2020 REPORT TO THE NSW DEPARTMENT OF EDUCATION

EVALUATING THE IMPACT OF COVID-19 ON NSW SCHOOLS

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Executive Summary

This report focuses on the impact of the COVID-19 pandemic on students and teachers in NSW government primary schools. In 2020, schools in 190 systems around the globe moved to a period of learning from home due to the pandemic. These school closures represent unprecedented disruption to teaching and learning for billions of students. Speculation about the impact of COVID-19 and learning from home on student academic achievement has been widespread, relying heavily on evidence from previous crisis situations. As a result, we've seen school systems and governments draw on estimations based on modelling from international, short-term, small-scale disruptions to schooling caused by dramatic events, such as natural disasters and school shootings. However, the size and scale of disruption caused by COVID-19 is truly unprecedented and cannot be directly compared with these earlier accounts. To date, there has been little empirical evidence of what actually happened to student achievement during the closedown period.

Our study is one of the earliest globally to contribute important first-hand evidence by:

1. examining the effects on students (achievement in mathematics and reading, attitudes to schooling, and well-being) of the COVID-19 pandemic; and
2. investigating changes to teacher efficacy and morale during the COVID-19 pandemic.

The focus of our research was Stage 2 (Year 3 and Year 4) students and teachers, using comparable data from a split cohort randomised controlled trial conducted in 2019 and 2020 on the effects of Quality Teaching Rounds professional development, as part of the *Building Capacity for Quality Teaching in Australian Schools* project being conducted by the Teachers and Teaching Research Centre.

The study

Data were collected in 62 NSW schools during Term[1] 1 (weeks 2 – 10) and Term 4 (weeks 2 – 9) in 2019 and 51 schools during Term 1 (weeks 3 – 8) in 2020, as part of our randomised controlled trial. When COVID-19 struck, and the intervention planned for Term 2 was no longer possible, we approached the NSW Department about collecting the same data in Term 4 (weeks 1 – 5) 2020 in order to examine the impact of the pandemic on a range of outcomes for students and teachers, including student learning. In June 2020, the Department agreed to fund the study. The serendipity of timing, given Australia's relatively successful control of the outbreak compared to many other parts of the world, has enabled us to provide this unique data set and comprehensive set of analyses in a timely fashion.

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[1] School terms in NSW government schools are typically 10 weeks

To assess growth in student achievement, we used Progressive Achievement Tests (PATs) (ACER). PATs have been rigorously tested and are widely used in Australian schools, and internationally, to monitor students' skills, understandings, and growth over time. This form of testing is one of the few validated standardised measures for assessing student achievement in a single school year available in Australia. To address student attitudes towards school, we employed a student survey, using items from the Quality of School Life instrument (Ainley & Bourke, 1992). Items from the Aspirations Longitudinal Study survey (Gore et al., 2015) were added to examine views on school learning culture. In total, we gathered data from 2156 Year 3 and 4 students who participated in the study in 2020 and 2738 Year 3 and 4 students from the control group in 2019.

We conducted preliminary analyses using all of the data (full report available on request, Gore et al., 2020). However, to guard against cohort effects, or different starting points in student achievement, we drew on a more robust sample of matched classes within schools (to account for in-school variance) from 2019 and 2020. That is, we matched a subset of schools on both baseline achievement and the socio-demographic variable of school ICSEA. Separate samples were created for Year 3 and Year 4 students given their different growth trajectories. Mathematics and reading achievement are highly correlated in Years 3 and 4, while science achievement is much more variable; hence, for the purpose of obtaining the closest match for baseline achievement, science was dropped from this analysis. This process produced a total sample of 3030 students (1584 in 2019, and 1446 in 2020).

Teachers (123 in 2019, 239 in 2020) also completed surveys in Terms 1, 2, 3 and 4 in 2019 and Terms 1, 3 and 4 in 2020. The surveys included items on teacher engagement, teacher efficacy, collective morale, sense of appraisal and recognition, and the amount of instructional time teachers devoted to each of the learning areas assessed (mathematics and reading). In addition, a representative sample of twelve teachers and six school leaders took part in semi-structured telephone interviews to provide contextual qualitative perspectives on their experiences during the period of learning from home and upon students' return to school. Participants came from a range of locations and levels of socio-educational advantage; the interviews took place during September and October 2020.

Findings

Student achievement

Our main finding is that, on average, there were no significant differences in student achievement growth between 2019 and 2020, as measured by PATs in mathematics or reading. Indeed, achievement growth (in mathematics and reading) for the 2020 cohort of students was at least equivalent to that of the 2019 cohort. Most students learned and achieved during 2020. They did not go backwards or experience learning 'loss'.

However, this remarkable headline result masks a more complex picture when the data were analysed by school-level advantage (ICSEA), Year level, school location and for sub-samples of Indigenous students and those in regional areas.

Student achievement by subgroups

When examined by Year level and ICSEA, Year 3 students in the least advantaged schools (ICSEA <950) in 2020 achieved significantly less growth, equivalent to two months, in mathematics relative to the 2019 cohort. In 2020, Year 3 students from schools in the middle ICSEA band (950-1050) achieved the equivalent of two months' additional growth in mathematics compared with those in the same ICSEA band in 2019 (Table 1). There were no significant differences reported in Year 4 by subject or school ICSEA.

No significant differences were found for Indigenous students in Year 3 or 4 and the only significant effect for students in regional schools was an additional three months' growth in reading for students in the mid-ICSEA band.

Collectively these results provide evidence that COVID-19 and learning from home had less impact on student achievement than anticipated, based on estimates and speculation.

Table 1 Year 3 significant differences in mathematics and reading achievement (2019-2020) by ICSEA

ICSEA	Mathematics	Reading
Low	- 2 months	
Mid	+ 2 months	
High		

Note.   Blank cells denote no significant difference between the 2019 and 2020 cohorts

Teacher perceptions of the impact on student achievement

While there was wide variation in experiences during the learning from home period and the return to schooling, several broad trends were reported by teachers and school leaders. In some schools, students were seen to be behind in their learning when they returned to school, while others reported either minimal decline or no substantial change in academic achievement. Indeed, some teachers reported that students strengthened their skills during the learning from home period, particularly in reading, writing and technology.

Parental support and student engagement with the resources provided by schools during closedown were considered key to maximising growth in student achievement. Also, upon the return to school, restrictions on

extracurricular activities because of the pandemic created additional time in the classroom, which helped teachers support students who they felt had fallen behind in their learning.

Impact on student and teacher well-being and morale

While the disruption to schooling had minimal impact on student achievement, there were profound negative effects on the well-being of many students and teachers.

Student well-being

Teachers and school leaders reported that during the learning from home period, student well-being was substantially impacted by high levels of anxiety in the broader community and within households. Many teachers shared stories of families who struggled with periods of lockdown and of how the challenges in supporting student learning were exacerbated by stress within the family home. The need for students and parents to adapt to new ways of teaching and learning was an additional source of anxiety, particularly for those families with limited digital literacy and/or access to the necessary technology to support learning from home.

Upon returning to school, students displayed serious signs of stress, anxiety and frustration. Many teachers also reported a decline in student behaviour and social interaction after the period of learning from home. The reduced curriculum in schools, with a relatively narrow focus on literacy and numeracy, was described as intensifying student stress, leading to fatigue, mental anguish and behavioural issues for some students.

Teacher well-being

The survey results illustrate that teachers' morale and belief in their capacity to engage their students in learning declined significantly over the 2020 school year – a pattern that was not evident for the 2019 teachers. The rapid shift from schooling-as-usual to learning from home meant an exponential increase in the workloads of teachers and school leaders. A particular challenge was the requirement to provide multiple forms of teaching, including: synchronous and asynchronous online lesson delivery; the creation of paper-based resources to support the needs of students and families who lacked adequate access to the internet or computers; and face-to-face delivery for the children of essential workers.

The related increase in workload impacted substantially on teacher morale and many reported feelings of inadequacy at not being able to deliver high quality lessons for all students. Additional stress related to student welfare concerns. For many teachers, the inability to check in as regularly as usual with their most vulnerable students increased their own stress and anxiety, grounded in increasing concern for student welfare. This period of insurmountable stress and exhaustion led some teachers to consider leaving the teaching profession.

Summary

Despite vast speculation about learning loss as a consequence of COVID-19 and the associated disruptions to schooling, we found no significant negative effects on student achievement growth, on average. There were important differences related to levels of disadvantage, but only for Year 3 student achievement in mathematics. Students in the lower ICSEA schools did not achieve the same growth in 2020 as they did in 2019, while students in the middle ICSEA band achieved greater growth in 2020. This pattern applied to Year 3 students only. In short, students in disadvantaged schools (ICSEA >950) and younger students (Year 3) showed varying effects of COVID-19 on their academic achievement in mathematics relative to their 2019 counterparts. Our analysis found minimal or no differences in reading achievement, or in the achievement of Year 4 students. Similarly, there were no significant differences in achievement growth between 2019 and 2020 for the Indigenous students in our sample. The additional growth in reading for regional students in mid-ICSEA schools could be a function of sample size.

These results provide powerful evidence at odds with the often loud but unsubstantiated claims of 'loss of learning' circulating in the Australian media and other public domain outlets.

However, the disruption to schooling and shift to new modes of teaching and learning did increase the stress felt by students, families, teachers and school leaders. The return to school and subsequent narrowing of the curriculum may have assisted in maintaining academic achievement levels, but might have been a factor in students' negative feelings about the relevance of school and in teachers' morale and self-efficacy, especially in terms of engaging their students.

Despite these broad trends, our data also highlight great variability among schools, families and students which is borne out in both the qualitative and quantitative evidence in this report. There *are* students and teachers who thrived and schools that soared. For a host of reasons that we explore in a discussion at the end of this report, many others suffered. Even so, the overall result of minimal difference in student achievement growth is a testament to the valiant efforts of teachers, leaders, and families, and the supports put in place both locally and centrally.

Our findings offer some comfort to parents, teachers and system leaders who have rightly worried about learning loss. They also offer a firm foundation for identifying where extra support is needed; namely, to assist student learning in low ICSEA schools, especially among the 2020 Year 3 cohort, and to address both teacher and student well-being. School systems elsewhere in Australia and around the world may find this report helpful in establishing a solid empirical basis for investigating what happened to students and teachers during COVID-19, in their own contexts.

1   Research Background

The COVID-19 pandemic led to unprecedented disruption to schooling in more than 190 education systems globally, impacting more than 90% of the world's school students (Psacharopoulos et al., 2020; UNESCO, 2020a; United Nations, 2020b). In late-March 2020, throughout Australia, parents were urged to keep their children at home, resulting in a swift and dramatic shift from face-to-face learning to flexible and remote delivery of education. In New South Wales government schools, 'learning from home' continued for two months for most students, except for the children of essential workers who continued to attend school. Upon return to face-to-face teaching, many schools also closed intermittently for deep cleaning after students or teachers returned positive COVID-19 tests. In addition, extensive restrictions to usual school practices were mandated (NSW Department of Education, 2020b), including the cancellation of school excursions, assemblies, sporting activities and large gatherings (Australian Government Department of Health, 2020).

This widespread disruption to traditional teaching has raised concerns, globally, that student learning has been substantially negatively impacted as teachers, school leaders and students navigated online education (Burgess & Sievertsen, 2020; Hampshire, 2020; Joseph & Fahey, 2020). While the shift to online schooling was promoted as a key way to support continuous learning in such crisis conditions (Baytiyeh, 2019), schools and teachers were required to implement online learning in a matter of days, developing their knowledge and skills for teaching in remote and flexible contexts with minimal professional development (Clinton 2020) and, arguably, at unreasonable speed (Norman, 2020; Potts Rosevear, 2020). At the same time, students faced a range of environmental barriers and enablers to learning. These included varying levels of parental supervision, and differing access to the internet and devices required to sustain their learning (Burgess & Sievertsen, 2020; CIRES & Mitchell Institute, 2020; Engzell et al., 2020). Of particular concern was how to support already vulnerable and disadvantaged students trying to 'learn from home' (Gulosino & Miron, 2017).

This 'quarantine recess' (Hinson et al., 2007) from traditional schooling generated substantial negative commentary about short-term and long-term effects on student outcomes and well-being, as well as the morale, self-efficacy and skills of teachers. While some commentators argued that a significant break from schooling does not necessarily have long term effects on student learning outcomes (Hattie, 2020), others invoked evidence that such breaks may result in student regression in basic skills and learning (Ofsted, 2020), increased disengagement, and higher levels of student attrition (Brown et al., 2020). Indeed, recent reports predict that this period of school closure and shift to online learning could lead to poorer educational outcomes for almost 50% of Australian students (Brown et al., 2020; Finkel, 2020), and not just in the short term (United Nations, 2020b).

However, to date, there remains limited robust empirical evidence about the extent to which students have been affected by the system-wide movement to online and remote learning. This is understandable, given the recent

moratorium in Australia on NAPLAN – Australia's major annual source of comparative achievement data. Other forms of testing have been implemented, at the school and state level, but their validity and reliability have not been established, especially when there are no directly comparable data from the start of the school year or previous cohorts.

Empirical evidence of the actual impact of the pandemic on student learning around the world has also been scarce, with just a handful of studies emerging in November and December 2020, none peer reviewed. Ofsted (2020a, 2020b) reported, after visiting and talking with staff at 380 schools, that children of all ages in the United Kingdom lost some learning and basic skills. In the United States, Dorn et al. (2020) reported that elementary school students beginning the 2020-21 school year in the United States were starting school, on average, three months behind in mathematics and one and a half months behind in reading compared with earlier cohorts (Dorn et al. 2020). A study using national standardised test data collected just prior to and just after an eight-week period of closedown in the Netherlands concluded that students lost one fifth of a year's learning, having made little or no progress while learning from home (Engzell et al. 2020). In Australia, modelling by the Grattan Institute (Sonnemann and Goss 2020), predicted a learning loss of one month from a two month period of school disruption for the most disadvantaged students. In December, the NSW Department of Education reported results from *Check-in* assessments in reading and numeracy conducted in schools during the end of Term 3 and beginning of Term 4. Over 62,000 Year 3 students (or 88% of all Year 3) from 1,439 schools participated. Results indicated that while Year 3 students were on their expected trajectory for numeracy, they were 3-4 months behind their expected trajectory in reading (NSW Department of Education, 2020a).

To date, estimation and speculation have been the main drivers of debate and policy, while valid inference requires data from before and after school closedown and a relevant comparison group (Engzell et al., 2020). Our study provides a comprehensive analysis of comparable data drawn from students in 2019 and 2020. In so doing, we offer insights for policy and practice by demonstrating, for this cohort at least, what actually happened during the widespread disruption to schooling-as-usual.

Rigorous empirical evidence is critical as a responsible basis for strategic action to address the effects of the quarantine recess on students and teachers. Without such evidence, school systems globally are relying on a small body of literature that focuses primarily on internal school and system crises such as school shootings (Thompson et al., 2017) and environmental disasters including fires, hurricanes, earthquakes, and tornadoes. Much of this research focuses on individual school closures (Alvarez, 2010; Convery et al., 2010; Ho et al., 2012; Trethowan & Nursey, 2015) rather than the recent system-wide transition to online learning, an unprecedented occurrence. While the extant literature provides an important context for understanding the effects of crises and disasters on school leaders, teachers, students and the broader school community, it is severely limited in its capacity to

inform schools and school systems in the transition back from learning at home following a system-wide period of school closure.

When the global impacts of the COVID-19 pandemic were beginning to become apparent, UNESCO (2020b) released a report outlining how the pandemic could be used to improve schooling and make education systems more inclusive; to "build back better" (para. 10). Despite this worthy manifesto, prior research on schooling following natural or other disasters suggests that such disruptions tend to exacerbate and highlight existing inequities rather than generate insights that repair them (Carr-Chellman et al., 2008; Ezaki, 2018). The design of our study allows for fine-grained analysis of outcomes in relation to school-level dis/advantage. Specifically, we draw on comparable student achievement data from the school year prior to COVID-19 to examine the effects of this rapid system-wide change on student learning outcomes.

We did not set out to study the effects of COVID-19. Instead, we were in the middle of a randomised controlled trial (RCT) on the effects of Quality Teaching Rounds professional development, split across 2019 and 2020 cohorts. The Australian school year starts in late January and concludes in late December, which aligns annual student achievement testing with the calendar year – unlike in many other countries in which the school year starts around August. Serendipitously, when COVID-19 struck, we had collected pre- and post-intervention data for 2019 and pre-intervention data from 2020 for most schools in the second cohort. The late March closedown of schools in NSW meant we missed out on data collection in a small number of schools. The upside was that data collected just prior to the shutdown was comparable with data from the 2019 control group of schools.

Fortuitously, given the relatively low number of COVID-19 cases in Australia (at the time of writing 28,762 cases and 909 deaths), schools in NSW re-opened in plenty of time for follow-up data collection which commenced in late October and concluded in early December. Just when the worldwide crisis was worsening and schools were still shut down or shutting down in many parts of the world, we were able to re-purpose our 2020 baseline data and go back into schools to investigate effects of the pandemic on student learning.

2 Methodology

In 2019, baseline (Term 1, weeks 2 – 10) and follow-up (Term 4, weeks 2 – 9) data were collected from 62 public schools for the *Building Capacity for Quality Teaching in Australian Schools* project. This group of schools formed the control group for a randomised controlled trial (RCT) examining the effects of a form of professional development, Quality Teaching Rounds (QTR), on student achievement (Gore et al., 2021; Miller et al., 2019). In 2020, equivalent data for a second cohort of 51 schools were collected in Term 1 (weeks 3 – 8) as a part of the same RCT (which had to be postponed because of COVID-19) and gathered again at the end of the 2020 school year (Term 4, weeks 1 – 5) (Table 2). In all instances, PATs and student surveys were administered by research assistants. The analysis is anchored in these data which take the form of student achievement tests (Progressive Achievement Tests [PATs] in mathematics, reading and science), student surveys and teacher surveys, as outlined below. Comparison of these datasets generated important insights into the effects of COVID-19 on students and teachers. Interviews were added for a subset of the 2020 teacher cohort to shed light on their experiences and perceptions of what happened to and for their students.

Table 2 Data collection (2019-2020)

	Term 1 (Jan – Apr)	Term 2 (Apr – Jul)	Term 3 (Jul – Sep)	Term 4 (Oct – Dec)
Teachers				
2019	Survey	Survey	Survey	Survey
2020	Survey		Survey, Interviews	Survey
Students				
2019	Survey, PATs			Survey, PATs
2020	Survey, PATs			Survey, PATs

Note. Teacher surveys were not conducted in Term 2, 2020 while ethics approval was being sought for this project, which was funded in June 2020 (University of Newcastle HREC: H-2020-0242; SERAP: 2020241).

2.1 Sample

Students and teachers from 51 schools participated in the study during 2020. These data were compared with data collected from 62 public schools in 2019 for the *Building Capacity for Quality Teaching in Australian Schools* project. Schools that participated in 2019 were primarily located in major cities (*n* = 35), and regional areas (inner regional, *n* = 21; outer regional, *n* = 5). One school was in a very remote area. A similar pattern characterised schools that participated in 2020, with most in major cities (*n* = 40), and a smaller group in regional areas (inner regional, *n* = 10; outer regional, *n* = 1). There were no schools from remote or very remote communities in the 2020 sample (Table 3).

Table 3 Sample characteristics (2019-2020)

Characteristics	Total		Year 3		Year 4	
	2019	2020	2019	2020	2019	2020
Schools, n	62	51	57	44	56	48
ICSEA, mean (SD)	995 (82)	1007 (76)	987 (80)	999 (72)	991 (79)	1009 (77)
ICSEA < 950, n (%)	19 (31)	10 (20)	19 (33)	9 (20)	18 (32)	9 (19)
ICSEA 950 - 1049, n (%)	29 (47)	25 (49)	27 (47)	24 (55)	27 (48)	23 (48)
ICSEA 1050+, n (%)	14 (23)	16 (31)	11 (19)	11 (25)	11 (20)	16 (33)
Rural, n (%)	27 (44)	11 (22)	27 (47)	11 (25)	24 (42)	10 (20)
Major Cities	35 (56)	40 (78)	30 (53)	33 (75)	32 (57)	38 (79)
Inner Regional	21 (34)	10 (20)	21 (37)	10 (23)	18 (32)	9 (19)
Outer Regional	5 (8)	1 (2)	5 (9)	1 (2)	5 (9)	1 (2)
Remote	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Very Remote	1 (2)	0 (0)	1 (2)	0 (0)	1 (2)	0 (0)
Students, n	2738	2156	1332	1016	1406	1140
Age – years, mean (SD)	9.7 (0.7)	9.7 (0.7)	9.2 (0.4)	9.1 (0.5)	10.1 (0.4)	10.1 (0.4)
Female, n (%)	1354 (50)	1073 (50)	657 (49)	510 (50)	697 (50)	563 (50)
Indigenous, n (%)	185 (7)	132 (6)	111 (8)	74 (7)	74 (5)	58 (5)
LBOTE, n (%)	666 (24)	522 (24)	306 (23)	248 (24)	360 (26)	274 (24)
Teachers, n	239	123				
Experience – years, mean (SD)	12.0 (9.6)	10.3 (8.34)				
Qualifications – Masters, %	32 (15)	16 (13)				
Qualifications – Bachelor, %	164 (76)	98 (79)				
Qualifications – Diploma, %	19 (8)	6 (5)				

2.2 Student data

2.2.1 Progressive Achievement Tests and student surveys

Students completed Progressive Achievement Tests (PATs) in mathematics, reading and science (Australian Council of Educational Research [ACER], 2011) in Term 1 and Term 4, 2020. Students also completed surveys addressing attitudes to school, using items from the Quality of School Life instrument (Ainley & Bourke, 1992), and views on school learning culture, using items from the Aspirations Longitudinal Study survey (Gore et al., 2015). The same data were collected from students in Term 1 and Term 4, 2019.

Slightly more students completed achievement tests in 2019 (*n* = 2738) than in 2020 (*n* = 2156). The mean age of students in both 2019 and 2020 was 9.7 years and there were equal proportions of female participants (50%) and students from language backgrounds other than English (LBOTE) (24%) in both samples. Slightly more Indigenous students participated in 2019 (7%) than in 2020 (6%) (Table 3). Students for whom the schools received NSW Department of Education funding for significant identified learning difficulties were excluded from the analysis, but not from the class activities associated with the research.

