PIRLS 2016
Reading Literacy and the Classroom
Acknowledgements

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Disclaimer: Opinions, findings and conclusions expressed in this report are those of the author.
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Executive Summary

Reading is an essential skill that provides the foundation for future wellbeing and success. As well as demonstrating fluency and basic comprehension, reading involves being able to reflect on texts and use them to gain knowledge. There is also an increasing emphasis in society on the ability to use and apply what has been read in new situations whether they be at school or in the workplace. Reading is not just something that is done at school for school; the reader is able to make sense of the world around them and participate fully in a range of settings—at home, at school, and in the wider community.

The Progress in International Reading Literacy Study

During late 2015 and early 2016, New Zealand and 49 other countries took part in the IEA’s Progress in International Reading Literacy Study (PIRLS) or PIRLS 2016. PIRLS is an international research study designed to measure trends in reading literacy achievement of middle-primary school students every five years. This was the fourth cycle, with the first study conducted in 2001, the second, during 2005 and 2006, and the third during 2010 and 2011.

PIRLS 2016 involved approximately 5,600 New Zealand Year 5 students from 188 schools, their teachers, and parents/caregivers. An overview of the key results pertaining to New Zealand was presented in report that was released to coincide with the announcement of the international results by the IEA and Boston College in December 2017.

New Zealand was one of 34 countries whose middle primary school students scored significantly higher, on average, than the PIRLS Scale Centrepoint (500). However, after a decade of relative stability, the results from PIRLS 2016 showed a slight weakening in New Zealand children’s reading achievement at this level. This was illustrated in:

- the small but statistically significant decrease in the mean reading score from 531 in PIRLS 2011 to 523 in PIRLS 2016
- a shift in the distribution of the scores, with the value of key percentiles such as the 25th and 75th lower in PIRLS 2016 than in PIRLS 2011
- proportionally fewer New Zealand children reaching the PIRLS international benchmarks, particularly the Advanced and High International Benchmarks
- a drop in New Zealand’s standing relative to the other 40 countries that took part in the two most recent cycles, from 22nd in PIRLS 2011 to 29th in PIRLS 2016.

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1 International Association for the Evaluation of Educational Achievement (IEA).
2 This is the fourth year of formal schooling, unless the average age of the country’s students is less than 9.5 years.
3 See PIRLS 2016: New Zealand’s Achievement on the Ministry of Education’s Education Counts website
4 This is the reference point for comparing country means. It remains constant over time.
5 The use of significant is to be understood in terms of statistical significance at the 5% level. See Glossary of Terms and Technical Notes for more details. Because of rounding some differences may appear inconsistent.
6 The 25th percentile is the achievement score on the scale where 25% of students score a lower value and 75% of students score higher. The 75th percentile is the achievement score on the scale where 75% of students score a lower value and 25% of students score a higher value. The 50th percentile is equivalent to the median.
The weaker performance was not limited to one area of reading or aspect of children’s reading comprehension. Decreases were across the board, but most concerning was the decline in students’ reasoning performance—the ability to interpret, integrate, and evaluate ideas.

The first national reporting focused on student outcomes — achievement and their attitudes to and confidence in reading. The initial focus on students’ attitudes to reading did not provide any immediate insight for the weaker performance in PIRLS 2016. A second report focused on the school context for learning. Again, there was no additional insight: most of conditions were the same as in 2010 when PIRLS 2011 was implemented in New Zealand.

The focus of this third report is on describing the classroom settings in which New Zealand’s Year 5 students were learning in 2015, from both teacher and student perspectives, as well as the practices used by teachers to develop students’ reading comprehension. It is important to remember when interpreting information reported by teachers in PIRLS that it is not necessarily representative of the views and experiences of all Year 5 teachers; they were, however, the teachers of a representative sample of Year 5 students in a representative sample of New Zealand schools.

PIRLS 2016 shows that Year 5 students were often in composite (or multi-level) classes, and had access to a classroom library as well as computers and tablets during reading. They were taught by well-qualified, collaborative teachers.

- Achievement and social criteria had been used to assign Year 5 students at the beginning of the 2015 school year.
- A class typically had 27 students and it was likely to be composite (or multi-level), with 15 at Year 5.
- Most teachers of Year 5 students had a bachelor’s or bachelor’s honours degree, had specialised in language or reading pedagogy during their formal education, and had 5 to 20 years teaching experience.
- Teachers collaborating with colleagues within the school setting was more likely to occur than with professional colleagues external to the school.
- Almost all Year 5 students had access to a classroom library, and more likely than their international counterparts to have access to computers (or tablets) during reading.

New Zealand teachers were teaching classes with Year 5 students of varying reading ability, with some students in need of additional assistance.

- There was an average of one Year 5 student per class who had difficulty understanding spoken English or te reo Māori (the languages of the PIRLS assessment).
- An average of two Year 5 students per class needed ‘remedial’ reading assistance of which one was receiving it.
- An average of four Year 5 students per class were judged by their teacher to be advanced readers.

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7 This means that the proportions (percentages) reflect the students taught by teachers who had indicated a particular response or had a certain characteristic. For example, 82 percent of Year 5 students were taught by teachers who had a bachelor’s or bachelor honours degree.
New Zealand teachers were generally well-placed implementing effective practices to develop their Year 5 students’ reading comprehension. They did stand out from their ‘English-language’ counterparts in how often they used some organisation and instructional practices.

- When organising a class for reading instruction, New Zealand teachers’ preference was to use same ability grouping. Only Northern Irish teachers use this approach as often. Teaching reading as a whole-class activity rarely or never occurred.

- Silent reading was a very common activity in New Zealand classrooms – it recorded the highest percentage of students who were asked daily to read silently on their own (88%). It was also common in the United States, Canada, and Australia but less common in the other English-language countries such as England, Ireland, and Singapore.

- New Zealand teachers were more likely to teach their Year 5 students critiquing skills when reading digitally than many of their international colleagues, including those in most of the English-language countries.

- New Zealand teachers rarely asked their Year 5 students to read aloud (in any setting), and were the least among the English-language countries.

- In New Zealand classrooms, there was a little more emphasis on teaching decoding sounds and words than teaching new vocabulary (systematically) compared with the emphases in other English-language countries’ classrooms.

- Year 5 students were less likely to read longer fiction chapter books as part of their reading instruction compared with their counterparts in other English-language countries.

- Year 5 students were generally a little less engaged during their reading than their international peers. They were also more likely to consider reading to be ‘boring’ in 2015 than their 2010 counterparts.

PIRLS 2016 shows that New Zealand Year 5 students generally had higher reading achievement . . .

. . . when their teachers had an emphasis on academic success.

- Compared with their international peers, New Zealand teachers generally held strong views on academic success in their schools.

- Most Year 5 students were taught by teachers who had either a high or very high emphasis on academic success. These students scored more than 30 score points on average than their Year 5 peers who were taught by teachers with a medium emphasis.
when their teachers’ instruction was not impeded by limiting attributes of the students in the class.

Overall, New Zealand teachers’ instruction tended to be either very little or only somewhat impacted by their student needs, and about the same as their international colleagues, on average.

The two single factors most likely to be identified as impacting on teachers’ class instruction were students’ lack of prior knowledge and students being absent from class (or school).

when they were rarely absent from school.

Compared with many of their international peers, Year 5 students were more likely to report that they were often (at least monthly) absent from school.

Asian or Pākehā/European were more likely to report they were rarely (never or almost never) absent than their Pacific and Māori peers.

Reading achievement was, on average, higher for Year 5 students who reported they were rarely absent, regardless of their socio-economic circumstances or ethnic identity.

if they liked reading.

Year 5 students’ views of reading were relatively positive when compared with their international peers.

Year 5 girls tended to be more positive than Year 5 boys, with Pacific and Asian students more positive about reading than their Pākehā/European and Māori peers.

Liking reading, however, only contributed to a two score point increase in reading achievement, after taking into account student demographic and socio-economic factors, language of the assessment, and language spoken in the home.

were confident as readers.

Year 5 students’ self confidence in their reading ability was relatively low internationally; they were the least confident among the English-language countries.

Year 5 boys, Māori and Pacific students were a little over-represented as not being confident.

Having confidence as a reader had a much stronger, positive relationship with achievement than simply just liking reading – a one point increase on the confidence scale corresponded to a 20 score point increase after taking into account student demographic and socio-economic factors, language of the assessment, and language spoken in the home.
Opportunity-to-learn, as measured by the amount of instructional time Year 5 students had for reading was about the same in 2015 as in 2010. Students being absent from class or school did, however, impact on this opportunity for learning.

- The proportion of time New Zealand schools allocated for language instruction (including reading) was greater than the international average. Across countries there was no obvious relationship between instructional time and reading achievement.

- The apparent impact of self-confidence ($d = 0.59$) and regular attendance at school ($d = 0.43$) on students’ reading achievement were stronger than students’ liking of reading ($d = -0.10$), after accounting for demographic and socio-economic factors, language of the assessment, and language spoken in the home.

**Final comment**

New Zealand has taken part in all four cycles of PIRLS. After a period of relative stability, the results from PIRLS 2016 show a slight weakening of New Zealand children’s reading performance. Furthermore, relative to the other 40 countries that took part in the two most recent cycles, New Zealand’s standing dropped from 22nd in PIRLS 2011 to 29th in PIRLS 2016.

This third report presents the classroom-related factors investigated in PIRLS 2016. It identifies some key factors associated with higher (or lower) achievement. The analyses highlight that teachers are faced with challenges such as students not being confident or engaged, not having the pre-requisite skills needed to meet the reading demands required to access the curriculum, or who are often absent from class. Students’ own reports on how often they were absent and the negative relationship this has with their reading achievement is also discussed.

It is important to remember that by the end of Year 5, students’ reading experiences at school have generally been influenced by more than one teacher. Reading achievement is likely to reflect the cumulative impact of those five years at school as well as home influences, not just the experiences of 2015. An overview of ‘self-reported’ practices and activities teachers used in their reading instruction as it was in 2015 is presented, and New Zealand appears to be on the whole well-placed with implementing known effective literacy practices. However, there are some areas where teaching practice is quite different from countries and jurisdictions where children are also learning in English. Understanding how New Zealand children’s exposure to (or not) particular practices, in conjunction with their early reading experiences, is impacting on their reading comprehension, is needed if the downward achievement trend – actual and relative – is to be addressed.

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8 An approach to looking at the strength of the relationship between the variables in question and reading achievement using quasi effect sizes.

9 A more in-depth commentary is outlined Reading literacy instruction in the English-language countries: similarities and differences (Chamberlain, with Forkert, 2019).

While this report was being written, the OECD’s *Measuring innovation in education 2019: What has changed in the classroom?*,\(^\text{11}\) was released, and in their conclusion the authors note that little ‘innovation’ was observed in the teaching of reading in New Zealand from 2005 to 2015.\(^\text{12}\) It is also worth noting that the frequency of New Zealand teachers’ use of some practices, such as grouping by ability and teaching decoding strategies, were highlighted back in PIRLS 2001.\(^\text{13}\)

Finally, it is recommended that the findings presented here are not viewed in isolation and are read in conjunction with the national reports:

- PIRLS 2016: New Zealand’s Achievement
- PIRLS 2016: Schools and School Climate for Learning
- *Reading literacy instruction in the English-language countries: similarities and differences*

The international publications released during 2016 and 2017 are invaluable for understanding PIRLS 2016 and are listed at the end of this report.

\(^{11}\) Vincent-Lancrin, Urgel, Kar, and Jacotin (2019, p. 283).
\(^{12}\) In the OECD publication the authors refer to 2006 to 2016 to reflect when Northern Hemisphere countries implemented PIRLS.
\(^{13}\) Caygill and Chamberlain (2004, pp. 67–69).
Section 1: Background to PIRLS 2016

This section provides an overview of . . .

... the purpose of PIRLS 2016, the reading comprehension processes and the types of texts used in the assessment.

... the literacy policy context for New Zealand at the time PIRLS 2016 was implemented in New Zealand in late 2015.

... the key achievement results for New Zealand Year 5 students that were reported in *PIRLS 2016: New Zealand’s Achievement* to coincide with the international release at the end of 2017.

... the analytical framework used for reporting the national results for the study.
Overview

The IEA’s14 Progress in International Reading Literacy Study, PIRLS, is a large-scale assessment study that looks at the reading literacy achievement of middle-primary school students, Year 5 in New Zealand, every five years. The study is designed to measure trends in reading literacy achievement, as well as gaining insight into changes in school and class context factors across time. New Zealand has participated in all earlier cycles: PIRLS 2001, PIRLS 2006, and PIRLS 2011.15

New Zealand and three other Southern Hemisphere jurisdictions administered the fourth cycle of PIRLS towards the end of the 2015 school year, with Northern Hemisphere countries conducting the administration at the end of their school year in the first quarter of 2016.

The purpose of this report is to describe the school context findings from the study. It is the second in a series of reports to be released on the study. The results from the assessment of Year 5 students were reported in *PIRLS 2016 New Zealand’s Achievement*,16 and released in December 2017 to coincide with the release of the international results.

What is PIRLS?

The Progress in International Reading Literacy Study, or PIRLS, is an international research study designed to measure trends in reading literacy achievement. It involves children in their fourth year of formal schooling, an important developmental age for children as it marks the turning point where they move from ‘learning to read’ to ‘reading to learn’. In PIRLS, reading literacy is defined as:

> “...the ability to understand and use those written language forms required by society and/or valued by the individual. Readers can construct meaning texts in a variety of forms. They read to learn, to participate in communities of readers in school and everyday life, and for enjoyment.”17

The *PIRLS 2016 Assessment Framework* describes the reading framework for assessing reading literacy, specifically the processes of comprehension and the purposes for reading that were to be assessed. It also sets out the contextual framework used to capture information from parents/caregivers, school principals, and teachers in order to understand the achievement outcomes and students’ reading behaviours and attitudes.18 Aspects of the study including the design of the study are described in Appendix A.

Processes of reading comprehension

The four processes of reading comprehension PIRLS assesses are the skills and strategies children are expected to demonstrate and use when they are reading the PIRLS texts and answering the assessment questions associated with the texts. They are described in detail in Box A.1 in Appendix A.

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14 International Association for the Evaluation of Educational Achievement.
15 The three earlier cycles of PIRLS were implemented in New Zealand in 2001, 2005, and 2010.
For reporting purposes, the four processes were combined into two broader categories. These are the:

- Text-based skills – *retrieving and straightforward inferencing*, which combines the focus on retrieve explicitly-stated information and make straightforward inferences processes
- Reasoning strategies – *interpreting, integrating, and evaluating*, which combines the process of interpret and integrate ideas and information with evaluate and critique content and textual elements process.

The purposes for reading

PIRLS focuses on two overarching purposes that account for most of the reading undertaken by middle primary school children, both in and out of school: *reading for literary experience* or *literary reading* (stories) and *reading to acquire and use information* or informational reading (articles, biographies). These are described in more detail in Appendix A, Box A.2.

The literacy policy context for PIRLS in New Zealand

Until 2009 much of the literacy-related activity was informed by recommendations made by the 1998 Literacy Taskforce and aligned under the overarching *Literacy and Numeracy Strategy*. The strategy provided a mechanism for aligning and ensuring consistency among a range of policies, programmes, and projects that were designed to improve the literacy achievement outcomes in English-medium settings. Programmes aimed to improve outcomes or make changes were, in general, delivered through frameworks and guidelines rather than prescriptions for all schools to implement. The scale of some of the more successful literacy-related initiatives has tended to be relatively small compared with those implemented in some other countries.19

A literacy strategy for Māori-medium education—*Te Reo Matatini Māori-medium Literacy Strategy*—consolidated a number of existing strategies as they affected learners in bilingual and Māori immersion settings and was used for prioritising a number of initiatives.20

Change of focus from 2010

*The New Zealand Curriculum* (NZC) was fully implemented at the beginning of 2010, while the implementation of *Te Marautanga o Aotearoa* (TMoA), the curriculum for teaching and learning in Māori-medium education was completed in 2011.21

National standards for literacy (including kōrero /speaking in Māori-medium settings) and mathematics were also introduced into primary schooling settings with Years 1 to 8 to concur with the full implementation of the NZC and TMoA in 2010 and 2011 respectively.22

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19 See Chamberlain (2012, 2013) for details. One of the key programmes under the umbrella of the literacy strategy was the Literacy Professional Development Project (LPDP). This whole-school, two-year intervention programme which started in 2004 and ended in 2009, supported schools with Years 1 to 8 students to improve English-language learning and raise achievement in literacy (reading comprehension and writing). However, by the end of 2009, LPDP had only involved just fewer than 400 schools (out of about 2,100 primary schools).


21 Introduced in 2007 and 2008 respectively.

22 The *New Zealand Curriculum reading and writing standards for years 1–8* and *Te Marautanga o Aotearoa whanaketanga reo kōrero, pānui, tuhituhi*. The main purpose of the standards was to provide reference points for teachers that described students’ progress and achievement at each year level.
Starting from 2012, each school with Years 1 to 8 students that used NZC was required to report annually to the Ministry of Education on the analysis of the information from the National Standards. The reporting included an overview of a school’s strengths as well as areas for improvement; the basis for identifying areas for improvement; and targets and accompanying actions planned for lifting achievement.23

The New Zealand Year 5 cohort assessed as part of PIRLS in November 2015 had all their schooling in this context.

Communities of Learning | Kāhui Ako

In 2014 the then government introduced its Investing in Educational Success policy with the aim of raising student achievement by promoting effective collaboration among education providers.24 Formally known as Communities of Learning | Kāhui Ako, these schools provide new leadership and teaching roles in and across schools. For example, a Community of Learning leader is responsible for providing leadership across the group of education providers and is a principal of one of the schools. By the time PIRLS was administered in New Zealand in November 2015, 96 Communities of Learning had been established.25 Thirteen percent of Year 5 students in PIRLS (N = 745) were attending schools that were part of a Community of Learning | Kāhui Ako.26

PIRLS 2016 – facts and figures

New Zealand and 49 other countries took part in PIRLS 2016 during late 2015 and early 2016.27 Eleven jurisdictions, regions, or student groups also took part as benchmarking participants, involving more than 300,000 students (see Appendix B). 28

Twenty of the PIRLS countries had also taken part in the three previous cycles 2001, 2006, and 2011; 42 had also taken part in PIRLS 2011.

