

PIRLS

Progress in International Reading Literacy Study

Teacher Strategies to Help Fourth-Graders Having Difficulty in Reading: An International Perspective

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Introduction

The Progress in International Reading Literacy Study (PIRLS), a study conducted by the International Association for the Evaluation of Educational Achievement (IEA), assesses the reading achievement of fourth-graders. Most recently, PIRLS 2006 analyzed nationally representative samples of fourth-graders in the United States and 44 other jurisdictions.¹ While scores on this assessment offer insight into how U.S. students compare to their international counterparts in reading, it is also useful to understand the context in which students learn and the current practices used in classroom instruction. To gain a better understanding of such contextual features, PIRLS also collects background information from students, teachers, and principals on a variety of topics.

This Statistics in Brief focuses on one particular aspect of reading instruction within the participating PIRLS 2006 jurisdictions; it attempts to describe international patterns and variation in the strategies reported by teachers to help fourth-grade students having difficulty in reading. This report uses data collected from the PIRLS 2006 teacher background questionnaire.

Teachers were asked, “What do you usually do if a student begins to fall behind in reading?” Teachers could respond “yes” or “no” to one or more of the following: (a) I wait to see if performance improves with maturation; (b) I spend more time working on reading individually with that student; (c) I have other students work on reading with the student having difficulty; (d) I have the student work in the regular classroom with a teacher-aide; (e) I have the student work in the regular classroom with a reading specialist; (f) I have the student work in a remedial reading classroom with a reading specialist; (g) I assign homework to help the student catch up; or (h) I ask the parents to help the student with reading.

Findings

This brief presents information regarding these eight strategies used by fourth-grade teachers to help struggling readers in two groups: (1) out-of-school support strategies if they are generally applied outside the school setting, and

¹ The assessment is open to countries as well as subnational entities such as Hong Kong Special Administrative Region (SAR), some individual Canadian provinces, and divisions of countries such as Belgium and the United Kingdom. In this report, participating countries and subnational entities are both referred to as “jurisdictions.”

(2) school support strategies if they are primarily applied within the school setting.

School-support strategies to help struggling readers often require active school staff involvement such as the use of reading specialists either in the remedial or regular classroom setting. Readers should be aware that PIRLS summaries based on jurisdiction reports reveal that reading specialists vary in terms of the specific details of their responsibilities across jurisdictions (Kennedy et al. 2007). For instance, reading specialists in the United States are mostly involved at the individual classroom level. They support classroom teachers by providing materials and ideas, and assisting in diagnosis and assessment. They may also work with individual students or small groups of students who are having difficulty. In contrast, reading specialists in Denmark (called reading consultants), besides acting as a resource for teachers, also play a key role in developing the overall reading and literacy strategy within entire school districts, and in some cases, monitoring school reading levels annually. However, even though their scope of work varied, in most of the jurisdictions, reading specialists are generally regarded as a source for specialized support to teachers in reading instruction. In contrast, teacher-aides provide less specialized assistance and may support teachers in more than one subject area.

This brief uses data from the PIRLS 2006 teacher background questionnaire to determine strategy use within jurisdictions (i.e., the percentage of fourth-graders whose teachers indicated that they use each strategy within each jurisdiction), and international patterns or variation in strategy choice made across jurisdictions (i.e., whether there are certain strategies that tend to be the most (or least) commonly used for all 45 jurisdictions).

To address the first objective, strategy use at the jurisdiction level is measured by the percentage of fourth-graders whose teachers indicated that they use a specific strategy when attempting to help students falling behind in reading. In this brief, strategy use is profiled both in terms of the range of percentages across all 45 jurisdictions as well as the number of jurisdictions that fell within specific percentage cutpoints (0–10 percent, 11–25 percent,

26–50 percent, 51–75 percent, 76–90 percent, and then 91–100 percent).

To address the second objective, international patterns in strategy choice are recognized by comparing all eight strategies within each jurisdiction and identifying those that received the highest and lowest percentages of reported use. Strategies identified as the “single most commonly cited” had a higher percentage than all other strategies within a given jurisdiction. However, in many cases, the strategy associated with the highest observed percentage did not measurably differ from percentages reported for other strategies. For instance, in Singapore, percentages for three of the eight strategies did not measurably differ from each other but were higher than those for all other five strategies. Therefore, these strategies are referred to as “among the most commonly cited.”