2.3   Teacher data

2.3.1   Teacher surveys

The teacher survey included questions on teacher efficacy (Tschannen-Moran & Hoy, 2001), collective morale and sense of appraisal and recognition (Hart et al., 2000) and instructional time (in mathematics, reading and science). Surveys administered at multiple time points during 2019 (Terms 1, 2, 3 and 4) were compared with surveys from 2020 (Terms 1, 3 and 4). In addition, teachers and school leaders were invited to take part in semi-structured telephone interviews. A representative sample of those who volunteered, based on school location and ICSEA, was selected to participate in the interviews which were conducted during September and October 2020.

There were more teachers who took part in the study in 2019 (n = 239) than in 2020 (n = 123). Their average years of teaching experience was 12.0 years in 2019 compared with 10.3 in 2020. A slightly higher proportion of teachers who participated in 2019 held a Master's qualification (15%) compared to 2020 (13%). A higher proportion of teachers in the 2020 sample held a Bachelor's qualification (79%) compared with teachers in the 2019 sample (76%) (Table 3).

2.3.2   Teacher interviews

In order to gain a deeper understanding of the nature and effects of changes to teaching and learning caused by the pandemic, telephone interviews were conducted during September and October 2020 with teachers (n = 12) and school leaders (n = 6) from 13 schools. There were slightly more schools in regional areas (n = 7; inner regional, n = 4; outer regional, n = 3) than in major cities (n = 6) (Table 4).

Table 4 Location of 2020 interview schools and participants

	Major city	Inner-regional	Outer-regional	Total
Schools	6	4	3	13
Principals	3	2	1	6
Teachers	5	4	3	12

The ICSEA of these schools ranged from just over 800 (least advantaged school) to around 1140 (most advantaged). The percentage of students in interview schools with a language background other than English (LBOTE) ranged from 0% (Schools 2 and 4) to more than 95% (School 5). Aboriginal and Torres Strait Islander student enrolment ranged from 1% in School 5 to around 60% in School 1. The number of classroom teachers in schools ranged from 3 (School 4) to 41 (School 13), and student enrolments ranged from just under 30 (School 4) to around 750 (School 13) (Table 5).

Table 5 Sociodemographic characteristics of schools in interview sample

	ICSEA[2]	Language Background (%)	Aboriginal or Torres Strait Islander Students (%)	Number of teachers (2019)	2019 Enrolment
School 1	low	<10	61-70	31-40	451-500
School 2	low	<10	31-40	<10	51-100
School 3	low	<10	41-50	11-20	251-300
School 4	low	<10	<10	<10	<50
School 5	low	91-100	<10	21-30	301-350
School 6	mid	11-20	11-20	21-30	451-500
School 7	mid	<10	<10	11-20	251-300
School 8	mid	<10	<10	<10	151-200
School 9	mid	71-80	<10	11-20	251-300
School 10	mid	<10	<10	11-20	301-350
School 11	mid	<10	<10	21-30	351-400
School 12	mid	11-20	<10	11-20	251-300
School 13	high	71-80	<10	41-50	751-800

2.4   Analysis

Statistical analyses of the primary and secondary outcomes were conducted using IBM PASW Statistics 25 (SPSS Inc. Chicago, IL) software, with alpha levels set at $p < 0.05$. Given the retrospective nature of this study, we chose not to adjust for family wise error using a Bonferroni corrected alpha.

2.4.1   Student outcomes

We conducted preliminary analyses using all of the data (full report available on request, Gore et al., 2020). However, to guard against cohort effects, or different starting points in student achievement, we drew on a more robust sample of matched classes within schools (to account for in-school variance) from 2019 and 2020. That is, we matched a subset of schools on both baseline achievement and the socio-demographic variable of school ICSEA. Separate samples were created for Year 3 and Year 4 students given their different growth trajectories. While mathematics and reading achievement are highly correlated in Years 3 and 4, science achievement is much more variable; hence, for the purpose of obtaining the closest baseline achievement match, science was dropped from this analysis.

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[2] In order to protect the anonymity of schools, ICSEA is reported as low ICSEA (<950), mid (ICSEA 9501-1050), and high (ICSEA >1050).

Classes within schools were ranked using the class level mean of the combined mathematics and reading percentile score at baseline (rounded to the nearest integer). Classes were ranked (ascending) by ICSEA and baseline achievement within ICSEA categories (low = <950; mid = 950 - 1049; high = 1050+). 2019 and 2020 classes within each percentile were paired with the closest ICSEA class if they were within ± 25 ICSEA. To retain as much data as possible, remaining 2020 classes were matched to 2019 classes that were within ±2 percentile points and the closest ICSEA within ±25 ICSEA. Sample characteristics of the matched subset of schools are provided in Table 6.

Table 6 Matched sample characteristics (2019-2020)

Characteristics	Year 3		Year 4		Total	
	2019	**2020**	**2019**	**2020**	**2019**	**2020**
Schools, n	35	35	40	37	51	46
ICSEA, mean (SD)	992 (64)	996 (74)	1005 (71)	1000 (68)	1003 (70)	1003 (67)
ICSEA < 950						
mean (SD)	918 (29)	916 (33)	916 (21)	912 (33)	914 (28)	917 (31)
n (%)	9 (26)	8 (2)	9 (23)	7 (19)	12 (24)	10 (22)
ICSEA 950 - 1049						
mean (SD)	993 (25)	1000 (25)	996 (27)	994 (25)	998 (28)	994 (27)
n (%)	20 (57)	20 (57)	21 (53)	20 (57)	27 (53)	25 (54)
ICSEA 1050+						
mean (SD)	1099 (32)	1088 (27)	1106 (26)	1093 (30)	1103 (25)	1092 (27)
n (%)	6 (17)	7 (20)	10 (25)	9 (24)	12 (24)	12 (26)
Regional, n (%)	17 (49)	10 (29)	18 (45)	7 (19)	23 (45)	10 (22)
Students, n	779	690	805	756	1584	1446
Age – years, mean (SD)	9.2 (0.5)	9.2 (0.5)	10.2 (0.4)	10.1 (0.4)	9.7 (0.6)	9.7 (0.7)
Female, n (%)	382 (49)	340 (49)	398 (49)	381 (50)	780 (49)	721 (50)
Indigenous, n (%)	72 (9)	60 (8)	32 (4)	38 (5)	104 (7)	98 (7)
LBOTE, n (%)	120 (15)	101 (15)	173 (22)	182 (24)	293 (19)	283 (20)

Notes. ICSEA = Index of socio-educational advantage; SD = Standard deviation

Linear mixed models were fitted to compare continuous outcomes for each of the cohorts (2019 and 2020). Year (2019 and 2020), time (Baseline [Term 1] and follow-up [Term 4]), and year-by-time interactions were assessed as categorical fixed effects within the models. A repeated measures statement was included to model the within-subject correlated errors across time, and random intercepts were included for students within schools to account for the hierarchical nature of the data. Students who answered all questions correctly at the baseline assessment time-point were excluded from analysis as growth could not be assessed for these students. Differences in means and 95% confidence intervals (CIs) were determined using the linear mixed models, and the 2019 cohort was set as the comparison group for group-by-time contrasts.

Cohen's (1988) *d* was used to determine effect sizes (d = (Mchange2020 – Mchange2019) / σ pooled), where Mchange is the change in mean score for each group relative to their baseline value and σ is the pooled unconditional standard deviation. Ninety-five per cent confidence intervals (95% CIs) of the effect size were computed using the compute.es function (AC Del Re, 2013) in R version 3.4.4 (R Core Team, 2019). This function computes confidence intervals using the variance in *d* derived by the Hedges and Olkin (1985) formula.

Given widespread concern for less advantaged students, subgroup analysis was conducted to investigate if student outcomes differed across cohorts among ICSEA bands (low = <950, mid = 950-1049 and high = 1050+), or for Indigenous and regional students. As the comparison of growth between the two cohorts (year-by-time interaction) was the parameter of interest, the linear mixed models were repeated separately for each group within sub-groups (as opposed to running a three-way interaction term), using the entire student dataset.

Student secondary outcomes (questionnaire scales) were evaluated using the same modelling approach. There were no significant effects among sub-groups for secondary outcomes, with this analysis not presented in this report.

2.4.2   Teacher outcomes

Linear mixed models were fitted to compare the linear trend of continuous teacher perception outcomes for each of the cohorts (2019 and 2020). Year (2019 and 2020), time (Term 1, Term 3 and Term 4), and year-by-time interactions were assessed as continuous fixed effects within the models. Random intercepts and slopes were included at the subject level using an unstructured covariance matrix.

2.4.3   Interview data

To understand the impact of learning from home on student achievement, we spoke to teachers and school leaders from a representative sample of schools. NVivo 12 (QSR International, 2020), a qualitative software analysis tool, was used to assist in thematic coding of interviews, using inductive and deductive logic (Creswell, 2013). A continuous process of reflection and discussion between coders about emergent themes ensured consistency and allowed themes to be expanded or combined as required (Harry et al., 2005). In reporting the substance of the interviews, pseudonyms are used to protect the anonymity of the participants and schools involved in the study.

2.5   Interpretation of tables and figures

Given the sheer volume of data in this report, the following notes are designed to assist with reading and interpretation, especially for readers unfamiliar with the kinds of statistics used in the analysis.

2.5.1　Student Progressive Achievement Test (PAT) tables

When viewing the PAT tables, the main columns to consider are the two on the right. Only those cells in the far-right column with an asterisk indicate a significant difference between the 2019 and 2020 cohorts. The second from the right column indicates the direction of the difference. Any effect size starting with a negative (e.g. -0.12) indicates lower results for the 2020 cohort. Significant effects without a negative indicate greater growth for the 2020 cohort. Using standards adopted by the Education Endowment Foundation (EEF) (2018), effect sizes between 0.05 and 0.09 are equivalent to one month difference in growth while effect sizes between 0.10 and 0.18 indicate two months' difference.

2.5.2　Student Progressive Achievement Test (PAT) figures

When viewing the PAT figures, the bold coloured lines indicate the trend for each cohort, showing the change from Term 1 to Term 4. The fine lines represent the different schools (or in some cases, students – for Indigenous students and students in regional schools) and highlight the variability underpinning the overall trend.

3   Findings

3.1   Impact on student achievement

Findings are reported using linear mixed models. Instructional volume (average time per week dedicated to each subject) is included, followed by extracts from teacher and school leader interviews detailing their perceptions of effects on student achievement.

3.1.1   Student achievement

For the Year 3 and Year 4 cohorts overall, no differences in student achievement growth were recorded between 2019 and 2020. However, a more complex picture emerged when taking ICSEA into account. In reporting findings, all Year 3 results are provided followed by Year 4 results. For each cohort, growth in student achievement is reported by subject (mathematics and reading) and school ICSEA. In each instance, an overview table precedes tables and figures with detail of the statistical analyses conducted.

3.1.1.1   Year 3 student achievement in Mathematics and Reading

A summary of Year 3 student achievement in mathematics and reading by ICSEA is displayed in Table 7. Full details supporting these results are available in Tables 8 and 9 and Figures 1 and 2. Students in low ICSEA schools showed two months' less growth in 2020 and those in the mid ICSEA schools showed two months' additional growth.

Table 7 Year 3 student achievement in mathematics and reading (2019-2020) by ICSEA

ICSEA	Mathematics	Reading
Low	- 2 months	
Mid	+ 2 months	
High		
Whole sample		

Note.   Blank cells denote no significant difference between the 2019 and 2020 cohorts

Key points

Mathematics

- No significant differences between the 2019 and 2020 cohorts (Table 7, Figure 1)
- Students in low ICSEA schools (ICESA<950) showed two months' less growth in 2020 than the equivalent 2019 cohort (d = -0.16; 95% CI = -0.31, -0.01; p = 0.033)[3] (Table 8, Figure 1)
- Students from mid ICSEA schools (ICSEA 950-1050) demonstrated additional achievement growth, equivalent to two-months, in 2020 (d = 0.15; 95% CI = 0.06, 0.25; p = 0.002) (Table 9, Figure 2)

Reading

- No significant differences between the 2019 and 2020 cohorts (Table 8, Figure 1)
- No significant differences between the 2019 and 2020 cohorts by school ICSEA (Table 9, Figure 2)

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[3] While this result is significant using a traditional p value of <0.05, it is no longer significant using a Bonferroni adjusted alpha of <0.025 given the two primary outcomes of achievement growth in reading and mathematics.

Table 8 Year 3 student achievement in mathematics and reading (2019-2020)

Outcome	n	Baseline mean (95% CI)	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size d (95% CI)[a]	P
Year 3									
Mathematics									
2020	670	39.68 (36.4, 42.97)	0 (0)	91	608 (62)	17.20* (15.84, 18.56)	1.65 (-0.21, 3.52)	0.06 (-0.01, 0.13)	0.082
2019	757	40.23 (37.02, 43.44)	5 (0.6)	92	693 (64)	15.55* (14.27, 16.82)	Reference	Reference	
Reading									
2020	664	30.45 (26.94, 33.97)	3 (0.4)	91	605 (59)	22.67* (21.1, 24.24)	1.15 (-1, 3.29)	0.04 (-0.03, 0.11)	0.295
2019	765	29.26 (25.84, 32.68)	0 (0)	91	698 (67)	21.52* (20.06, 22.98)	Reference	Reference	

Note. CI = Confidence Interval. Significance at $p < 0.05$.
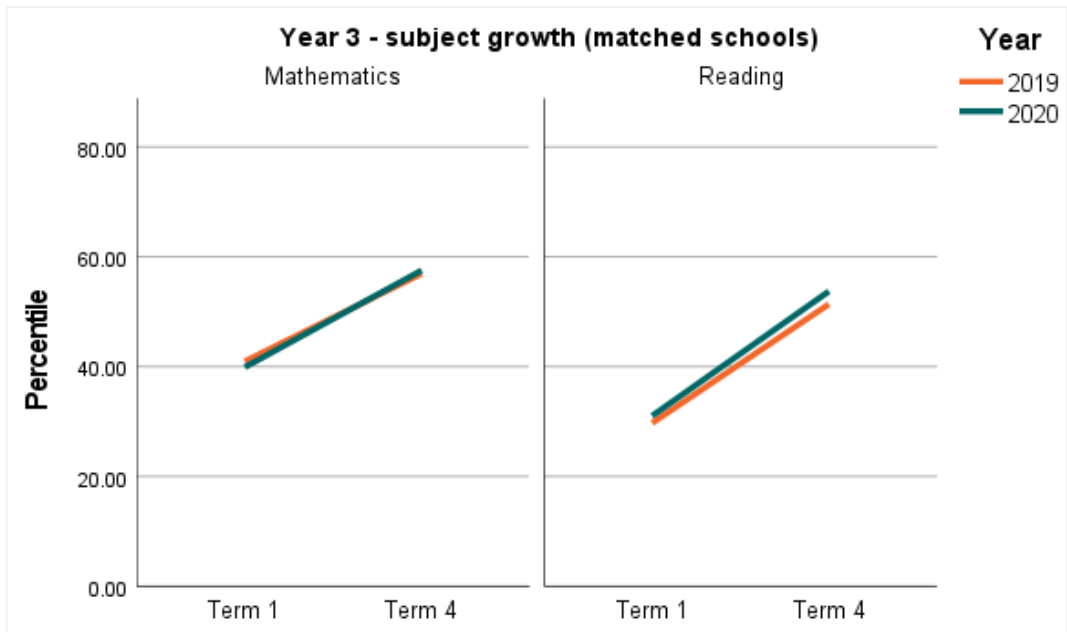
Figure 1 Year 3 student achievement in mathematics and reading (2019-2020)

Table 9 Year 3 student achievement in mathematics and reading (2019-2020) by ICSEA

Outcome	n	Baseline mean (95% CI)	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size d (95% CI)[a]	P
Year 3 Mathematics									
ICSEA <950									
2020	144	32.5 (27.78, 37.22)	0 (0)	86	124 (20)	11.66* (8.83, 14.49)	-4.03 (-7.74, -0.32)	-0.16 (-0.31, -0.01)	0.033*
2019	190	31.77 (27.47, 36.06)	1 (0.5)	91	173 (17)	15.69* (13.29, 18.09)	Reference	Reference	
ICSEA 950 - 1049									
2020	414	39.19 (35.58, 42.81)	0 (0)	91	375 (39)	18.23* (16.46, 20.01)	4.06 (1.53, 6.59)	0.15 (0.06, 0.25)	0.002*
2019	399	40.04 (36.39, 43.69)	0 (0)	90	360 (39)	14.17* (12.36, 15.98)	Reference	Reference	
ICSEA 1050+									
2020	112	51.92 (46.83, 57.02)	0 (0)	97	109 (3)	19.83* (16.71, 22.95)	1.31 (-2.74, 5.36)	0.05 (-0.11, 0.21)	0.525
2019	168	52.78 (48.25, 57.31)	4 (2.2)	95	160 (8)	18.52* (15.95, 21.1)	Reference	Reference	
Reading									
ICSEA <950									
2020	148	24.39 (20.05, 28.74)	0 (0)	85	126 (22)	18.41* (14.95, 21.87)	-1.32 (-5.88, 3.24)	-0.05 (-0.22, 0.12)	0.569
2019	193	20.98 (17.11, 24.86)	0 (0)	89	172 (21)	19.74* (16.77, 22.71)	Reference	Reference	
ICSEA 950 - 1049									
2020	401	28.58 (24.84, 32.31)	3 (0.7)	92	369 (32)	23.70* (21.69, 25.71)	2.21 (-0.64, 5.07)	0.08 (-0.02, 0.18)	0.129
2019	397	27.67 (23.94, 31.4)	0 (0)	91	361 (36)	21.49* (19.46, 23.52)	Reference	Reference	
ICSEA 1050+									
2020	115	46.34 (40.64, 52.05)	0 (0)	96	110 (5)	23.98* (20.37, 27.59)	0.48 (-4.19, 5.14)	0.02 (-0.15, 0.18)	0.841
2019	175	45.26 (40.19, 50.32)	0 (0)	94	165 (10)	23.50* (20.56, 26.45)	Reference	Reference	

Note. CI = Confidence Interval. Significance at $p < 0.05$.
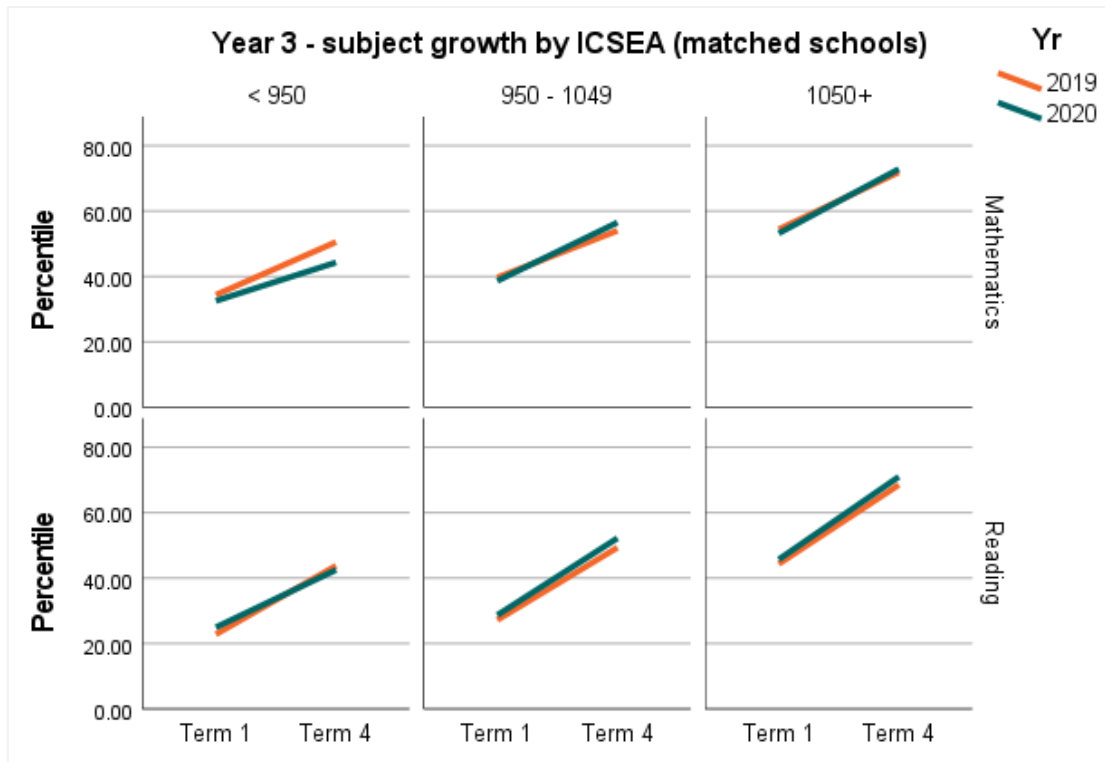
Figure 2 Year 3 student achievement in mathematics and reading (2019-2020)

3.1.1.2 Year 4 student achievement in Mathematics and Reading

There were no differences in student achievement growth recorded between the 2019 and 2020 cohorts when examined by the whole cohort or by school ICSEA. Full tables and figures supporting these outcomes are available in Tables 10 and 11 and Figures 3 and 4.