In New Zealand, approximately 5,600 Year 5 students from 188 schools took part, along with their teachers and parents/caregivers. The majority of Year 5 students had started primary school in 2011, and in 2015 they were typically about 10 years old.

23 Chamberlain (2017) referenced at the end of the report.
24 This includes childhood education services, schools, and post-secondary services.
26 A government announcement in June 2019 has meant that no new Communities of Learning | Kāhui Ako can be established. However, schools/education providers are still able to join one of the existing 221 Communities of Learning | Kāhui Ako.
27 Internationally, this cycle is referred to as PIRLS 2016. New Zealand and other Southern Hemisphere countries administered PIRLS in late 2015.
28 The 50 countries include the two Belgian systems (Flemish and French); the two Special Administrative Regions of China, Hong Kong and Macao; England and Northern Ireland. Benchmarking participants include a geographical region language group often from a participating country; their information is not included in the calculations of statistics.
What were the key achievement results for New Zealand’s Year 5 students?29

- In keeping with previous cycles, the mean reading score for New Zealand Year 5 students (523) was significantly30 higher than the PIRLS Scale Centrepoint (500).
- There was, however, a small but significant decrease in the New Zealand mean from PIRLS 2011 to PIRLS 2016.
- Proportionally fewer Year 5 students reached the Low, High, and Advanced International Benchmarks in PIRLS 2016 than in PIRLS 2011.
- Year 5 students showed relatively stronger performance when reading literary texts than informational texts. However, there were significant decreases in the means for both types of reading.
- Year 5 students showed relatively stronger performance when they were required to use reasoning strategies than questions that needed the text-based skills of retrieving and making straightforward inferencing. However, they showed significantly weaker performance in both these two comprehension areas in PIRLS 2016 than in PIRLS 2011.

Girls and boys

- In keeping with previous cycles, both Year 5 girls and boys generally achieved above the international means for girls and boys.
- However, both girls and boys recorded significantly weaker achievement, on average, than their respective peers did in PIRLS 2011.
- Internationally, girls generally had higher reading achievement than boys. New Zealand was no exception, and it continued to have one of the largest differences between girls’ and boys’ average reading achievement.

Children’s ethnic identity and reading achievement

- Pākehā/European children had weaker reading achievement overall in PIRLS 2016 than in PIRLS 2011. This was also reflected in significantly smaller proportions reaching the High and Advanced International Benchmarks.
- While there was a moderate decrease in the mean for Māori children, the change was not of statistical significance. There was however a significant decrease in the proportion of Māori children reaching the Low International Benchmark in PIRLS 2016 than in PIRLS 2011.
- There was a moderate (non-significant) increase in the mean for Pacific children, largely due to significantly stronger performance among Pacific girls.
- While there was more variability in Asian children’s reading scores in PIRLS 2016 than in previous cycles, there was no significant change in their mean from PIRLS 2011 to PIRLS 2016 for children in this grouping.

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29 See Figure C.1 in Appendix C for the mean scores for all participating countries.
30 The use of significant hereafter is to be understood in terms of statistical significance at the 5% level. For details, see Glossary of Terms and Technical Notes at the end of this report.
**Children’s home context**

- New Zealand children who were from well-resourced homes in PIRLS 2016 generally had lower reading achievement than children from similarly well-resourced homes in PIRLS 2011. There was no change for other groups.

- New Zealand children who always or almost always spoke the test language at home, either English or te reo Māori, generally had higher reading achievement than those who only sometimes or never did. The average difference in reading achievement between these two home-language groups—those who frequently spoke the test language and those who did not—had decreased overtime.

- Children who were born in another country and arrived in New Zealand when they were younger than five-years-old, generally had significantly higher reading achievement than both children who arrived when they were five years or older and children who were born in New Zealand.

- Parents/caregivers’ views about their own reading behaviours were less positive PIRLS 2016 than in PIRLS 2011, a finding common to more than half the countries.

**Children’s attitudes**

- New Zealand children’s views about reading were typical of many of their international peers, but they were much less confident about themselves as readers. There were no obvious changes in either their attitudes towards reading or their level of confidence from PIRLS 2011 to PIRLS 2016.

- The relationship between New Zealand children’s reading achievement and their confidence as readers was particular strong. Children who were not confident readers scored about 120 score points lower, on average, than children who were very confident.

**An analytical framework**

Figure 1.1 shows a framework to assist with understanding the aspects of the study and how they are reported. All components of the study have now been reported internationally, and links to online publications are listed in the References section at the end of the report.

Nationally, the focus of the first report was on student achievement and their attitudes to reading. This assessment information was captured when students responded to series of questions about a reading text – a story or an article – that assessed different types of reading comprehension. These comprehension processes involved interpreting, integrating, and evaluating texts (reasoning) and retrieving specific information and straightforward inferencing (text-based skills).
Classroom context

Most of the teaching and learning at school takes place in a classroom setting. PIRLS 2016 focused on a number of proven practices that have been found to improve teaching and learning:31

- Teacher preparation and experience
- Classroom resources
- Instructional time
- Instructional engagement
- Instruction for online reading
- Classroom assessment

This report looks at the classroom setting and the role of the teacher in developing middle primary children’s reading literacy. It describes information made available from the teachers of the students who took part. In some instances students’ perspectives are presented. Where possible, findings are compared with PIRLS 2011.

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31 Hooper, Mullis, and Martin (2015, p. 45).
Section 2: The Classroom Context

Key findings

Compared with their international peers, New Zealand teachers generally placed either a high or very high emphasis on academic success; students whose teachers placed more emphasis on academic success generally had higher reading achievement than students whose teachers held more moderate views.

About two-thirds of Year 5 students attended schools where their achievement information was used to assign them to their classes in 2015; the majority of students were in composite (or multi-level) classes.

The proportion of instructional time allocated to reading in 2015, including reading across the curriculum, was greater than the international average and about the same as in 2010.

Almost all classes with Year 5 students had a library, but they tended to be a little smaller than other countries’ class libraries, with few book and magazine titles. Year 5 students were less likely than their peers in other English-language jurisdictions to be allowed to borrow books from their classroom library to take home.

In 2015, just over one-quarter of Year 5 students attended schools that had a digital ‘bring your own device’ policy. Independent schools, and to a lesser extent deciles 9 and 10 schools were more likely to have the policy than other schools.

Compared with most of their international peers, Year 5 students were more likely to have access to computers (including tablets and laptops) during reading instruction.
Introduction

Teachers have a key role as they respond to and implement both school and national curricular intentions. Their preparation to teach and their experiences teaching reading, for example, are significant for students' development of reading literacy. Generally, classes will vary in size, which can often affect the structure of lessons and the learning environments—teacher-centred in larger classrooms to the child-centred approach associated with smaller classes—the number of students will often influence how teachers approach instruction.

This section presents background information provided by the teachers of Year 5 students assessed in PIRLS 2016. They provided information about themselves, their views about their schools, instructional opportunities to learn, and classroom resources available to them when teaching reading. When possible, their students' achievement is presented. It is important to remember that by the fourth or fifth year of schooling, students' reading experiences have generally been influenced by more than one teacher. The information collected from teachers in 2015 is just a snapshot of just one year.

Note: the information described here is from the teachers of a representative sample of Year 5 students who were teaching in a representative sample of New Zealand schools at the time PIRLS was administered in New Zealand in late 2015. As such, the information does not necessarily represent the views and experiences of all Year 5 teachers, and is typically framed from a student perspective.

Background and demographic characteristics of middle primary teachers\(^\text{32}\)

Formal Education\(^\text{33}\)

On average internationally, 26 percent of middle primary school students were taught by teachers who had completed a post-graduate university degree (e.g., doctorate, master's). Five percent of New Zealand's Year 5 students were taught by teachers with these post-graduate qualifications, with most – 82 percent – taught by teachers who had completed a bachelor's or bachelor's honours degree (60% on average internationally). Thirteen percent were taught by teachers with a college of education diploma or equivalent (11% on average internationally).

About 70 percent of Year 5 students were taught by teachers who had specialised in language (e.g., structure of the English or Māori languages) during their formal education/teacher preparation, 73 percent were taught by teachers who had reading pedagogy (teaching reading) as an area of emphasis, and 39 percent with teachers who had specialised in reading theory. In 2010, the corresponding percentages were 70 percent, 66 percent, and 30 percent respectively.

\(^{32}\) In New Zealand approximately 390 teachers of Year 5 students responded to the PIRLS Teacher Questionnaire.

\(^{33}\) Pathways and ISCED classifications have changed over time and therefore comparisons are limited. For example, the Trained Teachers Certificate, a form of primary teacher accreditation, used to be included in the same broad ISCED classification as the Bachelor's degree or equivalent. Similarly, a graduate diploma was included as a postgraduate degree. This is no longer the case.
Age

In 2015, the modal (or common) teachers’ age bands were 30–39 years (28% of students taught by teachers in this band) and 40–49 years (31%). Just 14 percent of Year 5 students were taught by teachers under 30 years (compared with 21% in 2010). About one in five teachers were 50–59 years (21%); just 6% of Year 5 students were taught by teachers who were 60 years or older. The age distribution for New Zealand was similar to the international distribution.

Gender

Internationally, most students at the middle primary level were taught by female teachers, 84 percent on average, and just 16 percent by male teachers. The percentage of New Zealand Year 5 students taught by women was 75 percent (also 75% in 2010) and 25 percent, by men. English and Finnish students were somewhat more likely than New Zealand students to be taught by male teachers (about 30% of children), while Latvian and Lithuanian students were much less likely with virtually all (99%) taught by female teachers.

Teaching Experience

On average internationally, teachers had 17 years teaching experience compared with 13 years for New Zealand teachers of Year 5 students (in 2010 it was an average of 11 years). Internationally, 42 percent of middle primary school students were taught by teachers who had 20 years or more teaching experience; in New Zealand it was half that at 21 percent. The converse to this is that New Zealand had a higher percentage of students (22%) taught by teachers who had less than five years teaching experience; the international average was 13 percent. Well over half of Year 5 students (about 60%) were taught by teachers with less years of teaching experience (40% at least 10 but less than 20 years and 18% at least 5 but less than 10 years).

Not surprising, teachers with less teaching experience tended to younger, while teachers with more years of teaching experience tended to be older in age. For example, all teachers who were under 25 years had less than five years teaching experience, while the majority of teachers who were 60 years or older had at least 20 years of teaching experience.

Being a teacher

In effective schools, the principal and teachers act as a team to ensure that the curriculum is appropriately implemented in the classrooms. Teachers who work collaboratively by sharing their knowledge and demonstrating their approaches to teaching provide opportunities for learning among their professional peers. Teachers working together have a positive impact on each other building collective professional expertise, which in turn makes teachers more

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34 International averages reported for age and gender are sourced from the PIRLS 2016 International Database Teacher Questionnaire Almanac; calculations are based on data from 47 countries, and not 50 as shown in the PIRLS 2016 international exhibits. Data from Egypt, Kuwait, and South Africa are not included in the published almanac.


36 See Exhibit 8.3 in Mullis, Martin, Foy, and Hooper (2017).

37 Although not directly comparable, this suggests a slightly younger work force teaching at this educational level than at Years 7–10 where the Teaching and Learning International Survey (TALIS) reported that a teacher had typically 16 years teaching experience (Cockerill, Taylor, and Marshall, July 2015; Ministry of Education, June 2019).
effective in supporting and advancing student learning.\textsuperscript{38} Collaboration also supports the notion of a positive working environment.\textsuperscript{39}

Collective efficacy among the teachers in a school, and trust staff members have for parents and students are attributes that have also been linked to well-functioning schools. Schools that welcome parental involvement, for example, are more likely to have parents who are involved. While promoting the importance of academic success in their schools, principal and teachers together need to communicate that it can be achieved.\textsuperscript{40}

**Teachers’ views of their schools’ emphasis on academic success**

PIRLS 2016 captured information on teachers and school leaders’ views on ‘academic success’ in their schools. Teachers and principals were both asked to rate on a five-point scale (from ‘very low’, ‘low’, ‘medium’, to ‘high’ or a ‘very high’ emphasis) 12 aspects of academic success, with their responses characterised in the *School Emphasis on Academic Success Scale* described in Box 2.1.

**Box 2.1: Emphasis on academic success, PIRLS 2016**

Level of emphasis in the school (rated from medium to very high) on these aspects:

1. Teachers understanding of the schools curricular goals
2. Teachers’ degree of success in implementing the school’s curriculum
3. Teachers’ expectations for student achievement
4. Teachers’ ability to inspire students
5. Collaboration between the school’s leadership team and teachers to plan instruction
6. Parental involvement in school activities
7. Parental commitment to ensure that students are ready to learn
8. Parental expectations for student achievement
9. Parental support for student achievement.
10. Students’ desire to do well in school
11. Students’ ability to reach school’s achievement goals
12. Students’ respect for classmates who excel academically

*School Emphasis on Academic Success Scale (Teachers’ Reports)*\textsuperscript{41}

- Students in schools where their teachers were found to have a very high emphasis had a score of at least 12.8, which corresponded to six of the 12 aspects being rated as ‘very high’ and the other six as ‘high’, on average.
- Students in schools where teachers had a medium emphasis had a score of no higher than 9.2, which corresponded to teachers’ rating six of the 12 aspects as ‘medium’ and the other six as ‘high’, on average.
- All other students were considered to be in schools that placed a high emphasis.

\textsuperscript{38} See for example Berry, Daughtrey, and Wieder (December, 2009).
\textsuperscript{39} Hooper, et al. (2015).
\textsuperscript{40} Mullis, Martin, Foy, and Drucker (2012, p. 162); Hooper, et al. (2015, p. 44).
\textsuperscript{41} The *Principals’ School Emphasis on Academic Success Scale* used the same components. However, the values of the cut points between medium and high emphases was 9.2 and 12.8 between high and very high emphases.
Although both ‘low’ and ‘very low’ options were available to teachers to categorise the levels of emphases, very few teachers across the countries, including New Zealand teachers, selected these options. As such, the minimum cut point on the scale (9.2) reflects those teachers who indicated up to a medium emphasis.

As Figure 2.1 shows, a relatively high percentage of New Zealand’s Year 5 students (13%) were taught by teachers who reported a very high emphasis on academic success as measured by the SEAS Scale (the international mean at this level was 8%). Twelve countries including England (19%), Northern Ireland (19%), Ireland (16%), and Australia (15%) had higher percentages of students in schools with a very high emphasis on academic success.

Almost two-thirds of New Zealand Year 5 students (65%) attended schools where teachers placed a high emphasis on academic success, again higher than the international mean (55%). Just under one-quarter of Year 5 students (23%) were taught by teachers who placed a medium emphasis on academic success (compared with 37% on average internationally).

![Figure 2.1: Schools’ emphasis on academic success – teachers’ reports, PIRLS 2016](image)

Notes:
The data points are the mean reading scores for students at each level of the scale. The vertical lines extending from each data point is the confidence interval for the mean.

The centrepoint of the SEAS Scale was set at 10.0. Two units on the scale corresponds to the standard deviation of the distribution.

The means for the scale ranged from a high of 11.6 (Kazakhstan) to 7.6 (Chile); the mean and standard error for New Zealand was 10.7 (0.13).

On average internationally, there was a relationship between reading achievement and teachers’ emphases but in New Zealand’s case it was a little stronger than observed internationally.

- Year 5 students whose teachers had a very high emphasis (545), achieved on average a significant 44 points higher than those students in schools where there was a medium emphasis (501).
- Year 5 students whose teachers had a high emphasis (532) scored a significant 30 points higher than students in schools where there was a medium emphasis (501).
- Year 5 students whose teachers had a very high emphasis scored on average 14 score points higher (545) than their peers whose teachers who had a high emphasis (532). The difference was not statistically significant.42

New Zealand’s teachers’ responses to the aspects of academic success were relatively consistent with school principals’ reports;43 this was also the case for many other countries. It is interesting to note that teachers in many of the continental European countries tended not to place a very high emphasis on academic success, as measured by this scale. For example, teachers of just one to percent of students in Finland, Germany, Norway, and Slovenia were taught by teachers with these views.

Interactions with other teachers

PIRLS 2016 asked teachers to indicate how often they interacted with their colleagues both in their schools and external to their schools. The interactions included sharing information, collaborating on how to teach a topic, and observing in a class. Figure 2.2 shows the percentages of Year 5 students whose teachers reported these types of interactions.

Figure 2.2: Year 5 teachers’ interactions with other colleagues, PIRLS 2016

42 There was more variation associated with the mean for the children who fell into this category. The average difference of 14 score points (with a standard error (7.7) was not statistically different at the 5% threshold ($t = 1.77$).

43 Chamberlain (2019, p. 41)
Internationally, the most common interaction among the teacher professionals was the sharing of their learning experiences – an average of 81 percent of middle primary students had teachers who *often or very often* had these types of interactions with their colleagues. In New Zealand, the percentage was a little higher at 88 percent. The interaction least likely to be undertaken by teachers was working with colleagues from other schools on the curriculum (19% on average internationally); this interaction tended to be more common in countries such as Iran (Islamic Republic), Kazakhstan, Oman, and Saudi Arabia than in other countries. The equivalent percentage for New Zealand was 13 percent.

Teachers observing in other classrooms was rare in French schools, with the majority of its students (80%) taught by teachers who ‘never or almost never’ had this interaction with their colleagues. In New Zealand it was much more common – just 15 percent of Year 5 students were taught by teachers who ‘never or almost never’ had this interaction; in Georgia, it was just one percent.

**Relationship with students’ reading achievement**

The relationship between the interactions and reading achievement was inconsistent: Sharing with others what had been learnt was associated with higher reading achievement, while observing in another class showed the reverse, with reading achievement tending to be lower as the frequency of class observations increased. It is important to note that this does not mean it is causal relationship, and it is likely that teachers in schools work more collegially when the learning needs of students is greater.

**New Zealand and Singapore**

Structured teacher collaboration has featured prominently in Singapore as the means for raising the quality of teachers and teaching, and student learning. Figure 2.3 shows the responses of New Zealand teachers compared with Singaporean teachers. Note that Singapore delivers its curriculum in English; its students’ average performance in reading was on a par with that of New Zealand students in PIRLS 2001; 14 years later in PIRLS 2016 its students scored an average of 50 score points higher than New Zealand students.