Note that analyses of the most and least commonly cited strategies compare percentages for each strategy *within* jurisdictions but do not compare percentages *across* jurisdictions. As such, one jurisdiction may report a strategy as among its most commonly cited while another jurisdiction does not; however, the reported percentage in the latter may be higher or not different from the reported percentage in the former.

Out-of-school support strategies

Asking parents to help

Across all 45 jurisdictions, the percentage of fourth-graders whose teachers cited asking the parents to help the student with reading ranged from 82 percent in Singapore to 100 percent in Denmark (table 1). Thirty-nine of these jurisdictions reported percentages between 91 and 100 percent, including the United States (97 percent).

Asking the parents to help the student with reading was among the most commonly cited strategies in 44 of the 45 jurisdictions (the exception being Hong Kong SAR); in 19 of these jurisdictions (including the United States), it was the single most commonly cited. None of the 45 jurisdictions reported asking the parents to help the student with reading as among its least common strategies.

Assigning homework

The percentage of fourth-graders whose teachers cited assigning homework to help the student catch up ranged from 23 percent in France to 99 percent in Georgia. Thirty-two jurisdictions reported percentages between 51 and 100 percent. Of these, 7 jurisdictions (Bulgaria, Georgia, Indonesia, Macedonia, Morocco, the Russian Federation, and South Africa) reported percentages between 91 and 100 percent; 11 jurisdictions reported percentages between 76 and 90 percent; and 14 jurisdictions reported percentages between 51 and 75 percent. The United States (45 percent) was among the 13 jurisdictions with percentages between 0 and 50 percent (12 jurisdictions reported percentages between 26 and 50 percent, and France reported a percentage between 11 and 25 percent).

Seven jurisdictions reported this strategy as among their most commonly cited; these included Bulgaria, Georgia, Indonesia, Kuwait, Macedonia, Morocco, and Romania. England and Denmark reported this strategy as among their least commonly cited.

Waiting for maturation

The percentage of fourth-graders whose teachers cited waiting to see if the student's reading performance improved with maturation ranged from 11 percent in Slovenia to 93 percent in Hong Kong SAR. Eleven jurisdictions reported percentages between 51 and 100 percent. Of these, Chinese Taipei, Hong Kong SAR, and Latvia reported percentages between 91 and 100 percent; Qatar reported a percentage between 76 and 90 percent; and 7 jurisdictions (Belgium (French), the Islamic Republic of Iran, Morocco, Macedonia, the Russian Federation, Singapore, and South Africa) reported percentages between 51 and 75 percent. The United States (32 percent) was among the 34 jurisdictions with percentages between 0 and 50 percent (22 jurisdictions reported percentages between 26 and 50 percent, and 12 jurisdictions reported percentages between 11 and 25 percent).

This strategy was the single most commonly cited strategy in Hong Kong SAR (93 percent) and among the most commonly cited in Chinese Taipei (91 percent). Waiting to see if the student's performance improves with maturation, was

among the least commonly cited strategies in nine jurisdictions.

School-support strategies

Spend more time working with the student individually

The percentage of fourth-graders whose teachers cited spending more time working with the student individually ranged from 70 percent in the Canadian province of Quebec to 99 percent in Poland. Eighteen jurisdictions reported percentages between 91 and 100 percent, and 24 jurisdictions, including the United States (89 percent), reported percentages between 76 and 90 percent.

Spending more time working with the student individually was among the most commonly cited strategies in 20 jurisdictions. As in the case of asking parents to help, none of the 45 jurisdictions reported spending more time working with the student individually as among its least common strategies.

Have other students work with the student having difficulty in reading

The percentage of fourth-graders whose teachers cited having other students work with the student having difficulty in reading ranged from 17 percent in Iceland to 97 percent in the Islamic Republic of Iran. Thirty-seven jurisdictions reported percentages between 51 and 100 percent. Of these, Chinese Taipei and the Islamic Republic of Iran reported percentages between 91 and 100 percent; 15 jurisdictions reported percentages between 76 and 90 percent, including the United States (80 percent); and 20 jurisdictions reported percentages between 51 and 75 percent. Eight jurisdictions reported percentages between 0 and 50 percent. Of these, 6 jurisdictions (Denmark, Luxembourg, Poland, Scotland, Spain, and Sweden) reported percentages between 26 and 50 percent, and Iceland and Norway reported percentages between 11 and 25 percent.