Key points

Mathematics

- No significant differences between the 2019 and 2020 cohorts (Table 10, Figure 3)
- No significant differences between the 2019 and 2020 cohorts by school ICSEA (Table 11, Figure 4)

Reading

- No significant differences between the 2019 and 2020 cohorts (Table 10, Figure 3)
- No significant differences between the 2019 and 2020 cohorts by school ICSEA (Table 11, Figure 4)

Table 10 Year 4 student achievement in mathematics and reading (2019-2020)

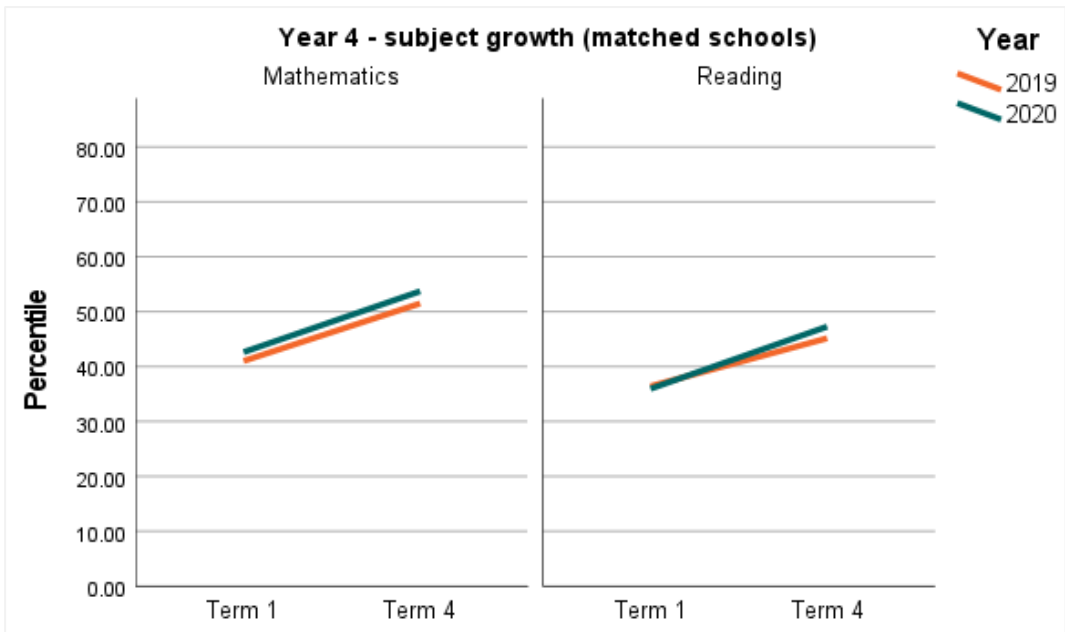| Outcome	*n*	Baseline mean (95% CI)	Ceiling *n* (%)	Retest %	*n* (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size *d* (95% CI)[a]	*P*
Year 4									
Mathematics									
2020	730	43.19 (39.57, 46.82)	7 (0.9)	91	662 (68)	10.62* (9.41, 11.83)	-0.15 (-1.84, 1.53)	-0.01 (-0.07, 0.06)	0.857
2019	768	42.63 (39.03, 46.23)	6 (0.7)	92	706 (62)	10.78* (9.61, 11.95)	Reference	Reference	
Reading									
Year 4									
2020	722	37.61 (34.01, 41.2)	2 (0.3)	89	645 (77)	10.53* (9.08, 11.98)	1.8 (-0.18, 3.79)	0.07 (-0.01, 0.14)	0.075
2019	793	38.19 (34.66, 41.71)	2 (0.2)	94	742 (51)	8.73* (7.38, 10.09)	Reference	Reference	

Note. CI = Confidence Interval. Significance at *p* < 0.05.

Figure 3 Year 4 student achievement in mathematics and reading (2019-2020)

Table 11 Year 4 student achievement in mathematics and reading (2019-2020) by ICSEA

Outcome	n	Baseline mean (95% CI)	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size d (95% CI)[a]	P
Year 4 Mathematics									
ICSEA <950									
2020	148	29.91 (24.62, 35.2)	0 (0)	84	125 (23)	11.49* (8.96, 14.02)	-1.17 (-5, 2.65)	-0.05 (-0.22, 0.12)	0.545
2019	108	29.2 (23.64, 34.75)	0 (0)	92	99 (9)	12.66* (9.80, 15.52)	Reference	Reference	
ICSEA 950 - 1049									
2020	320	39.83 (36.1, 43.56)	0 (0)	92	293 (27)	10.18* (8.36, 12.01)	-0.90 (-3.41, 1.61)	-0.04 (-0.14, 0.07)	0.483
2019	358	40.09 (36.48, 43.70)	0 (0)	91	327 (31)	11.08* (9.36, 12.81)	Reference	Reference	
ICSEA 1050+									
2020	262	56.13 (52.28, 59.98)	7 (2.6)	93	244 (18)	10.67* (8.61, 12.72)	0.90 (-1.91, 3.72)	0.04 (-0.08, 0.15)	0.528
2019	302	55.33 (51.63, 59.04)	6 (1.9)	93	280 (22)	9.76* (7.84, 11.68)	Reference	Reference	
Reading									
ICSEA <950									
2020	138	26.15 (20.71, 31.59)	0 (0)	84	116 (22)	11.11* (7.94, 14.28)	3.68 (-0.79, 8.15)	0.15 (-0.03, 0.34)	0.106
2019	124	27.09 (21.74, 32.45)	0 (0)	97	120 (4)	7.43* (4.28, 10.58)	Reference	Reference	
ICSEA 950 - 1049									
2020	315	32.46 (28.94, 35.98)	0 (0)	90	283 (32)	12.37* (10.20, 14.54)	0.11 (-2.85, 3.06)	0.00 (-0.11, 0.12)	0.944
2019	359	33.11 (29.74, 36.49)	0 (0)	92	332 (27)	12.27* (10.26, 14.27)	Reference	Reference	
ICSEA 1050+									
2020	269	51.76 (48.1, 55.42)	2 (0.7)	91	246 (23)	8.12* (5.73, 10.51)	2.87 (-0.38, 6.12)	0.11 (-0.01, 0.23)	0.084
2019	310	53.49 (50, 56.97)	2 (0.6)	94	290 (20)	5.25* (3.05, 7.45)	Reference	Reference	

Note. CI = Confidence Interval. Significance at $p < 0.05$.

Figure 4 Year 4 student achievement in mathematics and reading (2019-2020) by ICSEA

3.1.1.3 Student achievement by location

A summary of achievement growth in mathematics and reading for students in regional locations and major cities[4] is displayed in Table 12. Students in major cities demonstrated one-month's additional growth (d = 0.08; 95% CI = 0.00, 0.17; p = 0.047) in reading (Table 13, Figures 5 and 6). There were no significant differences in mathematics (Table 13, Figures 5 and 6). Due to the relatively small samples used in this analysis, and the fact that 'regional' was defined as outside major cities, these results should be interpreted with caution.

Table 12 Student achievement by subject and location (2019-2020)

Year	Location	Mathematics	Reading
3	Major cities		
	Regional		
4	Major cities		+ 1 month
	Regional		

Note.   Blank cells denote no significant difference between the 2019 and 2020 cohorts

[4] School location was classified using the Australian Statistical Geography Standard (ASGS) Remoteness Structure (2020).

Key points

Reading

- No significant differences between the 2019 and 2020 cohorts, Year 3 students (Table 13, Figure 5)
- Year 4 students in major cities showed one month more growth in 2020 than the equivalent 2019 cohort (d = 0.08; 95% CI = 0.00, 0.17; p = 0.047)[5] (Table 13, Figure 6)

Mathematics

- No significant differences between the 2019 and 2020 cohorts, Year 3 students (Table 13, Figure 5)
- No significant differences between the 2019 and 2020 cohorts, Year 4 students (Table 13, Figure 6)

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[5] While this result is significant using a traditional p value of <0.05, it is no longer significant using a Bonferroni adjusted alpha of <0.025 given the two primary outcomes of achievement growth in reading and mathematics.

Table 13 Year 3 and 4 student achievement in mathematics and reading (2019-2020) by location

Outcome	n	Baseline mean (95% CI) [a]	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI) [a]	Adjusted mean difference (95% CI) [a]	Adjusted effect size d (95% CI) [a]	P
Year 3									
Mathematics									
Major cities									
2020	481	58.90 (55.06, 62.74)	0 (0)	93	447 (34)	17.53* (15.9, 19.16)	1.86 (-0.52, 4.24)	0.07 (-0.02, 0.15)	0.125
2019	431	59.22 (54.97, 63.47)	4 (0.9)	92	395 (36)	15.67* (13.94, 17.4)	Reference	Reference	
Regional									
2020	189	35.77 (30.05, 41.48)	0 (0)	85	161 (28)	16.27* (13.74, 18.79)	0.87 (-2.26, 4.01)	0.03 (-0.09, 0.16)	0.585
2019	326	36.31 (31.76, 40.86)	1 (0.3)	91	298 (28)	15.39* (13.53, 17.25)	Reference	Reference	
Reading									
Major cities									
2020	484	32.04 (27.82, 36.26)	2 (0.4)	94	454 (30)	22.63* (20.79, 24.47)	0.43 (-2.25, 3.11)	0.01 (-0.07, 0.10)	0.753
2019	438	33.81 (29.15, 38.47)	0 (0)	92	405 (33)	22.20* (20.26, 24.15)	Reference	Reference	
Regional									
2020	180	26.80 (21.40, 32.21)	1 (0.5)	84	151 (29)	22.73* (19.68, 25.78)	2.14 (-1.63, 5.90)	0.08 (-0.06, 0.21)	0.265
2019	327	23.74 (19.52, 27.95)	0 (0)	90	293 (34)	20.59* (18.39, 22.80)	Reference	Reference	
Year 4									
Mathematics									
Major cities									
2020	626	45.55 (41.61, 49.48)	7 (1.1)	91	568 (58)	10.48* (9.17, 11.79)	-0.36 (-2.26, 1.54)	-0.01 (-0.09, 0.06)	0.710
2019	548	46.31 (41.89, 50.74)	6 (1.1)	93	511 (37)	10.84* (9.46, 12.22)	Reference	Reference	
Regional									
2020	104	33.19 (26.36, 40.02)	0 (0)	90	94 (10)	11.50* (8.30, 14.71)	0.90 (-3.00, 4.80)	0.04 (-0.12, 0.20)	0.649
2019	220	36.64 (31.76, 41.52)	0 (0)	89	195 (25)	10.60* (8.38, 12.82)	Reference	Reference	
Reading									
Major cities									
2020	621	39.41 (35.44, 43.38)	2 (0.3)	89	554 (67)	11.10* (9.51, 12.7)	2.32 (0.03, 4.61)	0.08 (0.00, 0.17)	0.047*
2019	559	42.17 (37.72, 46.61)	2 (0.4)	94	524 (35)	8.78* (7.14, 10.43)	Reference	Reference	
Regional									
2020	101	30.72 (24.15, 37.28)	0 (0)	90	91 (10)	7.17* (3.58, 10.76)	-1.46 (-5.73, 2.81)	-0.06 (-0.22, 0.11)	0.502
2019	234	31.89 (27.40, 36.38)	0 (0)	93	218 (16)	8.63* (6.31, 10.95)	Reference	Reference	

Note. CI = Confidence Interval. Significance at *p* < 0.05.
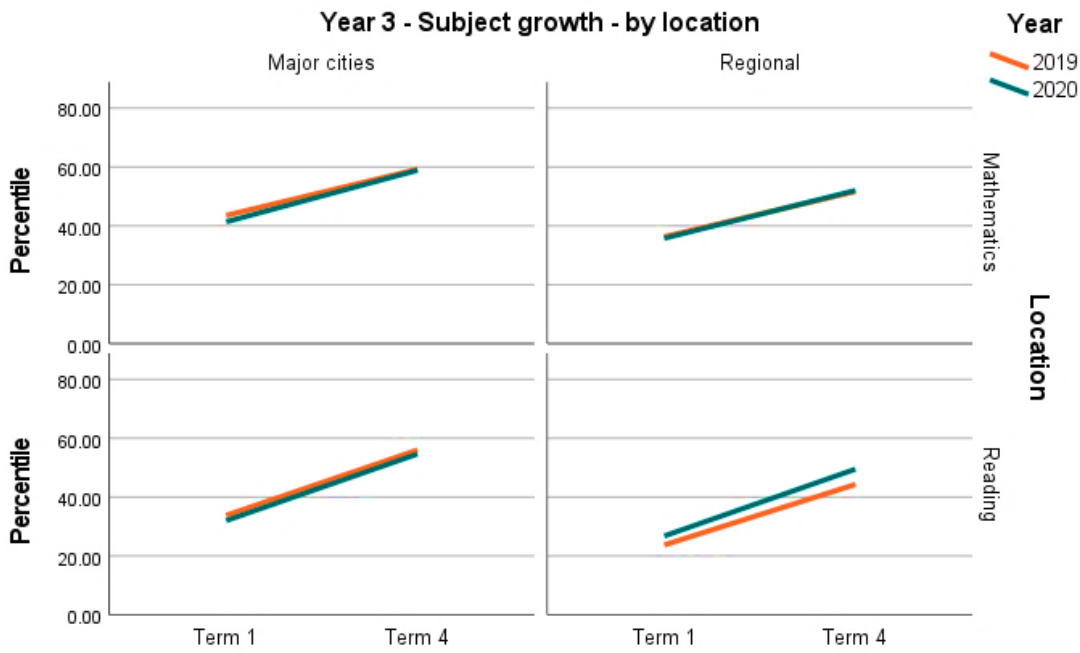
Figure 5 Year 3 student achievement in mathematics and reading (2019-2020) by location
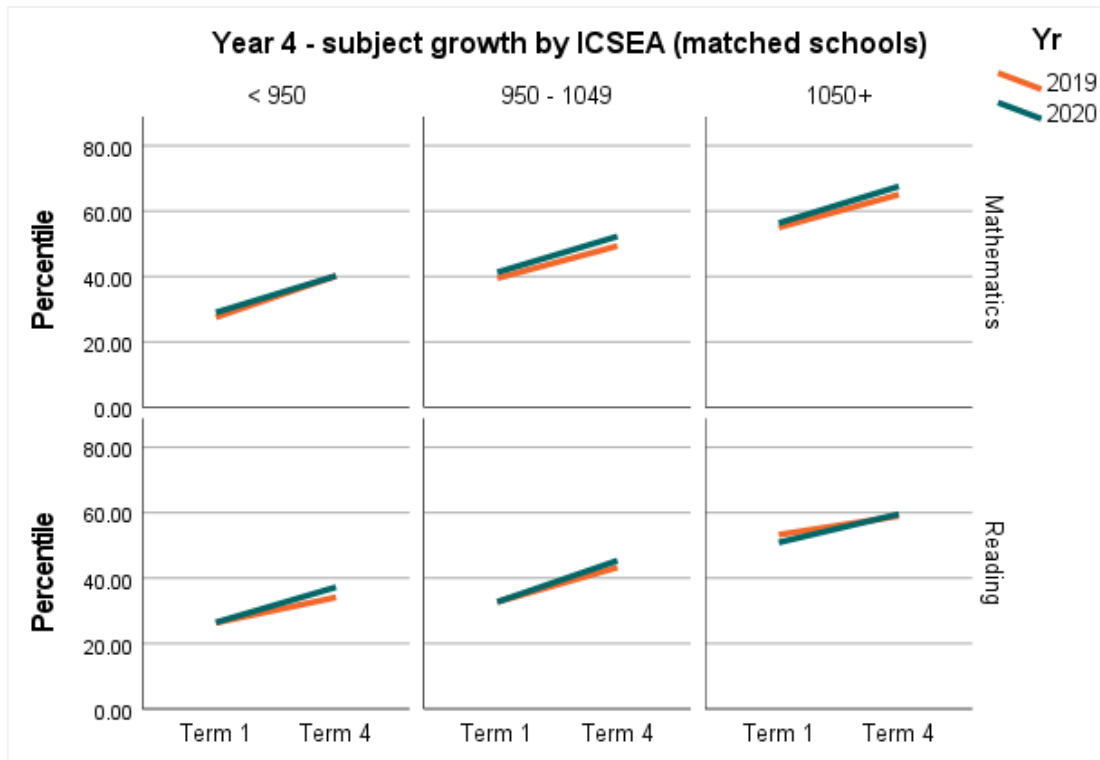

Figure 6 Year 4 Student achievement in mathematics and reading (2019-2020) by location

3.1.1.4   Regional student achievement by ICSEA

A summary of achievement growth in mathematics and reading for students in regional locations by ICSEA is displayed in Table 14. Year 3 students in mid-ICSEA schools demonstrated three months' additional growth (d = 0.20; 95% CI = 0.02, 0.38; p = 0.033) in reading (Table 15, Figure 7). There were no significant differences in

mathematics (Table 15, Figures 7 and 8). It should be noted that while there were no significant differences (p < 0.05) at baseline between year groups when evaluated by ICSEA grouping, school location was not included in the matching procedure. This explains the slight differences observed at baseline for the regional cohorts.

Table 14 Year 3 and 4 regional student achievement in mathematics and reading (2019-2020) by ICSEA

Year	ICSEA	Mathematics	Reading
3	**Low**		
	Mid		+ 3 months
4	**Low**		
	Mid		

Note.   Blank cells denote no significant difference between the 2019 and 2020 cohorts. There were no high ICSEA schools in regional areas in the matched sample.

Key points

Reading

- Year 3 students in mid-ICSEA schools (950-1050) showed three months' additional growth in 2020 than the equivalent 2019 cohort (d = 0.20; 95% CI = 0.02, 0.38; p = 0.033)[6] (Table 15, Figure 7)
- No significant differences between the 2019 and 2020 cohorts, Year 4 students (Table 15, Figure 8)

Mathematics

- No significant differences between the 2019 and 2020 cohorts, Year 3 students (Table 15, Figure 7)
- No significant differences between the 2019 and 2020 cohorts, Year 4 students (Table 15, Figure 8)

---

[6] While this result is significant using a traditional p value of <0.05, it is no longer significant using Bonferroni adjusted alpha of <0.025 given two primary outcomes (reading and mathematics).

Table 15 Year 3 and 4 regional student achievement in mathematics and reading (2019-2020) by ICSEA

Outcome	n	Baseline mean (95% CI) [a]	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI) [a]	Adjusted mean difference (95% CI) [a]	Adjusted effect size d (95% CI) [a]	P
Year 3 - Regional by ICSEA									
Mathematics									
<950									
2020	58	30.91 (23.46, 38.35)	0 (0)	83	48 (10)	13.54* (9.12, 17.96)	-1.93 (-6.97, 3.11)	-0.08 (-0.28, 0.13)	0.451
2019	179	31.71 (26.94, 36.48)	1 (0.5)	91	162 (17)	15.47* (13.05, 17.89)	Reference	Reference	
950 - 1049									
2020	131	38.80 (32.37, 45.22)	0 (0)	86	113 (18)	17.38* (14.22, 20.53)	2.69 (-1.79, 7.18)	0.11 (-0.07, 0.29)	0.238
2019	123	38.66 (32.29, 45.03)	0 (0)	91	112 (11)	14.69* (11.50, 17.87)	Reference	Reference	
Reading									
<950									
2020	55	23.62 (16.49, 30.75)	0 (0)	80	44 (11)	14.34* (8.92, 19.77)	-5.28 (-11.41, 0.85)	-0.20 (-0.43, 0.03)	0.091
2019	182	21.20 (16.91, 25.50)	0 (0)	88	161 (21)	19.63* (16.77, 22.48)	Reference	Reference	
950 - 1049									
2020	125	28.94 (22.15, 35.73)	1 (0.8)	86	107 (18)	26.18* (22.55, 29.8)	5.57 (0.45, 10.68)	0.20 (0.02, 0.38)	0.033*
2019	122	24.48 (17.83, 31.13)	0 (0)	89	109 (13)	20.61* (17, 24.21)	Reference	Reference	
Year 4 - Regional by ICSEA									
Mathematics									
<950									
2020	58	43.78 (35.19, 52.37)	0 (0)	88	51 (7)	12.52* (8.60, 16.43)	-0.40 (-5.43, 4.64)	-0.02 (-0.23, 0.20)	0.877
2019	87	43.80 (36.92, 50.68)	1 (0.5)	90	78 (9)	12.91* (9.74, 16.08)	Reference	Reference	
950 - 1049									
2020	46	35.47 (25.04, 45.89)	0 (0)	93	43 (3)	10.31* (5.07, 15.54)	1.37 (-4.87, 7.61)	0.05 (-0.19, 0.30)	0.665
2019	116	39.95 (32.82, 47.08)	0 (0)	87	101 (15)	8.94* (5.54, 12.34)	Reference	Reference	
Reading									
<950									
2020	57	30.93 (22.68, 39.18)	0 (0)	86	49 (8)	5.58* (0.82, 10.34)	-1.69 (-7.53, 4.14)	-0.07 (-0.30, 0.17)	0.567
2019	103	27.71 (21.56, 33.86)	0 (0)	96	99 (4)	7.28* (3.90, 10.65)	Reference	Reference	
950 - 1049									
2020	44	31.24 (22.77, 39.72)	1 (0.8)	95	42 (2)	9.06* (3.78, 14.33)	-0.96 (-7.22, 5.30)	-0.04 (-0.27, 0.20)	0.762
2019	114	34.27 (28.69, 39.84)	0 (0)	90	103 (11)	10.02* (6.66, 13.38)	Reference	Reference	

