
Armidale High School	Northern Tablelands
Auburn West Public School	Holroyd
Bangor Public School	Woronora River
Baradine Central School	Western Plains
Barellan Central School	Griffith
Barmedman Public School	Cootamundra
Beverley Park School	Campbelltown
Bexhill Public School	Lismore
Bexley North Public School	Canterbury
Birchgrove Public School	Port Jackson
Blackville Public School	Wollemi
Blairmount Public School	Campbelltown
Bobin Public School	Great Lakes
Botany Public School	Botany Bay
Bourke Public School	Western Plains
Bronte Public School	Botany Bay
Bundeena Public School	Port Hacking
Callala Public School	South Coast
Canley Heights Public School	Fairfield
Carenne School	Bathurst
Caringbah Public School	Port Hacking
Casula Public School	Glenfield
Chatswood Public School	Ku-Ring-Gai
Clemton Park Public School	Canterbury
Coledale Public School	Wollongong North
Colo Heights Public School	Hawkesbury
Colyton High School	Eastern Creek
Como West Public School	Woronora River
Coerwull Public School	Bathurst
Cooma North Public School	Queanbeyan
Corowa High School	Albury
Dural Public School	Dural
Fairfield Public School	Fairfield
Forster Public School	Great Lakes
Gilgandra High School	Western Plains
Glenorie Public School	Dural
Gosford East Public School	Gosford
Green Square School	Marrickville

Table A1:

Summary of schools included in annual report analysis

School	Principal Network
Greystanes Public School	Holroyd
Griffith High School	Griffith
Gwynneville Public School	Wollongong North
GyMEA Technology High School	Port Hacking
Haberfield Public School	Marrickville
Heaton Public School	Callaghan/Port Stephens
Hebersham Public School	Eastern Creek
Hurlstone Agricultural High School	Liverpool
Illaroo Road Public School	South Coast
James Erskine Public School	Penrith
Jamison High School	Blue Mountains
Kandee School	Albury
Kariong Public School	Wyong
Kearns Public School	Macarthur
Keiraville Public School	Wollongong North
Kitchener Public School	Hunter
Kootingal Public School	Tamworth
Kororo Public School	Coffs Harbour
Lansvale Public School	Fairfield
Lismore Heights Public School	Lismore
Lockhart Central School	Wagga Wagga
Lowesdale Public School	Albury
Mayrung Public School	Deniliquin
Middleton Grange Public School	Macarthur
Monteagle Public School	Southern Tablelands
Moorefield Girls High School	Georges River
Mount Austin High School	Wagga Wagga
Mount St Thomas Public School	Wollongong North
Narranga Public School	Coffs Harbour
Oatley Public School	Georges River
Oran Park Public School	Macarthur
Padstow Park Public School	Bankstown
Peakhurst West Public School	Georges River
Peats Ridge Public School	Wyong
Pelaw Main Public School	Hunter
Pendle Hill High School	Parramatta
Penrith South Public School	Penrith
Penshurst West Public School	Georges River
Picnic Point High School	Bankstown
Punchbowl Public School	Canterbury
Randwick Public School	Botany Bay
Rocky River Public School	Northern Tablelands
Ross Hill Public School	Barwon
Stanmore Public School	Marrickville
Stockinbingal Public School	Cootamundra
Taree High School	Great Lakes
Tottenham Central School	Lachlan
Tullibigeal Central School	Lachlan
Tyalgum Public School	Tweed
Ungarie Central School	Griffith
Urunga Public School	Coffs Harbour

Table A1:

Summary of schools included in annual report analysis

School	Principal Network
Wadalba Community School	Wyong
Wahroonga Public School	Hornsby
Walgett Community College - High School	Western Plains
Werrington Public School	Penrith
West Ryde Public School	Hornsby
Wolumla Public School	Far South Coast
Woodburn Public School	Lismore
Woolooware High School	Port Hacking
Woongarah Public School	Wyong
Wyaliba Public School	Northern Tablelands

Appendix B: CESE Principal Survey 2017 LSLD questions and profile of respondents

The CESE Principal Survey was launched in 2016 as an annual survey that encompasses a wide range of educational reforms. The survey is distributed at the end of term 1 to approximately half of all NSW public school principals.

Questionnaire items

The 2017 survey included nine closed questions on LSLD. Principals were asked to rate how strongly they agree or disagree with each statement on a five-point scale:

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Table B1:

Mapping LSLD reform areas to CESE Principal Survey questions

LSLD reform area	Question
Making Decisions	1. LSLD has had a positive impact on the extent to which I can make local decisions that best meet the needs of my school.
Managing Resources	2. The RAM/SBA methodology is transparent.
	3. The RAM has distributed funding equitably to my school in direct relation to the needs of my students.
	4. RAM/SBA funding is flexible enough to enable me to manage resources to meet student needs.
Staff in our Schools	5. With the implementation of LSLD, I have increased opportunities to employ staff to meet student needs.
	6. With the implementation of LSLD, I am better able to support staff in their performance and development
Working Locally	7. LSLD has had a positive impact on the way we consult with parents and the school community inform our local decision making.
	8. LSLD has had a positive impact on the way we engage with local businesses and organisations.
Reducing Red Tape	9. LSLD has simplified administrative processes for principals. E.g. school planning, reporting, budget management.

The survey also included two open-ended questions:

- What ongoing support does the Department need to provide to school leaders with regard to LSLD?
- How does LSLD help your school strive for excellence?

Profile of respondents

Invitations to complete the 2017 CESE Principal Survey were sent to 1,197 principals, drawn from the population of just over 2,200 schools. The overall response rate was 70 per cent. The respondents are broadly representative of the population of NSW public school principals.

The response rate was varied slightly across different school locations, ranging from 67 per cent for provincial schools to 77 per cent for very remote schools.

Table B2:

Profile of CESE Principal Survey respondents by location

Location	Survey invitations	Respondents	Response rate
Metropolitan	697	497	71%
Provincial	446	299	67%
Remote	41	28	68%
Very remote	13	10	77%
TOTAL	1,197	834	70%

The response rate also varied across different school types, ranging from 59 per cent for SSPs to 83 per cent for central schools.

Table B3:

Profile of CESE Principal Survey respondents by school type

School Type	Survey invitations	Respondents	Response rate
Primary/Infants	808	557	69%
Secondary	278	201	72%
Central	42	35	83%
SSP	69	41	59%
TOTAL	1,197	834	70%

Appendix C: Technical details for operationalising school need

With regard to LSLD, the concept of 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 with higher equity loadings were considered to have higher levels of need than schools of the **same size** with lower equity loadings. In the current study, the four RAM equity loadings for 2016 were operationalised using the following formula:

$$\text{level of need}_s = \ln\left(\frac{\sum_{i=1}^4 \text{RAM equity loading}_{si}}{\left(\left(\sum_{p=1}^6 \sum_{c=1}^4 \text{enrolment count}_{spc}\right)/4\right)}\right) \quad (1.0)$$

Where subscript *s* represents the school, subscript *i* represents the type of equity loading, subscript *c* represents the scholastic term and subscript *p* represents the scholastic year. Simply stated, the above equation divides the sum of the four equity loadings for a school by the average number of students enrolled in that school in 2016. The natural logarithm of the result was taken to normalise the distribution.