Having other students work with the student having difficulty in reading was among the most commonly cited strategies in Chinese Taipei, the Islamic Republic of Iran, Singapore, and Trinidad

Table 1. Percentage of fourth-graders with teachers who cited using various strategies to help students falling behind in reading, by strategy and jurisdiction: 2006

		Out-of-school-support strategies					
Ask parents to help student with reading		Assign homework to help student catch up		Wait to see if performance improves with maturation			
Jurisdiction	Percent	Jurisdiction	Percent	Jurisdiction	Percent		
International average ¹	95 ▲▲	International average ¹	67	International average ¹	42		
Denmark	100 ▲▲	Georgia	99 ▲	Hong Kong SAR ⁴	93 ▲▲		
Sweden	99 ▲▲	Bulgaria	97 ▲	Chinese Taipei	91 ▲		
Norway ²	99 ▲▲	Indonesia	96 ▲	Latvia	91		
Slovenia	99 ▲▲	Macedonia	95 ▲	Qatar	85		
Latvia	99 ▲▲	Russian Federation	94	Iran, Islamic Republic of	70		
Austria	99 ▲▲	Morocco	94 ▲	Russian Federation	65		
Moldova	99 ▲	South Africa	91	Morocco	55		
England	99 ▲▲	Romania	90 ▲	Macedonia	54		
Russian Federation	99 ▲▲	Iran, Islamic Republic of	90	Belgium (French)	53		
Poland	99 ▲	Qatar	89	Singapore	52		
Spain	98 ▲▲	Moldova	84	South Africa	51		
Netherlands ³	98 ▲	Latvia	80	Georgia	50		
Germany	98 ▲▲	Spain	79	Lithuania	49		
Slovak Republic	98 ▲	Hungary	79	Italy	48		
Georgia	98 ▲	Trinidad and Tobago	79	Austria	45		
Lithuania	98 ▲	Sweden	79	Canada, Quebec	44		
Canada, Alberta	98 ▲▲	Kuwait	78 ▲	Indonesia	43		
Iceland	98 ▲▲	Iceland	77	Luxembourg	43		
Hungary	97 ▲	Lithuania	75	Belgium (Flemish) ³	43		
South Africa	97 ▲▲	Chinese Taipei	73	France	41		
Qatar	97 ▲▲	Italy	72	Moldova	39		
United States³	97 ▲▲	Austria	69	Bulgaria	37		
Iran, Islamic Republic of	97 ▲	Scotland ³	68	Romania	36		
Bulgaria	97 ▲	Germany	63	Canada, British Columbia	36 ▼		
Canada, Quebec	97 ▲▲	Hong Kong SAR ⁴	61	England	34 ▼		
Canada, British Columbia	96 ▲▲	Canada, Ontario	56	Hungary	33		
Canada, Nova Scotia	96 ▲	Netherlands ³	55	Denmark	32 ▼		
Scotland ³	96 ▲	Poland	55	United States³	32		
Indonesia	95 ▲	Slovenia	54	Canada, Alberta	31		
Trinidad and Tobago	94 ▲	Canada, Alberta	54	Sweden	30		
Canada, Ontario	94 ▲	Israel	53	Kuwait	27 ▼		
Macedonia	94 ▲	Canada, Nova Scotia	52	Canada, Nova Scotia	27 ▼		
Romania	93 ▲	Singapore	49	Iceland	27		
Belgium (French)	93 ▲▲	Luxembourg	48	Spain	25		
New Zealand	93 ▲	New Zealand	47	Germany	25		
Italy	93 ▲	United States³	45	Trinidad and Tobago	25		
Chinese Taipei	93 ▲	Belgium (Flemish) ³	44	Slovak Republic	24		
Belgium (Flemish) ³	91 ▲	Canada, British Columbia	40	Norway ²	24		
Israel	91 ▲	England	39 ▼	Canada, Ontario	23 ▼		
Morocco	89 ▲	Canada, Quebec	38	New Zealand	19		
Luxembourg	86 ▲▲	Belgium (French)	37	Israel	19 ▼		
France	84 ▲	Norway ²	31	Netherlands ³	18		
Hong Kong SAR ⁴	83	Denmark	31 ▼	Scotland ³	17 ▼		
Kuwait	83 ▲	Slovak Republic	29	Poland	14		
Singapore	82 ▲	France	23	Slovenia	11 ▼		

See notes at end of table.