Note. CI = Confidence Interval. Significance at $p < 0.05$.
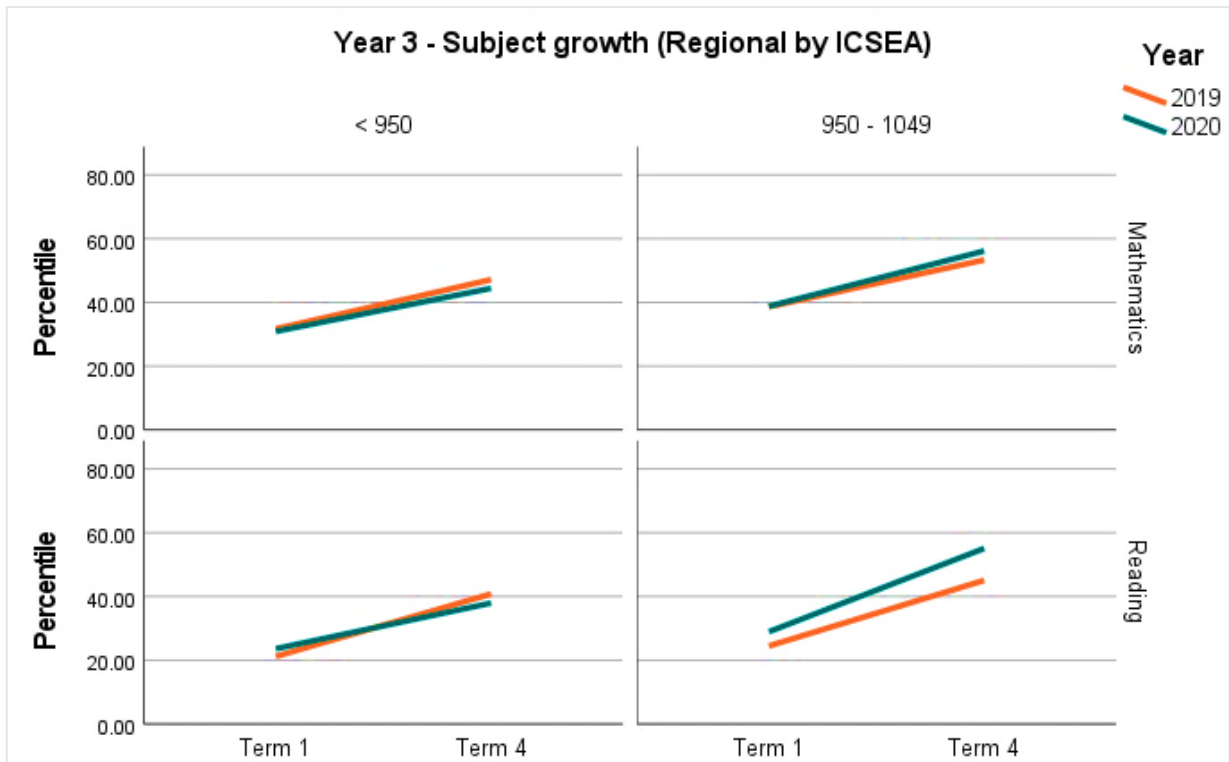
Figure 7 Year 3 regional student achievement in mathematics and reading (2019-2020) by ICSEA
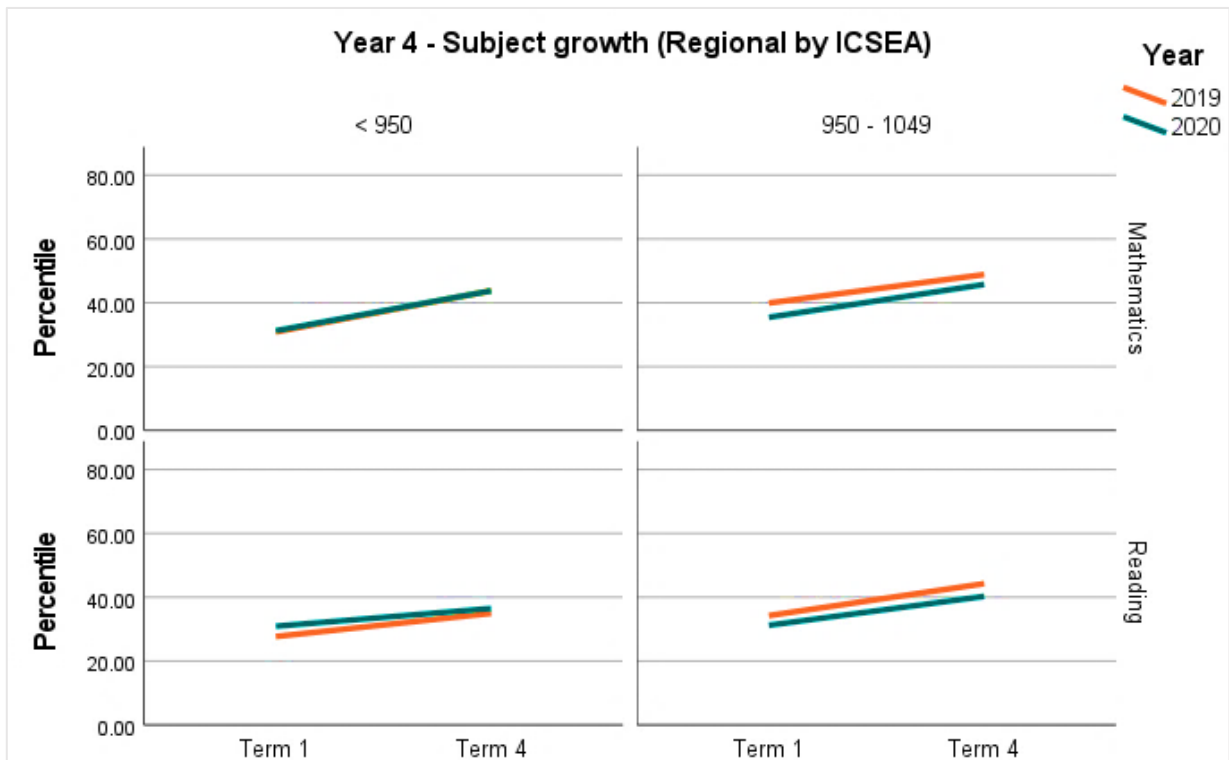
Figure 8 Year 4 regional student achievement in mathematics and reading (2019-2020) by ICSEA

3.1.1.5 Indigenous student achievement

For the Indigenous students in the sample, no differences in achievement growth were recorded between the 2019 and 2020 cohorts, by subject (Table 16, Figures 9 and 10). Due to the relatively small samples used in this analysis we were unable to analyse Indigenous student achievement by school ICSEA. For this reason, these results should be interpreted with caution.

Key points

Reading

- No significant differences between the 2019 and 2020 cohorts, Year 3 students (Table 16, Figure 9)
- No significant differences between the 2019 and 2020 cohorts, Year 4 students (Table 16, Figure 10)

Mathematics

- No significant differences between the 2019 and 2020 cohorts, Year 3 students (Table 16, Figure 9)
- No significant differences between the 2019 and 2020 cohorts, Year 4 students (Table 16, Figure 10)

Table 16 Indigenous student achievement in mathematics and reading (2019-2020)

Outcome	*n*	Baseline mean (95% CI)	Ceiling *n* (%)	Retest %	*n* (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size *d* (95% CI)[a]	*P*
Year 3 Indigenous Mathematics									
2020	58	31.13 (23.97, 38.30)	0 (0)	78	45 (13)	12.43* (7.39, 17.47)	-2.21 (-8.88, 4.45)	-0.09 (-0.36, 0.18)	0.512
2019	69	27.14 (20.47, 33.82)	0 (0)	88	61 (8)	14.65* (10.28, 19.01)	Reference	Reference	
Reading									
2020	59	38.67 (31.73, 45.60)	0 (0)	78	46 (13)	17.58* (12.16, 23.01)	0.28 (-6.92, 7.47)	0.01 (-0.28, 0.31)	0.939
2019	69	35.59 (29.30, 41.88)	0 (0)	90	62 (7)	17.30* (12.58, 22.03)	Reference	Reference	
Year 4 Indigenous Mathematics									
2020	37	28.69 (19.93, 37.44)	0 (0)	81	30 (7)	15.32* (10.96, 19.69)	1.65 (-4.77, 8.06)	0.07 (-0.20, 0.33)	0.610
2019	30	29.42 (20.20, 38.65)	0 (0)	87	26 (4)	13.68* (8.98, 18.38)	Reference	Reference	
Reading									
2020	36	39.77 (31.80, 47.74)	0 (0)	81	29 (7)	14.05* (8.50, 19.60)	4.80 (-3.21, 12.81)	0.20 (-0.13, 0.53)	0.235
2019	31	36.44 (27.99, 44.90)	0 (0)	87	27 (4)	9.25* (3.48, 15.02)	Reference	Reference	

Note. CI = Confidence Interval. Significance at *p* < 0.05.

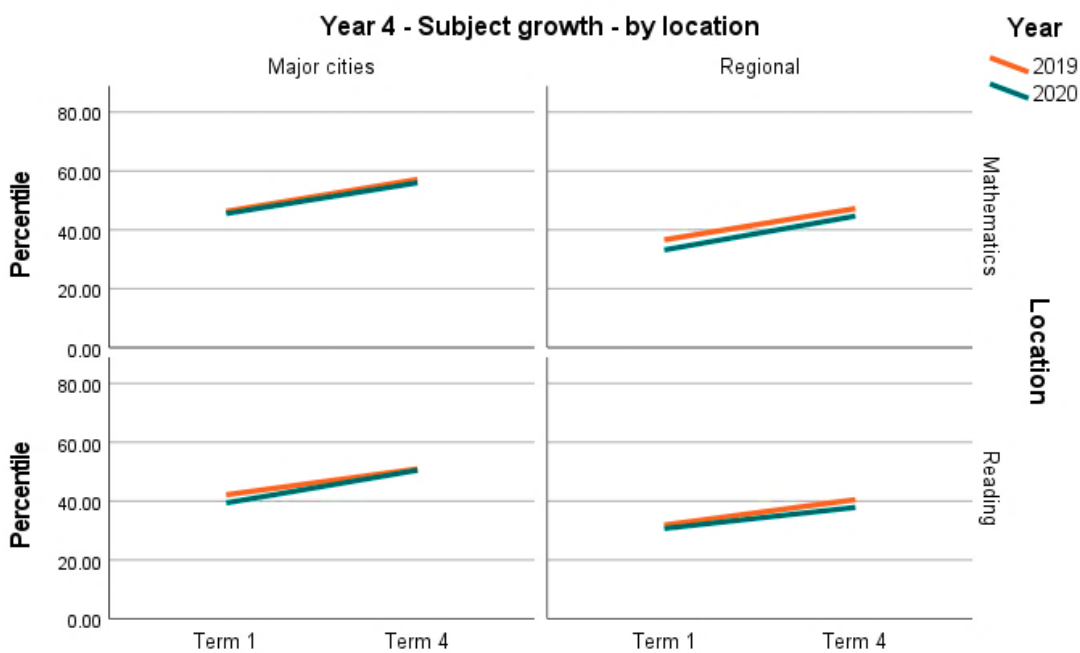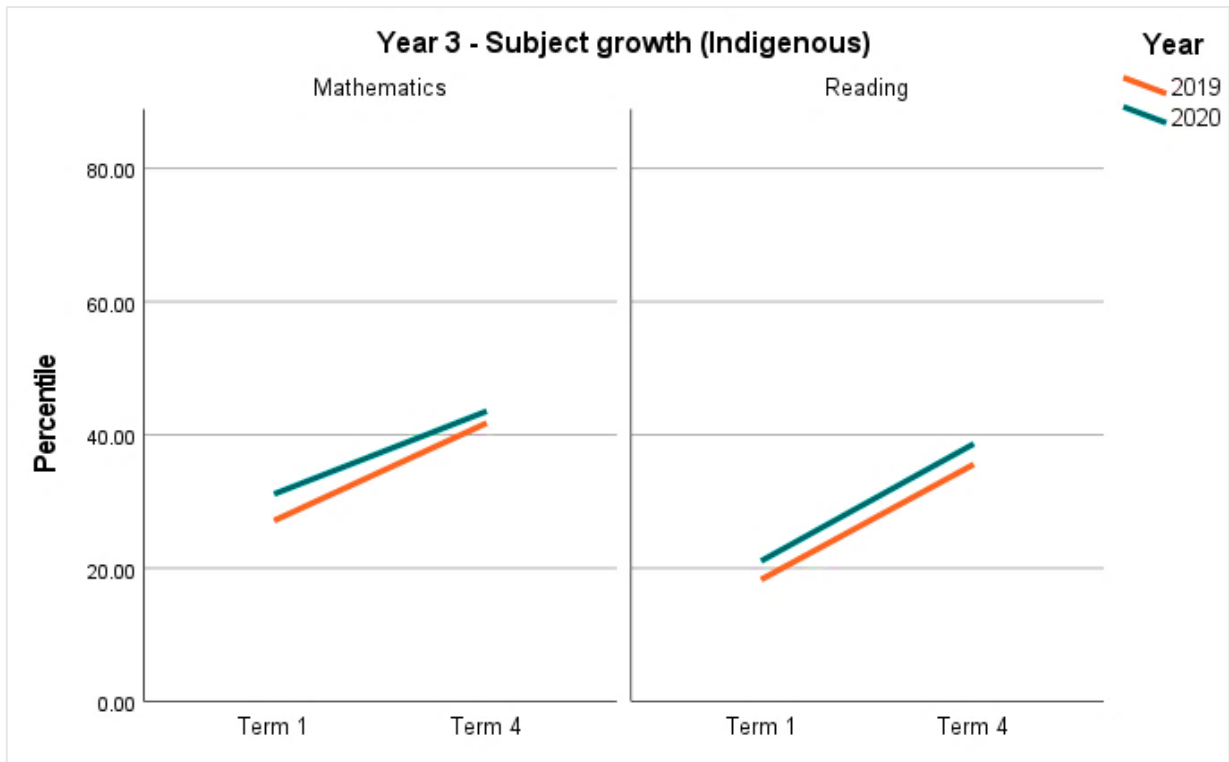**Figure 9 Year 3 Indigenous student achievement in mathematics and reading (2019-2020)**
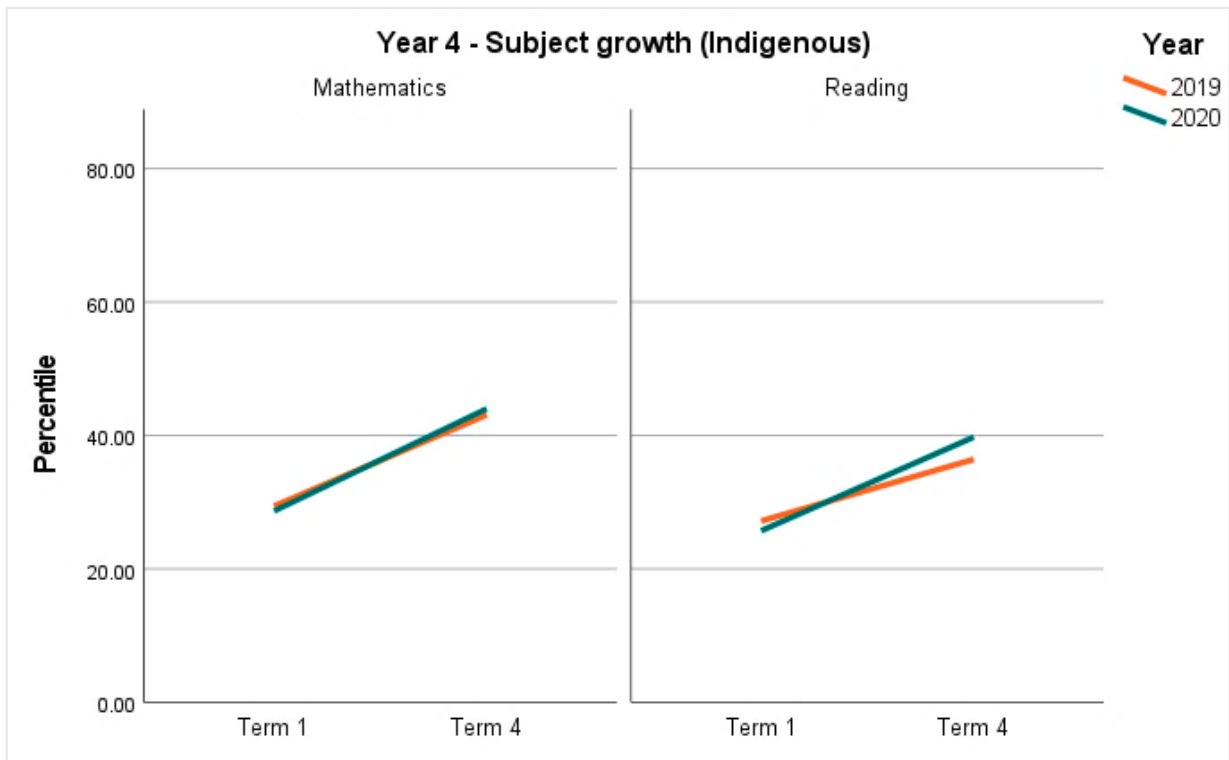
Figure 10 Year 4 Indigenous student achievement in mathematics and reading (2019-2020)

3.1.2   Instructional volume

The average time per week dedicated to each subject area was investigated via the teacher survey. Completed in Term 4, 2019 and at four time points in 2020 (Term 1, Term 2, Term 3 and Term 4), teachers were asked "*How many hours a week on average do your students spend learning the following subjects (to the nearest hour): for numeracy (mathematics), literacy (reading), reading for comprehension, and science?*" Reading for comprehension was included as a subset of literacy because the reading test largely focuses on this capability. As noted earlier, science was not included in these analyses.

Teachers reported providing the largest volume of instruction in reading, followed by mathematics (Table 17). Reported time spent in reading for comprehension, as a specific reading focus, was approximately half that of the reported time spent in mathematics instruction, across all groups. Overall, more time was spent on literacy in the 2020 group ($\bar{x}$ = 9.52 hours per week) compared to 2019 ($\bar{x}$ = 8.48) and on reading for comprehension in 2020 ($\bar{x}$ = 3.48 hours per week) compared to 2019 ($\bar{x}$ = 3.07). Numeracy was reported as receiving more time during 2020 ($\bar{x}$ = 6.76) than in 2019 ($\bar{x}$ = 6.74) – this was particularly true for Term 4 ($\bar{x}$ = 7.04), after the return to schooling.

Table 17 Instructional volume (hours per week) in literacy, reading and numeracy (2019-2020)

Subject area	Term	2019 hrs/week Mean (SD)	N	2020 hrs/week Mean (SD)	N
Literacy total	T1			9.27 (2.31)	41
	T3			9.36 (2.52)	39
	T4	8.48 (3.83)		9.87 (3.23)	47
	Total	**8.48 (3.83)**	**27**	**9.52 (2.74)**	**127**
Reading for comprehension	T1			3.24 (1.61)	41
	T3			3.26 (1.83)	39
	T4	3.07 (1.84)		3.87 (1.95)	47
	Total	**3.07 (1.84)**	**27**	**3.48 (1.82)**	**127**
	T1			6.46 (1.91)	41
Numeracy	T3			6.74 (2.06)	39
	T4	6.74 (3.84)		7.04 (2.23)	47
	Total	**6.74 (3.84)**	**27**	**6.76 (2.08)**	**127**

3.1.3   Impact on student achievement – perceptions of teachers and school leaders

In the following section, we report on major themes emerging from interviews with teachers and school leaders. Representative quotes are used to highlight the key themes identified. Enormous variation was reported in the effects of learning from home on student achievement, with some noting that students had *fallen behind* where they should be and others reporting *increased development* in relation to specific areas such as reading, writing and use of technology. Significant concern was expressed about the impact of the pandemic on future student

learning, particularly for students from disadvantaged and vulnerable backgrounds. In short, as was apparent with the PAT data, the impact on student learning varied significantly across schools and individual students.

3.1.3.1 Concern about learning loss

In some schools, teachers and leaders reported major concern about students falling behind, based on classroom testing and the formal *Check-in Assessment* administered by the NSW Department of Education (2020a). Katherine and Sarah, school leaders from regional areas, told us:

> We did find when we got the kids back in that we did have… like, we lost a lot of time of their learning. We had gone backwards. Because we tested them when we came back in, and so kids… They'd either marked time or gone backwards. Nobody had really excelled or taken off…So that was… Then we decided we would try and play catch-up. That was my big push. We're going to work harder to catch up. So, we felt there was a loss in learning. (Katherine, school leader, school 12, regional, mid ICSEA)

> It's been negative. So, the return rate of work, well down. …Ultimately, we found out by 1) the work that did or didn't come back; and 2) we were continually doing assessments all the way through, so you're seeing where kids are at. But the other thing is, the Department…came up with an assessment called the *Check-in Assessment*, and the Check-in was supposed to be for Years 3, 5, 7 and 9, so that schools could be informed of how students have been going, and we can see that it's not great. (Sarah, school leader, school 3, regional, low ICSEA)

Despite such reports that student achievement during learning from home was 'not great' or that students had 'gone backward', we also see in these quotes that teachers are working hard or harder ('catch up,' my 'big push') to make up what they see as losses in learning. However, there was considerable variation among schools and among students. For example, school leaders Rachel and Lauren, told us:

> It depends on the child. There'd be some children that there's been no loss of learning, and that they were engaged and had engaged parents that were very supportive during the period of time, and good wrap around, good emotional wrap around. … to the other extreme of either no capacity to engage, an unwillingness to engage. We had some parents that decided that the work that was sent home wasn't important, and were sort of… I mean, they weren't doing bad things, but decided that they were just going to sort of… Montessori meets Steiner in a mad way. They had their kids out digging worms in the garden. (Rachel, school leader, school 13, major city, high ICSEA)

> So, the teachers tell me students who were engaged regularly [during closedown], they had demonstrated sound achievement. But the students who did not engage, have shown little or no academic growth at all. (Lauren, school leader, school 6, major city, mid ICSEA).

Learning, according to teachers and school leaders, was dependent on two key factors: 1) the support students received at home, and 2) student engagement in remote learning. Rachel, a school leader, described the extremes – ranging from parents with "no capacity to engage" in their children's learning to those who were engaged and 'very supportive'.

However, there were worrying signs for students who were working below stage level prior to the COVID-19 pandemic, either 'going backwards' or 'missing out.' Melissa and Alya explain:

> I definitely think my ones that were already working below stage level, they haven't progressed; if not, some of them have gone backwards, in terms of reading and literacy skills. So, I think the gap widened a lot more for them. (Melissa, teacher, school 3, regional, low ICSEA)

> Definitely. Yes. I feel that a whole term, at least, they've missed out, I feel, on a whole term. And I just sometimes reflect on how much we could have prepared these kids, or how much these kids have missed out on a whole term. …But there are other kids who struggle, and their struggles are going to get wider and wider as time goes by. (Alya, teacher, school 5, major city, low ICSEA)

The learning of students from key equity groups was also negatively affected. Students in less advantaged schools, regional areas, and those from key equity groups faced greater challenges in completing learning from home activities, impacting their learning outcomes. For example:

> They [classroom teachers] tell me students with learning disabilities and difficulties have dropped in academic and social achievement. And that's possibly because they don't have the heavy support the teachers… give our disability and learning difficulty kids. …We found that the inequity of student backgrounds, so such as low SES, dysfunctional families, ATSI, disabilities, two parent working families really impacted on the achievement of students during COVID. (Lauren, school leader, school 6, major city, mid ICSEA)

> So those kids, the ones that were additional needs, basically were the ones that suffered because they missed out. They weren't participating at home, so they dropped back. (Jessica, teacher, school 2, regional, low ICSEA)

The negative effects on the learning of students who attend schools in low-SES communities were compounded by a lack of support for online learning. For example, Samantha, a teacher from a school in a low-SES community told us:

> So, we're from quite a low socioeconomic community and that, I feel, has really impacted the way that students and families were able to participate in learning during this time. Because obviously it was very heavily reliant on devices, and we didn't get any help with that. I think the government promise, that sort of never came through. (Samantha, teacher, school 1, regional, low ICSEA)

Ensuring students had access to online learning had been identified as a priority. As a result, a program designed to lend students laptops and provide internet dongles during learning from home was put in place (Hendry, 2020; NSW Department of Education, 2020c) but reported by our participants to have limited success. Teachers experienced either: 1) not receiving this additional support; 2) receiving the support too late, "we qualified for 500 devices after we completed the questionnaire. We received 50, but we received them halfway through Term 2" (Sarah, school leader, school 3, regional, low ICSEA); or, 3) not having access to the infrastructure to support

the devices, "…internet dongles didn't work unfortunately because the telephone service in [town] is really, really poor, so that wasn't an option" (James, school leader, school 4, regional, low ICSEA).