Controlling for year-to-year fluctuations in levels of need

When outcome data represents a series of longitudinal observations (i.e. where specific entities are followed through time), many potential confounding covariates are inherently fixed. However, when outcome data represents a series of repeated cross-sectional observations, many confounding covariates are not inherently fixed. To isolate the effect of interest, time-varying confounds must therefore be controlled using appropriate statistical methods. In the current study, the most important time-varying confound concerns fluctuating levels of need.

While the operationalisation of the four RAM equity loadings was considered to be consistent with the aims of LSLD, data regarding the four equity loadings were only available from 2016 onwards. This meant that historical RAM equity loadings could not be included in regression models. As a substitute, a highly related index was used to control for year-to-year fluctuations in levels of need—Index of Community Socio-Educational Advantage (ICSEA) values.

In order for ICSEA values to be suitable replacements for the missing RAM equity loadings, both variables had to be highly related to one another. While the relationships within each year could not be directly assessed, data regarding both variables were available for 2016. As shown in Figures C1 and C2, the RAM equity loadings for 2016 were strongly related to the ICSEA values for the same year (primary schools $r = -.81$; secondary schools $r = -.89$).

Figure C1:
Relationship between ICSEA values and RAM loadings - primary schools

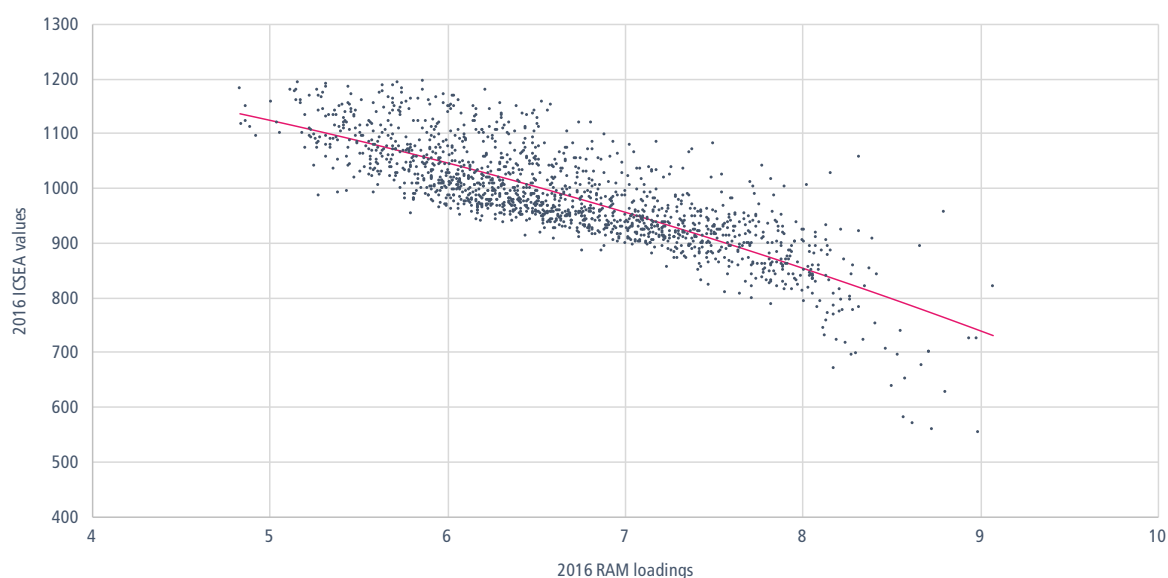
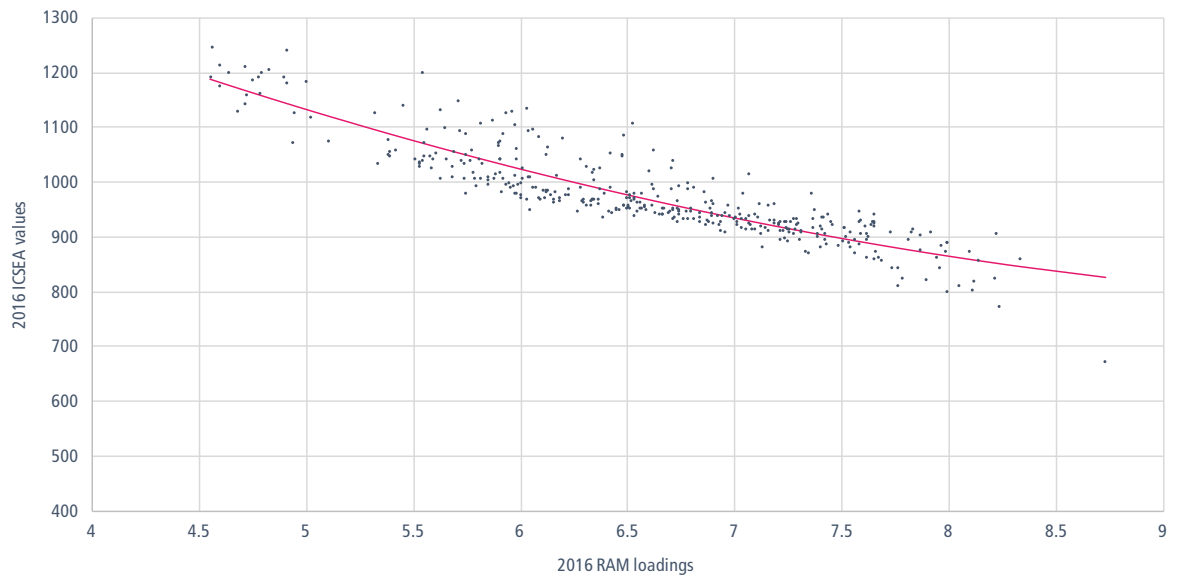


Figure C2:

Relationship between ICSEA values and RAM loadings - secondary schools



While regression techniques are capable of controlling for year-to-year fluctuations in levels of need, schools that have large year-to-year changes are cause for concern. These schools may not have an underlying stable level of need; thus predictions regarding expected rates of change for these schools are not theoretically justified. To assess the stability of the observed ICSEA values, intraclass correlation coefficients (ICC) were estimated. To estimate the appropriate ICCs, two-way mixed-effects models were fit to the data. These models can be written as:

$$y_{st} = \mu + r_s + c_t + e_{st} \quad (2.0)$$

Where y_{st} represents the observed ICSEA value for school s in year t ; μ represents the mean true ICSEA value; r_s represents a school effect; c_t represents a time effect; 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 $\theta_c^2 = \sum c_t^2 / (k-1)$. This implies that the observed years were the only time periods of interest. The absolute agreement ICC is then given by:

$$ICC(AA) = \frac{\sigma_r^2}{\sigma_r^2 + \theta_c^2 + \sigma_e^2} \quad (3.0)$$

The results indicated that the individual ICC(AA) for the primary and secondary schools were .94 and .98, respectively. While these results suggest that the observed ICSEA values were highly stable across the years of interest, further analyses showed that a small proportion of schools had excessively volatile ICSEA values. To identify these schools, ICSEA values were first standardised so that year-to-year changes were more meaningful. The differences between each schools maximum and minimum ICSEA values were then examined, with 8.4 per cent ($n = 131$) of the primary schools and 1.1 per cent ($n = 4$) of the secondary schools having a maximum standardised difference greater than 1. Further analyses revealed that the primary schools with volatile ICSEA values tended to be smaller ($\mu = 32.3$, $SD = 32.5$) than those with more stable ICSEA values ($\mu = 308.3$, $SD = 221.5$). This finding is unsurprising as smaller schools are more influenced by the characteristics of each additional student than larger schools. No differences were observed in the secondary schools. Given that the expected effect for these schools could not be determined (i.e. they did not have a time invariant level of need), schools that had a maximum standardised difference greater than 1 were excluded from the current study.