Table 1. Percentage of fourth-graders with teachers who cited using various strategies to help students falling behind in reading, by strategy and jurisdiction: 2006—Continued

School-support strategies					
Spend more time working with student individually		Have other students work with student having difficulty		Have student work in the regular classroom with a teacher-aide	
Jurisdiction	Percent	Jurisdiction	Percent	Jurisdiction	Percent
International average ¹	88	International average ¹	64	International average ¹	23
Poland	99 ▲	Iran, Islamic Republic of	97 ▲	England	72
Hungary	98 ▲	Chinese Taipei	92 ▲	Scotland ³	67
Bulgaria	98 ▲	Trinidad and Tobago	89 ▲	Israel	57
Lithuania	98 ▲	South Africa	86	Norway ²	56
Macedonia	97 ▲	Singapore	84 ▲	Canada, Alberta	53
Slovenia	97	Indonesia	83	New Zealand	50
Norway ²	96	Italy	83	Iceland	50
Romania	96 ▲	Qatar	83	Canada, British Columbia	47
Georgia	96	New Zealand	82	Iran, Islamic Republic of	45
Slovak Republic	95 ▲	Netherlands ³	82	Canada, Nova Scotia	40
Canada, Nova Scotia	95 ▲	United States³	80	Canada, Ontario	36
Canada, Ontario	94 ▲	Moldova	79	Sweden	35
Netherlands ³	94 ▲	Morocco	78	Kuwait	35 ▼
New Zealand	94 ▲	Canada, Alberta	77	South Africa	31
Moldova	94 ▲	Belgium (Flemish) ³	76	United States³	31
Italy	92 ▲	Canada, Ontario	76	Denmark	30 ▼
Scotland ³	92 ▲	Israel	76	Russian Federation	26
Israel	91 ▲	Canada, Quebec	75	Indonesia	25
Canada, Alberta	90	Canada, Nova Scotia	74	Qatar	25
Sweden	90	Georgia	71	Canada, Quebec	24 ▼
Iran, Islamic Republic of	90	Hong Kong SAR ⁴	69	Belgium (French)	23
South Africa	90	Germany	69	Italy	22
Trinidad and Tobago	90 ▲	Russian Federation	67	Georgia	21
Russian Federation	89	Canada, British Columbia	67	Austria	19
Canada, British Columbia	89	Romania	67	Belgium (Flemish) ³	19 ▼▼
United States³	89	Kuwait	63	Luxembourg	17
Spain	87	Austria	61	Spain	16 ▼▼
Belgium (Flemish) ³	87 ▲	France	58	Slovenia	14 ▼
Austria	86	Macedonia	57	Hong Kong SAR ⁴	13
Kuwait	85 ▲	Latvia	57	Netherlands ³	13
Morocco	85	Hungary	57	Trinidad and Tobago	12
Chinese Taipei	85	Bulgaria	55	Macedonia	12 ▼
Indonesia	84	Lithuania	55	Chinese Taipei	12 ▼
Denmark	84	Slovenia	54	France	11 ▼
Latvia	83	Slovak Republic	54	Slovak Republic	9 ▼
France	82 ▲	England	53	Lithuania	9
Hong Kong SAR ⁴	82	Belgium (French)	53	Moldova	8 ▼
Qatar	82	Poland	47	Germany	8 ▼
Germany	80	Luxembourg	47	Singapore	6 ▼
Iceland	79	Scotland ³	45	Latvia	6 ▼
Singapore	78 ▲	Spain	37	Bulgaria	5
England	78	Denmark	35	Poland	4 ▼▼
Belgium (French)	73	Sweden	35	Morocco	3! ▼
Luxembourg	73	Norway ²	18	Hungary	2! ▼
Canada, Quebec	70	Iceland	17 ▼	Romania	1! ▼

See notes at end of table.