> As much as I'd like to think that we did the best job we could, I think the curriculum that we delivered during that time was far less. There was far less content than we would have liked to [address]. The difference between what some students were doing, and other students were doing was enormous. So, we couldn't rely on that and then when we returned to school, we couldn't rely on that, the information, and the data we got from that. For a variety of reasons, one is we don't know how much parent support each student has had. So, it was very difficult to assess in that period as to how much learning students were getting. (Mark, teacher, school 8, regional, mid ICSEA)

3.1.3.2 Reports of minimal change and even gains in student achievement

Almost all existing literature on school disruption as a result of the COVID-19 pandemic has predicted major losses in student learning, with considerable concern shown for students from key equity groups (Baker, 2020b; Pedro Azevedo et al., 2020; Schleicher, 2020b). However, relatively little commentary has anticipated either no change, or indeed gains, in student achievement. Some teachers and school leaders reported minimal change, attributing this result, in part, to the support of parents during learning from home. Natalie, for example, said:

> On student achievement? That's a hard one. To be honest, I haven't seen, academically, a big, fall behind. In my class, I have not seen that, and other teachers have said along similar lines. We thought, "Oh, they're going to come back to school. They're going to be so far behind." A lot of people had thought that and that was not the case. That wasn't the case. You can miss out on a term and it's important, but it's not that big of an impact. They were still doing things and again, the parents played a very big part in maintaining the activities with their children. (Natalie, teacher, school 7, major city, mid ICSEA)

In other schools, teachers and school leaders reported improvements in some areas of student learning and declines in other areas. For example, Katherine and Kelly told us:

> They probably improved in writing, because they did a lot more… they had to do a lot more writing skills, and probably that was a better set task as a learning from home task. Because writing takes a long time at school, and we often don't have that timeframe to do a full, good… you know. …So, their writing wasn't too bad. We just noticed reading had gone back. (Katherine, school leader, school 12, regional, mid ICSEA)

> So, kids really jumped in their reading because they were home, but they were reading with mum and dad. …I've noticed in my class quite a big jump, but not all …because some kids didn't have a parent that was sitting there to read with them. So, some of my kids have progressed in reading really well. (Kelly, teacher, school 10, regional, mid ICSEA)

Perhaps unsurprisingly given the vast increase in the use of technology during learning from home (Selwyn, 2020), other improvements in student learning were related to improvements in computing and technology:

> I think the kids have got better ... they're more able to manipulate the computer a little bit more. Their typing skills have 100% improved. Since we've come back, we've done lots of publishing on the

laptops and rather than taking three lessons to publish a page worth of work, they're taking 30 minutes. So, I think just having to constantly be on and doing typing rather than writing - not that it's a substitute or anything - but I think that that has helped with their technology skills and their laptop skills. (Nicole, teacher, school 12, regional, mid ICSEA)

Overall, teachers reported that students who were well supported while learning from home demonstrated minimal loss in learning or showed some growth in some areas of the curriculum.

3.1.3.3   Concern about longer term impact

With almost all learning building on prior understanding (Hanuschek & Woessmann, 2020), one key area of concern for teachers and school leaders was how the disruption caused by the pandemic might impact student learning in the future. Many teachers were troubled by the possible long-term effects of learning from home and speculated on the influence on future learning. For example:

> I definitely just think this whole year is a bit of a write-off. Yeah. They're going to have long-term effects in terms of what they've sort of missed during that time. That will carry on through to next year. You know, they'll still have that gap that will continue to be there. Hopefully we can shrink it, make it smaller; but I'm just not sure. (Melissa, teacher, school 3, regional, low ICSEA)

Mark, a teacher from a regional school took a slightly different view of the impact on future learning. He suggested that while there might be short-term impact on student achievement, the impact, particularly for younger students, would not be noticeable in a short time:

> But we were really only away from the school for 8-10 weeks, I guess. It was that sort of block at the most. So, look, it will have all have had an impact, but I think for students at the age I teach in those Years, 3 and 4, I don't think it'll be noticeable in six months' time. (Mark, teacher, school 8, regional, mid ICSEA)

Others suggested that while learning lost by students could be made up in within a school stage (two-year period), students moving onto the next stage of schooling might face greater challenges. Missing out on key background knowledge for the next stage of schooling could have significant effects on future learning. Mateo and Kelly elaborate:

> I think the biggest jump will be from stages. So, going from Stage two to Stage three, and Stage one to Stage two, due to mainly for the fact that because when you start Stage two, so Year 3 and 4, the content that they're learning is similar. So, we are able to catch it up when they come to us next year, for Year 3…So, when the students are going up to Year 5 and 6, obviously they're learning different content. And if they haven't had the background skills, and obviously due to COVID, and they haven't been able to be full-time, that moving showed the biggest impact, there. (Mateo, teacher, school 13, major city, high ICSEA)

> But yeah, that's going to be a really interesting one I think come the end of the year, because there's also chunks of the curriculum that are just not going to get taught to the detail that you would normally teach simply because of time factors now. We were looking at maths and all the streams

that we have to teach this year. Some of them have to give somewhere. (Kelly, teacher, school 10, regional, mid ICSEA)

School leaders and teachers reported being proactive in trying to ensure that any learning lost while students were learning from home was made up once students returned to school. COVID-19 restrictions meant that in many schools, assemblies, interschool sport, sporting carnivals and school excursions were curtailed, and school visitors were prohibited. This meant far more time in the classroom. Samantha, for example, said:

> I don't think that it has impacted student achievement too much, because I feel like in the last term or so, we've had a lot of time in class without distractions, where we can catch up, and I feel like… We've sort of adjusted our terms. …I feel we didn't have… We haven't had assemblies, we haven't been able to have interschool sports and carnivals, and stuff like that; so, we're spending a lot more time in the classroom. So, I feel that it, sort of, balanced out a little bit. (Samantha, teacher, school 1, regional, low ICSEA)

The continued absenteeism of some students from school has remained a concern since the return to face-to-face schooling. At the beginning of September 2020, one report indicated that more than 3,000 of the 823,000 NSW school students continued to be regularly absent from school after learning from home (Chrysanthos, 2020). School leaders were concerned about the impact of continued absence and low levels of engagement on future learning. Kylie and Katherine explain:

> But we have a lot of high absences and the kids, particularly some of our Stage 3 students, are staying away because they couldn't be bothered coming to school. Just, you know, that sort of negative impact on their schooling, and as much as you try and say, you know, "You need to be at school," they don't particularly see the need. Not all of them, but the ones who were disengaged during COVID, a lot of them still remain disengaged. (Kylie, school leader, school 9, regional, mid ICSEA)

> So that's been really negative. Attendance is really down. Now, that can be… attendance is just shocking, now. That and picking up early is really bad. Lots of parents are working from home, so it's easy to keep the kids at home. (Katherine, school leader, school 12, major city, mid ICSEA)

Key points

Teachers and school leaders reported:

- A wide range of perspectives, from concern about less growth in student achievement in some schools, to gains in student achievement, particularly in reading, writing and technology.

- Parental support and student engagement during COVID were key to maximising student achievement growth.

- High levels of concern for students who were working below grade level prior to COVID, students from low-SES backgrounds, Indigenous students, students with a disability, and those in two parent working families.

- Almost all extracurricular activities in schools were curtailed (due to COVID restrictions) since return to school, which led to additional time in the classroom, enabling teachers to make up for time lost during school closures.

- Deep concern about continued student absenteeism and disengagement in schooling by some students.

3.2   Student perceptions of school

Students completed surveys addressing attitudes to school, using items from the QSL instrument (Ainley & Bourke, 1992) and items on school learning culture survey (SLC) (Gore et al., 2015). Completed by students during Terms 1 and 4 of 2019 and 2020, data collected from students in 2019 were compared to data collected from students in 2020 (full sample description is available at Table 3).

The Quality of School Life (QSL) instrument measures student attitudes towards school in general, teachers and other students (Ainley & Bourke, 1992). Five key areas of the QSL scale were included: General satisfaction, Achievement, Teachers, Relevance of schooling and Adventure (Appendix A). Students responded to survey questions by answering each question with one of four options "Agree", "Mostly Agree", "Mostly Disagree", "Disagree".

Five questions from the SLC instrument were included (Appendix A) and students were able to choose from four possible responses: "Never", "Rarely", "Sometimes", or "Frequently".

For the whole sample, no differences in QSL or SLC were found between the 2019 and 2020 cohorts. However, a more complex picture emerged when Year 3 and Year 4 students' responses were analysed separately (Table 18). Full tables and figures supporting these outcomes are available in Tables 19, 20 and 21 and Figures 11, 12 and 13.

Table 18 Quality of School Life and School Learning Culture (2019-2020)

	Year 3	Year 4	Whole Sample
General (QSL)			
Achievement (QSL)			
Teachers (QSL)		X	
Relevance (QSL)		X	
Adventure (QSL)			
School learning culture			

Note. Blank cells denote no significant difference between 2019 and 2020. X indicates a significant difference between the 2019 and 2020 student cohorts.

Key points

Year 3 (Table 19, Figure 11)

- No significant differences between the 2019 and 2020 cohorts in either QSL or SLC.

Year 4 (Tables 20, Figure 12)

- Students felt their interactions with teachers were less adequate in 2020 when compared to the 2019 cohort (d = -0.12; 95% CI = -0.24, 0; p = 0.044)
- Students felt schooling was less relevant in 2020 when compared to the 2019 cohort (d = - 0.11; 95% CI = -0.23, 0; p = 0.047)

Whole sample (Tables 21, Figure 13)

- No significant differences between the 2019 and 2020 cohorts in either QSL or SLC.

Table 19 Year 3 Quality of school life and school learning culture (2019-2020)

Outcome	*n*	Baseline mean (95% CI)	Ceiling *n* (%)	Retest %	*n* (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size *d* (95% CI)[a]	*P*
QSL – General									
2020	685	3.36 (3.3, 3.42)	N/A	67	457 (228)	-0.11 (-0.18, -0.04)	0.02 (-0.06, 0.11)	0.03 (-0.09, 0.16)	0.596
2019	1048	3.41 (3.36, 3.46)	N/A	75	791 (257)	-0.13 (-0.19, -0.08)	Reference	Reference	
QSL - Achievement									
2020	693	3.41 (3.36, 3.46)	N/A	67	464 (229)	-0.14 (-0.2, -0.08)	-0.07 (-0.14, 0.01)	-0.11 (-0.24, 0.02)	0.084
2019	1043	3.44 (3.4, 3.48)	N/A	76	795 (248)	-0.08 (-0.12, -0.03)	Reference	Reference	
QSL – Teachers									
2020	698	3.57 (3.52, 3.63)	N/A	66	462 (236)	-0.06 (-0.11, 0)	0.02 (-0.05, 0.09)	0.04 (-0.09, 0.16)	0.578
2019	1051	3.64 (3.6, 3.68)	N/A	77	806 (245)	-0.08 (-0.12, -0.03)	Reference	Reference	
QSL - Relevance									
2020	698	3.61 (3.57, 3.66)	N/A	67	467 (231)	-0.02 (-0.07, 0.03)	0 (-0.07, 0.07)	0 (-0.13, 0.13)	0.990
2019	1045	3.65 (3.61, 3.69)	N/A	77	808 (237)	-0.02 (-0.06, 0.02)	Reference	Reference	
QSL - Adventure									
2020	698	3.18 (3.12, 3.25)	N/A	67	468 (230)	-0.23 (-0.29, -0.16)	-0.07 (-0.15, 0.01)	-0.1 (-0.21, 0.02)	0.096
2019	1052	3.26 (3.21, 3.32)	N/A	77	810 (242)	-0.16 (-0.21, -0.11)	Reference	Reference	
School culture									
2020	686	2.83 (2.79, 2.88)	N/A	68	465 (221)	-0.04 (-0.09, 0.01)	-0.02 (-0.08, 0.05)	-0.04 (-0.17, 0.1)	0.600
2019	1045	2.72 (2.68, 2.75)	N/A	77	807 (238)	-0.02 (-0.06, 0.02)	Reference	Reference	

Note. CI = Confidence Interval. Significance at *p* < 0.05.
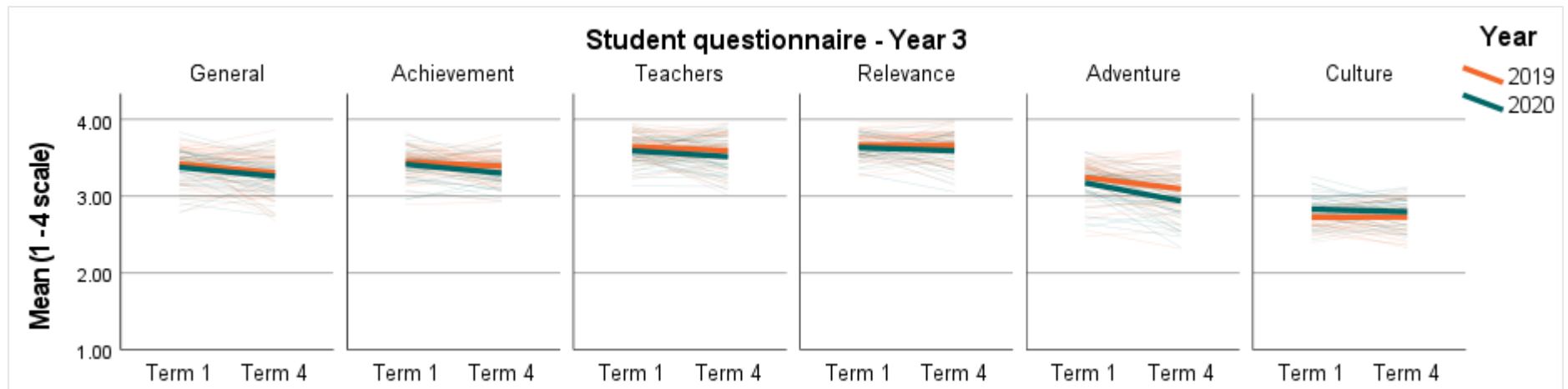
Figure 11 Year 3 Quality of school life and school learning culture (2019-2020)

Table 20 Year 4 Quality of school life and school learning culture (2019-2020)

Outcome	n	Baseline mean (95% CI)	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size d (95% CI)[a]	P
QSL – General									
2020	801	3.28 (3.21, 3.35)	N/A	73	582 (219)	-0.13 (-0.18, -0.07)	0.04 (-0.03, 0.12)	0.06 (-0.04, 0.17)	0.253
2019	1111	3.37 (3.31, 3.43)	N/A	80	894 (217)	-0.17 (-0.22, -0.12)	Reference	Reference	
QSL - Achievement									
2020	811	3.38 (3.33, 3.43)	N/A	72	585 (226)	-0.08 (-0.13, -0.03)	-0.01 (-0.07, 0.06)	-0.01 (-0.12, 0.1)	0.845
2019	1105	3.44 (3.39, 3.48)	N/A	82	911 (194)	-0.08 (-0.12, -0.04)	Reference	Reference	
QSL – Teachers									
2020	823	3.62 (3.56, 3.67)	N/A	73	597 (226)	-0.14 (-0.19, -0.09)	-0.07 (-0.13, 0)	-0.12 (-0.24, 0)	0.044*
2019	1112	3.6 (3.55, 3.65)	N/A	83	922 (190)	-0.07 (-0.12, -0.03)	Reference	Reference	
QSL - Relevance									
2020	824	3.64 (3.6, 3.69)	N/A	73	600 (224)	-0.11 (-0.15, -0.06)	-0.06 (-0.12, 0)	-0.11 (-0.23, 0)	0.047*
2019	1114	3.65 (3.61, 3.69)	N/A	83	925 (189)	-0.05 (-0.08, -0.01)	Reference	Reference	
QSL - Adventure									
2020	825	3.08 (3.01, 3.14)	N/A	73	602 (223)	-0.17 (-0.22, -0.11)	-0.01 (-0.09, 0.06)	-0.01 (-0.12, 0.09)	0.779
2019	1106	3.15 (3.09, 3.21)	N/A	84	927 (179)	-0.16 (-0.2, -0.11)	Reference	Reference	
School culture									
2020	819	2.87 (2.83, 2.91)	N/A	73	599 (220)	-0.05 (-0.1, -0.01)	-0.05 (-0.11, 0.01)	-0.11 (-0.22, 0.01)	0.079
2019	1109	2.75 (2.72, 2.79)	N/A	83	926 (183)	0 (-0.04, 0.03)	Reference	Reference	

Note. CI = Confidence Interval. Significance at $p < 0.05$.
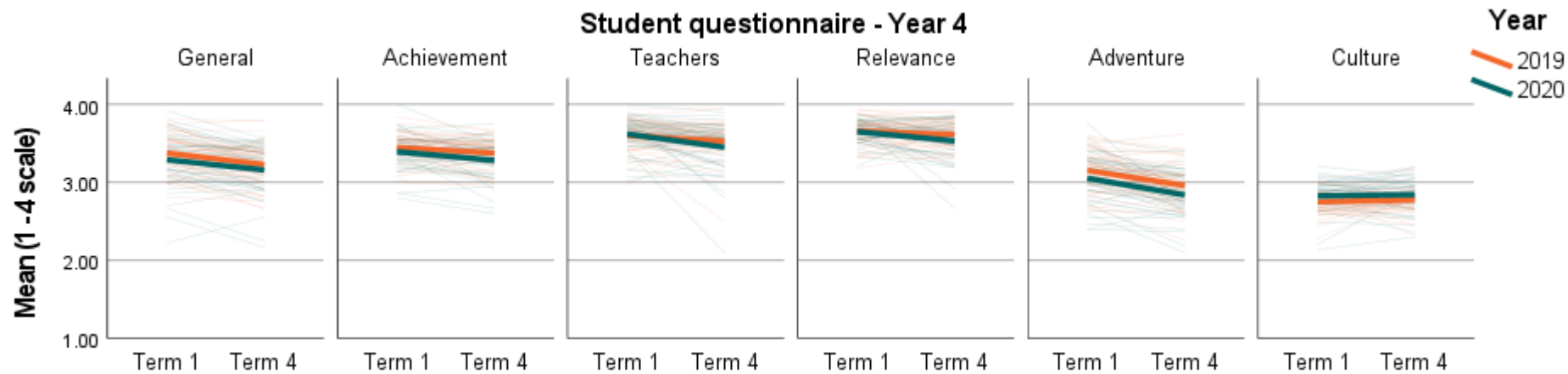
Figure 12 Year 4 Quality of school life and school learning culture (2019-2020)

Table 21 Whole sample Quality of school life and school learning culture (2019-2020)

Outcome	n	Baseline mean (95% CI)	Ceiling n (%)	Retest %	n (miss)	Mean change from baseline (95% CI)	Adjusted mean difference (95% CI)[a]	Adjusted effect size d (95% CI)[a]	P
QSL – General									
2020	1486	3.32 (3.27, 3.37)	N/A	70	1039 (447)	-0.12 (-0.16, -0.07)	0.03 (-0.02, 0.09)	0.05 (-0.03, 0.13)	0.259
2019	2159	3.39 (3.34, 3.43)	N/A	78	1685 (474)	-0.15 (-0.19, -0.12)	Reference	Reference	
QSL - Achievement									
2020	1504	3.39 (3.36, 3.43)	N/A	70	1049 (455)	-0.11 (-0.15, -0.07)	-0.03 (-0.08, 0.01)	-0.06 (-0.14, 0.02)	0.164
2019	2148	3.44 (3.41, 3.47)	N/A	79	1706 (442)	-0.08 (-0.11, -0.05)	Reference	Reference	
QSL – Teachers									
2020	1521	3.6 (3.56, 3.64)	N/A	70	1059 (462)	-0.11 (-0.14, -0.07)	-0.03 (-0.08, 0.02)	-0.05 (-0.14, 0.03)	0.240
2019	2163	3.62 (3.58, 3.65)	N/A	80	1728 (435)	-0.08 (-0.11, -0.05)	Reference	Reference	
QSL - Relevance									
2020	1522	3.63 (3.59, 3.67)	N/A	70	1067 (455)	-0.07 (-0.1, -0.03)	2.07 (-3.79, 7.93)	0.11 (-0.2, 0.41)	0.486
2019	2159	3.65 (3.62, 3.68)	N/A	80	1733 (426)	-0.03 (-0.06, -0.01)	Reference	Reference	
QSL - Adventure									
2020	1523	3.13 (3.07, 3.18)	N/A	70	1070 (453)	-0.19 (-0.24, -0.15)	-0.04 (-0.09, 0.02)	-0.05 (-0.13, 0.02)	0.186
2019	2158	3.21 (3.16, 3.25)	N/A	80	1737 (421)	-0.16 (-0.19, -0.12)	Reference	Reference	
School culture									
2020	1505	2.86 (2.82, 2.89)	N/A	71	1064 (441)	-0.05 (-0.08, -0.01)	-0.04 (-0.08, 0.01)	-0.07 (-0.16, 0.01)	0.098
2019	2154	2.73 (2.71, 2.76)	N/A	80	1733 (421)	-0.01 (-0.04, 0.02)	Reference	Reference	

Note. CI = Confidence Interval. Significance at $p < 0.05$.
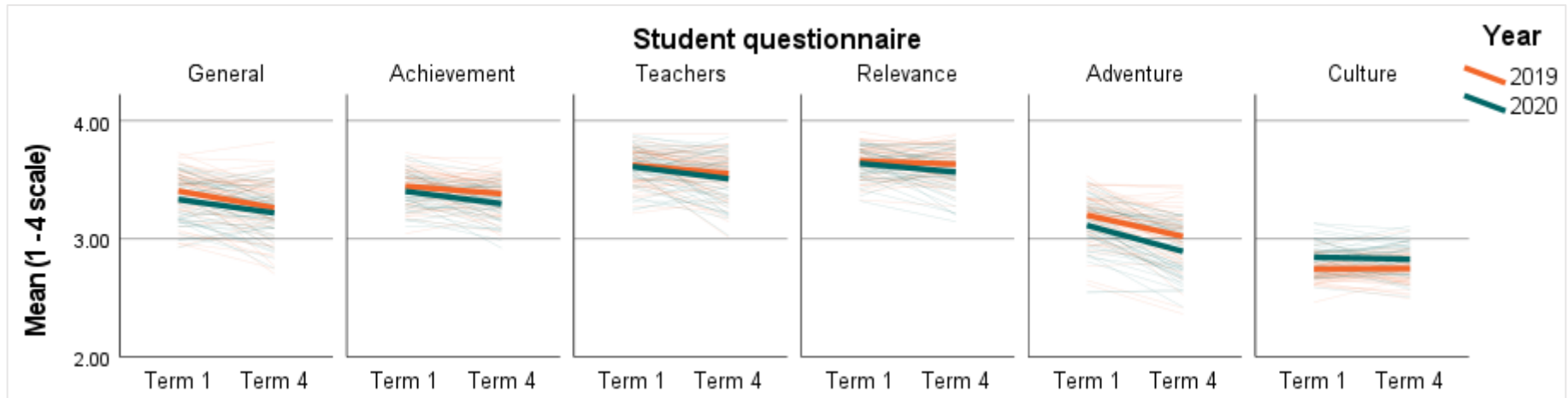
Figure 13 Whole sample Quality of school life and school learning culture (2019-2020)

3.3 Impact on student well-being

Young people and children are vulnerable to the effects of crises and at increased risk of stress, anxiety, depression and behavioural problems (OECD, 2020; United Nations, 2020a; Whaley et al., 2017). As such, it is unsurprising that the COVID-19 pandemic and the resultant learning from home period increased the concerns of parents, teachers, school leaders, education departments and governments about student well-being. Since the start of the pandemic there has been increasing commentary and advice provided to teachers on how to support student well-being (see, for example, Crawford, 2020; Street, 2020). Also, we are beginning to see the first empirical evidence of increased stress and anxiety in students (Forster, 2020; Lee, 2020; Zhang et al., 2020). In this section of the report, evidence from interviews with teachers and school leaders is used to identify how COVID-19 impacted on student well-being in NSW schools.