Appendix D: Technical details for CESE Principal Survey analysis

A series of generalized cumulative logistic regression models were used to analyse the Principal Survey data. These models were similar to those used to analyse the student aspirations data, except they did not include any random-effects. As these models are similar to those described earlier, specific equations are not presented here.

The first models included only a single linear predictor for the measure of need. The inputs were initially constrained to be the same across the cumulative logits (proportional odds) before they were allowed vary (non-proportional odds). Higher-order polynomial terms were then added to the models to test for non-linear relationships. These terms were also initially constrained across the cumulative logits before they were allowed to vary. Likelihood ratio tests were used to compare the fits of the various models. As each set of models required several likelihood ratio tests, the results from these tests are not presented here.

For most of the questions in the Principal Survey, a single predictor was sufficient to capture the relationship between the various responses and the measure of need. However, question 6 and 8 required a constrained quadratic term and an unconstrained linear predictor, respectively. Tables D1 through D9 show the parameter estimates obtained from the final models.

Table D1:

Parameter estimates obtained from the final model – Principal Survey question 1

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.14	0.07	.04	0.01	0.27
α_1	-1.22	0.08	–	-1.39	-1.06
α_2	-0.10	0.07	–	-0.23	0.04

Table D2:

Parameter estimates obtained from the final model – Principal Survey question 2

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.24	0.09	< .005	0.07	0.41
α_1	-2.06	0.11	–	-2.28	-1.84
α_2	-1.24	0.08	–	-1.41	-1.07

Table D3:

Parameter estimates obtained from the final model – Principal Survey question 3

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.47	0.08	< .005	0.31	0.62
α_1	-1.63	0.10	–	-1.82	-1.45
α_2	-0.89	0.08	–	-1.05	-0.74

Table D4:

Parameter estimates obtained from the final model – Principal Survey question 4

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.30	0.08	< .005	0.14	0.47
α_1	-2.14	0.11	–	-2.36	-1.91
α_2	-1.23	0.08	–	-1.40	-1.06

Table D5:

Parameter estimates obtained from the final model – Principal Survey question 5

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.43	0.07	< .005	0.29	0.58
α_1	-1.40	0.09	–	-1.58	-1.23
α_2	-0.54	0.07	–	-0.69	-0.39

Table D6:

Parameter estimates obtained from the final model – Principal Survey question 6

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.15	0.07	< .005	0.02	0.28
β_2	-0.10	0.05	.05	-0.19	-0.00
α_2	-1.55	0.10	–	-1.75	-1.35
α_2	-0.12	0.08	–	-0.29	0.04

Table D7:

Parameter estimates obtained from the final model – Principal Survey question 7

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.19	0.07	< .005	0.06	0.33
α_1	-1.79	0.10	–	-1.98	-1.59
α_2	0.50	0.07	–	0.35	0.64

Table D8:

Parameter estimates obtained from the final model – Principal Survey question 8

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
$\beta_1(\alpha_1)$	0.26	0.08	< .005	0.10	0.42
$\beta_1(\alpha_2)$	0.55	0.10	< .005	0.36	0.74
α_2	-1.07	0.08	–	0.91	1.23
α_2	1.59	0.10	–	-1.78	-1.40

Table D9:

Parameter estimates obtained from the final model – Principal Survey question 9

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	0.10	0.08	.19	-0.05	0.25
α_1	0.76	0.08	–	0.31	0.90
α_2	1.93	0.11	–	1.72	2.14

Appendix E: Principal workload and time use study fact sheet



PRINCIPAL WORKLOAD AND TIME USE STUDY

Objectives

In 2017 the NSW Department of Education commissioned Deloitte to conduct a research study into school principal workload and time use. The research set out to address the following key questions:

1. What tasks do principals spend their time on?
2. What are the enablers and barriers to principals managing their workload?
3. Is the current principal workload achievable and sustainable?
4. Has there been a change in either the quantity or nature of principals' work in recent years?
5. What are some examples of exemplary practice from which other schools could benefit?
6. Could the leadership and decision-making culture in schools change in any way to help manage principal workloads?

Key findings

- Principals spend a significant amount of time on activities related to management and administration, which reduces the time they have to be an instructional leader.
- Greater authority for school decision-making to schools is supported by principals but that, coupled with higher community expectations, has led to an increase in workload.
- The main barriers to managing principal workload include limited training and preparation for leadership roles, insufficient administrative support and lack of access to quality support services, tools and systems.
- There is no one-size-fits-all model of great leadership. Leadership practices are contextualised to the school and system support should enhance flexibility and collaboration for school leadership teams.
- Principals could better manage their workloads if there was better coordinated, streamlined and aligned department support tools and communications.

Time use breakdown

- 40% of principals' time is spent on leading the management of the school
- 30% is spent on leading teaching and learning
- 11% is spent on engaging and working with the community
- 9% is spent on developing self and others
- 6% is spent on leading improvement, innovation and change
- 3% on other activities.

Principals report it is difficult to fulfil their role as educational leaders because they spend a large proportion of time on activities they classify as administration.

Workload

Principals were asked how achievable or sustainable their current workload was:

- 75% said their workload is 'difficult to achieve' or 'not at all achievable'
- 77% said their workload is 'difficult to sustain' or 'not at all sustainable'.

Factors that help principals manage their workload

- capable and available executive and administrative support staff, in an appropriate structure where tasks are assigned to staff members based on their skills, capability, experience and capacity
- value-adding staff with capabilities that address gaps at the school level, such as the use of business managers
- creation of formal and informal collegial networks that are key sources of information and support, including involvement in principal professional bodies
- tools and frameworks such as the School Excellence Framework, the AITSL Framework and the Leadership and Management Credential for principals to self-evaluate the effectiveness of their work and identify opportunities for development.

Barriers that affect principals' ability to manage their workload

- limited availability of administrative support and resources, including the lack of allocated administrative funding
- inability to allocate executive staff for planned and ad hoc tasks
- limited training and 'on the job' support available for the breadth and complexities of the role
- lack of functionality, integration, sufficient support and training of department systems and tools
- no clear measures of effectiveness in the principal's role
- reduced department support services for specialist roles.

Opportunities for improvement

The research findings highlight opportunities for the department to respond to the challenges experienced by principals.

1. **Enhancing capacity:** How could the department enhance the capacity of principals to operate successfully in an environment of constant change so they are able to evaluate, prioritise and implement improvements within their context, and with the support and commitment of their teams?
2. **Creating high performing teams:** How could the department assist principals to structure and lead high performing teams so they achieve the desired outcomes of their school?
3. **Developing and supporting talent:** How could the department coach, develop and support high performing principals so they discharge their responsibilities and accountabilities to deliver against the success criteria of their role?
4. **Supporting networks:** How could the department enable and support principals' formal and informal networks so that principals receive the exposure, education, experience and environment they need to be successful?
5. **Streamlining administrative components:** How could the department enable principals to execute the administrative components of their role in the most efficient and effective way so they are able to increase their focus on educational leadership?