Table 1. Percentage of fourth-graders with teachers who cited using various strategies to help students falling behind in reading, by strategy and jurisdiction: 2006—Continued

School-support strategies			
Have student work in a remedial classroom with a reading specialist		Have student work in the regular classroom with a reading specialist	
Jurisdiction	Percent	Jurisdiction	Percent
International average ¹	34	International average ¹	12 ▼▼
Iceland	83	Canada, Quebec	46
Denmark	78	Kuwait	45
Netherlands ³	75	Spain	29
Sweden	75	Belgium (Flemish) ³	29
Spain	72	England	28 ▼
Poland	71	Canada, British Columbia	26 ▼
Belgium (Flemish) ³	66	Israel	25 ▼
Canada, Nova Scotia	65	Denmark	23 ▼
Canada, British Columbia	65	Iran, Islamic Republic of	22 ▼
Israel	63	Canada, Nova Scotia	22 ▼
Slovenia	60	Scotland ³	17 ▼
Norway ²	53	Iceland	17 ▼
Scotland ³	51	Sweden	16 ▼▼
United States³	50	Canada, Alberta	16 ▼▼
England	50	Slovenia	15 ▼
New Zealand	42	United States³	15 ▼▼
Canada, Alberta	39	Canada, Ontario	15 ▼
Canada, Ontario	37	France	14 ▼
Canada, Quebec	34 ▼	Slovak Republic	14 ▼
Kuwait	33 ▼	Indonesia	13 ▼
Germany	33	Poland	13
Lithuania	28	Qatar	12 ▼▼
Russian Federation	27	New Zealand	11 ▼▼
Hungary	27	Georgia	11 ▼
Iran, Islamic Republic of	26 ▼	South Africa	11 ▼▼
Chinese Taipei	26	Belgium (French)	10 ▼▼
France	23	Austria	9 ▼▼
Austria	22	Norway ²	9 ▼▼
Belgium (French)	20	Chinese Taipei	8 ▼
South Africa	19	Macedonia	7 ▼
Luxembourg	19	Netherlands ³	7 ▼▼
Qatar	19	Latvia	7 ▼
Latvia	17	Singapore	6 ▼
Trinidad and Tobago	15	Russian Federation	5 ▼▼
Singapore	13	Germany	5 ▼
Macedonia	13 ▼	Moldova	5! ▼
Slovak Republic	12 ▼	Trinidad and Tobago	5! ▼▼
Georgia	11 ▼	Luxembourg	5 ▼▼
Indonesia	10 ▼	Hong Kong SAR ⁴	4! ▼
Bulgaria	9	Lithuania	4 ▼▼
Romania	9	Bulgaria	2! ▼▼
Moldova	7 ▼	Hungary	1! ▼
Hong Kong SAR ⁴	7 ▼	Romania	1! ▼
Italy	4! ▼	Italy	1! ▼
Morocco	3! ▼	Morocco	1 ▼

■ 91–100 percent
■ 76–90 percent
■ 51–75 percent
■ 26–50 percent
■ 11–25 percent
■ 0–10 percent

▲▲ Single highest percentage reported within given jurisdiction across eight strategies.
▲ Among highest percentages reported within given jurisdiction across eight strategies.
▼▼ Single lowest percentage reported within given jurisdiction across eight strategies.
▼ Among lowest percentages reported within given jurisdiction across eight strategies.
 ! Interpret data with caution. Standard error is larger than one-third of the estimate.
¹ The international average is the average percentage across jurisdictions except for the Canadian provinces.
² Did not meet guidelines for sample participation rates after substitute schools were included.
³ Met guidelines for sample participation rates only after substitute schools were included.
⁴ Hong Kong SAR is a Special Administrative Region (SAR) of the People's Republic of China.
 NOTE: Data presented in this table include the 45 jurisdictions that participated in the Progress in International Reading Literacy Study (PIRLS). Jurisdictions are ordered by percentage cited for each strategy. Standard errors can be found in appendix A.
 SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2006.

and Tobago. One jurisdiction, Iceland, reported this strategy as among its least commonly cited.