3.3.1 During learning from home

The rapid move from learning at school to learning at home caused significant stress, frustration and anxiety for many students. Teachers and school leaders reported two key factors impacting student well-being. The first was general community and parent anxiety. Rachel, a school leader, explains:

> Everything spiked. You know, domestic violence, financial stress, all the things you're hearing about definitely have happened. We work with the products… you know, with the causes that that has, on the children. We sent food parcels out to numerous households. We had a mother had a baby at the height of the pandemic, and her husband walk out on her at the same time. (Rachel, school leader, school 13, major city, high ICSEA)

> So just this week I was talking to one parent about her child's attendance, which across the board has really been terrible since coming back. We've some days had 50 kids away. Out of 320 kids, that's a lot of kids. We're averaging about 25 now, but I spoke to the parent and she said, "Well, I lost my job. I got depression. My husband realised he was depressed. You know, we had some health issues." And then you listen to their stories and you hear the level of hardship that the families are under and the kids are supposed to sort of bounce back and be happy little resilient people. (Kylie, school leader, school 9, major city, mid ICSEA)

The second key influence on student well-being was accessing a new way of learning, predominantly the use of forms of technology with which students and parents had little previous experience. This was particularly the case in regional areas where internet access was an ongoing issue. For example, Jessica said:

> And the problem is some of the kids got frustrated. …So, he was getting frustrated because his mum wouldn't log in and help him and she said, "Oh, I can't do this". And I sent her the instructions, I offered to come out, I offered to meet parents at the school if they wanted to. …So, then we had other ones who couldn't because they were out on farms and their internet connection, they had was so poor, it would drop out. So they'd Zoom in, maybe get to do a little bit of a catch up and then they'd drop out completely and then they'd be frustrated because they'd spend the rest of their time

trying to get back in and they couldn't. … So, it was a bit of a debacle, but we did the best we could. (Jessica, teacher, school 1, regional, low ICSEA).

During learning from home, student-teacher communication diminished exponentially, and teachers were often unable to ascertain how their students were faring. As a result, teachers and school leaders chiefly spoke about the impact of learning at home after students returned to the classroom.

3.3.2   Upon return to school

Almost all teachers and school leaders who were interviewed for this project spoke about the significant impacts which were causing ongoing concern for teachers when they were interviewed during September and October 2020. One key concern related to the impact of a reduced curriculum. While students were able to catch up on learning due to the focus on specific key learning areas such as numeracy and literacy, the lack of extracurricular activities led to what one school leader described as 'Groundhog Day', resulting in fatigue and other less desirable behaviours. Rachel and Kylie explain:

> The more that that goes on now, the more I'm seeing the lack of balance. I mean, we were very focused on well-being when the kids were at home, because we were doing those well-being phone calls; The lack of interruptions and the lack of extracurricular [activity] in a school day now, they're starting to get… I'm seeing the kids are fatigued. The teachers are slightly fatigued, and it's just that… it's sort of like Groundhog Day, day-in, day-out. There's no excursions, there's no school camp. Lots of that provides… all of that real-time, real life learning that you don't get through doing things either virtually or from a book. I would have to say that while, yeah, we're ploughing through things, and we're getting things done, I don't know how rich it is. There's certainly not a lot of that experiential sort of learning that you want. (Rachel, school leader, school 13, major city, high ICSEA)

> But at the moment, there's a lot more mental anguish with the kids, and so the well-being of the children has diminished, but the other thing is we've had - so I've mentioned previously we have a lot of extracurricular programs. They've all been stopped, so there's nothing for the kids to look forward to. So, our school leaders have had no reason to be publicly speaking, or no reason to hold any events because you're not allowed to hold any events. Teachers not being able to have their buddy classes going because you can't mix stages. So, there's not much for the kids to look forward to, and then you know, we've had more aggressive behaviours at school…Certainly on the return to school we had a lot more aggressive behaviours, which we wouldn't normally have, and you know, kids being sleepy because they're on their devices at home, or you know, they think they can stay and play on their phones. There's just been a lot more not generally acceptable behaviour at school. (Kylie, school leader, school 9, major city, mid ICSEA)

Changes in student behaviour upon return to the classroom were not only attributed to changes in schooling, but to increased rates of stress and anxiety. This aligns with a report that calls to Kids HelpLine during the height of the pandemic in Australia were primarily due to mental health concerns (yourtown & Australian Human Rights Commission, 2020) . In many cases this anxiety manifested as poor behaviour and, in some cases, self-harm. Chris and Lauren capture the concern of most teachers:

I had a lot more behaviour issues creeping up, and I've got students with anxiety. I've got students that are medicated. I've got students with learning needs…And I think all of it's just being genuinely compounded by the stresses and pressures, and the general not knowing what it's going to look like. … I would say, there's a lot more anxiety. There were students that probably a bit less confident, which is probably a result of anxiety. I think that there was just generally worse behaviour when they came back. (Chris, school leader, school 11, major city, mid ICSEA)

Anxiety: we've got massive amounts of anxiety in our students. From physical behaviour, oppositional behaviours, kids not wanting to come to school. They're melting down at school. We've got a lot of, and I'm only a primary school. So, I have no idea how the high schools are handling it. We've got lot of self-harm and threatening self-harm and parent anxiety. (Lauren, school leader, school 6, major city, mid ICSEA)

Not surprisingly, concerns about student mental health led to an increased load on school counsellors, as Rachel, a school leader, points out:

Look, we're starting to see some trends around student stress. The counsellors have been very proactive, and I would say the counselling load is greater. We've had more referrals through learning and support team, around well-being, as opposed to learning; and things bubbling away in families. You know, we're picking up where kids are coming in and saying there's stuff going on at home. (Rachel, school leader, school 13, major city, high ICSEA)

Some teachers reported that the lack of social interaction during learning from home led to poor interactions with peers on return to school, in some cases exacerbated by cultural factors. Mateo and Samantha provide examples:

Students felt that because they'd been away for so long, they didn't have social interaction at all. Interacting with their peers. There were a lot of silly issues that we had to deal with. Things that before COVID and lock down, that we never had to even think about…Again, main one, social interaction. A lot of students at our school are of Asian background, so whether they be Korean, Chinese, they're from an Asian background. From what they tell me, they don't get a lot of social interaction, as it is before lockdown, due to all the extracurricular activity they do outside. So, their main social interaction, when they're not getting it now there's nothing, was a big issue for us. The way that students came back, and they couldn't talk or interact with their peers anymore, like they'd lost it. They were very self-centred, more than usual. Yeah, very temperamental. I'm pretty sure that's the word. (Mateo, teacher, school 13, major city, high ICSEA)

I feel that… I think it has really impacted them socially more than anything, and how they are engaging and relating to others. I think as well, the break up in the term, they sort of had three weeks before the holidays, and then five weeks afterwards, and I feel that they're getting… the students are getting quite fatigued, because they had such a long time at home in the middle there that it's really making a difference. You know, when we've had a normal term, like this term, they seem to be a bit more tired, not engaging as much, lots of behaviour issues, and stuff like that. (Samantha, teacher, school 1, regional, low ICSEA)

Indeed, lack of social interaction was the second top concern (behind mental health concerns) of children and young people who contacted Kids HelpLine during the height of the pandemic (yourtown & Australian Human Rights Commission, 2020).

For other students, a lower attention span and difficulty re-engaging in the classroom was a clear side-effect of the break from traditional schooling, as Mateo and Lauren told us:

> Focusing... They can't sit still for more than a minute and like I said, normally before COVID, they were fine. They were able to participate in class discussions. And all of a sudden now, engagement... They can't sit still anymore. They always got to be up. Focus and concentration floats in and out of that, too and again, routine is gone, it's not there anymore, as well, for them. (Mateo, teacher, school 13, major city, high ICSEA)

> So, students who didn't engage during distance learning, have continued with a high level of difficulty re-engaging back in the classroom. So, yes, my staff has seen the COVID has had a major impact on the mental well-being of the students who feel that they're unable to keep up. So, they just don't try anymore. …They lost touch with classroom expectations. So, that was a big one. But our classes have returned to normal, in terms of, you know, what we expect for student engagement…However, our teachers have seen, and I have seen myself when I go into the classroom, students have come back with a lack of drive in the classroom and especially re: social situations a lack of resilience…and kids are finding it more difficult to maintain focus. And another teacher commented, "Student engagement was lower when the kids returned to school, possibly because they weren't working to our usual expectations at home." …I think we're getting back to normal, but it has taken a while. (Lauren, school leader, school 6, major city, mid ICSEA)

While lower student engagement once students had returned to school was a recurring theme in the interviews, one teacher reported that her students were happy to be back at school. Nicole explained:

> I don't think it has changed. I think my kids, in particular, are the same as what they were before all of this. They're happy to come to school. They like coming to school. When we were in the transition out of home learning, where they would come on certain days of the week, whenever they were scheduled to come, they were always excited. I usually had the full attendance of the kids who were supposed to be there, because they were quite keen to come back to school and they really enjoyed doing things as a class again. They liked having their teacher back. They liked just being back in the environment. So, I think their engagement from then until now has been good. (Nicole, teacher, school 12, regional, mid ICSEA)

Key points

According to teachers and school leaders:

- Two key factors impacted student well-being: 1) community and parental anxiety, and 2) adapting to new ways of learning.
- Upon return to school, students displayed significant signs of stress, anxiety, and frustration.
- The reduced curriculum once students returned to school (due to COVID restrictions) led to fatigue, mental anguish, and aggressive behaviour in some students.
- Some students seemed unable to socially interact with their peers in the same way as prior to learning from home.

3.4 Impact on teachers

COVID-19 and the related disruption to schooling had an immense impact on teachers and school leaders. In Australia and elsewhere there have been repeated reports of exhaustion (Phillips & Cain, 2020), stress and negative effects on teacher well-being (Dabrowski, 2020; MacIntyre et al., 2020). In this report, we focus on the impact of COVID-19 on teacher self-efficacy, teacher morale, and teachers' sense of appraisal and recognition.

To provide empirical evidence of impact on teachers, data from teacher surveys conducted with 123 teachers from 51 schools in 2020 were compared with equivalent data collected from 239 teachers from 62 schools in 2019. The survey included questions on teacher self-efficacy (Tschannen-Moran & Hoy, 2001) collective morale, and appraisal and recognition (Hart et al., 2000). In addition, semi-structured telephone interviews were conducted with teachers (n = 12) and school leaders (n = 6) from 13 schools during September and October 2020, in order to gain more qualitative insights on the impact on teachers.

Sample and descriptive statistics for the teacher survey across three time points (Term 1, 2 and 3) are displayed in Table 22. In 2019, 228 teachers completed the survey during Term 1 compared to 119 teachers who completed the survey in Term 1, 2020. Response rates were lower for Terms 3 and 4 in both cohorts, with 66% completing the survey in Term 3, 2019 and 56% in Term 4, 2019. In 2020, 63% completed the survey in Term 3 and 68% in Term 4.

Table 22 Teacher survey sampling and descriptive statistics (2019-2020)

Outcome	Time	2019 Mean (SD)	N (% of T1)	2020 Mean (SD)	N (% of T1)
Engagement	T1	7.16 (0.92)	228	7.25 (1.04)	119
	T3	7.26 (0.98)	151 (66)	7.23 (1.1)	76 (64)
	T4	7.52 (0.87)	127 (56)	7.24 (1.07)	81 (68)
Instruction	T1	7.27 (0.91)	228	7.41 (0.98)	119
	T3	7.48 (0.84)	151 (66)	7.7 (0.94)	76 (64)
	T4	7.69 (0.86)	127 (56)	7.74 (0.89)	81 (68)
Management	T1	7.58 (0.89)	228	7.56 (0.97)	119
	T3	7.66 (0.86)	151 (66)	7.71 (1.05)	76 (64)
	T4	7.82 (0.8)	127 (56)	7.76 (1.05)	81 (68)
Morale	T1	4.04 (0.85)	228	4.14 (0.75)	119
	T3	4.11 (0.78)	151 (66)	4.09 (0.8)	75 (63)
	T4	4.28 (0.75)	126 (55)	4.05 (0.87)	81 (68)
Appraisal and recognition	T1	3.73 (0.92)	228	3.67 (1.02)	119
	T3	3.91 (0.86)	151 (66)	3.57 (1.03)	75 (63)
	T4	3.85 (0.91)	126 (55)	3.6 (0.93)	81 (68)

Note. T = Term. SD = Standard deviation. N = Total sample population

Full tables and figures supporting the outcomes described below are available in Table 23 and Figures 14 and 15.

Key points

Teacher efficacy – student engagement

- In comparison to the 2019 cohort, teachers in 2020 felt less able to engage their students in learning (d = -0.08; 95% CI = -0.16 - -0.01; p <0.05)

Teacher efficacy – instructional strategies

- No significant differences between the 2019 and 2020 cohorts

Teacher efficacy – classroom management

- No significant differences between the 2019 and 2020 cohorts

Morale

- Teacher morale increased slightly during 2019 in comparison to a downward linear trend in teacher morale in 2020 (d = -0.07; 95% CI = -0.12 - -0.01; p <0.05).

Appraisal and recognition

- No significant differences between the 2019 and 2020 cohorts

Table 23 Teacher efficacy, teacher morale and appraisal (2019-2020)

	Teacher efficacy			Morale	Appraisal
	Engagement	Instruction	Management		
Fixed effects					
Initial status					
Intercept (95% CI)	7.15 (7.02 - 7.27)***	7.27 (7.15 - 7.39)***	7.57 (7.45 -7.69)***	4.03 (3.93 - 4.14)***	3.75 (3.63 - 3.88)***
Baseline difference (95% CI)	0.08 (-0.13 - 0.29)	0.14 (-0.06 - 0.34)	-0.03 (-0.23 - 0.17)	0.11 (-0.07 - 0.29)	-0.09 (-0.3 - 0.12)
Rate of change					
Intercept (95% CI)	0.10 (0.05 - 0.15)***	0.12 (0.08 - 0.17)***	0.06 (0.02 - 0.11)**	0.04 (0.01 - 0.08)*	0.03 (-0.02 - 0.07)
Year * Time (95% CI)	-0.08 (-0.16 - -0.01)*	0.00 (-0.07 - 0.07)	0.02 (-0.05 - 0.10)	-0.07 (-0.12 - -0.01)*	-0.04 (-0.12 - 0.03)
Variance components					
Level 1					
Within person	0.41 (0.33 - 0.51)***	0.29 (0.24 - 0.36)***	0.30 (0.25 - 0.38)***	0.20 (0.16 - 0.25)***	0.22 (0.17 - 0.27)***
Level 2					
Initial status	0.52 (0.38 - 0.71)***	0.57 (0.44 - 0.73)***	0.53 (0.41 - 0.69)***	0.46 (0.36 - 0.58)***	0.70 (0.57 - 0.86)***
Rate of change	0.01 (-0.04 - 0.06)	-0.04 (-0.08 - 0.01)	-0.03 (-0.07 - 0.02)	0.00 (-0.03 - 0.03)	-0.06 (-0.11 - -0.02)**
Covariance	0.00 (0.00 - 853.46)	0.01 (0.00 - 0.06)	0.02 (0.01 - 0.07)	0.00 (0.00 - 3.46)	0.04 (0.02 - 0.07)***

Note. CI = Confidence Interval. Significance: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
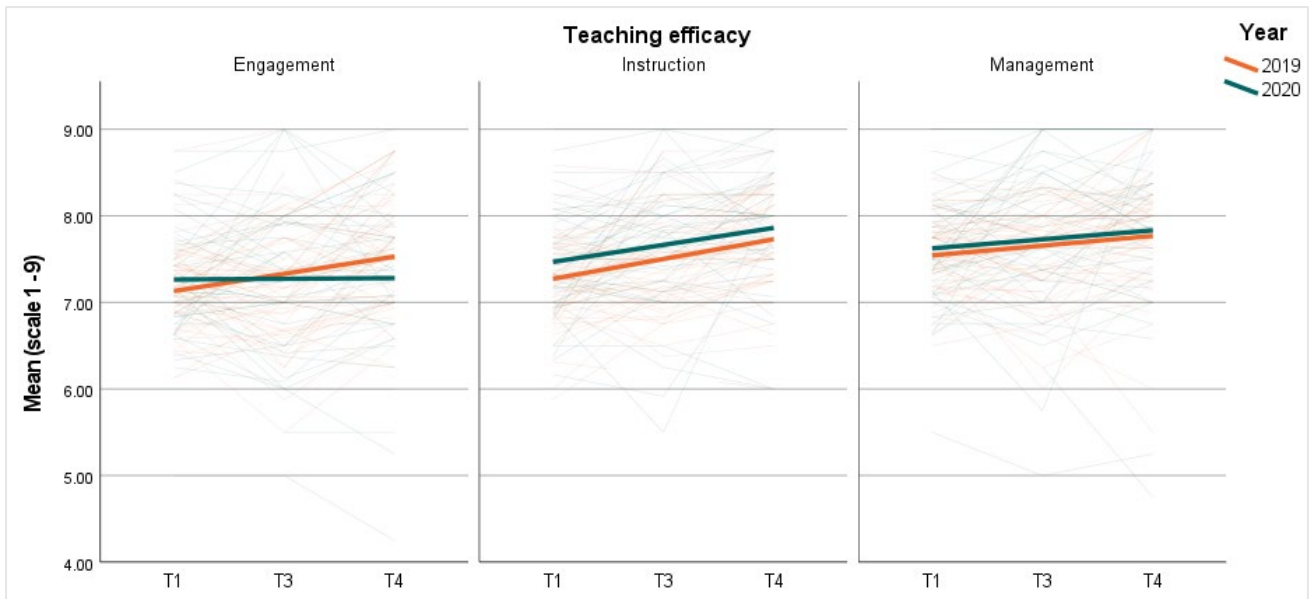
Figure 14 Teacher efficacy (2019-2020)
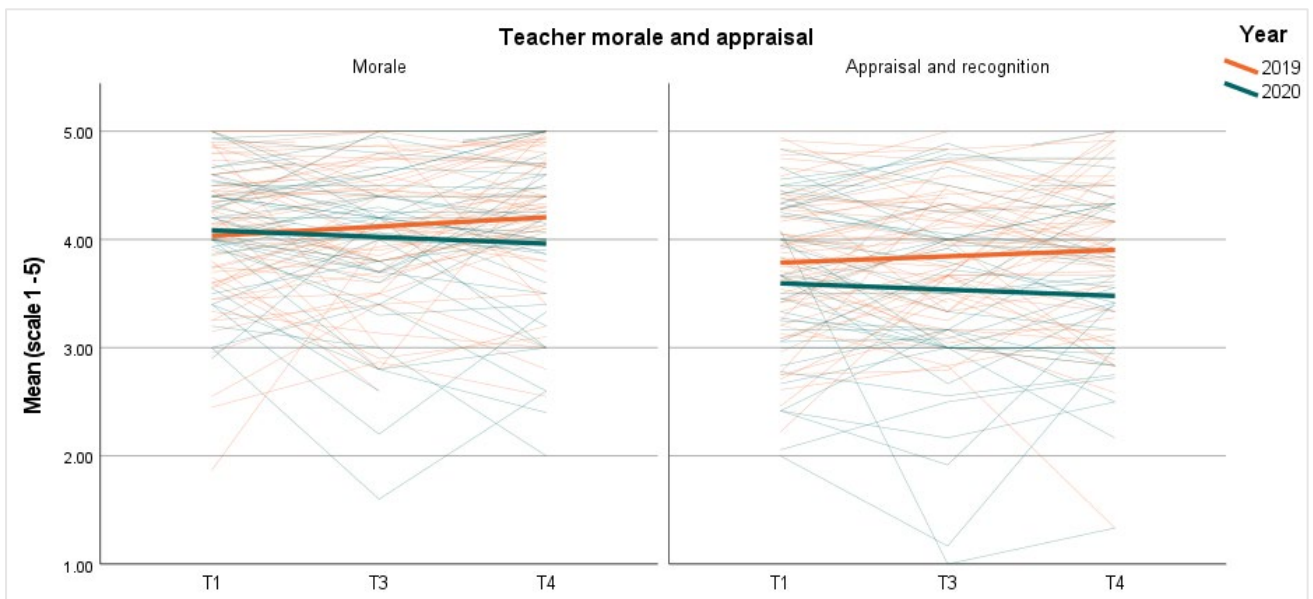
Figure 15 Teacher morale and appraisal (2019-2020)

3.4.1 Teacher morale

During the learning from home period, teachers were required to deliver lessons to students in a variety of ways including online lessons to students, face-to-face lessons to the children of essential workers and creating paper-based learning resources for students who may have had limited access to technology.