With one exception, the teachers of New Zealand students were more likely to be interacting with their colleagues than teachers of Singaporean students. In particular, New Zealand teachers were more likely to have the interaction where they shared what they had learnt with their colleagues. Teachers working with colleagues in other schools on curriculum was about the same in both countries.

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44 Harion and Tan (2017).
45 Singapore also administered PIRLS 2016 in late 2015.
Teachers’ professional development

Ongoing professional development enables teachers to keep abreast of current practices and developments in teaching. Teachers of just over two-fifths of Year 5 students (41%) had spent 16 hours or more during 2014 and 2015 in professional development related to reading (27% in 2010); just 7% had spent no time (13% in 2010). The remaining teachers either spent from 1 to 5 hours (22%) or 6 to 15 (30%). Internationally the experiences of teachers was wide. As an example, teachers of 59% of Finnish students had no professional development during this period.

Year 5 classes in 2015

School principals were asked about the policy used to assign Year 5 students to classes. The purpose was to understand the criteria applied given the nature of within-class organisation for instruction, particularly for reading, that prevails in New Zealand classrooms.46

Two-thirds of Year 5 students attended schools where there was a policy to use achievement information to assign them to their classes, while the rest (34%) were in schools where it was either irrelevant because there was only one class or group with Year 5 students in the school (15% of Year 5 students), or other criteria were used (19% of students). See Figure 2.4.

46 Chamberlain (2013, p. 146).
Examples of criteria given by principals included:

- social reasons – “social behaviour factors”, “social relationships”, “social groupings”, “behaviour”
- gender – “even mix girls and boys”
- age of students – “younger Year 5s with Year 4s, and the rest with Year 6s”
- teachers – “teacher strengths”, “teacher match”, “teacher skill level”.

The most likely policy was to use a combination of achievement AND social considerations to assign students (57%). Just using Year 5 students’ achievement information was not as common (about 9% of students in these schools), while students’ reading achievement information was rarely used (just one school, representing less than 0.5% of Year 5 students).47

Was there any relationship between schools’ grouping by ability and the decile of the school? Essentially, no. It appears to have been prevalent in deciles 1 to 4 schools as it was deciles 9 and 10 schools, while deciles 5 to 8 schools were less likely to have a policy for grouping their students (Figure D.1 in Appendix D). This suggests the size of the school including the number of Year 5 students was probably a factor in how students were assigned to their classes.

Class arrangements

Teachers of Year 5 students were teaching classes with an average of about 27 students. In most instances, the participating PIRLS 2016 classes (87%) were composite classes, and from this, 83 percent of Year 5 students were estimated to be in composite classes. In a typical class, there were 15 Year 5 students.48

47 Also discussed by Medina (2019).
48 Adjusted for all missing. Complete student numbers for 81% of classes in PIRLS 2016. The mean number of Year 5s in class was 17, the median, 15, and the mode, 12.
Composite classes are not unique to New Zealand, but appear to exist through choice more than necessity. Both the Irish Republic and Northern Ireland use composite classes to accommodate two or more year groups, particularly in rural areas.\(^49\) Just under a quarter of the Irish classes (23%) in PIRLS had multi-level classes, with about the same proportion of their middle primary students in these classes (23%).

**Opportunity to learn – instructional time**

There are a number of ways that the notion of ‘opportunity to learn’ (OTL) is described in research literature. The IEA studies such as the Trends in International Mathematics and Science Study often use this concept to describe the ‘curriculum’ opportunities in a class setting. Are teachers implementing the intended curriculum? How much time is allocated to learning this topic? In this section OTL is considered from a time perspective – how much time is allocated to teaching reading? In Section 3 (page 45) OTL is considered from the perspective of students – being at school in order to have the opportunity to learn.

**Intended hours for instruction**

The *intended* number of hours dedicated to instruction per week in many countries is mandated at the national level, usually by the country’s agency responsible for education. In some instances the specified times are minimum requirements. New Zealand is one of several countries (e.g., both the French and Flemish Belgian systems, Norway, and Spain) that do not specify the number of instructional hours for any learning area or subject in their *intended* curriculum. Countries that do specify include Chinese Taipei (25% of total instructional time), Denmark (23%), Italy (48%) and Singapore (33%).\(^50\) The relationship between a country’s average reading achievement and mandated hours varied considerably with both higher- and lower-performing countries mandating instructional time.

**Instructional time for reading**

Principals and teachers were asked about the number of instructional hours, overall and hours allocated to reading as part of language learning (in New Zealand’s case English in English-medium or te reo Māori in Māori-medium settings), and reading across the curriculum. On average internationally, the total hours of instruction per year across all learning areas was 898; in New Zealand it was 926. (See Table 2.1 for details.)

In terms of reading, on average internationally, at the middle primary level 27 percent of the annual instructional time (or 242 hours per year) was spent on language or language-related instruction including reading, writing, speaking and other language skills; 18 percent (or 156 hours) was spent on reading, formal and informal including reading across the curriculum. The mean percentages estimated for New Zealand are 37 percent (340 hours) and 24 percent (215 hours), respectively. There was no obvious relationship between instructional time and reading achievement. Some higher-performing countries spent less instructional time on reading and language than New Zealand (e.g., Ireland, Finland) while other countries spent more time (e.g., the Netherlands, United States).

\(^49\) Perry, Love, and McKay (2017). Nearly 60% of Northern Ireland’s schools have composite classes, the majority of which (87%) were made up of two year groupings.

\(^50\) Mullis, Martin, Goh, and Pendergarst (2017, Exhibit 10).
Table 2.1: Instructional time on reading for English-language countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Total instruction hours per year all subjects</th>
<th>Language instruction, including reading, writing, speaking, literature, and other language skills</th>
<th>Reading instruction, including reading across the curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours per year</td>
<td>Percentage of total instruction time</td>
<td>Hours per year</td>
</tr>
<tr>
<td>United States</td>
<td>1051 (12.7)</td>
<td>301 (15.3)</td>
<td>30 (1.6)</td>
</tr>
<tr>
<td>Singapore</td>
<td>1040 (0.3)</td>
<td>278 (9.1)</td>
<td>27 (0.9)</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>1008 (17.1)</td>
<td>361 (22.8)</td>
<td>38 (2.1)</td>
</tr>
<tr>
<td>Australia</td>
<td>1001 (6.7)</td>
<td>336 (7.9)</td>
<td>24 (0.8)</td>
</tr>
<tr>
<td>England</td>
<td>993 (10.5)</td>
<td>273 (9.5)</td>
<td>28 (0.9)</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>958 (10.5)</td>
<td>267 (10.7)</td>
<td>27 (1.3)</td>
</tr>
<tr>
<td>Canada</td>
<td>952 (5.1)</td>
<td>292 (4.9)</td>
<td>31 (0.5)</td>
</tr>
<tr>
<td>Malta</td>
<td>942 (0.4)</td>
<td>178 (0.4)</td>
<td>19 (0.0)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>926 (4.0)</td>
<td>340 (6.8)</td>
<td>37 (1.0)</td>
</tr>
<tr>
<td>Ireland</td>
<td>915 (0.3)</td>
<td>206 (5.2)</td>
<td>23 (0.5)</td>
</tr>
<tr>
<td>International mean</td>
<td>898 (1.5)</td>
<td>242 (1.4)</td>
<td>27 (0.2)</td>
</tr>
</tbody>
</table>

Notes:

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An “r” indicates data are available for at least 70% but less than 85% of the students. An “s” indicates data are available for at least 50% but less than 70% of the students.


Any change since PIRLS 2011?

There appears to have been no change in the amount of time New Zealand schools set aside for language instruction and reading over the intervening years, with the percentages about the same as reported in PIRLS 2011.\(^{51}\)

\(^{51}\) Chamberlain (2013 p. 128).
Classroom libraries

According to Effective Literacy Practice Years 5 to 8: “Providing students (and the school community) with access to a range and a variety of texts is one of the main functions of the school library or information centre.” Students who have relatively easy access to reading material, through either a school or class library, will have more opportunity to read for enjoyment as well as for intended purposes such as reading required to meet curriculum goals.

Teachers were asked as to whether or not there was a library (or reading corner) in their classroom and if so, details about the number of books (and magazines), and then for details on accessing material from the library corner. Figure 2.6 summarises this information for the English-language countries.

Figure 2.6: Students in English-language classrooms with libraries

Notes:
Countries are ordered by their students’ mean reading achievement (see Figure c.1 in Appendix C). The three grey shadings for New Zealand correspond to the red shadings shown for the other countries (e.g. mid grey corresponds to a class with more than 50 books).


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53 English-language countries are a selection of countries or jurisdictions where English is either the, or a language of instruction. Also see page 53 for additional information.
On average internationally, 72 percent of students were in classes where there was a class library. New Zealand recorded one of the highest percentages (97%), about the same as Hong Kong SAR (97%), Macau SAR (98%), and the United States (98%). Egyptian classrooms were the least likely to have classroom libraries (14% of students in such classes). Less than 50 percent of students in the Nordic countries were in classes with a library.

New Zealand classroom libraries did tend to be smaller with relatively few book and magazine titles compared with some other countries. Just 36 percent of Year 5 students were in classes where the libraries had more than 50 books and 42 percent with at least three magazine titles. As a comparison, 82 percent of Irish students were in classes with more than 50 books, but just 23 percent with at least three magazine titles. The corresponding international averages were 33 percent and 32 percent.

Being able to borrow books from the classroom library to take home was relatively common in most English-language countries (e.g., more than 80% of students in England, Ireland, and the United States), but not that common in New Zealand (60% of students in such classes), similar to Singapore (63%). On average internationally, 55 percent of students were in classes where students were allowed to borrow books.

**Access to digital devices**

Generally, most New Zealand primary school educators hold positive views about the use of digital technology in learning programmes. However, schools and parents/caregivers alike are faced with the challenge of keeping up with an ever changing digital world. One way schools are reducing the financial burden of maintaining and replacing digital technologies is by promoting a ‘bring your own device’ policy.

**School policy for ‘Bringing Your Own Device’**

In 2015, a minority of New Zealand principals reported that their school had a policy that promoted bringing a digital device (BYOD), tablet or laptop, to school (29% of Year 5 students in these schools); the majority of Year 5 students (71%) attending schools without a policy. Figure 2.6 shows this policy for schools according to their school decile. Deciles 1 and 2 schools were much less likely to have this type of policy and independent schools the most likely.

For the schools that did have a BYOD policy, students’ reading achievement was higher, on average, than for schools that did not have a policy (538 compared with 520). While this pattern held overall, the achievement pattern varied by decile. For example, the average reading achievement of Year 5 students in deciles 5 and 6 schools with a policy was higher (537) than similar schools without a policy (523). In contrast, in deciles 7 and 8 schools the opposite was observed—average reading achievement was lower in schools with a policy (535) and higher in schools without a policy (549). However, while none of the differences were found to be statistically significant, it does suggests that the decile used for resourcing schools did not determine the quality of the learning that was taking place. (See next section on the classroom setting for BYODs).

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54 Bolstad (2017).
Year 5 students bring their own device

New Zealand teachers were also asked whether or not their Year 5 students brought their own ‘computer’ (tablet or laptop) from home. About one-quarter of Year 5 students (26%) were bringing their own device from home, and these students scored an average of 12 score points higher than their peers who did not bring a device (538 compared with 526). The difference was statistically significant, but after taking into account the (average) socio-economic mix of the classes, the difference all but disappeared. That is, students’ reading achievement was not related to whether or not they had access to a device.

Access to computers during reading instruction

Internationally, teachers were asked about their students access to ‘computers’ (including tablets and laptops) during reading, and the types of activities they were doing when they using computers during reading instruction. As Table 2.2 indicates, there was wide variation across the countries in the availability of computers during reading. Availability was highest in New Zealand (93% of students) and Denmark (92%) and rare in South Africa (8% of students), Belgium (French) (7%), and Morocco (6%).

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55 This was a New Zealand-specific question.
Although the majority of New Zealand students had access to computer(s) during reading, they most likely to be shared among students (83% of students). By way of contrast, Georgian students were much more likely to have their own computer (60% of students compared with 13% of New Zealand students). Note that in Georgia, all students in public schools receive free netbooks at entry to Grade 1.56

The relationship with achievement varied. In New Zealand’s case Year 5 students who had access to a computer during reading tended to have higher achievement (529) than the very small proportion of students who did not (498). Due to the level of uncertainty of the mean for the students who did not use computers, as indicated by the size of the standard error, the 30 score point difference was not statistically significant.

56 Miminoshvili (2017).
Section 3: Students in the Classroom

Key findings

In a typical class, two Year 5 students had been judged by their teachers as needing remedial instruction, while one student received it. There were four Year 5 students in this typical class that were considered to be advanced readers.

Compared with their international peers, New Zealand’s Year 5 students were relatively positive about reading. Year 5 girls liked reading more than Year 5 boys; Asian and Pacific students tended to like reading more than their Māori and Pākehā/European peers.

Compared with their international peers, Year 5 students were a lot less confident about their reading ability. Year 5 boys tended to be less confident than Year 5 girls; Māori, and Pacific students tended to be less confident than their Asian and Pākehā/European peers.

Comparable to international reports, New Zealand teachers’ classroom instruction tended to be impacted either very little or somewhat, by student-related factors that can affect or engage students’ readiness to learn.

Two factors that were most likely to limit how teachers taught their Year 5 students were their students’ lack of prerequisite knowledge and the students being absent from class (or school).

Compared with their international peers, Year 5 students were more likely to report they were sometimes or frequently absent from school. There was a strong relationship between both their reports and the decile of the school they attended and their own socio-economic circumstances.

A student being a confident reader or rarely being absent from school had a stronger relationship with higher reading achievement than liking reading, after accounting for their gender, ethnic identity, whether or not they spoke the language of the assessment at home, and the language of the assessment.
Introduction

Teachers’ decisions on the approaches they take will be influenced by their prior experiences, beliefs, and knowledge, their pre-teaching education, and their teaching experience. Decisions made around the instructional practices will also be influenced by the group of learners they are teaching—the learners’ pre-requisite knowledge and skills, and their motivation and attitudes to learning.

Children bring their knowledge, skills, attitudes, and dispositions to the classroom, all of which have been influenced from outside of the school environment as well as from prior learning experiences at school. Students’ prior knowledge, characteristics, and needs will influence a teacher’s decisions on the best learning approaches to use in instruction.

Number of students with reading difficulties

As noted on page 25, on average there were 27 students per class (intact or composite). In a class there was typically one Year 5 student who had difficulty understanding the instructional language – English or te reo Māori. An average of two Year 5 students per class were judged (by their teacher) as needing remedial reading instruction, of which one was typically receiving it. The need for remedial reading ranged from nil to a high of 11 Year 5 students. An average of four Year 5 students per class were considered to be very advanced readers.

Diverse reading abilities was not just a feature of New Zealand classes. For example, in a typical English class, which was likely to be a single year level, there was an average of four students needing remedial reading assistance. In both Australian and Irish classes, about three students on average needing remedial instruction. As was the case in New Zealand not all children were receiving remedial instruction. In Australia, on average 2 (out of the 3) children were receiving it, while in England it was 3 (out of 4).

Students and their views of reading

Teachers’ influence on students’ motivation to learn are both direct and indirect. Students do not necessarily like or be motivated to learn every subject at school, but students who find reading to be interesting and enjoyable and have a positive attitude towards reading. Furthermore, those students who enjoy reading are likely to read more frequently and read a wider range of material than those who get little pleasure from reading, thus enhancing both their comprehension skills and learning experiences. Contexts such as the classroom setting can either aid or suppress children’s inner motivation.

To gauge attitudes towards reading, students were asked to indicate on a four-point scale (‘agree a lot’, ‘agree a little’, ‘disagree a little’, or ‘disagree a lot’) how much they agreed with six attitudinal statements about reading, and how often they did two particular reading activities. The Students Like Reading (SLR) Scale summarises students’ responses to the statements and activities. These components are summarised in Box 3.1.

57 A brief overview of New Zealand students’ views about reading was first presented in Ministry of Education (2017).
58 From theories of intrinsically or extrinsically motivation.
Box 3.1: Students’ attitudes to reading, PIRLS 2016

What do you think of reading?

1. I like talking about what I read with other people
2. I would be happy if someone gave me a book for a present
3. I think reading is boring*
4. I enjoy reading
5. I learn a lot from reading
6. I like to read things that make me think
7. I like it when a book helps me imagine other worlds

How often do you these things outside of school?

1. I read for fun
2. I read things that I choose myself

Students Like Reading Scale

*)Negatively worded statement reverse coded for the scale.

- Students who very much like reading had a score of at least 10.3 on the scale, had agreed a lot with at four of the six statements and agreed a little to the other four, as well as read for fun and chose reading material they liked almost every day, on average.
- Students who do not like reading scored at most 8.3 on the scale, had typically disagreed a little with four statements, agreed a little with the other statements, and read and choose their own reading material only once or twice a month.
- All other students were considered to somewhat like reading.

According to the scale, New Zealand Year 5 students’ views about reading were typical of their international peers. Forty-four percent were found to very much like reading (compared with 43% on average internationally) and 42 percent somewhat like reading (compared with 41% international). Just 14 percent of Year 5 students were in the do not like reading category (about the same as the international mean of 16%).

There was a reasonably strong relationship between students liking reading and reading achievement. That is, Year 5 students who were found to very much like reading scored a significant 27 score points higher than their peers who do not like reading. Figure D.2 in Appendix D shows the percentage of Year 5 students in each category of the scale.

Across countries, the pattern of achievement was generally consistent with higher reading achievement associated with students who very much like reading. However, it is worth noting that higher-performing countries such as Finland (28%), Netherland (24%), and Norway (22%), recorded smaller percentages of their students as very much like reading, while mid- to lower performing countries had higher percentages of students in this category – for example, Portugal (72%), Kazakhstan (71%), and Iran (70%).

Figure D.3 shows a comparison of this information for New Zealand and the other English-language countries. For each country, the mean reading score for students in each category are also shown.