Have student work in the regular classroom with a teacher-aide

The percentage of fourth-graders whose teachers cited having the student work in the regular classroom with a teacher-aide ranged from 1 percent in Romania to 72 percent in England. Five jurisdictions (England, Scotland, Israel, Norway, and the Canadian province of Alberta) reported a percentage between 51 and 75 percent. Forty jurisdictions reported percentages between 0 and 50 percent. Of these, 12 jurisdictions reported percentages between 26 and 50 percent, including the United States (31 percent); 17 jurisdictions reported percentages between 11 and 25 percent; and 11 jurisdictions reported percentages between 0 and 10 percent.

None of the 45 jurisdictions reported having the student work in the regular classroom with a teacher-aide as among its most commonly cited strategies. This strategy was among the least commonly cited in 18 jurisdictions; of these, it was the single least commonly cited in Belgium (Flemish), Poland, and Spain.

Have student work in a remedial classroom with a reading specialist

The percentage of fourth-graders whose teachers cited having the student work in a remedial classroom with a reading specialist ranged from 3 percent in Morocco to 83 percent in Iceland. Thirteen jurisdictions reported percentages between 51 and 90 percent. Of these, Denmark and Iceland reported percentages between 76 and 90 percent, and 11 jurisdictions reported percentages between 51 and 75 percent. Thirty-two jurisdictions reported percentages between 0 and 50 percent. Of these, 13 reported percentages between 26 and 50 percent, including the United States (50 percent); 12 reported percentages between 11 and 25 percent; and 7 jurisdictions (Bulgaria, Hong Kong SAR, Indonesia, Italy, Moldova, Morocco, and Romania) reported percentages between 0 and 10 percent.

None of the 45 jurisdictions reported having the student work with a reading specialist in a

remedial classroom as among its most commonly cited strategies. This strategy was among the least commonly cited in 11 jurisdictions.

Have student work in the regular classroom with a reading specialist

The percentage of fourth-graders whose teachers cited having the student work in the regular classroom with a reading specialist ranged from 1 percent in Italy, Hungary, Morocco, and Romania to 46 percent in the Canadian province of Quebec. Six jurisdictions (Belgium (Flemish), England, Kuwait, Spain, and the Canadian provinces of British Columbia and Quebec) reported percentages between 26 and 50 percent; 19 jurisdictions reported percentages between 11 and 25 percent, including the United States (15 percent); and 20 jurisdictions reported percentages between 0 and 10 percent.

None of the 45 jurisdictions reported having the student work with a reading specialist in the regular classroom as among its most common strategies. This strategy was among the least commonly cited in 40 jurisdictions. Fifteen of these jurisdictions (including the United States) reported this strategy as their single least common.

Comparing the results for working with a reading specialist in a remedial classroom versus in the regular classroom, the former was among the least commonly cited strategies in 11 jurisdictions, while the latter was among the least commonly cited in 40 jurisdictions.

Summary

The PIRLS 2006 questionnaire asked teachers whether they use specific strategies when a fourth-grader begins to fall behind in reading. Asking the parents to help the student with reading was among the most commonly cited strategies in 44 of the 45 jurisdictions presented (the exception being Hong Kong SAR); 39 jurisdictions reported percentages between 91 and 100 percent for this strategy, including the United States. Spending more time working with the student individually was among the most commonly cited strategies in 20 jurisdictions; 18 jurisdictions reported percentages between 91 and 100 percent for this

strategy. None of the 45 jurisdictions reported these two strategies as among its least common.

None of the 45 jurisdictions presented reported working with a reading specialist (in either a regular or remedial classroom) or a teacher-aide as among its most commonly cited strategies. Iceland and Denmark reported percentages between 76 and 90 percent for having the student work in a remedial classroom with a reading specialist. No other jurisdictions reported percentages between 76 and 100 percent for these three strategies. Comparing the results for working with a reading specialist in a remedial classroom versus in the regular classroom, using a reading specialist in a remedial classroom was among the least commonly cited strategies in 11 jurisdictions, while using a reading specialist in the regular classroom was among the least commonly cited in 40 jurisdictions.

Technical Notes

For complete information on the Progress in International Reading Literacy Study (PIRLS) methodology, please see *PIRLS 2006 Technical Report* (Martin, Mullis, and Kennedy 2007).