Although there were large differences in the use of technology between schools, Kylie's description is representative of teaching during the lockdown period:

> We made sure that every child had access to some learning, so we hand delivered paper packs to families who weren't engaging online. The teachers created a weekly, and then daily, schedule of suggested outcomes, suggested learning, and that was posted online or delivered in the paper packs. We sent lots of letters home to parents just saying, you know, "Do what you can, but make sure, or try and make sure, your child does some online learning or some paper learning." We gave out stationery, exercise books, readers, some sport equipment, and basically, we wanted the parents to show the teacher that they'd done some work. So, the teachers were required to check in twice a day with the families or see that the families had checked in twice a day. One was the good morning call, and the other one was hopefully posting some work or just a bit of a verbal via the ClassDojo to make sure there was some connection happening. Then we asked them to ring the school if they didn't have any work or didn't know how to do that. (Kylie, school leader, school 9, major city, mid ICSEA)

The intensification of labour for teachers is clear. For most teachers, the creation of lessons that were able to be delivered in multiple forms (face-to-face, online and paper) increased their workload exponentially during the period of closedown. One teacher said "the workload was really overwhelming, and I felt like we had to reinvent the wheel each day" (Chris, teacher, school 11, major city, mid ICSEA). The increased workload of teachers was unrelenting, including when students had returned full-time to the classroom. Lauren explains:

> Double the workload. I think I've seen that in nearly everyone. Doubled the workload. Teachers now feel like now we've will come back to school, they now feel like they have to catch up on all the content that they missed due to our overcrowded syllabus. And we all know that our syllabus is not the best one in the world. And the fact that no matter how well we were set up for distance learning, there were some kids who did not engage at all in any of the learning. So, teachers are now very stressed that they have to catch up on this syllabus. Teachers, myself, my DP, we're all struggling with the behaviour of students and this is affecting teachers' well-being hugely, absolutely hugely. We're in school suspending, we're evacuating classrooms. The behaviour has really ratcheted up a notch. (Lauren, school leader, school 6, major city, mid ICSEA)

In many schools, teachers and school leaders reported flagging morale, which they attributed to a perceived lack of support from the Department and from Government. In some instances, teacher morale was profoundly impacted by poor communication with schools. Rachel explains:

> I think the Department were caught between a rock and a hard place. As a principal, I didn't feel particularly well supported. We were doing extraordinary hours, and it was the changing… you know, the changing landscape, and the time they were communicating with us as principals, at 11 or 12 o'clock at night, and it was kind of, "Is there an expectation that we're checking our emails at that time of night, and what's the expectation that you have of me getting that out to my community?"…So, yeah, so that was hard. I think they could have been a little bit more respectful of their communications to us as principals, and a bit more aware that something coming out… They felt they'd ticked the box by getting it out late at night, but that doesn't mean you can have that up

and running for the next day at school, because there's turnaround in communication. (Rachel, school leader, school 13, major city, high ICSEA)

Teacher workload has long been linked with teacher morale (Mackenzie, 2007; Senechal et al., 2016). With a considerable increase in teaching workload during the learning from home period, it is unsurprising that teacher morale declined. Lauren, a school leader, explains:

> And it did have a big impact on morale. …Now some staff also had personal difficulties that they were facing such as partner job losses, but they had to still maintain the school workload. And I'm reading their words here, they felt extremely undervalued by the government's stance that and I quote, "teachers will be right back at school as kids can't get it." They just felt they didn't count. I'm reading their answer again, "Staff morale was and still is at all time low with a lack of genuine appreciation from the government and the Department. They have felt demoralised and not valued." That's a really sad one. (Lauren, school leader, school 6, major city, mid ICSEA)

Such impact was felt even more intensely in communities with poor communication infrastructure. The lack of access to 4G networks and access to quality resources provided by the Department left teachers feeling undervalued and adrift— unable to provide their students with the same quality that children in major cities were receiving. For example, Andrew said:

> I think the Department really worked on thanking us more than anything, and we didn't need thank you because we were doing our jobs. What we needed was that support, what you're doing is okay. I don't think they really got that message out, it was more like a "this is what we have to do, this is the benchmark". Sharing all the top things that teachers were doing but those teachers have access to 4G networks, and you know, social hubs within urban areas and we couldn't really match that at all. So, very quickly myself and the principal saw inequalities in what we were delivering to our kids very quickly. And that crushes the spirit when you're truly really trying to give, like provide a quality education. So yeah, I saw a really big imbalance about what our kids were going to receive out here as opposed to kids in urban areas. …So, that's where I feel like that we weren't supported. (Andrew, teacher, school 4, regional, low ICSEA)

Decreased morale in schools brought about by exhaustion, fatigue and stress led some teachers and school leaders to reconsider their careers as teachers. The desire to leave the profession was so strong for leaders such as Lauren, that she would 'walk away' if not so committed to her role:

> I talk to my LMG and I've got a great LMG, that's a local management group of our schools, our little group of schools, community schools I suppose, we work together. But we do talk, we're exhausted, we're tired, we are demoralised. We do feel undervalued. And we've all spoken about it, if we could, we'd all walk away. We really, really would. We'd all walk away. But I suppose that's why we're principals. We do have strong mental health and resilience and that character to get on with the job. (Lauren, school leader, school 6, major city, mid ICSEA)

By contrast, other teachers and school leaders highlighted that the disruption caused by the COVID-19 pandemic allowed them to feel secure in their chosen profession. It also provided an opportunity to reflect on their careers and their positive impact on students. James, for example, said:

> I actually love my job I think I'm super bloody blessed to do what I do. I think teaching is probably the best profession in the world and I love what I do. Although there were days where I went, holy shit that was a challenging day or whatever, there were also days where I went that was a great day and I was able to support staff or whatever it was. So, if anything, the COVID period has probably provided me with greater clarity about the importance of what we do as leaders of a school. It's also provided greater clarity about the impacts that we can have on kids, kids' well-being, kids' academic domain. So, if anything it's probably sparked more a desire to do what I'm doing. (James, school leader, school 4, regional, low ICSEA)

3.4.2 Teacher efficacy

While it is widely accepted that teachers with greater self-efficacy are more resilient when faced with challenges than colleagues with lower self-efficacy (Tschannen-Moran et al., 1998), teachers do experience role overload during crises (Kuntz et al., 2013) leading to decreased self-efficacy (Seyle et al., 2013) and a considerable decline in their sense of success as a teacher (Kraft et al., 2020). In this study, some teachers reported feeling inadequate, overworked, and frustrated. Andrew and Chris explain:

> I don't need a pat on the back, I get paid to do my job and I'm very proud to be paid. There were times when I felt, I did feel inadequate. There were times where I thought I can't help these kids, they're at home I can't sort of, I can ring them up on the phone but they'll… There were times I thought "oh, I'm really not doing my job well", you know you should be really prepared for any type of learning and I didn't really feel like that at all. (Andrew, teacher, school 4, regional, low ICSEA)

> Well, I can't speak for other stages, but I know that my feelings were pretty well shared across the cohort. I think we all share the same frustrations. We were all exhausted. There were probably things that everyone wanted to do in different directions, but were told to stick to consistency, even though we worked well as a team, I don't think anyone would have been left behind. But yeah, I think those three main frustrations of workload and being tired as well as feeling like you're not providing good content and then the students aren't learning the way they should be. And then also not being able to teach in the way that you feel best, I think those were all shared frustrations between the whole group. (Chris, teacher, school 11, major city, mid ICSEA)

Perhaps the greatest concern among teachers, however, was the inability to keep in contact with their students on a regular basis. Unease about the welfare of their students heightened the anxiety of many teachers, like Kylie and Sarah:

> I think the biggest thing was the lack of face to face contact with their kids. They really missed seeing the students. It was checking in and some people were constantly trying to get in contact with people and couldn't, and so that heightened their fear that something, you know, horrid was happening. I think for me as well, others were very aware of physical, mental or sexual abuse,

because you know, we're trained to look for that and when the kids are at home, you don't know how vulnerable they are, and that was personally an anxiety that teachers had. So, the well-being of the students not being known was a big worry. (Kylie, school leader, school 9, major city, mid ICSEA)

I guess the other challenge I guess for the teachers was you really couldn't tell what was going on at home. I know that's one of the reasons that they brought us back was because all of the mandatory reporting, all those numbers plummeted… So, the social and emotional well-being of the students; we didn't know what was going on at home anymore. We didn't know how much work the kids were doing; if they were doing it on paper and they didn't bring it back. We didn't know what the supervision levels were like at home and we didn't know what the care levels were. So, were the parents drinking all night and not getting up in the morning to look after the kids? Was there food in the house? All those things, because we would know those things when those kids were coming to school because they wouldn't have any lunch or their hair wasn't brushed, or all those things. We didn't have that view into their world to support them. (Sarah, school leader, school 3, regional, low ICSEA)

Key points

Teachers and school leaders reported:

- An exponential increase in their workload which impacted substantially on their morale.

- Exhaustion, fatigue and stress which led some teachers to reconsider their career choice.

- Feelings of inadequacy and frustration at being unable to deliver quality lessons to students – often hampered by poor infrastructure, particularly in rural communities.

- Heightened anxiety and unease about the welfare of their students during learning from home.

4 Discussion

The COVID-19 pandemic disrupted schooling throughout the world (UNESCO, 2020a). In NSW government schools the disruption took the form of 'learning from home' for a period of 8 to 10 weeks during which most students engaged in schooling remotely. In this report, we examined the effects of the COVID-19 pandemic and learning from home on: student academic achievement; student and teacher well-being, teacher efficacy, teacher morale, and teachers' sense of appraisal and recognition.

Although 'learning loss' is now part of the 2020 lexicon, together with 'unprecedented', 'pivot', and 'you're on mute,' we have deliberately avoided the expression throughout this report to guard against literal readings and causing undue worry among parents and the wider community. Students learned and achieved during 2020. They did not go backward or lose what they had learned. Rather, some did not achieve the same level of growth as students in the previous cohort. Most affected, according to our analysis, were Year 3 students in lower ICSEA schools in mathematics and student and teacher well-being.

4.1 The importance of context

Speculation about the impact of COVID-19 and learning from home on student academic achievement has been widespread, relying heavily on evidence and modelling from previous crisis situations. However, the size and scale of disruption caused by COVID-19 is truly unprecedented and cannot directly be compared with these earlier accounts. Our study provides rigorous empirical evidence of what happened to students and teachers in Years 3 and 4, in NSW, during the pandemic. While the analysis has implications for countries around the world, we note that extrapolation even within Australia should be approached with care. In the state of Victoria, for example, schools were closed for around 18-20 weeks while schools in the Northern Territory were closed for just four days at the end of Term 1 (Storen and Corrigan, 2020). Such contextual differences require vigilance when interpreting research findings.

To date, with the exception of the Dorn et al. (2020) report from the United States, the Engzell et al. (2020) report using data from the Netherlands, and the reported results from the NSW *Check-in* assessments, we have found no quantitative evidence of the impact of COVID-19 on student academic achievement. Interpreting the results of these international studies must also take context into account. For example, the Dorn et al. (2020) report is based on a secondary analysis of data collected by Curriculum Associates (2020). The data were collected from more than 250,000 students across 28 states in the United States, each with different 'closedown' or 'learning from home' periods. In addition, they compare test scores to the average achievement of students in the previous three testing cycles.

The Engzell et al. (2020) analysis shares more similarities with our own, given that both studies are based on data collected before and after an eight-week period of school closure and a relevant comparison group, but the follow up data in the Netherlands were collected straight after the return to school. Such immediate measures were not possible in our study, given the exclusion of non-essential personnel from schools. Nor did we want to burden teachers or students with additional testing when many were feeling fragile.

In our study, students attended school for most of Term 1 and were (mostly) back by Term 3. The follow-up data collection a full term after the return to school therefore represents achievement growth over the entire year, not just during the learning from home period. Before closedown, students and teachers in our study had established relationships and ways of working that would have helped in the shift to learning from home. By contrast, the new school year in the United States, framed by astonishing levels of COVID-19 (at the time of writing, more than 25.5 million cases and 425,000 deaths) compared with Australia, could be expected to negatively affect student testing. These differences in research design and local circumstances are critical to meaningful comparison of findings.

The same applies to other local forms of testing. For example, the Check-in assessments conducted in NSW (NSW Department of Education, 2020a) indicated that Year 3 students were substantially behind in reading by Term 4, 2020 while our study showed no significant difference from the previous cohort. In this instance we need to take into account test administration, assessment comparability, sample size and representativeness of samples. The *Check-in* assessment was a NAPLAN-like test administered by classroom teachers. A quarter of the test items came from NAPLAN and were used to scale and equate the *Check-in* assessment with previous years' NAPLAN results. The test addressed multiple components of reading (NSW Department of Education, 2020a). *Check-in* assessments had a much larger sample and results were weighted to arrive at population estimates. In our study, the reading test were administered by trained researchers, the entire test from 2020 was directly comparable with the 2019 test, and the test focused more narrowly on reading comprehension. These differences in testing, and in the representativeness of the two samples, might explain the different results for reading.

4.2   Predicted versus actual impact on student learning

While it was broadly predicted that students would face some 'learning loss' during the COVID-19 learning from home period (Brown et al., 2020; OECD, 2020; Pedro Azevedo et al., 2020; Sawchuk, 2020; United Nations, 2020b), our study indicates that growth in student achievement during the 2020 school year varied minimally from growth in achievement during 2019. This result might partly be accounted for by the relatively short closedown period and by the timing of our achievement growth measures, one term after the return to school for most students.

Reading achievement was not significantly different for either Year 3 or Year 4 students. Additional time spent reading, supported by family members, during the learning from home period may have been a factor in these results. Furthermore, there was no apparent effect on mathematics achievement for Year 4 students. The only significant effects were for Year 3 students in mathematics whereby those in mid-ICSEA schools showed an additional two months' growth and those in low-ICSEA schools showed two months' less growth than the comparison schools.

If students fell behind in their learning during closedown, as the *Check In* assessments in NSW government schools suggested (Baker, 2020b; NSW Department of Education, 2020a), our study indicates that teachers have done an outstanding job in helping students draw level with and even overtake (in the case of students in mid-ICSEA schools in mathematics) expected achievement levels. They have ensured that achievement, at least in maths and reading, is as strong as usual (taking the 2019 cohort to be indicative of student growth in a typical year). Our results also signal the capacity of students to learn despite serious disruption to 'schooling as usual'. Teacher reports of students' increased facility with technology as a result of learning from home may have been a factor in the varying achievement growth by ICSEA. Instructional volume might also have contributed to these results. That is, teachers reported spending more time in mathematics and reading during Term 4 than in Term 1 of 2020, and more time than teachers reported in Term 4 of 2019. This increase in subject-specific instructional time is likely to have played a role in students 'catching up.'

However, as predicted by many commentators (Brown et al., 2020; Schleicher, 2020a; Sonnemann & Goss, 2020), there were some negative effects on student achievement in lower ICSEA (disadvantaged) schools, particularly for younger students. The lower growth in mathematics for Year 3 students in these schools might be explained by the greater challenges faced by families in disadvantaged circumstances who are likely to have been disproportionately impacted by disruptions to education (ISSR, 2020).

The result we obtained for students in regional locations, which follows a similar pattern of extra growth for students in mid ICSEA schools, for reading this time, is noteworthy but less robust given the smaller samples. Stories we heard from teachers of some country kids spending the learning from home period working and playing on the family farm, may have been a factor for some.

The result of no significant differences for Indigenous students between 2019 and 2020 is cause for celebration, especially when lower growth might have been predicted, on average, given the over-representation of Indigenous students in lower ICSEA schools. It is a testament to their families and teachers that no negative effects of COVID-19 and learning from home were evident in their academic achievement. On the other hand, achievement levels for Indigenous students in Australia have consistently been significantly below those of their non-Indigenous peers which means there is still much to do in working towards more equitable outcomes.

In all disadvantaged contexts, ameliorating lower growth in academic achievement is likely to require significant investment in the form of additional support for teachers and students. The recently announced $377 million tutoring scheme (NSW Government, 2020) has a critical role to play here. It represents a unique opportunity to address longstanding inequities as well as those exacerbated by the pandemic, if done well (Slavin, 2020).

4.3   Heightened concern for student well-being

While little is known about the long-term impact of school closures or learning from home on the well-being of children and adolescents (Lee, 2020), the first empirical evidence of increased stress and anxiety in students as a result of the COVID-19 pandemic has been reported. In a study conducted in China, Zhang et al. (2020) found significant increases in depressive systems, non-suicidal injuries, suicide ideation and suicide plans among their sample of 1389 students in Grades 4 through 8. A Canadian study, by Children's Mental Health Ontario (2020), found that changes to schooling caused by COVID-19 were adversely related to the mental health of children and their parents. This is supported by recent empirical research conducted in Australia which also found that the mental health of children during COVID-19 was strongly associated with stress, anxiety and depression in their parents (Whittle et al., 2020). In another Australian study, the authors found that during the learning from home period, teachers were so concerned that they placed higher priority on attending to student well-being than to learning outcomes (Forster, 2020). Despite these early reports, evidence of the actual impacts of learning from home on student well-being remains scarce. Our study contributes in a small way.

While our original study was not designed to address student well-being in any depth, we investigated students' assessment of the quality of school life and school culture as possible proxies. However, our statistical analyses showed no significant differences between the 2019 and 2020 cohorts, with the exception of the Year 4 2020 cohort who rated their teachers and the relevance of schooling lower than did the 2019 cohort. When combined with the qualitative data, a more troubling picture emerged. Many teachers reported increased stress, frustration and anxiety among students as they moved to learning from home. Notably, this effect on student well-being was not simply mitigated once students returned to school. Instead, with the cancellation of all extra-curricular activities within schools due to COVID-19 restrictions, teachers and school leaders reported high levels of fatigue in students and a rise in unacceptable behaviour. The monotony ('*groundhog day*') of schooling while COVID-19 restrictions were still in place was reported to be a factor in student conduct. Teachers also spoke of increased stress, anxiety, poor social interaction and focus, and difficulties re-engaging in the classroom among their students. For many teachers, these concerns were also seen as a function of challenging circumstances in the homes of some students. Given that we were only investigating effects on Year 3 and 4 students, the reports by some teachers of poor behaviour, poor social interaction, poor mental health and even self-harm, when extrapolated to older student cohorts, signal potentially widespread social and emotional effects of the pandemic

on student well-being. Significant investment in student well-being programs may be essential in ameliorating any long-term impact.

4.4 Teachers, the un/sung heroes?

During the period of learning from home, we heard outpourings of admiration and respect for teachers, particularly from parents and carers trying to support their children's learning (Doyle, 2020; Duffy & Kent, 2020). At times, the status of teachers appeared to be just below that of nurses and doctors on the 'frontline' of the pandemic. When other workers were ordered to work from home and keep their children home if they could, most teachers were expected to be at school, caring for the children of essential workers and delivering lessons face-to-face and/or online. They quickly pivoted to and from modes of learning and there are countless stories of heroic efforts as teachers delivered learning materials to homes, made daily phone calls and provided a range of other support for children and their families during tough times.

Our study illuminates how the disruption to schooling shaped the experience of teachers during the 2020 school year. The survey data showed that morale was significantly lower for teachers in 2020 than in 2019, and lower at the end of the year than at the start. This result alone is indicative of the challenges faced by teachers in 2020. It might also be a function of challenging personal circumstances affecting many teachers and school leaders – including their own parenting and caring responsibilities and access to suitable technology for meeting their teaching responsibilities – as well as indicative of widespread malaise in the community. Morale and mental health among healthcare workers, for example, also fell during the pandemic (Spoorthy, 2020; Yang et al., 2020) and adult mental health concerns have multiplied dramatically (Black Dog Institute, 2020; Moreno et al., 2020; Pfefferbaum & North, 2020). As a so-called caring profession, teachers' capacity to keep on giving over the longer term could well be compromised if their morale does not lift. Certainly, in their interviews, school leaders reported lower morale among their staff. And teachers openly reported increased workload and emotional exhaustion, conditions that can lead to a stronger desire to leave the profession (Skaalvik & Skaalvik, 2017). Such loss of teachers from the profession could be devastating for Australia at a time when teacher shortages are predicted to increase (Henebery, 2020). Arguably, there is nothing more important than supporting teachers and school leaders over the next few years as recovery from the COVID-19 pandemic continues. Teacher morale and well-being are foundational to student achievement.

The survey also showed a possible effect of COVID-19 on teachers' efficacy. Of the three areas measured by the efficacy scale, their reported capacity to engage their students was the only area of difference. That is, teachers in 2020 reported feeling equally competent in their instructional strategies and classroom management, but less so in their capacity to motivate students in learning and schoolwork. Despite reporting poorer behaviour by students, management was not reported to be a major problem. Rather, it seems some teachers struggled to re-engage students. Possible explanations include: students having to re-adjust to the more rigid structures and

controlled environment of school learning compared with learning from home; students distracted from learning by wider concerns, as noted above; students feeling fatigue as a result of more time in the classroom; a narrower curriculum focus on literacy and numeracy and the absence of key uplifting events such as school concerts and excursions; and teachers with low morale, high workload and high levels of personal and professional stress struggling to put the same level of energy into their work. Without ongoing, rigorous, and contextualised research into the effects of COVID-19 on both students and their teachers, such explanations remain speculative.

5   Significance

This study offers unique insight based on rigorous evidence given limited system-level data globally on the effects of COVID-19 on either student learning or on teachers and teaching. The lack of evidence is partly because of the pandemic's timing relative to the school year in the northern hemisphere and partly because of limited access to directly comparable data. This study's significance lies in demonstrating that in NSW at least, the disruptions to schooling caused by COVID-19 did not have the kinds of dire academic consequences for student learning that many commentators predicted. Although specific to NSW, these findings are likely to resonate across Australia and across the globe, given our shared experience in this (hopefully) once-in-a lifetime occurrence. Despite even well-informed speculation on the potential effects of COVID-19 on teachers, students and schooling (see for example, Baker, 2020a; Hargreaves & Fullan, 2020; Henebery, 2020; Joseph & Fahey, 2020), very little of this commentary is grounded in empirical evidence.

The multi-faceted qualitative and quantitative data of this study, drawing on directly comparable data from 2019, provides clear evidence of the impacts of the COVID-19 pandemic on schooling in 2020. The analysis offers some comfort to parents, teachers and system leaders who have rightly worried about student learning. It also offers a firm foundation for identifying where extra support is needed; namely, to assist learning in low ICSEA schools, especially among the 2020 Year 3 cohort, and to address both teacher and student well-being. School systems elsewhere in Australia and around the world may find this report helpful in establishing a solid empirical basis for investigating what happened to students and teachers during COVID-19, in their own contexts.