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60 Mullis, et al. (2017, Exhibit 10.2).
Like reading and gender

Year 5 girls were more likely to be in the very much like reading category than Year 5 boys (50% of girls compared with 39% of boys), with boys more likely to be in the do not like category (9% of girls compared with 18% of boys).

As Figure 3.1 illustrates, the relationship between liking reading and reading achievement was similar for boys and girls—both groups of students who very much like reading scored, on average, about 22 to 26 score points higher than their counterparts who do not like reading.

Figure 3.1: Year 5 students and Students Like Reading (SLR) Scale, PIRLS 2016

Notes:
The data points are the mean reading scores for students who very much like reading, somewhat like reading, and do not like reading. The vertical lines extending from each data point is the confidence interval for the mean.

Like reading and ethnic identity

Pacific and Asian students tended to be somewhat more positive about reading than their Māori and Pākehā/European peers. About half of both Pacific (52%) and Asian (50%) students very much like reading compared about two in every five Māori (41%) and Pākehā/European (43%) students.

The relationship between reading achievement and students’ attitudes towards reading, as measured by the SLR Scale, was relatively strong for Pākehā/European students (i.e., 40 score point difference between the mean scores of students who liked reading a lot and those who did not like reading) but weak for Pacific students. The small proportion of Pacific students (8%) who did not like reading scored an average of 12 score points higher than their counterparts who very much like reading (492 compared with 480).
Summarising the relationship between reading achievement and liking reading

The relationship between students’ attitudes to reading and their reading achievement, after taking into account their sex, ethnic identity, language spoken in the home, the language of the PIRLS assessment, and their socio-economic status appears to be weak.\(^{61}\)

A one point increase on the attitudes to reading scale corresponded to a two score point increase in reading achievement.

Any change since PIRLS 2011

Unfortunately the PIRLS 2011 and PIRLS 2016 attitudes to reading scales are not directly comparable. However, there were statements common to both cycles. Looking at three individual statements used in the scale:

- I enjoy reading
- I think reading is boring
- I read for fun

A significantly smaller proportion of students disagreed ‘a lot’ with the statement ‘I think reading is boring’ in 2015 (57%) than in 2010 (61%), which suggests Year 5 students were a little more disengaged with reading in 2015. However, there were no changes in students’ level of agreement to enjoying of reading or how often they read for fun outside of school.

Students’ confidence as readers

“Motivation is affected by the learner’s self-concept and sense of self-efficacy…A belief in themselves and their ability to succeed in classroom tasks has an energising effect on both teachers and students.”\(^{62}\) As well as holding positive views about reading, children who are self-assured of their reading ability are likely to read more often and more varied materials.

The Students Confident in Reading (SCR) Scale summarises a series of statements developed to draw information from students about their confidence as readers. Students were asked to indicate on a four-point scale (‘agree a lot’, ‘agree a little’, ‘disagree a little’, or ‘disagree a lot’) their level of agreement to the seven statements in Box 3.2 (next page).

Just 35 percent of New Zealand Year 5 students were found to be very confident readers (compared with the international mean of 45%). This percentage was relatively low, with only six other countries having a smaller percentage than New Zealand – Egypt (33%), Morocco (31%), Latvia (30%), Saudi Arabia (29%), Macao SAR (21%), and South Africa (20%). Countries with relatively high percentages of very confident readers included Sweden (65%), Finland (60%), and Poland (59%).\(^{63}\)

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\(^{61}\) A proxy for socio-economic status (SES) is used based on the number of books in the home and certain items often associated with households with more disposable income (e.g., internet connection, dishwasher, clothes dryer, and heat pump/air conditioner). The responses to these variables have been combined and then transformed from discrete values to a continuous scale.


\(^{63}\) Mullis et al, (2017, Exhibit 10.3).
Box 3.2: Confidence as a reader, PIRLS 2016

Components of the scale

1. I usually do well in reading
2. Reading is easy for me
3. I have trouble reading when there are difficult words
4. Reading is easier for me than for many of my classmates
5. Reading is harder for me than any other subject*
6. I am just not good at reading*

Students Confident in Reading Scale

<table>
<thead>
<tr>
<th>Not confident</th>
<th>Somewhat confident</th>
<th>Very confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2</td>
<td>10.3</td>
<td></td>
</tr>
</tbody>
</table>

* Negatively worded statement reversed coded for the scale.

- Students who were very confident had a score on the scale of at least 10.3, which corresponded to their agreeing ‘a lot’ with three of the six statements and agreeing ‘a little’ with the other three, on average.
- Students who were not confident had a score no higher than 8.2, which corresponded to students disagreeing ‘a little’ with three of the statements and agreeing ‘a little’ with the other three on average.
- All other students were considered to be somewhat confident.

Across all countries confidence in reading was associated with higher reading achievement. The mean reading score for Year 5 students who were very confident (577) was significantly higher than the mean for Year 5 students who were somewhat confident (520), which in turn was higher than the mean for Year 5 students who were not confident (457).

Figures D.4 in Appendix D show the percentage of Year 5 students in each category of the scale, and Figure D.5 shows a comparison of this information for New Zealand with the English-language countries.

Self-confidence and gender

Girls (38%) were more likely than boys (32%) to be very confident readers. Year 5 boys tended to be slightly over-represented among the readers who were not confident (27% of boys compared with 20% of girls). The average difference in achievement between those students who were very confident and those who were not confident was about the same for both girls (118) and boys (120).

Self-confidence and ethnicity

Pākehā/European students (42%) were more likely to be very confident readers than Asian (35%), Māori (23%) and Pacific students (21%), with these groups tending to be more moderate with their views as most were somewhat confident.

The positive relationship between being a confident reader and reading achievement was observed for all ethnic groupings. However, the relationship was most marked for Māori and

64 This was the statement implemented in New Zealand; the international statement was “I have trouble reading stories with difficult words.”
Pākehā/European students, with the mean difference in achievement between those students who were confident and those who were not, 117 and 114 score points respectively. The average difference for Asian students was 105; the smallest difference was observed for Pacific students (88 score points).

**Figure 3.2: Year 5 students and Students Confident in Reading (SCR) Scale, PIRLS 2016**

A. Asians students

B. Māori students

C. Pacific students

D. Pākehā/European students

**Notes:**
The data points are the mean reading scores for students who were very confident, somewhat confident, and not confident. The vertical lines extending from each data point is the confidence interval for the mean.

**Summarising the relationship between reading achievement and confidence as a reader**

The relationship between students’ reading confidence and their achievement after taking into account their sex, ethnic identity, language spoken in the home, the test language of the assessment, and socio-economic status appears to be stronger than the students’ liking of reading. A one point increase on the confidence scale corresponded to a 20 score point increase in reading achievement.

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65 See footnote 48 for details of the proxy socio-economic measure used in the analysis.
Any change since PIRLS 2011?

The PIRLS 2016 *Students Confident in Reading Scale* was not comparable to the reading confidence scale described in PIRLS 2011. However, there were three statements common to both:

- I usually do well in reading
- Reading is easy for me
- I have trouble reading stories with difficult words

There was no changes from 2010 to 2015 in how Year 5 students viewed their success as readers and how easy they found it. There was a slight shift in how they felt about reading stories with difficult words — 55 percent of students agreed with the statement in 2010 compared with 60 percent in 2015, which suggests that Year 5 students were finding vocabulary more of an issue in 2015 than in 2010. Interestingly, the 2014 cycle of the *National Monitoring Study of Student Achievement* found that ‘difficult words’ was the reason most often provided by Year 4 students as to what made reading hard for them. When asked how their reading could be improved, learning more words and mastering more complicated or longer words were most often cited.66

Factors limiting instruction

As well as teachers having to negotiate students’ negative attitudes towards learning, teachers often have to deal with a range of student factors such as students or attributes that could impact on their teaching.

Using a three point scale (‘not at all’, ‘some’, ‘a lot’), PIRLS sought information from teachers to gauge the extent to which their students’ lack of prerequisite knowledge or basic nutrition, inadequate sleep, being absent, disruptive or uninterested, or had emotional or psychological issues limited their ability to teach. Teachers’ rating of each limiting factor is shown in Figure 3.3.

Students’ lacking of prior knowledge was the factor most likely to limit teachers when teaching their class (with just over 75% at least to ‘some’ extent). The least limiting factor for teachers was students lacking in basic nutrition; the majority of Year 5 students (about 70%) were taught by teachers who did not see this as limiting factor.

In terms of lacking basic nutrition it was worth noting that 35 percent of Year 5 students were attending schools that provided breakfast to either some (27%) or all (8%) their students. Breakfast was being provided at least 3 or 4 days a week. Schools also provided lunches to some (31%) or all (2%) of their students. Just over one-quarter of Year 5 students (27%) were attended schools that provided breakfast and lunch to at least some of their students.

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66 EARU and NZCER (2015, pp. 25–26)
Students being absent from class (or school) was also likely to be viewed as limiting teachers’ instruction (67% of Year 5 students taught by teachers who indicated this either some or a lot). The Classroom Instruction Limited by Student Attributes Scale summarises teachers’ responses to all seven statements shown in Box 3.3.

Box 3.3: Factors affecting instruction, PIRLS 2016

To what extent do the following limit how you teach your Year 5 students?

1. Students lacking prerequisite knowledge or skills
2. Students suffering from lack of basic nutrition
3. Students suffering from not enough sleep
4. Students absent from class (or school)
5. Disruptive students
6. Uninterested students
7. Students with intellectual, emotional, or psychological impairment

Classroom Instruction Limited by Student Attributes Scale

- Students in schools where their teachers who felt their teaching was limited very little had a score of at least 11.0, which corresponded to reporting they were ‘not at all’ limited by four of the seven student attributes and to ‘some’ extent by the other three, on average.
- Students in schools where their teachers were affected a lot had a score of no higher than 6.2, which corresponded to teachers’ feeling limited ‘a lot’ by four of the seven attributes and to ‘some’ extent by the other three, on average.
- All other students had teachers who felt their teaching was limited to some extent.

Note: responses were received from teachers of 70-85% of students.
On average internationally, just under two-thirds of students (63%) were taught by teachers who felt their instruction was impeded by these factors to some extent; the New Zealand proportion was similar at 61 percent. It was rare for students to be taught by teachers who were limited a lot – the international average was just four percent, with the New Zealand proportion about the same at three percent. The remainder, about one third of students (34%), on average internationally, were taught by teachers who were impacted very little; the New Zealand proportion was 37 percent.

The relationship between how teachers viewed the limiting factors and students’ reading achievement was relatively strong (Figure 3.4).

**Figure 3.4: Teachers’ instruction limited by student needs, PIRLS 2016**

![Graph showing the relationship between teachers' instruction and student achievement](image)

*Category on Classroom Instruction Limited by Student Attributes Scale*

- NZ Year 5 students
- International mean

*Notes:*

The data points are the mean reading scores for students in each category. The vertical lines extending from each data point is the confidence interval for the mean.

The centrepoint of the CILSA Scale was set at 10.0. Two units on the scale correspond to the standard deviation of the distribution. The means for the scale ranged from a high of 11.3 (Italy, Slovak Republic) to 8.6 (Russian Federation); the mean and standard error for New Zealand was 10.1 (0.09).


Year 5 students whose teachers reported their classroom instruction was limited very little, scored a significant 34 score points higher, on average, than their peers whose teachers’ instruction was limited to some extent (551 compare with 516), and a significant 61 score points higher than their peers whose teachers were impeded a lot. There was no statistical difference between the achievement of students in the some and a lot categories largely because of the variation around the difference between the means for students in these two groups (SE = 23.2, t = 1.16).
Limiting factors by school decile

Figure 3.5 illustrates the relationship between the Classroom Instruction Limited by Student Attributes Scale and the decile of the schools in which the teachers were teaching. According to the scale, teacher instruction tended to be limited to some extent in deciles 1 to 6 schools, while those teaching in deciles 7 and 8 schools were tracking towards not being impacted. Teacher instruction in deciles 9 and 10 schools was for the most not at all impacted by the student factors.

However, it is apparent that the factors were more limiting for teachers in low decile schools. The national mean on the scale was 10.1. The means for deciles 1 and 2 (8.6), deciles 3 and 4 (9.5), and deciles 5 and 6 (9.9) were statistically lower than the means for deciles 7 and 8 (10.5) and deciles 9 and 10 schools (11.0). There were no statistical differences between the means for deciles 3 and 4 and deciles 5 and 6, or between deciles 7 and 8 and deciles 9 and 10 schools.

Students’ reports of feeling tired or hungry

More than two-fifths of Year 5 students (43%) reported they felt tired when arriving at school, one of the largest proportions internationally. Other countries with relatively large proportions included Germany (50%), United States (47%), and the Czech Republic and Hungary (both 43%).

One-third of Year 5 students reported they arrived at school feeling hungry ‘every day or almost every day’, and one of the largest proportions among the English-language countries. Only Malta and the United States had larger proportions (40% and 36% respectively).
In some countries such as the United States and England, there are schools that provide free or reduced price lunches to students from low socio-economic backgrounds. In New Zealand a significant number of schools servicing lower socio-economic communities run breakfast clubs, either in partnership with local businesses or funded from their schools' operating budgets. As noted on page 40, about 35 percent of Year 5 students attended schools where either breakfast or lunches were provided to at least some of the students; and just over one-quarter of Year 5 students (27%) attended schools where both lunches and breakfasts were provided.

Figure 3.6 shows the relationship between students’ reports on feeling tired (A) or hungry (B) when they arrived at school and reading achievement. The relationship between the frequency of feeling tired and achievement was curvilinear with students who sometimes felt tired generally achieving higher than their peers who either never arrived tired or felt that way every day.

Figure 3.6 Students’ reports of feeling tired or hungry when arriving at school

A. Feeling tired

B. Feeling hungry

Notes:
The data points are the mean reading scores for students in each response category. The vertical lines extending from each data point is the confidence interval for the mean.

It is of some concern that just over 40 percent of students were arriving at school every day or almost every day feeling tired. This group of students did, however, score higher than their peers who reported ‘never’ arriving at school tired (a significant 17 score points on average). But, they also scored a significant 22 score points lower, on average, than the 49 percent of their peers who arrived sometimes feeling tired (518 compared with 540).

The relationship between how often students were feeling hungry when arriving at school and their reading achievement was relatively strong. Twenty-eight percent of Year 5 students who never felt hungry scored a significant 10 score points higher, on average, than the 38 percent of students who sometimes arrived feeling hungry (545 compared with 535), and a significant 42 points higher than the 33 percent of students who arrived at school every day or almost every day feeling hungry (503).

Opportunity to learn – being in the classroom

In Section 2, the notion of ‘opportunity to learn’ (OTL) was looked at from the perspective of the amount of time allocated for reading instruction. In this section, OTL is considered from the perspective of students being at school, specifically not absent, in order to have the opportunity to learn.

Teachers’ reports on their students absenteeism limiting their teaching

One of the seven statements teachers were asked to consider as a factor that limited their instruction was students being absent from class (or school). The relationship between New Zealand teachers’ views of absenteeism limiting their teaching and reading achievement was fairly strong. Year 5 students whose teachers were ‘not at all’ limited scored an average of 57 score points higher than students whose teachers were limited ‘a lot’, about twice the international average difference (28). See Figure D.6 in Appendix D for details.

Students’ reports of being absent from school

Being present at school provides the foundation for having an opportunity to learn. Students were asked to indicate how often they were away from school (for any reason). On average internationally 70 percent of students reported they were never or almost never absent from school; the equivalent New Zealand percentage was 61 percent and lower than many comparable countries such as England (76%), United States and Ireland (both 71%), and Canada (69%). Hong Kong student reports indicate a low level of absenteeism (89% never or almost never), while those from Egyptian students indicate a relatively high level (41%).

Figure 3.7 illustrates the relationship between students’ reports of being absent and their reading achievement. There was no difference between the average reading achievement of the Year 5 students who were rarely absent (never/almost never) and their peers who reported being absent on occasions (once a month). There were, however, significant achievement differences between students who were either never or occasionally absent and students who were absent more frequently (once a week or fortnightly). Students who were never or almost never absent scored an average of 80 score points higher than those who were absent once a week or more. Internationally, the difference between these two groups of students was about 62 score points.
Figure 3.7: Students’ reports on how often they were absent from school, PIRLS 2016

Notes:
The data points are the mean reading scores for students according to teachers’ responses. The vertical lines extending from each data point is the confidence interval for the mean.

School decile and students’ reports of being absent

Figure 3.8 (next page) shows the percentage of students’ reports on how often they were absent by school decile grouping. The percentage of Year 5 students reporting they were absent at least weekly decreased from a high for students in deciles 1 and 2 schools (27%) to a relatively low percentage for students in deciles 9 and 10 schools (5% of students). Just under one-half of Year 5 students (48%) in deciles 1 and 2 schools reported never or almost never being absent. This compared with at least 60 percent of students in deciles 3 and 4 schools through to deciles 9 and 10 schools.

There was a clear relationship between achievement and being absent from school in each decile grouping. That is, regardless of the decile of the school reading achievement decreased as the frequency of being absent increased. See Figure D.7 and Table D.1 in Appendix D for details.
Figure 3.8: Students' reports of being absent from school and school decile

<table>
<thead>
<tr>
<th>School decile grouping</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deciles 1 &amp; 2</td>
<td></td>
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<td></td>
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<tr>
<td>Deciles 5 &amp; 6</td>
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<td></td>
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<tr>
<td>Deciles 7 &amp; 8</td>
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<td></td>
<td></td>
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<tr>
<td>Deciles 9 &amp; 10</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Never or almost never  Once a month  Once every two weeks  Once a week

**Being absent and students’ socio-economic background**

As well as looking at the decile of a school it is worth considering students' own economic circumstances. Students from the lowest quarter of the individual socio-economic indicator were much more likely to report being absent (19% about weekly) than the mid-50% of students (9%) and the highest quarter (4%).

As with decile, there was also a clear relationship between reading achievement and being absent from school for students in each economic grouping (see Figure 3.9). That is, regardless of their own socio-economic circumstances, students' reading achievement tended to decrease as the frequency of being absent increased. As noted at the beginning of this section, children were not asked for the reasons why they were absent. However, while reasons for being absent may differ for children according to their socio-economic situation, this finding points to the importance of regular attendance at school for all students regardless of their background circumstances.