Overview of PIRLS 2006

PIRLS is an assessment of the reading comprehension of students in their 4th year of formal schooling in jurisdictions around the world. PIRLS is conducted by the International Association for the Evaluation of Educational Achievement (IEA), with national sponsors in each participating jurisdiction. In the United States, PIRLS is sponsored by the National Center for Education Statistics (NCES), in the Institute of Education Sciences in the U.S. Department of Education.

PIRLS began in 2001 and takes place every 5 years. The data for this analysis are from the most recent administration in 2006. In this report, participating countries and subnational entities are both referred to as “jurisdictions.” In 2006, forty-five jurisdictions, including the United States, participated in PIRLS. In addition to 38 participating countries, this total includes 5 participating Canadian provinces and 2 separate samples of students from Belgium (Flemish and French).

The PIRLS 2006 instruments were prepared in English and translated into 45 languages. Although most jurisdictions administered the assessment in one language, 16 jurisdictions administered the test in more than one language. The United States administered the test in just one language: English.

Sampling, Response Rates, and Data Collection

The PIRLS 2006 international project team set sampling and response rate benchmarks to ensure international comparability and to ensure precise estimates of the main criterion variables for all jurisdictions. To further ensure the comparability of data across jurisdictions, standardized procedures were established for instrument translation, test administration, quality assurance, scoring, and data entry and cleaning.

The target population for PIRLS was defined by the IEA using the International Standard Classification of Education (ISCED), developed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO 1999). In PIRLS 2006, countries were required to sample students in the grade that corresponded to the end of 4 years of formal schooling, providing that the mean age at the time of testing was at least 9.5 years. As defined by PIRLS, the 1st year of formal schooling begins with the 1st year of primary school (ISCED97 level 1), which should mark the beginning of formal instruction in reading, writing, and mathematics. For most jurisdictions, the target grade was fourth grade, or its national equivalent. One goal of PIRLS was to provide 95 percent coverage of the target population within each jurisdiction. Jurisdictions that excluded more than 5 percent of students for any reason are noted in the PIRLS 2006 international report (Mullis et al. 2007) as having less than full coverage of the target population.

Standardized sampling procedures were developed by the IEA and disseminated in a school sampling manual. Statistics Canada was responsible for approving the designs and verifying the samples of all participating jurisdictions. The basic sample design called for a two-stage stratified cluster

design, with schools selected at the first stage and classrooms at the second stage. Schools were sampled using a probability proportionate to size sampling method. Within each jurisdiction, 150 schools were selected. Information on the number of classrooms containing fourth-grade students, and on the size of the classes, was collected from participating schools and entered into the within-school sampling software provided by the IEA. In most jurisdictions, one or two classes per school were randomly selected using this software. All students in sampled classrooms were selected.

IEA also established sample size and response rate targets for all jurisdictions. A country could meet the IEA sampling requirements, after using substitute schools, by either having a response rate of at least 85 percent at both the school and the student level, or by having an overall sample participation rate (the product of the school participation rate and the student participation rate) of at least 75 percent. The 85-percent response rate target for schools included a minimum participation rate among “original sample schools” of 50 percent. When the original sample was drawn, the schools immediately before and immediately after each sampled school in the sampling frame were designated as “substitute” schools and were contacted if the original sample school refused to participate. The response rate target for classrooms was set at 95 percent, along with the target student response rate at 85 percent. In addition, classrooms with student participation below 50 percent were excluded from the final data. Substitution of sampled classrooms was not permitted, and the school would be classified as a nonrespondent if no other classrooms had been sampled.

School contacting began in April 2005, approximately 1 year prior to data collection. The suggested testing window for PIRLS in the southern hemisphere was October through December, 2005, and in the northern hemisphere it was March through June, 2006.

Sampling, Response Rates, and Data Collection in the United States

The PIRLS sample in the United States was designed to be representative of all fourth-grade students in the 50 states and the District of Columbia. The

U.S. sample was designed to yield 180 participating schools. The PIRLS school sample was drawn in March 2005. The sampling frame was constructed using data from the 2002–03 Common Core of Data (CCD) and preliminary data from the 2003–04 Private School Universe Survey (PSS).

Of the 214 original eligible sample schools, 120 participated (57 percent weighted). An additional 63 substitute schools were contacted and agreed to participate, for a total of 183 schools. The weighted response rate, using final adjusted weights, was 86 percent.² The United States met the international guidelines for the school response rate, but only after using substitute schools.