Methodology

The research was conducted in Term 2, 2017. The quantitative research component consisted of direct observation of principals from a representative sample of 119 NSW government schools. Researchers observed and recorded the tasks that the principal undertook and the time spent on tasks.

The qualitative research consisted of 14 two-hour immersive contextual inquiries with principals; four focus group sessions with other school staff; and five industry subject matter expert interviews. The researchers also interviewed 16 key stakeholders.

A copy of the full report is available at: <https://education.nsw.gov.au/media/schools-operation/Principal-workload-and-time-use-study-Nov-2017.pdf>

Appendix F: School leadership strategy summary

Table F1:

Summary of school leadership strategy

1. Quality leadership and development preparation	2. Stronger collegial support	3. Better services and support for school leaders
<p>NSW DoE Leadership Institute Provide development programs for all school leadership at all stages of their careers, starting with new principals in 2018.</p>	<p>A new principal role statement Clarify core responsibilities and outcomes against which they can measure their effectiveness.</p>	<p>Additional \$50 million flexible funding Principals can use the funding in any way that increases their capacity to focus on instructional leadership. May include business managers or more administrative staff.</p>
<p>Systemic induction and onboarding of new school leaders PSLs to coach new principals for their first two years in the job. 20 per cent of existing principals can also request this support.</p>	<p>45 additional director positions New role as Director, Educational Leadership. 110 new principal networks, reducing ratio from 1:34 to 1:20.</p>	<p>Teacher performance improvement support Eight new field officers to provide hands-on support and guidance to principals in managing teacher underperformance.</p>
<p>Scholarships for the best principals 20 scholarships per year for principals to participate in an internationally renowned leadership program.</p>	<p>Maintain 50 Principals, School Leadership (PSL) positions Focus on providing coaching and mentoring for all principals. Maintain key role in external SEF validation.</p>	<p>Compliance inspection support New central department to manage activities such as tree audits, emergency management equipment and bushfire management.</p>
	<p>Increase number of Operational Directorates from four to six Sydney metropolitan north, Sydney metropolitan south, regional north, regional south, rural north and rural south and west.</p>	<p>Better coordinated, streamlined and aligned support Major reviews of: Educational Services, Assets Management and Staffing Entitlement.</p>

Further details are available at: <https://education.nsw.gov.au/our-priorities/strengthen-teaching-quality-and-school-leadership/school-leadership-strategy-at-a-glance>

Appendix G: Technical details for student engagement analysis

Analysis of attendance and suspensions

As stated in the main text, information regarding school attendance and suspensions was available at the school-level. Specifically, for each NSW government school, administrative records included: (a) the number of students who were enrolled each term; (b) the number of days the school was open each term; (c) the number of absent days each term; and (d) the number of unique students who received long suspensions each term. All administrative records were disaggregated by scholastic year (e.g. Kindergarten, Year One). To prepare the data for statistical modelling, the following formulae were applied to the attendance and suspensions data:

$$n_{st} = \text{number of enrolment days}_{st} = \sum_{p=1}^6 \sum_{c=1}^4 \text{enrolment count}_{stpc} \cdot \text{school days}_{stpc} \quad (1a)$$

$$y_{st} = \text{number of attended days}_{st} = n_{jt} - \sum_{p=1}^6 \sum_{c=1}^4 \text{absent days}_{stpc} \quad (1b)$$

$$n_{st} = \text{number of students enrolled}_{st} = (\sum_{p=1}^6 \sum_{c=1}^4 \text{enrolment count}_{stpc})/4 \quad (2a)$$

$$y_{st} = \text{number of unique suspensions}_{st} = \sum_{p=1}^6 \sum_{c=1}^4 \text{unique suspension count}_{stpc} \quad (2b)$$

where subscript c represents the scholastic term; subscript p represents the scholastic year; subscript t represents the calendar year; and subscript s represents the school. The values from (1a) and (1b) were used in the analysis of the attendance data whereas the values from (2a) and (2b) were used in the analysis of the suspensions data.

To investigate the key research questions, a series of mixed-effects generalized linear regression models were fit to the data. The model building process began with a simple linear growth model, written as:

$$y_{st} \sim \text{Binomial}(n_{st}, \pi_{st})$$

$$g(\pi_{st}) = \beta_{00} + \beta_{10} \cdot \text{time}_{st} + e_{st} + u_{0s},$$

for $t = 1, 2, \dots, T$ calendar years and $s = 1, 2, \dots, n_t$ schools.

where time_{st} represents a linear predictor for time (coded 0 for the initial calendar year and increasing by 1 for each subsequent calendar year) and $g(\cdot)$ represents a logit link function. With the above specification, the estimate of β_{00} represents the mean school-specific starting value (i.e. the average intercept) and the estimate of β_{10} represents the fixed linear effect of time, which is assumed to be the same for each school. The estimate of σ^2_{u0} represents the variability across the school-specific starting values, with errors assumed to be normally distributed with constant variance (i.e. $u_{0s} \sim N(0, \sigma^2_{u0})$). The above model also includes an observation level random effect to account for over-dispersion, which is also assumed to be normally distributed with constant variance (i.e. $e_{st} \sim N(0, \sigma^2_e)$).

Once the parameters of the initial models had been estimated, specifications were altered such that the linear growth components were allowed to vary across schools (model 2). Higher order polynomial terms were then added to the models to test whether the effects of time were constant over the years of interest, with quadratic growth components initially fixed across schools (model 3) before being allowed to vary (model 4). While including school-specific quadratic growth terms did slightly improve the fit of the models, the variances associated with the quadratic growth terms were very small; thus the more simple models were preferred. Cluster mean centred (CMC; see Enders & Tofighi 2007) ICSEA values were then included (model 5) in the models to control for year-to-year fluctuations in levels of need (see Appendix C). Importantly, all models were estimated using full maximum likelihood so that model comparisons could be made via likelihood ratio (LR) tests (see Tables G1 and G2; Vuong 1989)

Table G1:

Results from likelihood ratio tests – attendance analysis

Model comparison	Primary schools			Secondary schools		
	Chi-squared value	Degrees of freedom	p value	Chi-squared value	Degrees of freedom	p value
Model 1 vs. 2	766	3	<.005	191	3	<.005
Model 2 vs. 3	542	1	<.005	117	1	<.005
Model 3 vs. 4	--	--	--	--	--	--
Model 3 vs. 5	32	1	<.005	11	1	<.005
Model 5 vs. 6	769	2	<.005	319	2	<.005
Model 6 vs. 7	15	1	<.005	13	1	<.005

Table G2:

Results from likelihood ratio tests – suspensions analysis

Model comparison	Primary schools			Secondary schools		
	Chi-squared value	Degrees of freedom	p value	Chi-squared value	Degrees of freedom	p value
Model 1 vs. 2	123	3	<.005	83	3	<.005
Model 2 vs. 3	12	1	<.005	4	1	.044
Model 3 vs. 4	–	–	–	–	–	–
Model 3 vs. 5	9	1	<.005	3	1	.112
Model 5 vs. 6	554	2	<.005	244	2	<.005
Model 6 vs. 7	2	1	1	24	1	<.005