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67 See footnote 48 for details of the proxy socio-economic measure.
**Being absent and gender**

Overall, there was no difference between girls’ and boys’ reports of being absent from schools. However, girls in the lowest socio-economic quarter were less likely than boys to report they were *never or almost never* absent from school (51% of girls in this quarter or 12% of all girls) compared with their male peers (57% or 14% of all boys); the difference between the percentages was, however, not statistically significant. The only statistical difference was in the highest socio-economic quarter group. Although very small percentages were being compared, boys (6% of boys in this quarter or 2% of all boys) were more likely than girls (4% of girls in this quarter or 1% of all girls) to report being absent fortnightly (the difference was significant $t = 1.97$).

**Being absent and ethnic identity**

Pacific and then Māori students were more likely to report they were absent from school (for any reason) at least fortnightly than students from other groupings. About one out of three Pacific students (34%) reported being absent at least once a fortnight. Most of this group of Pacific students were absent weekly (21% of all Pacific students). For Māori it was a similar picture. More than one-quarter of Māori students (28%) reported being absent at least fortnightly, with 18 percent at least weekly. By way of comparison, just 12 percent of Asian and 10 percent of Pākehā/European students were absent at least fortnightly. The overall relationship between Year 5 students’ reading achievement and being absent was also observed for each ethnic grouping as shown in Figure 3.10.
Figure 3.10: Students’ reports on how often they were absent from school, by ethnic grouping

A. Asian students
B. Māori students
C. Pacific students
D. Pākehā/European students

Notes:
The data points are the mean reading scores. The vertical lines extending from each data point is the confidence interval for the mean.
With the exception of ‘Never or almost never’ (68%), the actual number of Year 5 students in the ‘Other ethnic groups’ category in the other response categories were too small to report reliable estimates.

Summarising the relationship between reading achievement and being absent from school

The relationship between students’ reports of being absent from school, for any reason, and their reading achievement taking into account their sex, ethnic identity, language spoken in the home, the test language of the assessment, and socio-economic status is relatively strong. A change from about weekly to almost never corresponded to a 46 score point increase in reading achievement.

See footnote 48 for details on the proxy socio-economic measure.
The relationship between students’ confidence as a reader, their liking of reading, and being at school

Previously, it was noted that liking reading and having confidence as a reader were both associated with students’ reading achievement. It is also clear that opportunity to learn, in this case, not being absent from school has a strong relationship. To understand better the strength of the relationship taking into account students’ sex, their ethnic identity, language spoken in the home, the test language of the assessment, and socio-economic status, the apparent ‘impact’ of students’ attitudes towards reading (including confidence), and being absent from school were considered together. This was done by calculating (quasi) effect sizes, in this case for each factor, Cohen’s $d$.69

![Figure 3.11: Quasi effect sizes – students’ confidence and liking of reading and rarely being absent](image)

Notes:

‘Gender’ is the effect size associated with the difference between girls and boys achievement (i.e., girls – boys).

The red dots show the effect size. The black bars represent the lower and upper confidence limits of the effect size. Since none cross the zero horizontal line, the effect sizes are statistically significant.

Figure 3.11 (above) shows the relatively strong, positive impact of being a confident reader ($d = 0.59$) and rarely being absent from school (0.43) on students’ reading achievement compared with students’ liking of reading, which had a small, negative effect when student characteristics were accounted for (-0.10). For comparison, the apparent impact of gender was also considered.

At $d = -0.20$, the effect of gender was greater than students’ liking of reading after taking in account all other factors noted above, but the strength of the relationship between gender and reading achievement was less than students’ confidence and rarely being absent.

69 The technique used here was regression analysis. The resulting regression coefficients were ‘normalised’ and then adjusted to take into account that they were derived from continuous variables, whereas gender is a binary variable (i.e., only two possible values)
Gender is still an important variable to consider when understanding reading achievement in New Zealand; boys tend to fare not as well as their female counterparts regardless of their ethnic identity.\textsuperscript{70} In the compendium report \textit{Schools and School Climate for Reading}, it was reported that the apparent impact of being a boy on reading achievement was stronger ($d = -0.24$) than two school climate factors (bullying, 0.17; and belonging, 0.09), after taking into account students’ ethnic identity, and the decile of the school they attended. That is, boys tended to have lower reading achievement than girls even when the aforementioned factors were considered.\textsuperscript{71}

In this case, being a confident reader and rarely being absent are factors that do, however, appear to have greater impact on reading achievement than being a boy. Increasing reading mileage way go some way to raising student confidence, but to do this different approaches to engage students, particularly boys, with what they read need to be considered in order to do this.

\textsuperscript{70} Ministry of Education (2017, pp. 25–31).

\textsuperscript{71} See Chamberlain (2019, pp. 55–56).
Section 4: Classroom Organisation and Teaching Reading

Key findings

New Zealand teachers tended to use a variety of approaches for organising their reading instruction, but their preferred approach was to ‘always or almost always’ form ability groups; reading was rarely taught as a whole-class activity.

Compared with their counterparts in the other English-language jurisdictions, New Zealand teachers

- rarely asked their students to read aloud, but often asked them to do silent reading
- were less to likely teach students new vocabulary systematically
- were less likely to use longer fiction chapter books during reading instruction
- were more likely to teach their students critiquing skills when reading digitally
- were more likely to have their students look up information, research a topic or use devices to write stories or other texts.

Internationally, Year 5 students tended to be less engaged during reading, and were much less engaged than their peers in Ireland and the United States.

Year 5 boys were less likely to be engaged during reading than Year 5 girls, while Māori and Pākehā/European students were not as engaged as their Asian and Pacific peers. Higher engagement was associated with higher reading achievement, particularly for girls, Māori and Pākehā/European students.
Introduction

Educational studies have often found it difficult to link student achievement directly to teachers’ instructional practices and activities. Despite this, such information can be very insightful. In this most recent cycle of PIRLS an attempt was made to better understand the factors that interact with teacher practice and delivery of the curriculum, one of these being student content engagement (from both teacher and student perspectives). This section looks at the organisation of classrooms for reading instruction, and some of the preferred instructional practices including those around student engagement.

For the Reader: in this section cross-country comparisons hereafter are made mostly with English-language countries.

- In these countries, children have the same challenge of learning to read and write in a language that is often described as orthographically complex or irregular—the written form is not always the same way it sounds when spoken. Finnish and Dutch are examples of regular languages in that the oral pronunciation is closer to the written form (see Twist and Whetton, 2009).

- The English-language countries are also representative of both Northern and Southern Hemisphere countries; low and high-performing systems; and most have diverse populations through immigration, or have large proportions of students learning in a language different from one spoken in the home (Singapore and Malta\(^72\)). Some also deliver the curriculum through more than one medium (e.g., Ireland, Canada, and New Zealand), and assessed students in their instructional language (Canada and New Zealand).\(^73\)

Implementation and organisation of reading classes

Background

According to the IEA’s watershed study, the Reading Literacy Study, conducted in the early 1990s, most New Zealand teachers of ‘standard 3’ students (equivalent to Year 5) reported that the determinant on which to form groups during reading instruction was using their students’ ability (89% of teachers). Despite using this criterion, most teachers either ‘strongly disagreed’ or ‘disagreed’ that “children should always be grouped by reading ability”.\(^74\)

Since PIRLS was first implemented in 2001, it has been apparent that grouping students by their reading ability prevails as an organisational approach in most New Zealand classrooms. The approach has also been increasingly used in the United States with more than 90 percent of classrooms using grouping as a means of targeting instruction in 2015 compared with just two-thirds using this approach in 1992.\(^75\)

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\(^72\) In PIRLS 2016, Maltese students were assessed in Maltese rather than English as was the case in PIRLS 2011. Since the teaching of reading comprehension in the two media is undertaken by the same class teacher, the practices are likely to be the same for both (Personal Communication, 2019, Louis Scerri, Ministry for Education and Employment, Malta).

\(^73\) In Ireland, PIRLS was considered an assessment of reading comprehension in the English language. Therefore, Ireland’s Irish medium schools implemented PIRLS in English.

\(^74\) Chamberlain (1993, pp. 109–112).

\(^75\) Sparks (2018).
There are disadvantages and advantages of forming within-class groups of students based on ability. For example, while it allows teachers to meet the needs of the varying groups by being able to modify the learning objectives and pace of instruction, it does reduce the amount of direct instructional time that students receive. However, teaching reading to a whole class also has its downside. While it has the benefit of students hearing the same messages and experiencing the same ‘curriculum’ and exposure to the same instruction and instructional material, teachers may find it difficult to provide individualised instruction to students who have reading difficulties.

Until recently mixed-ability grouping has rarely been use when teaching reading. Sukhnandan and Lee noted in their review that there are both advantages and disadvantages of using mixed-ability grouping; for example, it improves opportunities for all students to access a ‘common’ curriculum, the teacher, and resources, although greater demands are put on teachers to provide more individualised teaching.

As part of its reporting in 2018, UNICEF’s Innocenti Report Card 15, An Unfair Start: Inequality in Children’s Education in Rich Countries, highlighted some characteristics of school systems that may influence education inequality. While New Zealand compared favourably on many characteristics, it compared a lot less favourably in its use of within-school ability grouping. The OECD in Equity in Education: Breaking Down Barriers to Social Mobility has gone as far as suggesting that it is possible ability grouping exacerbates social and achievement differences within schools.

**Class organisation for teaching reading**

Teachers in PIRLS 2016 were asked to indicate on a four-point scale how often (‘always or almost always’, ‘often’, ‘sometimes’, or ‘never’) they used different types of organisational approaches to teach reading and/or reading activities: whole class, same-ability, mixed ability organisation arrangements, and individualised instruction. Teachers in most countries tend to use a variety of organisational approaches when teaching reading and the approach is likely to be dependent on the activity planned for a class. With the exception of Arabic-speaking nations, in most countries, individualised instruction is a relatively rare approach to use on a daily basis. Figure 4.1 (next page) summarises the organisational approaches for the English-language countries.

Note that the English-language countries are clustered and ordered (ranked) according to their mean reading achievement scores.

- **Cluster 1:** Singapore, Ireland, and Northern Ireland were the highest-performing English-language systems.
- **Cluster 2:** England, United States, Australia, and Canada are in the second cluster; the students in these countries had significantly higher performance on average than New Zealand students.
- **Cluster 3:** Trinidad and Tobago and Malta is the third cluster; the students in these two countries had significantly lower performance on average than New Zealand students.

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77 Medina (2019); Vincent-Lancrin, Urgel, Kar and Jacotin (2019, p. 113).
80 Also see Figure C.1 in Appendix C.
In keeping with information from earlier cycles of PIRLS, same-ability grouping was the preferred approach used by New Zealand teachers with 43 percent of Year 5 students taught in classes where this approach was ‘always or almost always’ used; a similar percentage (39% of students) were ‘often’ taught reading this way. On average internationally, teachers of just 10 percent of students were ‘always or almost always’ taught in same-ability groups (with 29% ‘often’). Only Northern Ireland recorded a higher percentage than New Zealand (55% always/almost always and 37% often).

Figure 4.1: Class organisation practices frequently used by teachers in English-language countries

According to the OECD, teaching reading as a whole class activity’ has its advantages as all students can in principle benefit from the guidance and attention of the teacher, but is should be balanced with other types of teaching and learning strategies.81

Internationally, ‘teaching reading as a whole class activity’ was the most preferred single organisational approach used by teachers ‘always or almost always’, with 31 percent of students, on average,82 in such classes. Teachers in Kazakhstan (76% of students), Chile (66%), and Iran (64%) were most likely to ‘always or almost always’ use this approach; the Netherlands (7%), Northern Ireland (6%), Belgium-Flemish (3%), and New Zealand (2%) the least likely.

Notes:
‘Frequently’ is the combined response to two categories: Always/Almost Always and Often. The grey shading for New Zealand corresponds to the red shading used for the other English-language countries (e.g. mid grey corresponds to creating same ability groups).
Source: PIRLS 2016 International Database Teacher Questionnaire Almanac (Foy, 2018).

82 Based on data from 47 countries and reported in the PIRLS 2016 International Database Teacher Questionnaire Almanac. Data from Egypt, Kuwait, and South Africa are not included.
Using mixed ability grouping practices was far less common internationally (a combined 48% of students at least often on average). It was more prevalent in Arabic-speaking countries (e.g., Bahrain, Oman, and Saudi Arabia) as well as in Iran (Islamic Republic). Thirty percent of Year 5 students were in classes where it was ‘always/almost always’ or ‘often’ used.

**Note to Reader: the relationship between achievement and any teacher practice or approach**

- The relationship between a given teaching approach or skill taught and students’ reading achievement is complex. It is a correlational one, NOT a causal relationship. For example, a certain condition, skill, or strategy may well be taught every day because students need to be developed in this area (as reflected by their lower achievement); teaching the skill or strategy less often will not necessarily lead to or cause higher achievement.

- Schematic figures are shown to illustrate the complex relationship between how often an approach, or teaching a skill or strategy is used and Year 5 students’ average reading achievement.

- Other factors such as class size and the ability composition of the class, or the grade structure (e.g., composite classes), may also influence teachers’ decisions on how they organise their classes.

**Relationship with Year 5 reading achievement**

The figure on the left shows a representation of the relationship between reading achievement and the frequency with which Year 5 students were taught by teachers who used the three organisational approaches – same- and mixed-ability grouping, and teaching it as a whole class activity.

The relationship between reading achievement and the frequency with which a particular organisational approach was used by teachers varied across countries as well as within countries. In New Zealand, reading achievement tended to be lower as the frequency of using an organisational practice increased.

**Grouping practices and class size**

Analysis suggests that the size of class was associated with some of the grouping practices teachers used when teaching reading. While rare, teachers who taught reading to the whole class tended to have smaller to average size classes, either less than 24 or 24 to 29 students (in total). Mixed-ability settings, while not common, were associated with both smaller (less than 24 students) and larger classes (more than 29 students). The size of a class did not appear to be associated with same-ability grouping.

**Any change since PIRLS 2011**

In the intervening years since PIRLS 2011, New Zealand teachers’ reports in 2015 indicate that they were less likely to use same-ability grouping than their colleagues in 2010 (see Figure 4.2 with Figure D.8 in Appendix D). In 2015, Year 5 students were less likely to be taught reading by teachers who frequently used this approach (83%) compared with in 2010 (96%). This was due to a 23 percentage point decrease for teachers who ‘always or almost always’ used this grouping practice approach (43% of Year 5 students in such classes in 2015 compared with 66% in 2010). The decrease was statistically significant. At the same time there was a significant 17 percentage point increase in students taught either ‘always or almost always’ or ‘often’ in mixed-ability groups (just 13% in 2010 to 30% in 2015). There was no statistical change in teachers’ reports of
either how often they taught teaching reading as whole class activity or used individualised instruction.

Figure 4.2: Organisational approaches frequently used when teaching reading, 2010 and 2015

<table>
<thead>
<tr>
<th>Approach</th>
<th>2010 (%)</th>
<th>2015 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teach reading as a whole-class activity</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Create same-ability groups</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Create mixed-ability groups</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Individualised instruction</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Note: Frequently is the combined response to two categories: ‘Always/Almost Always’ and ‘Often’.

New Zealand-specific approaches when Year 5 students work in groups

Guided and shared reading, and reciprocal teaching are reading instructional practices promoted in the New Zealand classroom. According to the Ministry of Education’s Effective Literacy Practice in Years 5 to 8:

- Guided reading: Focused (group) setting for instruction; students have similar instructional needs for teacher to provide deliberate and considered instruction in decoding, making meaning and critical thinking.
- Shared reading: Teacher reads aloud to small or large groups with clear, explicit instructional objectives (more so than teacher reading to the students).
- Reciprocal teaching: Teacher leads the instruction with a small group of students, explaining and modelling particular strategies; students gradually take over more of the responsibility of the instruction by taking turns to lead the group (often with more fluent and independent readers).

New Zealand teachers were asked how often they used the following approaches when working with their students:

- ‘I work with one group of students while the other students work independently (in their groups or on their own)’
- ‘I have students take turns to lead or share discussion about their reading in their groups’
- ‘I do shared reading as a whole class activity’.

Most teachers (93% of Year 5 students either ‘almost always/always’ or ‘often’) reported working with one of their groups, while other students worked independently in their groups or on their
Encouraging students to lead the discussion in their groups (an indicator of reciprocal teaching) was also relatively common (61% of Year 5 students frequently). Shared reading as a whole class activity was not that common with less than half of Year 5 students (46%) in classes where this occurred on a regular basis. Note: given the propensity of grouping, it might be that shared reading was more likely to be done in a smaller group setting.

**Figure 4.3: New Zealand-specific organisational strategies teachers frequently used when teaching reading**

![Bar chart showing the frequency of different organisational strategies used by teachers.](chart.png)

**Relationship with Year 5 reading achievement**

The schematic figure on the right illustrates the relationship between each practice and reading achievement. Year 5 students in classes where group and independent work often took place concurrently (item 1) scored 19 score points lower than their peers where it was rarely used in this instructional setting (526 compared with 545 respectively). However, the difference between the means was not statistically different at the normal threshold of 5% ($t = 1.87$).

Students whose teachers regularly had them lead discussions in their groups scored, on average, a significant 16 score point lower than their peers whose teachers ‘never’ or only ‘sometimes’ used this approach (522 compared with 537, $t = 3.21$). There was no statistical difference between the mean scores for students whose teachers frequently did shared reading as a whole class activity (524) and those who rarely did (compared with 531).
Explicit teaching of reading skills and strategies

Deliberate acts of teaching refer to instructional strategies that focus learning in order to meet a particular objective. Topics or content are broken down into small parts and taught in logical order. Explicit teaching involves explanation, demonstration (modelling), and practice. The teacher shows students what to do and how to do it.83

In PIRLS 2016, teachers were asked how often (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) they taught five reading skills and strategies to develop their students’ reading comprehension.

These were
1. Teaching strategies for decoding sounds and words
2. Teaching new vocabulary systematically
3. Teaching how to summarise the main idea in a reading text
4. Teaching (or modelling) skimming and scanning strategies
5. Teaching students how to formulate questions.

Figures 4.4 to 4.6 summarise the findings for items 1 to 4 for New Zealand and the English-language countries. Item 5 is discussed separately.