References

AC Del Re. (2013). *compute.es: Compute Effect Sizes. R package version 02.2*. https://cran.r-project.org/web/packages/compute.es/

Ainley, J., & Bourke, S. (1992). Student views of primary schooling. *Research Papers in Education*, *7*(2), 107–128. https://doi.org/10.1080/0267152920070202

Alvarez, D. (2010). "I Had To Teach Hard": Traumatic conditions and teachers in post-Katrina classrooms. *The High School Journal*, *94*(1), 28–39. https://doi.org/10.1353/hsj.2010.0007

Australian Bureau of Statistics. (2020). *The Australian Statistical Geography Standard (ASGS) Remoteness Structure*. https://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure

Australian Council of Educational Research [ACER]. (2011). *Interpreting ACER test results*. https://www.acer.org/files/PATM-Interpreting-Scores.pdf

Australian Government Department of Health. (2020, April 17). *Australian Health Protection Principal Committee (AHPPC) advice on reducing the potential risk of COVID-19 transmission in schools*. https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-advice-on-reducing-the-potential-risk-of-covid-19-transmission-in-schools

Baker, J. (2020a, August 9). *Coronavirus Australia: COVID-19 pandemic is taking its toll on students*. The Sydney Morning Herald. https://www.smh.com.au/education/restless-and-unsettled-the-pandemic-is-taking-its-toll-on-students-20200807-p55jqm.html

Baker, J. (2020b, November 27). "Simply staggering": NSW students fall months behind due to COVID-19. *The Sydney Morning Herald*. https://www.smh.com.au/education/simply-staggering-nsw-students-fall-months-behind-due-to-covid-19-20201126-p56ibk.html

Baytiyeh, H. (2019). Mobile learning technologies as a means of maintaining education delivery in crisis situations. *International Journal of Information and Communication Technology Education*, *15*(3), 1–10. https://doi.org/10.4018/IJICTE.2019070101

Black Dog Institute. (2020). *Mental health ramifications of COVID-19: The Australian context*. https://www.blackdoginstitute.org.au/wp-content/uploads/2020/04/20200319_covid19-evidence-and-reccomendations.pdf

Brown, N., te Riele, K., Shelley, B., & Woodroffe, J. (2020). *Learning at home during COVID-19: Effects on vulnerable young Australians*. https://www.dese.gov.au/system/files/doc/other/learning_at_home_during_covid_30042020.pdf

Burgess, S., & Sievertsen, H. H. (2020). *Schools, skills, and learning: The impact of COVID-19 on education*. VOX, CEPR Policy Portal. https://voxeu.org/article/impact-covid-19-education

Carr-Chellman, A. A., Beabout, B., Alkandari, K. A., Almeida, L. C., Gursoy, H. T., Ma, Z., Modak, R. S., & Pastore, R. S. (2008). Change in chaos: seven lessons learned from Katrina. *Educational Horizons*, *87*(1), 26–39. https://files.eric.ed.gov/fulltext/EJ815369.pdf

Children's Mental Health Ontario. (2020). *Return to school during COVID-19*. https://cmho.org/wp-content/uploads/Return-to-school-during-COVID19-Evidence-summary-for-community-service-providers.pdf

Chrysanthos, N. (2020, September 1). Coronavirus NSW: Thousands of students not returning to school after COVID-19 lockdown. *The Sydney Morning Herald*. https://www.smh.com.au/national/nsw/thousands-of-nsw-students-never-returned-to-school-after-lockdown-20200901-p55rai.html

CIRES, & Mitchell Institute. (2020). *Brief assessment to the Australian Government, Department of Education, Skills and Employment: Impact of learning from home on educational outcomes for disadvantaged children*. https://www.vu.edu.au/sites/default/files/impact-of-learning-from-home-federal-government-brief-mitchell-institute.pdf

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Lawrence Erlbaum Associates.

Convery, I., Balogh, R., & Carroll, B. (2010). 'Getting the kids back to school': Education and the emotional geographies of the 2007 Hull floods. *Journal of Flood Risk Management*, *3*(2), 99–111. https://doi.org/10.1111/j.1753-318X.2010.01060.x

Crawford, N. (2020). *Supporting student well-being during COVID-19. Tips from regional and remote Australia*. https://www.ncsehe.edu.au/wp-content/uploads/2020/05/NicoleCrawford-StudentWellbeing-Covid19.pdf

Curriculum Associates LLC. (2020). *i-Ready Diagnostic Results Understanding Student Needs Paper 2020*.

Dabrowski, A. (2020). Teacher wellbeing during a pandemic: Surviving or thriving? *Social Education Research*, *2*(1), 35–40. https://doi.org/10.37256/ser.212021588

Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020). *COVID-19 and learning loss—disparities grow and students need help*. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help

Doyle, M. (2020, April 27). Teachers head to the classrooms on a wave of #TeachersRock support following coronavirus shutdown - ABC News. *ABC News*. https://www.abc.net.au/news/2020-04-27/coronavirus-teachers-return-to-school-celebrities-show-support/12188268

Duffy, C., & Kent, L. (2020, April 26). Parents reflect on homeschooling as teachers voice fears about schools during coronavirus pandemic - ABC News. *ABC News*. https://www.abc.net.au/news/2020-04-26/coronavirus-homeschooling-remote-learning-public-private-schools/12177112

Education Endowment Foundation. (2018). *The EEF's months of additional progress measure*. https://educationendowmentfoundation.org.uk/modals/help/projects/the-eefs-months-progress-measure/

Engzell, P., Frey, A., & Verhagen, M. (2020, November 9). *The collateral damage to children's education during lockdown*. VOXeu CEPR Policy Portal. https://voxeu.org/article/collateral-damage-children-s-education-during-lockdown

Ezaki, N. (2018). Impact of the 2015 Nepal earthquakes on children's schooling: Focusing on individual children's enrolment flow. *Education 3-13*, *46*(7), 867–878. https://doi.org/10.1080/03004279.2017.1383502

Finkel, A. (2020). *Differential learning outcomes for online versus in-class education*. https://www.science.org.au/sites/default/files/rrif-q005-covid19-online-vs-in-class-education.pdf

Forster, D. (2020, November 9). *Is learning more important than well-being? Teachers told us how COVID highlighted ethical dilemmas at school*. The Conversation. https://theconversation.com/is-learning-more-important-than-well-being-teachers-told-us-how-covid-highlighted-ethical-dilemmas-at-school-144854

Gore, J. M., Fray, L., Miller, A., Harris, J., & Taggart, W. (2020). *Evaluating the impact of COVID-19 on NSW schools*.

Gore, J. M., Holmes, K., Smith, M., Southgate, E., & Albright, J. (2015). Socioeconomic status and the career aspirations of Australian school students: Testing enduring assumptions. *Australian Educational Researcher*, *42*(2), 155–177. https://doi.org/10.1007/s13384-015-0172-5

Gore, J. M., Miller, A., Fray, L., Harris, J., & Prieto, E. (n.d.). Teaching and Teacher Education Improving student achievement through professional development : Results from a randomised controlled trial of Quality Teaching Rounds. *Teaching and Teacher Education*.

Gulosino, C., & Miron, G. (2017). Growth and performance of fully online and blended K-12 public schools. *Education Policy Analysis Archives*, *25*(124), 1–38. https://doi.org/10.14507/epaa.25.2859

Hampshire, A. (2020). *Youth poverty in COVID-19 Australia*. Committee for Economic Development of Australia. https://www.ceda.com.au/Digital-hub/Blogs/CEDA-Blog/April-2020/Youth-poverty-in-COVID-19-Australia

Hanuschek, E. A., & Woessmann, L. (2020). *The economic impacts of learning losses*. OECD ILibrary. https://doi.org/10.1787/21908d74-en

Hargreaves, A., & Fullan, M. (2020). Professional capital after the pandemic: revisiting and revising classic understandings of teachers' work. *Journal of Professional Capital and Community*. https://doi.org/10.1108/JPCC-06-2020-0039

Harry, B., Sturges, K. M., & Klingner, J. K. (2005). Mapping the process: An exemplar of process and challenge in grounded theory analysis. *Educational Researcher*, *34*(2), 3–13. https://doi.org/10.3102/0013189X034002003

Hart, P. M., Wearing, A. J., Conn, M., Carter, N. L., & Dingle, A. R. K. (2000). Development of the School Organisational Health Questionnaire: A measure for assessing teacher morale and school organisational climate. *British Journal of Educational Psychology*, *70*(2), 211–228. https://doi.org/10.1348/000709900158065

Hattie, J. (2020). *Visible Learning effect sizes when schools are closed: What matters and what does not*. Corwin Connect. https://corwin-connect.com/2020/04/visible-learning-effect-sizes-when-schools-are-closed-what-matters-and-what-does-not/

Hedges, L. V, & Olkin, I. (1985). *Statistical methods for meta-analysis*. Academic Press. https://idostatistics.com/hedges-olkin-1985-statistical-methods-for-meta-analysis/

Hendry, J. (2020, April 1). *NSW schools to loan thousands of laptops during COVID-19 - Hardware - iTnews*. Itnews. https://www.itnews.com.au/news/nsw-schools-to-loan-thousands-of-laptops-during-covid-19-545889

Henebery, B. (2020, May 26). *Report reveals lockdown's toll on learning*. The Educator. https://www.theeducatoronline.com/k12/news/report-reveals-lockdowns-toll-on-learning/271568

Hinson, J. M., LaPrairie, K., & Carroll, E. (2007). Emergency preparedness and E-Learning: recommendations for readiness. *Journal of Interactive Instruction Development*, *20*(2), 3–7. http://eds.b.ebscohost.com/eds/pdfviewer/pdfviewer?vid=0&sid=9144bcc4-d27f-4d67-8da2-60a4c5a48401%40sessionmgr101

Ho, R. T. H., Fan, F., Lai, A. H. Y., Lo, P. H. Y., Potash, J. S., Kalmanowitz, D. L., Nan, J. K. M., Pon, A. K. L., Shi, Z., & Chan, C. L. W. (2012). An expressive arts-based and strength-focused experiential training program for enhancing the efficacy of teachers affected by earthquake in China. *Creative Education*, *3*(01), 67–74. https://doi.org/10.4236/ce.2012.31011

ISSR. (2020). *Learning through COVID-19: Maximising educational outcomes for Australia's children and young people*

experiencing disadvantage. https://issr.uq.edu.au/Learning-through-COVID-19

Joseph, B., & Fahey, G. (2020). Pain without gain: Why school closures are bad policy. In *Policy Paper* (Vol. 28). https://www.cis.org.au/publications/policy-papers/pain-without-gain-why-school-closures-are-bad-policy/

Kraft, M. A., Simon, N. S., & Lyon, M. A. (2020). *Sustaining a sense of success: The importance of teacher working conditions during the COVID-19 pandemic*. EdWorkingPaper: 20-279. https://doi.org/10.26300/35nj-v890

Kuntz, J. R. C., Näswall, K., & Bockett, A. (2013). Keep calm and carry on? An investigation of teacher burnout in a post-disaster context. *New Zealand Journal of Psychology*, *42*(2), 57–68.

Lee, J. (2020). Mental health effects of school closures during COVID-19. *The Lancet Child and Adolescent Health*, *4*(6), 421. https://doi.org/10.1016/S2352-4642(20)30109-7

MacIntyre, P. D., Gregersen, T., & Mercer, S. (2020). Language teachers' coping strategies during the COVID-19 conversion to online teaching: Correlations with stress, wellbeing and negative emotions. *System*, *94*, 102352. https://doi.org/10.1016/j.system.2020.102352

Mackenzie, N. (2007). Teacher morale: More complex than we think? *Australian Educational Researcher*, *34*(1), 89–104. https://doi.org/10.1007/BF03216852

Miller, A., Gore, J. M., Wallington, C., Harris, J., Prieto-rodriguez, E., & Smith, M. (2019). Improving student outcomes through professional development: Protocol for a cluster randomised controlled trial of quality teaching rounds. *International Journal of Educational Research*, *98*(May), 146–158. https://doi.org/10.1016/j.ijer.2019.09.002

Moreno, C., Wykes, T., Galderisi, S., Nordentoft, M., Crossley, N., Jones, N., Cannon, M., Correll, C. U., Byrne, L., Carr, S., Chen, E. Y. H., Gorwood, P., Johnson, S., Kärkkäinen, H., Krystal, J. H., Lee, J., Lieberman, J., López-Jaramillo, C., Männikkö, M., … Arango, C. (2020). How mental health care should change as a consequence of the COVID-19 pandemic. In *The Lancet Psychiatry* (Vol. 7, Issue 9, pp. 813–824). Elsevier Ltd. https://doi.org/10.1016/S2215-0366(20)30307-2

Norman, P. (2020, August 10). *The shock of dealing with COVID-19 has made teachers even stronger and better at their craft*. EduResearch Matters. https://www.aare.edu.au/blog/?p=7103

NSW Department of Education. (2020a). *Check-in assessments - Years 3, 5 and 9*. https://www.cese.nsw.gov.au/images/stories/PDF/Check-in-assessment-AA.pdf

NSW Department of Education. (2020b). *Lessons from the COVID-19 Pandemic January – July 2020* (Issue July).

NSW Department of Education. (2020c, March 31). *Laptop loans help bridge the digital divide*. News. https://education.nsw.gov.au/news/latest-news/laptop-loans-help-bridge-the-digital-divide

NSW Government. (2020, November 10). *Free tutoring to support students | NSW Government*. Ministerial Media Releases. https://www.nsw.gov.au/media-releases/free-tutoring-to-support-students

OECD. (2020, August 11). *Combatting COVID-19's effect on children*. OECD Policy Responses to Coronavirus (COVID-19). http://www.oecd.org/coronavirus/policy-responses/combatting-covid-19-s-effect-on-children-2e1f3b2f/

Ofsted. (2020). Ofsted: Children hardest hit by COVID-19 pandemic are regressing in basic skills and learning. In *Ofsted COVID-19 series*. https://www.gov.uk/government/news/ofsted-children-hardest-hit-by-covid-19-pandemic-are-regressing-in-basic-skills-and-learning

Pedro Azevedo, J., Hasan, A., Geven, K., Goldembert, D., & Aroob Iqbal, S. (2020, September 10). *Learning losses due to COVID19 could add up to $10 trillion*. World Bank Blogs. https://blogs.worldbank.org/education/learning-losses-

due-covid19-could-add-10-trillion

Pfefferbaum, B., & North, C. S. (2020). Mental Health and the Covid-19 Pandemic. *New England Journal of Medicine*, *383*(6), 510–512. https://doi.org/10.1056/nejmp2008017

Phillips, L., & Cain, M. (2020). *"Exhausted beyond measure": what teachers are saying about COVID-19 and the disruption to education*. The Conversation. https://theconversation.com/exhausted-beyond-measure-what-teachers-are-saying-about-covid-19-and-the-disruption-to-education-143601?fbclid=IwAR1Qu48DrpOrpx6OGYe2ZA_1jpnK7szssRk4A5j7t9pMf-ol0iTJ1gRFee4

Potts Rosevear, M. (2020, November 22). Disadvantage and the digital divide in education. *The Sydney Morning Herald*. https://www.smh.com.au/national/disadvantage-and-the-digital-divide-in-education-20200930-p560tx.html

Psacharopoulos, G., Parinos, H. A., Collis, V., & Vegas, E. (2020). *The COVID-19 cost of school closures*. World Bank. Education for Global Development. https://blogs.worldbank.org/education/covid-19-cost-school-closures

QSR International. (2020). *NVivo 12* (No. 12). QSR International.

R Core Team. (2019). *R: The R Project for Statistical Computing*. https://www.r-project.org/

Sawchuk, S. (2020, August 19). *Overcoming COVID-19 learning loss*. Education Week. https://www.edweek.org/ew/issues/reopening-schools/overcoming-covid-19-learning-loss.html

Schleicher, A. (2020a). The impact of COVID-19 on education insights from education at a glance 2020. In *OECD*.

Schleicher, A. (2020b). The long shadows of the education crisis. *Teacher*. https://www.teachermagazine.com.au/columnists/andreas-schleicher/the-long-shadows-of-the-education-crisis?utm_source=Twitter&utm_medium=socialmedia&utm_term=social

Selwyn, N. (2020, October 26). *How creative use of technology may have helped save schooling during the pandemic*. The Conversation. https://theconversation.com/how-creative-use-of-technology-may-have-helped-save-schooling-during-the-pandemic-146488

Senechal, J., Sober, T., Hope, S., Johnson, T., Burkhalter, F., Castelow, T., Gilfillan, D., Jackson, K., Nabors, A., Nueman, P., Robinson, R., Sargeant, R., Standford, S., & Varljen, D. (2016). *Understanding Teacher Morale*. http://scholarscompass.vcu.edu/merc_pubshttp://scholarscompass.vcu.edu/merc_pubs/56

Seyle, D. C., Widyatmoko, C. S., & Silver, R. C. (2013). Coping with natural disasters in Yogyakarta, Indonesia: A study of elementary school teachers. *School Psychology International*, *34*(4), 387–404. https://doi.org/10.1177/0143034312446889

Skaalvik, E. M., & Skaalvik, S. (2017). Motivated for teaching? Associations with school goal structure, teacher self-efficacy, job satisfaction and emotional exhaustion. *Teaching and Teacher Education*, *67*, 152–160. https://doi.org/10.1016/j.tate.2017.06.006

Slavin, R. (2020, December 17). *Large-scale tutoring could fail. Here's how to ensure it does not*. Robert Slavin's Blog; Routledge. https://robertslavinsblog.wordpress.com/

Sonnemann, J., & Goss, P. (2020). *COVID catch-up: Helping disadvantaged students close the equity gap*. http://www.grattan.edu.au/.

Spoorthy, M. S. (2020). Mental health problems faced by healthcare workers due to the COVID-19 pandemic–A review. In *Asian Journal of Psychiatry* (Vol. 51, p. 102119). Elsevier B.V. https://doi.org/10.1016/j.ajp.2020.102119

Storen, R., & Corrigan, N. (2020, October 22). *COVID-19: a chronology of state and territory government*

announcements (up until 30 June 2020) – Parliament of Australia. Parliament of Australia.
https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp2021
/Chronologies/COVID-19StateTerritoryGovernmentAnnouncements#_Toc52275796

Street, H. (2020, May 28). Student wellbeing: Understanding different COVID-19 experiences -…. *Teacher*.
https://www.teachermagazine.com/au_en/articles/student-wellbeing-understanding-different-covid-19-
experiences

Thompson, B., Jerome, A. M., Payne, H. J., Mazer, J. P., Kirby, E. G., & Pfohl, W. (2017). Analyzing postcrisis challenges
and strategies associated with school shootings: An application of discourse of renewal theory. *Communication
Studies*, *68*(5), 533–551. https://doi.org/10.1080/10510974.2017.1373370

Trethowan, V., & Nursey, J. (2015). Helping children and adolescents recover from disaster: A review of teacher-based
support programs in Victorian schools. *The Australian Journal of Emergency Management*, *30*(4), 17–20.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher
Education*, *17*(7), 783–805. https://doi.org/10.1016/S0742-051X(01)00036-1

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher Efficacy: Its Meaning and Measure. *Review of
Educational Research*, *68*(2), 202–248. https://doi.org/10.3102/00346543068002202

UNESCO. (2020a). *School closures caused by Coronavirus (COVID-19)*. Education: From Disruption to Recovery.
https://en.unesco.org/covid19/educationresponse

UNESCO. (2020b). *Reopening schools: When, where and how?* https://en.unesco.org/news/reopening-schools-when-
where-and-how

United Nations. (2020a). *Policy brief: The impact of COVID-19 on children*.
https://unsdg.un.org/sites/default/files/2020-04/160420_Covid_Children_Policy_Brief.pdf

United Nations. (2020b). *Policy brief: Education during COVID-19 and beyond*.
https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-
19_and_education_august_2020.pdf

Whaley, G., Cohen, W., & Cozza, S. (2017). Children and families responding to disaster and bereavement. In R. J.
Ursano, C. S. Fullerton, L. Weisaeth, & B. Raphael (Eds.), *Textbook of Disaster Psychiatry* (pp. 213–230).
Cambridge University Press. https://doi.org/10.1017/9781316481424.015

Whittle, S., Bray, K., Lin, S., & Schwartz, O. (2020). *Parenting and child and adolescent mental health during the COVID-
19 pandemic*. PsyArXiv Preprints; PsyArXiv. https://doi.org/10.31234/OSF.IO/AG2R7

Yang, L., Yin, J., Wang, D., Rahman, A., & Li, X. (2020). Urgent need to develop evidence-based self-help interventions
for mental health of healthcare workers in COVID-19 pandemic. In *Psychological Medicine* (pp. 1–2). Cambridge
University Press. https://doi.org/10.1017/S0033291720001385

yourtown, & Australian Human Rights Commission. (2020). *Impacts of COVID-19 on children and young people who
contact Kids Helpline*. https://humanrights.gov.au/sites/default/files/document/publication/ahrc_khl_covid-
19_2020.pdf

Zhang, L., Zhang, D., Fang, J., Wan, Y., Tao, F., & Sun, Y. (2020). Assessment of mental health of Chinese primary school
students before and after school closing and opening during the COVID-19 pandemic. *JAMA Network Open*, *3*(9),
e2021482. https://doi.org/10.1001/jamanetworkopen.2020.21482

Appendix A. Student Survey extract

Quality of School Life (Ainley & Bourke, 1992)

Item	Description
General satisfaction	I really like to go to school each day
	I like to be at school
	I feel happy at school
	I feel proud to be a student
	I have a lot of fun at school
	I get enjoyment from being at school
Achievement	I am a success as a student
	I know how to cope with the work
	I am good at school work
	I know I can keep up with the work
	I think my school work is of good quality
Teachers	My teacher is fair to me
	My teacher takes an interest in helping me with my work
	My teacher listens to what I say
	My teachers help me to do my best
	My teacher treats me fairly in class
Relevance of schooling	The work is good preparation for my future
	The things I learn are important
	Things I learn will help me in secondary school
	I can learn what I need to know
	What I learn will be useful
	Learning will be useful when I leave school
Adventure	I like to do extra work
	Learning is fun
	I enjoy what I do in class
	I get excited about the work we do
	The work we do is interesting

School Learning Culture (Gore et al; 2015)

Item
My friends help me with school work
My friends talk about doing well at school
My friends laugh at students who do well at school
My friends distract me from listening in school
A member of my family helps me with my schoolwork

Appendix B. Teacher Survey extract

Teacher efficacy (Tschannen-Moran & Hoy, 2001)

Item	Description
Classroom management	How much can you do to control disruptive behaviour in the classroom?
	How much can you do to get children to follow classroom rules?
	How much can you do to calm a student who is disruptive or noisy?
	How well can you establish a classroom management system with each group of students?
Instructional strategies	To what extent can you craft good questions for your students?
	How much can you use a variety of assessment strategies?
	How much can you do to provide an alternative explanation when students are confused?
	How well can you implement alternative strategies in your classroom?
Student engagement	How much can you do to motivate students who show low interest in school work?
	How much can you do to get students to believe they can do well in school work?
	How much can you do to help your students value learning?
	How much can you assist families in helping their children do well in school?