The next step involved adding the RAM loadings to the models (see Appendix E). To determine the most appropriate functional form for the input, the Best Linear Unbiased Predictors (BLUPs) of the random effects were locally regressed on the measure. Grand mean centered (GMC) linear predictors were then included in the equations for the intercepts and slopes (model 6), with quadratic terms sequentially added to the intercept (model 7) and slope (model 8) equations. The most complex final model specification can be written as:

$$y_{st} \sim \text{Binomial}(n_{st}, \pi_{st})$$

$$g(\pi_{st}) = (\beta_{00} + \beta_{01} \cdot \text{need GMC}_s + \beta_{02} \cdot \text{need GMC}_s^2 + e_{st} + u_{0s}) + \\ (\beta_{10} + \beta_{11} \cdot \text{need GMC}_s + \beta_{12} \cdot \text{need GMC}_s^2 + u_{1s}) \cdot \text{time}_{st} + \\ \beta_{20} \cdot \text{time}_{st}^2 + \beta_{30} \cdot \text{ICSEA CMC}_{st},$$

for $t = 1, 2, \dots, T$ calendar years and $s = 1, 2, \dots, n_t$ schools,

$$\text{and } e_{st} \sim N(0, \sigma_e^2) \text{ and } \mathbf{u}_s \sim MN \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{u_0}^2 & \sigma_{01} \\ \sigma_{10} & \sigma_{u_1}^2 \end{pmatrix} \right].$$

The parameter estimates from the final models are presented in Tables G3, G4, G5 and G6.

Table G3:

Parameter estimates obtained from the final attendance model – primary schools

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_{00}	2.69	0.01	<.005	2.67	2.70
β_{01}	-0.20	0.01	<.005	-0.22	-0.19
β_{02}	-0.03	0.01	<.005	-0.04	-0.01
β_{10}	0.04	0.00	<.005	0.04	0.04
β_{11}	-0.00	0.00	0.30	-0.00	0.00
β_{12}	–	–	–	–	–
β_{20}	-0.01	0.00	<.005	-0.01	-0.01
β_{30}	0.00	0.00	<.005	0.00	0.00
σ_e	0.11	–	–	–	–
σ_{u0}	0.21	–	–	–	–
σ_{u1}	0.03	–	–	–	–
Corr(σ_{u0}, σ_{u1})	-0.54	–	–	–	–

Table G4:

Parameter estimates obtained from the final attendance model – secondary schools

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_{00}	1.99	0.02	<.005	1.95	2.02
β_{01}	-0.37	0.02	<.005	-0.40	-0.33
β_{02}	0.08	0.02	<.005	0.04	0.12
β_{10}	0.05	0.00	<.005	0.04	0.06
β_{11}	-0.01	0.00	<.005	-0.01	-0.00
β_{12}	-0.01	0.00	.02	-0.01	-0.00
β_{20}	-0.01	0.00	<.005	-0.01	-0.01
β_{30}	0.00	0.00	<.005	0.00	0.00
σ_e	0.10	–	–	–	–
σ_{u0}	0.29	–	–	–	–
σ_{u1}	0.03	–	–	–	–
Corr(σ_{u0}, σ_{u1})	-0.30	–	–	–	–

Table G5:

Parameter estimates obtained from the final suspensions model – primary schools

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_{00}	-6.14	0.05	<.005	-6.24	-6.04
β_{01}	1.18	0.06	<.005	1.06	1.29
β_{02}	–	–	–	–	–
β_{10}	0.15	0.03	<.005	0.08	0.21
β_{11}	0.01	0.02	.37	-0.02	0.05
β_{12}	–	–	–	–	–
β_{20}	-0.03	0.01	<.005	-0.04	-0.01
β_{30}	-0.00	0.00	<.005	-0.00	-0.00
σ_e	0.38	–	–	–	–
σ_{u0}	1.21	–	–	–	–
σ_{u1}	0.24	–	–	–	–
Corr(σ_{u0}, σ_{u1})	-0.44	–	–	–	–

Table G6:

Parameter estimates obtained from the final suspensions model – secondary schools

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_{00}	-3.43	0.05	<.005	-3.53	-3.33
β_{01}	0.84	0.05	<.005	0.74	0.94
β_{02}	-0.24	0.05	<.005	-0.33	-0.14
β_{10}	-0.06	0.02	<.005	-0.10	-0.02
β_{11}	0.02	0.01	.03	0.00	0.04
β_{12}	–	–	–	–	–
β_{20}	0.01	0.00	.04	0.00	0.02
β_{30}	-0.00	0.00	.20	-0.00	0.00
σ_e	0.22	–	–	–	–
σ_{u0}	0.74	–	–	–	–
σ_{u1}	0.10	–	–	–	–
Corr(σ_{u0}, σ_{u1})	-0.17	–	–	–	–

Analysis of student engagement data

In order to derive measures of student engagement, item-level data from the TTFM survey was used to estimate two generalized partial credit models (GPCM). One GPCM included the items designed to measure social engagement while the other included the items designed to measure institutional engagement. When applied to the TTFM data, the GPCM invokes a step interpretation of the different response categories. Specifically, where the i^{th} item is scored $0, 1, \dots, K_i$, a positive response in category k implies a positive response in the categories preceding k (e.g. a positive response in category 2 implies positive responses in category 1 and 0). The GPCM models the K adjacent logits of the response, with the probability of the j^{th} student with latent engagement θ_j reaching the k^{th} category of the i^{th} item given by:

$$\Pr(Y_{ij} = k | a_i, \mathbf{b}_i, \theta_j) = \frac{\exp\{\sum_{t=1}^k a_i(\theta_j - b_{it})\}}{1 + \sum_{s=1}^{K_i} \exp\{\sum_{t=1}^s a_i(\theta_j - b_{it})\}} \quad (3.0)$$

where a_i represents the discrimination of the i^{th} item and $\mathbf{b}_i = (b_{i1}, b_{i2}, \dots, b_{iK_i})$ represents the step difficulties that distinguish the K ordered categories of the i^{th} item. The model was fit using the slope-intercept form, written as:

$$\Pr(Y_{ij} = k | \alpha_i, \beta_i, \theta_j) = \frac{\exp(k\alpha_i\theta_j + \beta_{ik})}{1 + \sum_{s=1}^{K_i} \exp(s\alpha_i\theta_j + \beta_{is})} \quad (3.1)$$

where the intercepts are parametrized with a negative sign⁴³. Once (3.1) had been fit to the data, the estimated parameters (denoted by $\hat{\mathbf{B}}$) were used to derive the empirical posterior distribution of the latent trait. Namely, where y_{ij} represents the observed response for \mathbf{Y}_{ij} (assumed to be independent after conditioning on θ_j), the joint density for the j^{th} student was calculated by multiplying together the conditional probabilities:

$$f(\mathbf{y}_j | \hat{\mathbf{B}}, \theta_j) = \prod_{i=1}^I \Pr(Y_{ij} = y_{ij} | \hat{\mathbf{B}}, \theta_j) \quad (3.2)$$

where $\mathbf{y}_j = (y_{1j}, \dots, y_{Ij})$ and I is the number of items in the particular model of engagement. The likelihood contribution for the j^{th} student was then computed by integrating out the latent variable from the joint density:

$$L_j(\hat{\mathbf{B}}) = \int_{-\infty}^{\infty} f(\mathbf{y}_j | \hat{\mathbf{B}}, \theta_j) \phi(\theta_j) d\theta_j \quad (3.3)$$