Teaching decoding strategies and new vocabulary

When children are first learning to read, they use their knowledge of letter-sound relationships to accurately read a word—decode—in order to be able to access print language. By the middle primary years, decoding is relatively more complex, as children learn more about the conventions of language (e.g., prefixes and suffixes).84 Teaching decoding and new vocabulary require teachers to use deliberate and focused strategies in order for students to expand their knowledge, awareness and appreciation of language, and to build their lexicon. Furthermore, developing vocabulary improves both reading comprehension and writing.

With one exception, across the English-language countries middle primary students were more likely to be taught new vocabulary than they were decoding strategies (Figure 4.4). The exception was New Zealand where the emphasis appeared to be on teaching decoding strategies than new vocabulary.85

More than four-fifths of New Zealand Year 5 students were being taught strategies to decode sounds and words (84%) and new vocabulary (81%) at least weekly. As a comparison, the focus in Australian classrooms was developing both skill sets with nearly being all students taught decoding strategies (91%) and new vocabulary (96%) at least weekly. Vocabulary was also the focus of Irish and American classrooms (both 94% of students), with less emphasis on decoding strategies.

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83 Hammond (2019).
84 Ministry of Education (2006, pp. 162-166)
85 Examples of other countries where students were taught decoding strategies and new vocabulary at least weekly are Finland, 31% and 62% of its students respectively; France, 32% and 92%; and the Netherlands, 74% and 81%.
Figure 4.4: Teaching decoding strategies and new vocabulary at least weekly in English-language countries

Notes:
‘At least weekly’ is the combined response to two categories: Every day/Almost Every day and Once or twice a week. The grey shading for New Zealand corresponds to the red shading used for the other English-language countries (e.g., mid grey corresponds teaching new vocabulary systematically).

Source: PIRLS 2016 International Database Teacher Questionnaire Almanac (Foy, 2018).

Relationship with Year 5 reading achievement

There was a relatively strong relationship between how often Year 5 students were taught decoding skills and their reading achievement. Students who were taught either daily (34%) or weekly (50%) had significantly lower achievement, on average, than the small group (2%) who were never taught these skills.86 Students taught new vocabulary daily tended to have lower achievement than the small group of Year 5 students who were rarely taught them, but differences between groups were not found to be of statistical significance.

Any changes since PIRLS 2011

As shown in Figure 4.5 (next page), with the exception of 2010, there has been a greater emphasis on teaching decoding strategies than new vocabulary. Year 5 students were somewhat

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86 Eight-four percent of students were taught decoding at least weekly. The difference between the means of those who were being taught daily (507) and weekly (534) was statistically significant.
more likely to be taught decoding strategies in 2015 (84% of students) than 15 years earlier in 2001 (80%). They were also more likely to be taught new vocabulary at least weekly (81%) in 2015 than either the 2001 (71%) or 2005 (71%) cohorts. In 2010, students were more likely to be taught both skill sets, with more emphasis on teaching new vocabulary (89%) than on decoding strategies (81%). A breakdown of the proportions who were taught daily or weekly in the four assessment years are shown in Figure D.9 in Appendix D.

Identifying the main idea in a piece of text and then summarising this effectively, are key to developing students’ comprehension skills, while skimming and scanning strategies enables readers to be more efficient in locating vocabulary they may not know or specific information, or examining the layout or organisation features of texts.

About 80 percent of Year 5 students were taught summarising strategies at least weekly, about the same as the percentage of their Australian peers (see Figure 4.6). There tended to be less emphasis on the explicit teaching of skimming and scanning strategies internationally and among the English-language countries. Examples of where teaching of skimming and scanning strategies was less common were Finland (33% at least weekly) and France (16%).

An effective strategy which helps students’ metacognitive awareness is to teach students how to formulate questions when reading a text. It is also an example of a modelling strategy. New Zealand teachers were also asked how often they taught this skill to their Year 5 students. About two thirds (67%) were taught this approach at least weekly and the remainder (33%) monthly or not at all.
Figure 4.6: Teaching summarising, skimming and scanning techniques at least weekly in English-language countries

![Bar chart showing the percentage of students taught summarising, skimming, and scanning techniques at least weekly in various countries.]

Notes:
At least weekly is the combined response to two categories: Every day/Almost every day and Once or twice a week. The grey shading for New Zealand corresponds to the red shading used for the other English-language countries (e.g., mid grey corresponds teaching new vocabulary systematically).

Source: PIRLS 2016 International Database Teacher Questionnaire Almanac (Foy, 2018).

Relationship with Year 5 reading achievement

Year 5 students who were taught how to summarise main ideas or skimming and scanning strategies ‘every day or almost every day’ tended to have lower achievement than the group of students who were rarely taught them. There was no statistical relationship between the frequency of teaching formulating questions and students’ reading achievement.

Instructional activities

Teachers were asked how often they undertook particular instructional activities (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) during reading.
These were

1. Students are asked to read silently on their own
2. Teacher reads aloud to students
3. Teacher asks students to read aloud.

Reading aloud to students is often carried out as a shared reading activity, with the teacher having explicit instructional objectives in mind to guide the activity or to model fluency. Students reading aloud with or without the support from a teacher also helps develop their reading fluency and print awareness. As well as developing fluency, by the middle primary years many students are likely to be progressing to be independent readers and reading silently on their own.

In New Zealand, there is little information about appropriate and safe ways for (Year 5) students to read aloud during reading. According to *Effective Literacy Practice in Years 5 to 8*, chorus (or coral) reading where students read aloud together with their teacher, and round robin reading where students take turns to read aloud in their groups, are approaches that appear to be discouraged from teachers’ repertoire of practices.87

Figure 4.7 (over page) summarises the reports of teachers on these three activities for New Zealand and the English-language countries. There was considerable variation across countries in both achievement and the frequency that activities were implemented.

**Silent reading, teacher reads aloud, and students read aloud**

American, Australian, Canadian, New Zealand and Northern Irish teachers were more likely to have silent reading activities than other English-language countries (more than 80% of students in each country reading silently ‘every day or almost every day’). Interestingly, their Finnish counterparts were much less likely to have their students do silent reading on a daily basis (65%).

While it was relatively common in the English-speaking countries, the practice of the teacher reading aloud varied markedly across countries. For example, this practice to occur daily was rare in Danish, Finnish, German, and Chinese Taipei classrooms (less than 30% of students in such classes), while it was common in Bulgarian (96% of students) and Omani (90%) classrooms.

The practice of having students reading aloud also varied. Almost all students in both high-performing and lower performing countries (Bulgaria, Georgia, Italy, Kazakhstan, Morocco, Omani and the Russian Federation) incorporated this practice. There was also variation across the English-language countries; Irish teachers were very likely to use include this activity daily (85% of students), while New Zealand teachers were much less likely (29%). There was some variation across the Nordic countries too – Finnish (56%) and Norwegian teachers (43%) were more likely to incorporate this practice on a daily basis than either of their Danish or Swedish counterparts (just 20% of students for both countries).

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The relationship between these activities and students’ reading achievement did vary considerably, even among the English-language countries. For example, the mean reading score for Australian students who did silent reading on their own ‘once or twice a week’ was higher (553) than their peers who did silent reading ‘every day or almost every day’ (544). The opposite was observed in New Zealand. Those Year 5 students who did silent reading daily scored an average of 22 points higher than their peers who read independently once or twice a week (529 compared with 507).

Year 5 students who read aloud either daily (525) or weekly (524) tended to have lower, but not statistically, reading achievement than their peers who read aloud less often (535 for both once or twice a month or never). The relationship between American students reading aloud and their achievement was the pattern for New Zealand, but for the other English-language countries there was no discernible difference between the frequency of an activity and students’ reading achievement.
**Teaching text-based comprehension skills**

Comprehension occurs when readers make connections between what they know and what they are reading. Explicit instruction of comprehension strategies requires teachers to draw on a raft of practices such as explaining, demonstrating/modelling, and guiding to develop these strategies.\(^{88}\) Two of the four comprehension processes assessed in PIRLS, often referred to as text-based processes, relate directly to *surface features* of texts: ‘focus on and retrieve explicitly stated information’ and ‘make straightforward inferences’.\(^{89}\)

Teachers were asked how often (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) they asked their students to do two things related to surface features of texts:

1. Locate information within a text
2. Identify the main idea(s) of what they have read

Figure 4.8 summarises the responses from teachers to these two items for the English-language countries.

**Figure 4.8: Developing surface-feature comprehension skills at least weekly in English-language countries**

![Graph showing the percentage of students in various countries who develop surface-feature comprehension skills at least weekly.]

*Note:*
The two grey shadings for New Zealand correspond to the red shadings for the other countries (e.g. mid grey corresponds to identifying the main idea in a text).

*Source: Exhibit 9.2 in Mullis, et al. (2017).*

\(^{88}\) McLaughlin (2012).

\(^{89}\) PIRLS assesses four comprehension processes, and these are described in Box A.1 in Appendix A.
Almost all students (more than 90%) in the English-language countries were doing reading activities to locate specific information and to identify the main ideas in a text at least weekly.

**Relationship with Year 5 reading achievement**

As the figure to the right shows, Year 5 students’ reading achievement tended to be lower as the frequency of developing these two strategies increased. The difference between the mean scores (25) for students who were often asked to locate information (526) and the two percent of students who were rarely/never asked (551) was statistically significant. However, there was no statistical difference between the means for identifying the main idea (528 and 539, $t = 1.37$).

**Developing deeper comprehension strategies and skills**

Students need a repertoire of comprehension strategies to foster their understanding of the purpose of a text. The two other processes PIRLS assesses are often referred to as the reasoning processes as they require students to ‘interpret and integrate ideas and information’ and ‘evaluate and critique content and textual elements’ of texts.

Teachers were also asked about how often (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) they asked students to do six things to develop to enhance students’ deeper reading skills and strategies.

These things were:

1. Compare what they have read with experiences they have had
2. Compare what they have read with other things they have read
3. Make predictions about what will happen next in the text they are reading
4. Make generalisations and draw inferences based on what they have read
5. Describe the style or structure of the text they have read
6. Determine the author’s perspective or intention.

Figure 4.9 summarises the responses from teachers to these six items for the English-language countries.

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90 According to Effective Literacy Practice, p. 143, making predictions usually relates to the surface feature of a text (as it refers to a word, or sentence or paragraph level).
Comparing and connecting; predicting and generalising; evaluating and critiquing

Teachers asking their students to compare what they have read with either their own experiences or with other material they read (items 1 and 2) were activities often undertaken among the English-language countries. By way of contrast, Finnish teachers were less likely to report that they were developing these skills often amongst their students (comparing experiences: 72% at least weekly; comparing with other reading material: 45% daily experiences at least weekly).

Figure 4.9: Developing deeper comprehension strategies at least weekly in English-language countries

Notes:
The two grey shadings for New Zealand correspond to the red shadings for the other countries (e.g. mid grey corresponds to determining the author’s perspective).

When readers are able to *generalise and draw inferences* from a text they are likely to have a well-developed understanding of the author’s intent. They construct meaning drawing on their own experiences and knowledge, and make inferences or construct a mental image from the information they have.

Making *predictions and generalisations* (items 3 and 4) were approaches often used in English-language countries, with at least 90 percent of students in five countries, including New Zealand, asked to demonstrate these at least weekly. Interestingly, Finnish teachers were again less likely to be asking their students to do either of these things this frequently during reading instruction (‘make predications’, 44% of students; and ‘make generalisations’, 51%, at least weekly).

Readers will often *evaluate and critique* content or elements of a text drawing either from their personal or objective perspectives. There was some variation across the English-language countries in how often students were being asked to either: describe the style of a text or determine the author’s perspective or intent. New Zealand students were less likely to be asked to do either of these activities than their English, American and Australian peers.

**Relationship with Year 5 reading achievement**

As the left-hand-side diagram shows, Year 5 students’ reading achievement tended to be lower as the frequency of developing comparing and connecting strategies increased.

A similar pattern was observed between reading achievement and how often teaching predicting and generalisation strategies were taught: reading achievement tended to be higher for the small group of Year 5 students who were asked to do these monthly or less often than their peers who were asked every day.

Year 5 students who were often asked to describe the style or determine an author’s perspective tended to have higher reading achievement than their peers who were rarely taught them. There was no consistent relationship across the English-language countries between the frequency of asking students to do these two things and their reading achievement. For example, in Ireland, higher reading achievement was associated with an increased frequency of having students describe the style of a text and determine an author’s perspective, whereas in Australia there was no relationship between how often teachers had their students do either of these activities and their reading achievement.
Literary forms used during reading instruction

According to the Ministry of Education’s *Effective Literacy Practice in Years 5 to 8*:

“It is important that students and teachers use and create a range and variety of texts in their reading and writing. . . Students and teachers need to be able to select from a collection of fiction and non-fiction texts, both print and electronic, that cover a wide range of interests and reading levels.”

Information from earlier cycles of PIRLS have found that the primary resource used for the basis of New Zealand teachers’ reading programmes was a reading series (specifically the *School Journal*), but often supplemented by the use of children’s books (both fiction and non-fiction).

The question about the primary resource was not asked in PIRLS 2016, but the type of text was—teachers were asked how often (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) they used particular types of literary reading materials with their students (in print or digital format) during reading. Literary or ‘fiction’ texts includes reading material with events, actions, consequences, and characters. These forms were:

1. Short stories (e.g., fables, fairy tables, action stories, science fiction, detective stories)
2. Longer fiction books with chapters
3. Plays
4. Poems

Figure 4.10 (next page) and the following discussion summarises the responses from teachers to these four literary material items.

**Short stories, longer fiction books, plays, and poems**

Reading short stories at least weekly was relatively common internationally, with an average of 78 percent of students taught by teachers who used this text form. Among the English-language countries, Trinidadian and Tobagonian teachers were the most likely to use this form (92% of students), while English (61%) and Northern Irish (60%) teachers were the least. Just over three-quarters of New Zealand students (77%) were in classes where this form was used at least weekly.

Longer fiction books were more likely to read by students at least weekly in some higher-performing countries, including a number of English-language countries, than in New Zealand. More than 90 percent of Dutch, Swedish and Northern Irish students read this literary form at least weekly as part of their instruction. The percentage of New Zealand students was lower at 62 percent.

In most countries, plays were rarely used for instruction (9% of students, on average, at least weekly). Although still used relatively infrequently, New Zealand teachers were more likely to use this form than their counterparts in other English-language countries.

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In addition to the other literary forms, New Zealand teachers were also asked how often they asked their students to read poetry as part of their instructional programmes. About one-quarter of Year 5 students were reading poetry at least once a week.

Figure 4.10: Literary materials used for reading instruction at least weekly in English-language countries

Note:
The three grey shadings for New Zealand correspond to the red shadings shown for the other countries (e.g. very light grey corresponds to plays.


Relationship with Year 5 reading achievement

It is important to remember the relationship between how often texts are used in instruction and reading achievement is not a causal one; teachers may be using particular types according to availability or for a way of developing or improving skills for weaker readers.

There was no statistical relationship between how often Year 5 students read short stories as part of their instructional programme and their reading achievement in New Zealand. Across the English-language countries, reading longer fiction chapter books on a regular basis was associated with higher achievement; in New Zealand there was only a weak association.93

93 The mean for Year 5 students who often read short stories (77% of students) was 525 score points; the mean for the students (23%) who read them less often (monthly or less) was 532. Year 5 students who often read longer texts (62%) scored an average of 528 compared with a mean of 523 for their peers (38%) who were read this form less often. Neither of the differences were not statistically significant.
The use of *plays* as an instructional reading text showed a different pattern. The mean reading score for the 16 percent of Year 5 students whose teachers used this genre at least weekly was 50 score points lower than those students where plays were used less often (484 compared with 534).

New Zealand teachers were also asked how often they asked their students to read *poetry* as part of their reading programme. About one-quarter of Year 5 students were reading poetry at least once a week. The mean for these students was 510 and a significant 21 score points lower than the mean for students who read poetry infrequently or never (532).

**Informational materials used during reading instruction**

Informational or non-fiction texts can take different forms—charts, articles, continuous and non-continuous, chronological, expository, and can cover a range of subject or content areas (scientific, historical, and geographical). As with the literary forms, teachers were asked to indicate how often (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) they had their students read the following during reading instruction:

1. Subject area books or textbooks
2. Longer books with chapters
3. Articles that describe and explain about things, people, events or how things work (e.g., newspaper articles, brochures)
4. Non-linear reading material on websites

Figure 4.11 and the following discussion the responses from teachers to these four informational material forms.

**Subject-area books and longer books with chapters, articles, and non-linear material**

Just over 80 percent of Year 5 students were reading *subject-area books* at least once a week. This compared to the international average of 71 percent. Interestingly, this text type was less likely to be used in higher-performing England (67%) and Singapore (59%). *Longer non-fiction texts* were less likely to be used in the English-language countries than other non-fiction forms. The use of this text form in New Zealand classrooms was not that common with just 38 percent of Year 5 students in such classes. The international average was even lower at 24 percent.

*Articles* were a relatively popular text form with about two-thirds Year 5 students reading this form at least weekly (compared with the international average of 39%) Across the English-language countries, their use did vary, with teachers in Trinidad and Tobago the least likely to have their students read this type of text, while those in the United States the most likely. American students were also the most likely to read articles on a daily basis (31% of students) than students in any other country.
In addition to the other non-fiction text forms, New Zealand teachers were also asked how often they had their students read (non-linear) reading material on websites. About the same percentage of students were reading website texts at least weekly (65%), as were reading articles. The remainder read this form either about monthly (28%) or not at all (7%).

Figure 4.11: Informational materials used for reading instruction at least weekly in English-language countries

Note:
The three grey shadings for New Zealand correspond to the red shadings shown for the other countries (e.g. very light grey corresponds to plays.


Relationship with Year 5 reading achievement

There was no statistical relationship between how often Year 5 student read ‘traditional’ information text forms and their reading achievement. Students who read non-linear material more frequently scored an average of nine score points higher than their peers who read this form less often (530 compared with 521); the difference was not of statistical significance.
Students’ engagement with reading

The underlying notion of student engagement is the idea that classroom activities bring the student and the subject content together. Engagement in reading can take place when a student listens to the teacher, discusses texts with peers, or reads independently. It is the “in-the-moment” cognitive interaction with the content, without competition with distractions unrelated to the task at hand.94

To gauge how engaged middle-primary students were during reading, they were asked to indicate on a four-point scale (‘agree a lot’, ‘agree a little’, ‘disagree a little’ or ‘disagree a lot’) how much they agreed with nine practices that occurred in their classes during reading (Box 4.1). The Students Engaged in Reading Lessons (SERL) Scale summarises students’ responses to the statements.