43 The transformation between (3.0) and (3.1) is $a_i = \alpha_i$ and $b_{ik} = -\{(\beta_{ik} - \beta_{i,k-1})/\alpha_i\}$, with b_{i0} and β_{i0} constrained to equal zero.

where $\phi(\cdot)$ is the density function for the standard normal distribution. This anchors the model and implies $\theta_j \sim N(0,1)$. The empirical conditional posterior distribution of the latent variable was then calculated by combining the prior information about the latent variable with the likelihood:

$$\omega(\theta_j | \mathbf{y}_j, \hat{\mathbf{B}}) = \frac{f(\mathbf{y}_j | \hat{\mathbf{B}}, \theta_j) \phi(\theta_j)}{L_j(\hat{\mathbf{B}})} \quad (3.4)$$

with the posterior mean of the latent variable computed by:

$$\tilde{\theta}_j = \int_{-\infty}^{\infty} \theta_j \omega(\theta_j | \mathbf{y}_j, \hat{\mathbf{B}}) d\theta_j \quad (3.5)$$

Once the latent measures of student engagement had been derived, a series of mixed-effects linear regression models were used to estimate the growth that occurred over the years of interest. These models were very similar to those used in the analysis of the attendance and suspensions data, except the growth components were constrained to be strictly linear (model 1 and 2) and the identity link function was used instead of the logit link (the conditional response was assumed to follow a Gaussian distribution). The models also included a series of scholastic year indicators (model 3) to account for differences in school response composition across the years of interest. This is important because student engagement is known to depend on scholastic year, with a change in the response composition across the years of interest potentially manifesting as a change in student engagement. The dummy coded scholastic year indicators were centred at their school-specific means. ICSEA values were then added to the models (model 4) to account for intra-school differences in need across calendar years.

The next step involved adding the RAM loadings to the models (see Appendix E). To determine the most appropriate functional form for the input, the Best Linear Unbiased Predictors (BLUPs) of the random effects (from model 4) were locally regressed on the measure. As shown in Figure G1 and G2, the measure of need was curvilinearly related to the varying intercepts for both social and institutional engagement.

Figure G1:

Relationship between varying intercepts and RAM loadings - institutional engagement

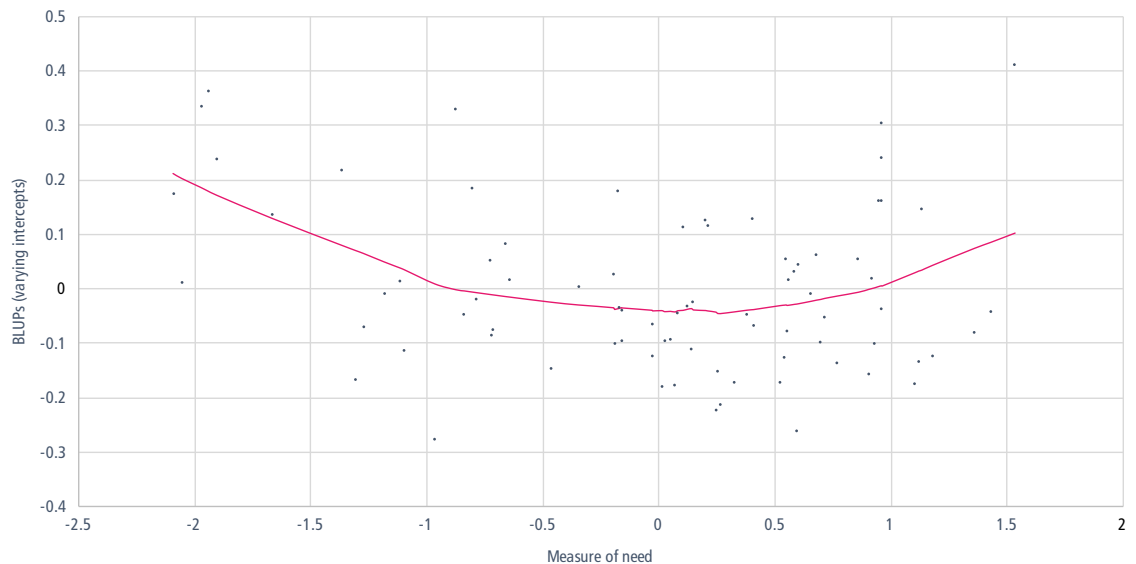
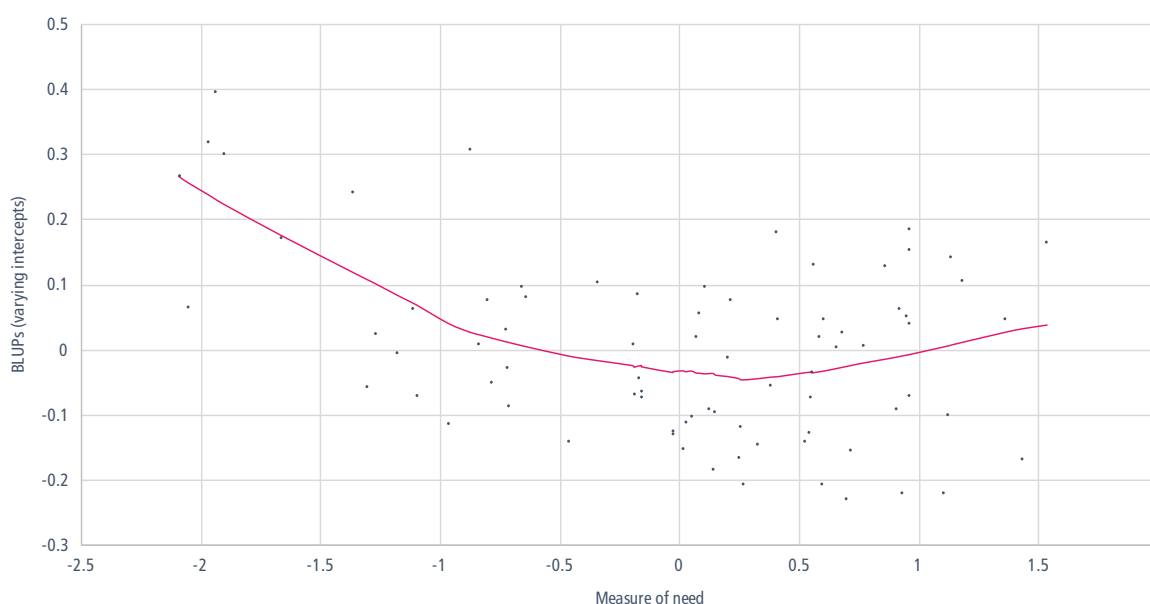


Figure G2:

Relationship between varying intercepts and RAM loadings - social engagement



The RAM equity loadings were therefore first included as linear predictors in the intercept and slope equations (model 5) before quadratic terms were sequentially included in the intercept (model 6) and slope equations (model 7). The most complex model specification can be written as:

$$\begin{aligned} \tilde{\theta}_{js} = & \beta_{00} + \beta_{01} \cdot \text{need GMC}_s + \beta_{02} \cdot \text{need GMC}_s^2 + e_{js} + u_{0s} + \\ & \beta_{10} + \beta_{11} \cdot \text{need GMC}_s + u_{1s}) \cdot \text{time}_{js} + \\ & \beta_{20} \cdot \text{ICSEA CMC}_{js} + \beta_{30} \cdot \text{Year 9 CMC}_{js} + \dots + \beta_{60} \cdot \text{Year 12 CMC}_{js}, \\ & \text{for } s = 1, 2, \dots, 80 \text{ schools, } j = 1, 2, \dots, n_s \text{ students,} \\ & \text{for } s = 1, 2, \dots, 80 \text{ schools, } j = 1, 2, \dots, n_s \text{ students,} \end{aligned}$$

The results from the likelihood ratio tests are presented in Table G7 while the parameter estimates from the final models are presented in Tables G8 and G9.

Table G7:

Results from likelihood ratio tests – engagement analysis

Model comparison	Institutional engagement			Social engagement		
	Chi-squared value	Degrees of freedom	<i>p</i> value	Chi-squared value	Degrees of freedom	<i>p</i> value
Model 1 vs. 2	66	2	<.005	50	2	<.005
Model 2 vs. 3	1,098	4	<.005	207	4	<.005
Model 3 vs. 4	2	1	.13	3	1	0.1
Model 4 vs. 5	20	2	<.005	42	2	<.005
Model 5 vs. 6	14	1	<.005	19	1	<.005
Model 6 vs. 7	2	1	.27	0	1	.76

Table G8:

Parameter estimates obtained from the final social engagement model

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
				Wald based 95% confidence intervals	-3.33
Model parameter	Point estimate	Standard error	p value	Lower limit	Upper limit
β_{00}	-0.21	0.02	<.005	-0.25	-0.17
β_{01}	-0.02	0.02	.24	-0.06	0.01
β_{02}	0.08	0.02	<.005	0.04	0.11
β_{10}	0.04	0.01	<.005	0.01	0.06
β_{11}	-0.05	0.01	<.005	-0.07	-0.03
β_{20}	0.00	0.00	.11	-0.00	0.00
β_{30}	-0.13	0.01	<.005	-0.15	-0.11
β_{40}	-0.11	0.01	<.005	-0.14	-0.09
β_{50}	-0.08	0.01	<.005	-0.10	-0.06
β_{60}	-0.06	0.01	<.005	-0.08	-0.03
σ_e	0.87	--	--	--	--
σ_{u0}	0.12	--	--	--	--
σ_{u1}	0.05	--	--	--	--
$\text{Corr}(\sigma_{u0}, \sigma_{u1})$	0.19	--	--	--	--

Table G9:

Parameter estimates obtained from the final institutional engagement model

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_{00}	-0.32	0.02	<.005	-0.37	-0.28
β_{01}	0.01	0.02	.71	-0.03	0.05
β_{02}	0.08	0.02	<.005	0.04	0.11
β_{10}	0.09	0.01	<.005	0.06	0.11
β_{11}	-0.02	0.01	.07	-0.04	0.00
β_{20}	0.00	0.00	.07	-0.00	0.00
β_{30}	-0.23	0.01	<.005	-0.25	-0.21
β_{40}	-0.26	0.01	<.005	-0.28	-0.24
β_{50}	-0.22	0.01	<.005	-0.25	-0.21
β_{60}	-0.34	0.01	<.005	-0.36	-0.31
σ_e	0.84	--	--	--	--
σ_{u0}	0.14	--	--	--	--
σ_{u1}	0.07	--	--	--	--
$\text{Corr}(\sigma_{u0}, \sigma_{u1})$	0.17	--	--	--	--

Analysis of student aspirations data

The analysis of the student aspirations data involved fitting a series of generalized cumulative logistic mixed-effects models to the data. Where K represents the number of response categories, these models can be written as:

$$\Pr(y_{js} > k) = g(\mathbf{x}_{js}\boldsymbol{\beta}_k + \mathbf{u}_s - \alpha_k), \text{ for } j = 1, 2, \dots, n_s \text{ students, } s = 1, 2, \dots, S \text{ schools and } k = 1, 2, \dots, K - 1 \text{ cutpoints}$$

where y_{js} represents the response category for student j in school s ; \mathbf{x}_{js} represents a set of covariates for the fixed effects ($\boldsymbol{\beta}_k$); α_k represents a set of cutpoints; \mathbf{u}_s represents a set of random effects; and $g(\cdot)$ represents the logistic cumulative function.

The initial model included a fixed linear effect for time (model 1) while the second allowed the linear effect to vary across schools (model 2). A series of cluster mean centred indicators representing scholastic year levels were then added to the model to account for differences in school response composition across the years of interest (model 3). Cluster mean centred ICSEA values were then included to account for year-to-year fluctuations in levels of need (model 4).

The next step involved adding the RAM loadings to the model. In order to determine the most appropriate functional form for the input, the Best Linear Unbiased Predictors (BLUPs) of the random effects (from model 4) were locally regressed on the measure of need. Linear predictors were then included in the equations for the intercepts and slopes (model 5), with quadratic terms sequentially added to the intercept (model 6) and slope (model 7) equations. The final specification can be written as:

$$P(y_{js} > k) = g((\beta_{01} \cdot \text{need GMC}_s + \beta_{02} \cdot \text{need GMC}_s^2 + u_{0s} - \alpha_k) + (\beta_{10} + \beta_{11} \cdot \text{need GMC}_s + u_{1s}) \cdot \text{time}_{js} + \beta_{20} \cdot \text{ICSEA CMC}_{js} + \beta_{30} \cdot \text{Year 9 CMC}_{js} + \dots + \beta_{60} \cdot \text{Year 12 CMC}_{js}),$$

for $j = 1, 2, \dots, n_s$ students, $s = 1, 2, \dots, 80$ schools, $k = 1, 2$ cutpoints,

$$\text{and } \mathbf{u}_s \sim \text{MN} \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{u0}^2 & \sigma_{01} \\ \sigma_{10} & \sigma_{u1}^2 \end{pmatrix} \right].$$

The results from the likelihood ratio tests are presented in Table G10 while the parameter estimates from the final model are presented in Table G11.

Table G10:

Results from likelihood ratio tests – student aspirations to complete Year 12

Model comparison	Chi-squared value	Degrees of freedom	p value
Model 1 vs. 2	31	2	<.005
Model 2 vs. 3	605	4	<.005
Model 3 vs. 4	1	1	.44
Model 4 vs. 5	44	2	<.005
Model 5 vs. 6	32	1	<.005
Model 6 vs. 7	0	1	.50

Table G11:

Parameter estimates obtained from the final

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_{00}	-0.30	0.05	<.005	-0.40	-0.19
β_{01}	0.29	0.05	<.005	0.20	0.39
β_{02}	-0.30	0.03	<.005	-0.36	-0.24
β_{10}	0.01	0.03	.65	-0.04	0.07
β_{11}	0.00	0.00	.16	-0.00	0.00
β_{20}	-0.14	0.03	<.005	-0.19	-0.09
β_{30}	0.02	0.03	.41	-0.03	0.07
β_{40}	0.21	0.03	<.005	0.16	0.27
β_{50}	0.61	0.03	<.005	0.54	0.67
β_{60}	-1.55	–	–	–	–
σ_e	-0.53	–	–	–	–
σ_{u0}	0.12	–	–	–	–
σ_{u1}	0.02	–	–	–	–
Corr(σ_{u0}, σ_{u1})	0.01	–	–	–	–

Appendix H: Technical details for SEF analysis

A series of generalized cumulative logistic regression models were used to analyse the School Excellence Framework (SEF) data. Once again, these models were similar to those used to analyse the student aspirations data, except they did not include any random-effects. As these models are similar to those described earlier, specific equations are not presented here.

The intention of this analysis was to investigate whether higher-need schools were more or less likely to have higher self-reported ratings in 2017 than lower-need schools, controlling for differences in their self-report ratings the year before. Separate models were first used to investigate the unconditional relationships between the measure of need (see Appendix E) and the 2016 and 2017 SEF ratings. These initial models included linear predictors for the measure of need, with quadratic and cubic polynomial terms sequentially added to test for non-linear relationships. All terms were initially constrained to be the same across the cumulative logits before they were allowed to vary. Likelihood ratios tests were used to compare the various models. For each of the four SEF elements examined, the results showed that higher-need schools were more likely to have lower ratings in 2016 and 2017. As these models were not the primary focus of the analysis, the results are not presented here.

To account for the relationships between the 2016 SEF ratings and the measure of need, a series of dummy indicators were added to the models for the 2017 ratings. These indicators represented the various categories of the SEF. The indicators were allowed to vary across the cumulative logits so as to fully condition the 2017 ratings on the 2016 ratings.

For element 12 and 14, the results showed that a single linear predictor was sufficient to capture the conditional relationship between the self-report ratings for 2017 and the measure of need. However, for element 11 and 13, unconstrained linear predictors were required. Tables H1 through H4 show the parameter estimates obtained from the final models.

Table H1:

Parameter estimates obtained from the final model – SEF element 11

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
$\beta_1(\alpha_1)$	-0.44	0.13	<.005	-0.69	-0.18
$\beta_1(\alpha_2)$	-0.01	0.06	.90	-0.12	0.10
$\beta_1(\alpha_3)$	-0.06	0.08	.46	-0.23	0.10
$\beta_2(\alpha_1)$	2.42	0.31	<.005	1.82	3.01
$\beta_2(\alpha_2)$	1.12	0.26	<.005	0.60	1.64
$\beta_2(\alpha_3)$	13.66	668.74	.98	-1,297.05	1,324.36
$\beta_3(\alpha_1)$	3.01	0.34	<.005	2.33	3.68
$\beta_3(\alpha_2)$	3.60	0.27	<.005	3.07	4.13
$\beta_3(\alpha_3)$	15.57	668.74	.98	-1,292.48	1,326.28
$\beta_4(\alpha_1)$	17.71	972.49	.99	-1,888.33	1,923.76
$\beta_4(\alpha_2)$	4.19	0.35	<.005	3.51	4.87
$\beta_4(\alpha_3)$	18.22	668.74	.98	-1,292.48	1,328.93
α_1	1.36	0.22	–	0.93	1.79
α_2	-1.88	0.25	–	-2.38	-1.38
α_3	-17.92	668.74	–	-1,328.62	1,292.79

Table H2:

Parameter estimates obtained from the final model – SEF element 12

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	-0.18	0.05	<.005	-0.28	-0.09
$\beta_2(\alpha_1)$	2.74	0.24	<.005	2.28	3.21
$\beta_2(\alpha_2)$	1.06	0.27	<.005	0.52	1.60
$\beta_2(\alpha_3)$	12.89	572.09	.98	-1,108.39	1,134.16
$\beta_3(\alpha_1)$	3.54	0.33	<.005	2.88	4.19
$\beta_3(\alpha_2)$	3.47	0.28	<.005	2.92	4.01
$\beta_3(\alpha_3)$	14.84	572.09	.98	-1,106.44	1,136.11
$\beta_4(\alpha_1)$	3.98	1.02	<.005	1.98	5.97
$\beta_4(\alpha_2)$	4.93	0.50	<.005	3.96	5.90
$\beta_4(\alpha_3)$	17.90	572.09	.98	-1,103.38	1,139.18
α_1	0.63	0.17	–	0.31	0.96
α_2	-2.17	0.26	–	-2.68	-1.65
α_3	-17.75	572.09	–	-1,139.02	1,103.53

Table H3:

Parameter estimates obtained from the final model – SEF element 13

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
$\beta_1(\alpha_1)$	-0.63	0.18	<.005	-0.98	-0.28
$\beta_1(\alpha_2)$	-0.15	0.06	.01	-0.26	-0.03
$\beta_1(\alpha_3)$	-0.23	0.07	<.005	-0.38	-0.08
$\beta_2(\alpha_1)$	2.55	0.36	<.005	1.84	3.26
$\beta_2(\alpha_2)$	0.94	0.31	<.005	0.33	1.55
$\beta_2(\alpha_3)$	0.57	1.04	.58	-1.46	2.60
$\beta_3(\alpha_1)$	4.26	0.53	<.005	3.23	5.29
$\beta_3(\alpha_2)$	3.30	0.32	<.005	2.68	3.92
$\beta_3(\alpha_3)$	1.91	1.01	.06	-0.08	3.89
$\beta_4(\alpha_1)$	19.04	1,357.98	.99	-2,642.56	2,680.64
$\beta_4(\alpha_2)$	4.35	0.41	<.005	3.54	5.16
$\beta_4(\alpha_3)$	4.69	1.02	<.005	2.70	6.68
α_1	1.24	0.30	–	0.65	1.83
α_2	-1.29	0.30	–	-1.88	-0.70
α_3	-4.18	1.01	–	-6.15	-2.20

Table H4:

Parameter estimates obtained from the final model – SEF element 14

Model parameter	Point estimate	Standard error	p value	Wald based 95% confidence intervals	
				Lower limit	Upper limit
β_1	-0.23	0.05	<.005	-0.33	-0.14
$\beta_2(\alpha_1)$	2.65	0.25	<.005	2.16	3.14
$\beta_2(\alpha_2)$	0.82	0.22	<.005	0.39	1.25
$\beta_2(\alpha_3)$	1.67	1.02	.10	-0.34	3.67
$\beta_3(\alpha_1)$	3.12	0.30	<.005	2.53	3.71
$\beta_3(\alpha_2)$	3.22	0.23	<.005	2.78	3.67
$\beta_3(\alpha_3)$	2.89	1.01	<.005	0.91	4.87
$\beta_4(\alpha_1)$	16.91	463.85	.97	-892.21	926.04
$\beta_4(\alpha_2)$	3.96	0.31	<.005	3.34	4.57
$\beta_4(\alpha_3)$	5.48	1.01	<.005	3.50	7.46
α_1	0.78	0.16	–	0.46	1.10
α_2	-1.63	0.21	–	-2.03	-1.22
α_3	-5.14	1.00	–	-7.10	-3.17



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