### Box 4.1: Engagement during reading, PIRLS 2016

How much do you agree with these statements when you have reading at school?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agreement Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like the things I read about at school</td>
<td>Very engaged (9.5)</td>
</tr>
<tr>
<td>My teacher gives me interesting things to read</td>
<td>Very engaged (9.5)</td>
</tr>
<tr>
<td>I know what my teacher expects me to do</td>
<td>Somewhat engaged (7.1)</td>
</tr>
<tr>
<td>My teacher is easy to understand</td>
<td>Somewhat engaged (7.1)</td>
</tr>
<tr>
<td>I am interested in what my teachers says</td>
<td>Somewhat engaged (7.1)</td>
</tr>
<tr>
<td>My teacher encourages me to say what I think about what I have read</td>
<td>Less than engaged (7.1)</td>
</tr>
<tr>
<td>My teachers let me know what I have learnt</td>
<td>Less than engaged (7.1)</td>
</tr>
<tr>
<td>My teacher does a variety of things to help us learn</td>
<td>Less than engaged (7.1)</td>
</tr>
<tr>
<td>My teacher tells me how to do something differently when I make a mistake</td>
<td>Less than engaged (7.1)</td>
</tr>
</tbody>
</table>

- Students who were very engaged had a score of at least 9.5 on the scale, had agreed a lot with five of the nine statements and agreed a little with the other four, on average.
- Students who were less than engaged scored at most 7.1 on the scale, had typically disagreed a little with five statements and agreed a little with the other four statements, on average.
- All other students were considered to somewhat engaged during their reading lessons.

New Zealand Year 5 students were either very engaged during reading (58% compared with 60% internationally) or somewhat engaged (38% compared with 35% internationally), with just four percent of Year 5 students less than engaged (about the same as the international mean of 5%).

It is interesting to note that some higher-performing countries had students not as engaged as students in many other countries. Examples of these countries were Hong Kong SAR (34% very engaged students), the Netherlands (37%), and Finland (39%). Very engaged students were mostly likely to be from Bulgaria (84% of students), Azerbaijan and Portugal (each with 83% of students).

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Within countries, the pattern of achievement was consistent – higher reading achievement was associated with students who were very engaged. In New Zealand’s case there was no difference between the mean reading scores for students who were very engaged (526) and somewhat engaged (524). Both groups of students did score (statistically) higher (25 and 23 score points respectively) on average than their peers who were less than engaged (501). Figure 4.12 summarises the views of students’ in the English-language countries.

**Figure 4.12: English-language countries and Students Engaged in Reading Lessons (SERL) Scale**

<table>
<thead>
<tr>
<th>Country</th>
<th>441</th>
<th>467</th>
<th>496</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trinidad &amp; Tobago</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Malta</td>
<td>567</td>
<td>435</td>
<td>465</td>
</tr>
<tr>
<td>United States</td>
<td>521</td>
<td>549</td>
<td>568</td>
</tr>
<tr>
<td>Ireland</td>
<td>553</td>
<td>566</td>
<td>580</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>539</td>
<td>566</td>
<td>567</td>
</tr>
<tr>
<td>International mean</td>
<td>490</td>
<td>506</td>
<td>518</td>
</tr>
<tr>
<td>Canada</td>
<td>512</td>
<td>540</td>
<td>550</td>
</tr>
<tr>
<td>New Zealand</td>
<td>501</td>
<td>524</td>
<td>526</td>
</tr>
<tr>
<td>England</td>
<td>530</td>
<td>558</td>
<td>562</td>
</tr>
<tr>
<td>Australia</td>
<td>579</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>555</td>
<td>578</td>
<td>587</td>
</tr>
</tbody>
</table>

**Notes**

The centre-point of the SERL Scale was set at 10.0. The means on the scale ranged from 11.4 (Azerbaijan) to 8.9 (Hong Kong); the mean for New Zealand was 9.9 (SE 0.04).

Mean reading scores for students who were very engaged, somewhat engaged, and less than engaged are shown on the respective bars (without the standard errors).


**Reading engagement and gender**

Year 5 girls (63%) were more likely than boys (52%) to be very engaged in their reading lessons. As noted, a very small proportion of Year 5 students was less than engaged in reading although these students did tend to be boys (5% of Year 5 boys compared with 3% of Year 5 girls). The difference between the mean reading scores for very engaged girls and their less than engaged female peers (23 score points) was statistically significant. The corresponding difference for boys (20 score points) was not significant at the 5% level (t = 1.85).

**Reading engagement and ethnicity**

When student engagement in reading was examined for students in each ethnic grouping, Pacific and Asian students were more likely to be very engaged during reading instruction (67% and 62% respectively) than Māori students (57%) and Pākehā/European (55%).
The relationship between engagement and reading achievement did, however, vary across the ethnic groupings (Figure 4.13 below). For example, there was no statistical relationship between reading achievement and reading engagement for either Asian or Pacific students. For Māori and Pākehā/European students the relationship between reading achievement and the level of engagement was stronger.

**Figure 4.13: Students Engaged in Reading Lessons (SERL) Scale, by ethnic grouping**

A. Asian  
B. Māori  
C. Pacific  
D. Pākehā/European

Category on the SERL Scale
--- Mean reading score

Note:  
The data points are the mean reading scores for each category on the SERL Scale. The vertical lines extending from each data point is the confidence interval for the mean.  
There were insufficient numbers of Asian and Pacific students in the less than engaged category to calculate reliable mean estimates.

Pākehā/European students who were *very engaged* scored an average of 21 score points higher than their Pākehā/European peers who were *less than engaged* (549 compared with 528). Māori students who were either *very engaged* (488) or *somewhat engaged* (479) scored higher than their peers who were *less than engaged* (440). The differences, 48 and 39 score points, were both statistically significant.
How are the computers used during reading?\textsuperscript{95}

PIRLS 2016 shows that in many countries, the use or presence of digital devices/computers in classrooms is relatively common, and much more so than when PIRLS 2006 was administered more than decade ago. This offers new challenges in terms of both teaching practice and instructional activities for students. Reading online provides additional challenges for students, which means teachers need to provide instruction on how to locate, evaluate and synthesise information across multiple sources.\textsuperscript{96}

Teachers were also asked how often (‘every day or almost every day’, ‘once or twice a week’, ‘once or twice a month’, or ‘never or almost never’) they taught or did the following computer teaching activities during reading:

1. Teach strategies for reading digital texts
2. Teach students to think critically when reading on the Internet
3. Ask their students to read digital texts
4. Ask their students to look up information
5. Ask their students to research a particular topic
6. Ask their students to write stories or other texts.

The proportion of students in English-language countries where teachers were asking their students to do particular activities or who were explicitly teaching the strategies noted are shown in Figure 4.14.

Digital instruction and activities

There was quite a variation across countries as to how often children being asked to do these types of activities. For example, more than half of Australian and New Zealand students (both 57%) were more likely to read digital texts at least weekly than students in Canada (30%), England (26%), Singapore (17%), and Ireland (14%).

New Zealand students were often looking up information (78% of students) and researching a topic (70%) during reading. Year 5 students were more likely to be asked by their teachers to do these activities on at least a weekly basis than students in any other country.

Writing texts were relatively common activities in both New Zealand and Australian classrooms, with teachers in these two countries more likely to ask their students to use computers for writing at least weekly than teachers in all other countries (64 % and 51% of students respectively). As a comparison, just under one-quarter of Finnish (22%) students were doing this type of activity.

\textsuperscript{95} Also see Forkert, with Chamberlain (in press).
\textsuperscript{96} Hooper, et al (2015, p. 50).
Figure 4.14: English-language countries and teaching digital strategies and activities, at least weekly

A. Teaching digital strategies and skills

B. Self-directed research activities

C. Literacy activities

Relationship with Year 5 reading achievement

The relationship between how often Year 5 students were asked to do the digital activities was weak. Students who read digital texts or wrote stories at least weekly tended to score an average of 10 score points higher than their peers who did these activities less often or never. However, the differences were not of statistical significance. As with other teaching strategies, there was no statistical relationship between how often digital skills were taught and students’ reading achievement.

Finally

When the PIRLS 2016 results were released in December 2017, the Year 5 student achievement results were the focus for the reporting because of the overall weakening of performance since PIRLS 2011. PIRLS 2016 provides more than achievement data – there is considerable contextual information, which is invaluable in understanding why there are differences in reading performance across countries, including the English-language countries.

A second report PIRLS 2016 Schools and School Climate for Learning was released in May 2019.97 This third report presents an overview of the classroom context for learning, including what Year 5 students brought to the classroom in terms of their attitudes and how these may impact on teachers’ instruction, and the practices and approaches to teaching reading comprehension.

PIRLS looks at reading behaviours beyond the classroom; children read for pleasure outside of school as well as read to learn at school. Their recreational reading is likely to be strongly influenced by the instructional programmes they have encountered at school. But it is important to remember that by the fifth year of schooling, their experiences are likely to have been influenced by more than one teacher. Students’ reading achievement at Year 5, for the most part, reflects the cumulative impact of five years of schooling, not just the one year of which PIRLS took a snapshot in 2015.

PIRLS 2016 does show that in general, New Zealand classrooms in were resourced well for teaching reading — almost all had class libraries and students had access to school libraries, and they were well-placed for using computer/digital technology during instruction. While the national curriculum does not specify the amount of time schools or teachers should spend on teaching reading, relative to other countries the time schools allocate as a proportion of total instructional time was reasonably high.

However, teachers’ instruction was being impacted by their students not having the necessary prerequisite knowledge and being absent from the classroom (or school). Students’ own reports of being absent from school highlight the strong relationship between reading achievement and regular attendance. New Zealand students are not confident as readers and were the least confident of their peers in the ‘English-language’ countries.

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97 Chamberlain (2019).
Coincidently, while drafting this report, researchers at Liège University (Belgium) released an analysis based on PIRLS 2016 showed that overall, ‘English-speaking’ systems, including New Zealand, were well-placed with implementing known effective literacy practices, compared with German-speaking and French-speaking education systems.98

Included in the current report is a discussion of many of the literacy practices and activities used in New Zealand classrooms, and how their implementation compares with other countries. An in-depth commentary on the practices implemented in New Zealand, along with questions about the teaching of reading particularly when children start school are presented in Reading literacy instruction in the English-language countries: similarities and differences.99

Some of the ‘practices or approaches’ described in earlier cycles of PIRLS were still being implemented to the same extent in 2015. Moreover, in the OECD100 Measuring innovation in education 2019: What has changed in the classroom? it states that:

“Between 2006 and 2016, students in New Zealand have experienced a moderate level of innovation in education, a bit less than in an average OECD system. Changes in mathematics education practices have been close to the OECD average, but much lower for reading.”

The Education Review Office’s 2018 report Keeping children engaged and achieving in reading101 noted that changes in the approaches to teaching reading evident in some schools have vastly improved the confidence and self-efficacy of reluctant readers. For example, mixed-ability grouping of Year 5 and 6 students allowed children with different reading ages to work together and support each other. Another approach was to engage reluctant readers by matching them with texts according to their chronological ages and interests, and give them strategies to succeed with the text, rather than material according to their ability.

Lastly, in many New Zealand primary schools there is a tendency to use class arrangements such as composite or multi-level classes for organising students for instruction, particularly in bigger schools. Achievement combined with social reasons, is a criterion often used to assign students to classes, and could be construed as another form of ability grouping. A key question arising from this practice is how well are students in such settings progressing relative to their expected year cohort?

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99 Chamberlain, with Forkert (2019).
Appendix A

The IEA’s\textsuperscript{102} Progress in International Reading Literacy Study, PIRLS, is an international research study designed to measure trends in reading literacy achievement. It involves children in their fourth year of formal schooling, an important developmental age for children as it marks the turning point where they move from “learning to read” to “reading to learn”.

The PIRLS 2016 Assessment Framework describes the reading framework for assessing reading literacy. Specifically, the processes of comprehension and the purposes for reading that were to be assessed. It also sets out the contextual framework used to capture information in order to understand the achievement outcomes and students’ reading behaviours and attitudes.\textsuperscript{103}

Box A.1: The PIRLS 2016 processes of reading comprehension

<table>
<thead>
<tr>
<th>Comprehension process</th>
<th>Percentage of assessment questions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on and retrieve explicitly stated information</td>
<td>20%</td>
<td>Readers are required to recognise information or ideas presented in the text, and how that information is related to the information being sought. Specific information to be retrieved is typically located in a single sentence or phrase.</td>
</tr>
<tr>
<td>Make straightforward inferences</td>
<td>30%</td>
<td>Readers move beyond the surface of texts to fill in the ‘gaps’ in meaning. Proficient readers often make these kinds of inferences automatically, even though it is not stated in the text. The focus may be on the meaning of part of the text, or the more global meaning representing the whole text.</td>
</tr>
<tr>
<td>Interpret and integrate ideas and information</td>
<td>30%</td>
<td>Readers need to process the text beyond the phrase or sentence level. Readers attempt to construct a more specific or complete understanding of the text by integrating personal knowledge and experience with meaning that resides in the text. Because of this, meaning that is constructed is likely to vary among readers.</td>
</tr>
<tr>
<td>Evaluate and critique content and textual elements</td>
<td>20%</td>
<td>Readers draw on their interpretations and weigh their understanding of texts against their world view - rejecting, accepting, or remaining neutral to the text’s representation. Readers need to draw on their knowledge of text genre and structure, as well as their understanding of language conventions. Readers may also reflect on the author’s devices for conveying meaning and judge their adequacy, or identify weaknesses in how the text was written.</td>
</tr>
</tbody>
</table>


\textsuperscript{102} International Association for the Evaluation of Educational Achievement

\textsuperscript{103} PIRLS 2016 Assessment Framework
Box A.2: PIRLS 2016 purposes for reading

<table>
<thead>
<tr>
<th>Reading for literary experience</th>
<th>Reading to acquire and use information</th>
</tr>
</thead>
<tbody>
<tr>
<td>The reader becomes involved in imagined events, settings, actions, consequences, characters, atmosphere, feelings, and ideas; he or she brings his or her own experiences, feelings, appreciation of language and knowledge of literary forms to the text. For young readers, literature offers the opportunity to explore situations and feelings they have not yet encountered. This is often accomplished through a range of genres—narrative fiction, poetry, and plays.</td>
<td>The reader engages with types of texts where she or he can understand how the world is and has been, and why things work as they do. Readers go beyond acquisition of information and use it in reasoning and in action; they must be able to bring a critical mind in order to form opinions. Texts take many forms, but one major distinction is between those organised chronologically and those organised non-chronologically.</td>
</tr>
</tbody>
</table>

In PIRLS, narrative fiction is the main literary device used; poetry is difficult to translate and plays are not widely used. In PIRLS, the types of texts used are intended to reflect authentic experiences children have when reading for information in and out of school. Authentic, age-appropriate websites were used in ePIRLS.


The IEA has overall responsibility for the study, which has been undertaken every five years since 2001. The fourth cycle, PIRLS 2016, was conducted in New Zealand and four other Southern Hemisphere participating countries in the last quarter of 2015. It was conducted in Northern Hemisphere countries in the first quarter of 2016.

**Which students took part?**

PIRLS involves students in their fourth year of formal schooling, ‘Grade 4’. To ensure comparability across countries, the minimum average age of children needed to be at least 9.5 years old. In New Zealand, like England, Malta, and Trinidad and Tobago where students start school at age 5 years, the average age of children in the fourth year of formal schooling is about 9 years. So children in their fifth year of schooling—Year 5 in New Zealand’s case—took part. New Zealand students in PIRLS were on average about 10 years-old.

**Who took part in New Zealand?**

A class or classes with Year 5 students were (randomly) selected from a representative sample of 188 schools; 5,646 students took part in total. In addition, 175 principals and 365 teachers completed questionnaires. Parents or caregivers of the Year 5 students were also asked to complete a questionnaire about their child’s early learning experiences.

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104 As with all previous assessment cycles, the International Study Center at Boston College’s Lynch School of Education in the United States managed the international coordination of PIRLS 2016. The other key partners involved were: the IEA’s Secretariat (Amsterdam, Netherlands); the IEA’s Data Processing and Research Center (Hamburg, Germany); Statistics Canada (Ottawa, Canada); and the Educational Testing Service (Princeton, New Jersey, United States).

105 Representative of both state/state integrated and independent schools.

106 A total of 2762 questionnaires were completed by parents/caregivers either on paper or online. This represented a response rate of 49%, and results should be treated with some caution.
What did students have to do in PIRLS?

Students were systematically assigned one of 16 booklets, each with two passages: one literary text (story) and one informational text (article). A total six literary texts and six information texts were rotated across the booklets, which meant that students did not all have the same material. Each passage was followed by a series of questions (about 12 to 14) with about half in multiple-choice format and half in constructed-response format (i.e., students had to write their own response to the question).107

Two passages—one story and one article—were in a simpler format, than the questions were integrated throughout the texts. They also had easier vocabulary and simpler syntax than the other 10 passages.

All students in all countries undertake the same assessment in the language in which they receive their instruction. In New Zealand, schools were given the option of testing students in English or in te reo Māori.108 The texts are translated from United States English to appropriate (instructional) languages, with some minor adaptations that reflect the country context. This ensures reliability and validity of the assessment across countries.

What additional information does PIRLS gather?

In addition to the comprehensive assessment information, a rich array of contextual background information was collected from students, teachers, parents/caregivers, and school principals. Their responses to a range of questions were used to better understand the context of students’ reading achievement. The questionnaires covered topics such as students’ views about reading and school, the availability of educational resources at home, early literacy activities in the home, and teachers’ organisational and instructional practice for teaching reading.

Students gave their views about the reading passages in the assessment. Each country also provided national educational policy information to aid the interpretation of results: PIRLS 2016 Encyclopaedia

ePIRLS

Fourteen countries and two benchmarking participants took advantage of the web-based reading assessment called ePIRLS. This initiative enabled countries to determine how proficient their students are at web-based informational reading as well as finding out if they are more or less proficient at web-based reading than paper-based informational reading. ePIRLS was administered to a subsample of students taking part in the paper-based assessment. New Zealand did not take part.

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107 Chapter 3 in the PIRLS 2016 assessment framework provides more detail.
108 The texts are translated from US English to appropriate (instructional) languages, with some minor adaptations that reflect the country context. This ensures reliability and validity of the assessment across countries. ‘Adaptation’ means changing things such as US English spelling or grammar to New Zealand English, using metric instead of imperial measurements, and using terms that would be familiar to New Zealand students.
How does PIRLS summarise students’ reading literacy achievement?

As noted above a student answers a set of questions associated with just one of 16 booklets. That is, students answer subsets of a much larger pool of questions. PIRLS then combines all the information from all students (across all countries). It uses techniques based on Item Response Theory to produce five estimates of student proficiency in reading for each student, even though they have answered only a small sample of the total pool. These estimates are then transformed into meaningful numbers, and then each student’s estimates are used to calculate statistics such as the mean or standard deviation. The resulting population statistics are reported on a scale.

PIRLS also describes the comprehension skills and processes associated with the range of scores on the achievement scale. For example, what does it actually mean for a country to have a score of 531 or 435 and how are they different? What competencies are students demonstrating when they answer questions on a story or article? PIRLS uses four different points on the achievement scale to do this, and these are referred to as benchmarks.

How does PIRLS measure trends in achievement?

The PIRLS reading achievement scale was established in the first cycle in PIRLS 2001. The average (mean) of the country means of 500 and a standard deviation of 100 was set and remains constant from assessment to assessment; it is referred to as the PIRLS Scale Centrepoint. This also means that the reference point 500 has the same meaning from assessment to assessment and trends can be measured with confidence.

If the international mean was used in each cycle (i.e., averaging the country means), this statistic would change from assessment to assessment as the number and characteristics of participating countries changed. This would result in unreliable estimates of changes in achievement over time.

Reading texts are retained after each assessment cycle. In PIRLS 2016, six of the 12 passages and accompanying questions (one literary text and one informational text) had been retained from each of PIRLS 2001 (two texts), PIRLS 2006 (two texts), and PIRLS 2011 (two texts).

Technical information

For details on some of the technical aspects pertaining to the reporting of the information in this report, see the Glossary of Terms and Technical Notes at the end of this report. A full account of the procedures (e.g., the sampling design, assessment item analysis and review, and Item Response Theory scaling methodology) used in PIRLS 2016 is provided in the PIRLS 2016 technical report, available on the PIRLS website: PIRLS 2016 Methods and Procedures

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109 From logits to 3 digit whole numbers.
110 Item Response Theory (IRT) is used to summarise the reading achievement results. For further details, refer to Martin, Mullis, and Hooper (2017).
111 See Glossary of Terms and Technical Notes.
Appendix B

Which countries participated?

Table B.1: Countries and education systems participating in PIRLS 2016

<table>
<thead>
<tr>
<th>PIRLS 2016 Country participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
</tr>
<tr>
<td>Austria</td>
</tr>
<tr>
<td>Azerbaijan</td>
</tr>
<tr>
<td>Bahrain</td>
</tr>
<tr>
<td>Belgium (Flemish)</td>
</tr>
<tr>
<td>Belgium (French)</td>
</tr>
<tr>
<td>Bulgaria</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>Chile</td>
</tr>
<tr>
<td>Chinese Taipei</td>
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<tr>
<td>Czech Republic</td>
</tr>
<tr>
<td>Denmark</td>
</tr>
<tr>
<td>Egypt</td>
</tr>
<tr>
<td>Sweden</td>
</tr>
<tr>
<td>United Arab Emirates</td>
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<td>United States</td>
</tr>
<tr>
<td>United States</td>
</tr>
<tr>
<td>United States</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PIRLS Benchmarking participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buenos Aires (Argentina)</td>
</tr>
<tr>
<td>Denmark (3)</td>
</tr>
<tr>
<td>Oslo</td>
</tr>
<tr>
<td>Ontario (Canada)</td>
</tr>
<tr>
<td>Moscow City (Russian Fed)</td>
</tr>
</tbody>
</table>

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112 The 50 countries include the two Belgian systems (Flemish and French); the two Special Administrative Regions of China, Hong Kong and Macao; England and Northern Ireland. Benchmarking participants include a geographical region language group often from a participating country; their information is not included in the calculations of statistics.
Appendix C

Figure C.1: Mean achievement for PIRLS 2016 countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russian Federation</td>
<td>681</td>
</tr>
<tr>
<td>Singapore</td>
<td>676</td>
</tr>
<tr>
<td>Hong Kong SAR</td>
<td>669</td>
</tr>
<tr>
<td>Ireland</td>
<td>667</td>
</tr>
<tr>
<td>Finland</td>
<td>666</td>
</tr>
<tr>
<td>Poland</td>
<td>665</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>665</td>
</tr>
<tr>
<td>Norway (Ø)</td>
<td>659</td>
</tr>
<tr>
<td>Chinese Taipei</td>
<td>659</td>
</tr>
<tr>
<td>England</td>
<td>659</td>
</tr>
<tr>
<td>Latvia</td>
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<tr>
<td>Sweden</td>
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<tr>
<td>Hungary</td>
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<td>Bulgaria</td>
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<td>United States</td>
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<td>Lithuania</td>
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<td>Denmark</td>
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<tr>
<td>Mexico SAR</td>
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<td>Netherlands</td>
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<td>Australia</td>
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<td>Czech Republic</td>
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<td>Canada</td>
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<tr>
<td>Slovenia</td>
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<tr>
<td>Austria</td>
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<td>Germany</td>
<td>637</td>
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<tr>
<td>Kazakhstan</td>
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<tr>
<td>Slovak Republic</td>
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<td>Israel</td>
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<td>Portugal</td>
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</tr>
<tr>
<td>Spain</td>
<td>628</td>
</tr>
<tr>
<td>Belgium (Flemish)</td>
<td>625</td>
</tr>
<tr>
<td>New Zealand</td>
<td>623</td>
</tr>
<tr>
<td>France</td>
<td>621</td>
</tr>
</tbody>
</table>

PIRLS Scale Centrepoint: 500

Country mean significantly higher than the PIRLS Scale Centrepoint.
Country mean not significantly different from the PIRLS Scale Centrepoint.
Country mean significantly lower than the PIRLS Scale Centrepoint.
Appendix D

Figure D.1: School policies for assigning Year 5 students to their classes

<table>
<thead>
<tr>
<th>Deciles 1 &amp; 2</th>
<th>Deciles 3 &amp; 4</th>
<th>Deciles 5 &amp; 6</th>
<th>Deciles 7 &amp; 8</th>
<th>Deciles 9 &amp; 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Percentage of students
- Yes
- No

Figure D.2: Year 5 students and Students Like Reading (SLR) Scale, PIRLS 2016

Figure D.3: English-language countries and Students Like Reading (SLR) Scale, PIRLS 2016

Notes:
The centre-point of the SLR Scale was set at 10.0. The means on the scale ranged from 11.4 (Portugal) to 8.9 (Sweden); the mean for New Zealand was 10.1 (SE 0.04). The mean reading scores for students who very much like reading, somewhat like reading, and do not like reading are shown on the bars (without the standard errors).

Source: Exhibit 10.2 in Mullis, et al. (2017).

Figure D.4: Year 5 students and Students Confident in Reading (SCR) Scale, PIRLS 2016

Figure D.5: English-language countries and Students Confident in Reading (SCR) Scale, PIRLS 2016

Notes:
The centre-point of the SCR Scale was set at 10.0. The means ranged from 10.8 (Sweden) to 8.8 (South Africa); the mean for New Zealand was 9.6 (SE 0.03). The mean reading scores for students who were very confident, somewhat confident, and not confident are shown on the bars (without the standard errors).
Source: Exhibit 10.3 in Mullis, et al. (2017).

Figure D.6: Teachers’ reports on the extent to which their students being absent limit their teaching

Note: The data points are the mean reading scores for students according to teachers’ responses.
Source: PIRLS 2016 International Database Teacher Questionnaire Almanac (Foy, 2018).
Figure D.7: Year 5 students' reports of being absent from school by decile

Table D.1  Mean reading scores for Year 5 students and their reports of being absent from school

<table>
<thead>
<tr>
<th>School decile grouping</th>
<th>Never or almost never</th>
<th>Once a month</th>
<th>Once every two weeks</th>
<th>Once a week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deciles 1 &amp; 2</td>
<td>476</td>
<td>478</td>
<td>446</td>
<td>432</td>
</tr>
<tr>
<td>Deciles 3 &amp; 4</td>
<td>516</td>
<td>520</td>
<td>466</td>
<td>452</td>
</tr>
<tr>
<td>Deciles 5 &amp; 6</td>
<td>535</td>
<td>527</td>
<td>531</td>
<td>458</td>
</tr>
<tr>
<td>Deciles 7 &amp; 8</td>
<td>551</td>
<td>546</td>
<td>520</td>
<td>495</td>
</tr>
<tr>
<td>Deciles 9 &amp; 10</td>
<td>566</td>
<td>563</td>
<td>542</td>
<td>497</td>
</tr>
</tbody>
</table>
Figure D.8: Organisational practices used when teaching reading to Year 5 students, 2010 and 2015

- Teach reading as a whole-class activity
- Create same-ability groups
- Create mixed-ability groups
- Individualised instruction

Figure D.9: Teaching decoding strategies and new vocabulary to Year 5 students, 2001 to 2015

- Teach strategies for decoding sounds and words
- Teach new vocabulary systematically
Glossary of Terms and Technical Notes

For more detailed information on the technical aspects of the study readers are advised to go to the PIRLS 2016 Methods and Procedures, edited by M. Martin, I. V. S. Mullis, and M. Hooper (2017), which is available on the PIRLS website: Methods and Procedures in PIRLS 2016

Background scales

In order to have (continuous) measures for summarising and making inferences from contextual data, Item Response Theory scales were developed from sets of background or contextual questions gathered from students, teachers, and school leaders. The underlying premise during the process of selecting sets of items and then developing scales was that there should be a positive relationship within and across countries between the items or scales, and reading achievement.

There were three aspects to consider when developing a scale such as the Students Confident in Reading:

1. **Unidimensional**: a scale was considered ‘sufficiently unidimensional’ if a single underlying construct was the dominant influence on the responses to the items. A technique called Principal Components Analysis was used to confirm this.

2. **Reliable (internally consistent)**: Conbrach’s Alpha, a measure of internal consistency, was computed to provide an indicator of the reliability of each proposed scale. A scale was considered sufficiently reliable if Conbrach’s Alpha was at least 0.7.

3. **A valid relationship with achievement**.

A few of the scales did not have the expected relationship with student achievement and were not used in reporting the main survey results. For the main survey, a 1-Paremeter IRT (Rasch) measurement model was used to scale the actual responses to the items forming the scales.

**ISCED**

ISCED stands for the International Standard Classification of Education and was developed by the UNESCO Institute for Statistics. ISCED Level 1 corresponds to primary education or the first stage of basic education with the first year of Level 1 marking “systematic apprenticeship of reading, writing, and mathematics”. (Mullis, et al., 2017)

**Mean**

The achievement of students (or percentage with a particular attribute) is summarised for the population or sub-populations using the statistic referred to as the mean (which is a type of average). The mean is calculated by summing up all the scores (or percentages) and dividing by the total number of students or observations. All the means reported for PIRLS are adjusted (or weighted) so they reflect the total population for which inferences are being made; that is for
the Year 5 student population. The mean scores (or the differences between means) for some sub-populations appear either in parentheses in the text or in graphics.

**International achievement means**

The Item Response Theory scaling procedures produce five imputed scores or plausible values for each student. The differences between the five values tend to be very small, and reflect the degree of uncertainty in the imputation process. To obtain the best estimate of a statistic (e.g., the mean), the calculation is carried out using the five plausible values, with the results then averaged. The mean for an individual country, for example, is calculated by first calculating the (weighted) mean of each of the five plausible values, and then calculating the mean of these means. Note: the result is not equivalent to taking the mean of the five plausible values for each student and then taking the mean of these means.

The international achievement means reported in relation to background variables such as gender were calculated by first computing the national mean for each plausible value for each country and then calculating the mean across the countries. The five estimates resulting from this were then averaged to derive the international means presented in this report and in the international PIRLS reporting. Each country contributes equally to the calculations.

**Median**

The median is another form of the average. It is the value separating the higher half of a sample or population from the lower half. It can be found by arranging all the observations from lowest value to highest value (e.g., the lowest percentage to the highest percentage) and then selecting the middle value. The international median is used when reporting the benchmark information.

**Minimum group size for reporting achievement data**

Internationally, PIRLS does not report mean achievement scores for groups that represent less than 2.5 percent (rounded) of the population. However, in this report, if the percentage of New Zealand students in a group was estimated to be two percent (rounded), achievement results are reported as long as there were more than 50 students from 10 schools in the ‘cell’ to estimate the statistic.

**OECD countries**

There are 35 member countries of the Organisation for Economic Cooperation and Development, the OECD. Twenty-six OECD countries took part in PIRLS. The OECD countries that did not take part were Estonia, Greece, Iceland, Japan, Korea, Luxembourg, Mexico, Switzerland, and Turkey.

The United Kingdom (England, Northern Ireland, Scotland, and Wales) has single membership of the OECD, but England has its own membership of the IEA. England and Northern Ireland data is combined as one OECD country for any comparisons against OECD countries.

Belgium is also an OECD country but the French and Flemish systems of Belgium each has its own membership of the IEA. Belgium (French) has taken part in earlier cycles, while Belgium (Flemish) took part for the first time in 2016. For the purpose of making comparisons with OECD countries both systems are counted as an OECD country.
PIRLS Scale Centrepoint

The PIRLS reading achievement scale was established in the first cycle in PIRLS 2001. The average (mean) of the country means of 500 and a standard deviation of 100 was set and remains constant from assessment to assessment. In earlier cycles it was referred to as the PIRLS Scale Mean. This term refers to the fact that the achievement scale uses the same point of reference—500—from assessment to assessment, and in the case of PIRLS it relates to the original 2001 cycle.

If the international mean was used in each cycle (i.e., averaging the country means), this statistic would change from assessment to assessment as the number and characteristics of participating countries changed. This would result in unreliable estimates of changes in achievement over time. (Also see explanation of the international mean.) The actual mean has been calculated for the 18 trend countries participating in all four cycles of PIRLS.

Range

The range refers to the difference between the highest value and the lowest value of a set of numbers or percentages (e.g., the difference between the highest reading score and the lowest reading score). In PIRLS, the range in achievement is often reported by using the difference between the 5th and 95th percentiles and provides a measure of the spread of achievement. The ‘5th percentile’ is the lowest outer limit corresponding to the score at which only five percent of children achieved a lower score and 95 percent achieved a higher score. The ‘95th percentile’ is the highest outer limit corresponding to the score at which only five percent of children achieved a higher score and 95 percent a lower score. Ninety percent of students’ achievement scores are then between the 5th and 95th percentiles.

Scaling

PIRLS uses multiple-matrix sampling whereby students answer subsets of items from a larger pool of test items. Psychometric scaling techniques based on Item Response Theory enable population estimates to be generated even though students do not respond to all the same achievement items.

Three Item Response Theory models are used, corresponding to the three types of assessment questions. For multiple-choice questions a three-parameter logistic model is used, which characterises the item in terms of difficulty, discrimination and the possibility of guessing. For dichotomous open-response questions, a two-parameter logistic model is used (the possibility of guessing is discounted). For extended response items with 0, 1, 2, and 3 as possible scores, a generalised partial-credit model was used, which factors in the different scores available to respondents.

The Item Response Theory scaling applied in PIRLS uses the plausible value methodology to produce estimates of student proficiency in reading.
Standard error

A mean or a proportion is usually reported along with its standard error, a measure of how confident we can be with the statistic being reported. In PIRLS, the calculation of the standard errors is not straightforward as it reflects the uncertainty due to working from a sample AND the assessment design whereby children were assigned different subsets of items. The standard errors are not shown for all graphics; however in most instances they are reported with the national statistics. There is no standard error associated with the median or the range.

Statistically significantly different

Throughout this report, when a comparison or difference between two statistics is said to be significantly different this refers to the difference being statistically significantly different. Statistically significant is the likelihood that a relationship (or a difference) between two or more variables is caused by something other than random chance. Statistical tests have been undertaken using the difference between two statistics (e.g., two means) and the resulting standard error of the difference to determine whether or not one statistic is different from another. The significance level or the ‘alpha ($\alpha$) level’ for making the comparison is set at $\alpha = 0.05$—the probability of there not being a difference is five percent.

Multiple comparisons

When making a comparison between two means, the value of $t$ must be at least equal to the critical value 1.96 for $\alpha \leq 0.05$ (two-tailed). However, in cases where there are more than two means being compared (e.g., comparisons of the reading means for schools in quintiles), there are more sources of measurement error to be considered. The Dunn-Bonferroni procedure has been used in these instances. Essentially, this procedure raises the critical value that $t$ must reach before the (multiple) comparisons can be considered statistically significantly different at the five percent level.

Weighting

In general, the sampling design required schools to be sampled with a probability proportional to size (PPS), and for classrooms to be sampled with equal probabilities. In addition, many countries, including New Zealand, used stratification to improve the precision of their sampling. Weighting was applied to all countries’ data to ensure proper survey estimates and to adjust for the fact that the sampling design resulted in differential probabilities of selection for each student within the population. The weighting took into account school-, class-, and student-level information so that the overall sampling weight was a product of the school, class, and student weights.
References


Medina, E. (2019). How often are students organised into same and mixed ability groups? Wellington: Ministry of Education.


Links to international reports

PIRLS 2016 Assessment Framework
PIRLS 2016 Encyclopaedia
What Makes a Good Reader: International Findings from PIRLS 2016
PIRLS 2016 Methods and Procedures
We shape an education system that delivers equitable and excellent outcomes

He mea tārai e mātou te mātauranga kia rangatira ai, kia mana taurite ai ōna huanga