Of the 256 classrooms sampled, 255 participated, or 99 percent. Within these classrooms, 5,442 students were eligible, and 5,190 completed the assessment, for a weighted student response rate of 95 percent. The United States met the international guidelines for classroom and student response rates.

In addition to having students complete the assessment and a questionnaire, PIRLS asked teachers and school administrators to complete questionnaires. Of the 256 teachers sampled, 249 completed teacher questionnaires, or 97 percent. Among school administrators, 182 of the 183 questionnaires were completed, for a response rate of 99 percent.

The United States was allowed to administer PIRLS earlier (on January 23) than the suggested testing window of March through June, 2006 to accommodate schools that wished to participate before state-mandated testing occurred. Many U.S. schools also asked to participate after completing state tests, so the United States was allowed to continue testing through June 9, 2006, resulting in a 4½-month test window rather than the more typical 1- to 2-month test window. The mean score of students completing the assessment in January through March was 539.5, which was

² All weighted response rates discussed in this report refer to final adjusted weights. Response rates were calculated using the formula developed by the IEA for PIRLS. The standard NCES formula for computing response rates would result in a lower school response rate of approximately 63 percent.

not significantly different from the score (541.1) of the students completing the assessment in April through June.

Exclusions in the PIRLS Sample

Schools that were very small or that were classified as special education, vocational, or alternative schools (private and public) were excluded from the sampling frame. In the United States these excluded schools enrolled 3.2 percent of the expected number of fourth-grade students.

Within classrooms, students were excluded from participation in PIRLS if they met the exclusion criteria established by IEA:

- *Students with intellectual disabilities.* These are students who were considered, in the professional opinion of the school principal or other qualified staff members, to have an intellectual disability or who had been so diagnosed in psychological tests. This category included students who were emotionally or mentally unable to follow the general instructions of the test. It did not include students who merely exhibited poor academic performance or discipline problems.
- *Students with functional disabilities.* These are students who had a permanent physical disability in such a way that they could not perform in the PIRLS testing situation. Students with functional disabilities who could perform were included in the testing.
- *Non-native-language speakers.* These are students who could not read or speak the language of the test and so could not overcome the language barrier of testing. Typically, a student who had received less than 1 year of instruction in the language of the test was excluded, but this definition could be adapted in different countries.

In the United States, 2.8 percent of students were excluded from PIRLS on the basis of these criteria. In keeping with international protocol, no testing accommodations were offered to students.

The overall exclusion rate was 5.9 percent in the United States, which means that the overall U.S. coverage rate was 0.9 percent below the recommended rate of 95 percent. See Mullis et al. (2007) for the exclusion rates of all other jurisdictions that participated in PIRLS 2006.

Nonresponse Bias Analysis

NCES standards require a nonresponse bias analysis if the school-level response falls below 85 percent of the sampled schools as it did for the U.S. PIRLS sample. Thus, an analysis of school nonresponse was initiated and conducted in two parts. The basis for both analyses was the original sample of 214 eligible schools. In the first analysis, the distribution of the 120 responding original sample schools was compared with that of the total sample of eligible original schools. All original schools in the sample that declined to participate in the study were treated as nonparticipants regardless of whether they were substituted by a replacement school. This analysis found that school composition was significantly different across the two groups: the mean percentage of Asian students in schools in the eligible sample was 3.5 percent, while among participating original sample schools it was 2.4 percent; the measure of bias was 1.07.

In the second analysis, the final sample of all participating schools (both original and replacement) was compared to the total eligible sample. In this analysis, the percentage of Asian students in the school was not significantly different between the two groups. However, the number of fourth-grade students enrolled in the school was related to nonresponse. Schools with fewer students enrolled in fourth grade (schools with an average of 67 students in the fourth grade) were less likely to participate than larger schools (schools with an average of 71.2 students in fourth grade); the measure of bias was 4.17. It is unclear whether this bias has any impact on student achievement scores. More detailed information on nonresponse bias analysis, including item nonresponse analysis, can be found in Green, Herget, and Rosen (2009).

Weighting and Variance Estimation

Sampling weights are necessary for computing statistically valid, nationally representative

estimates. Survey weights help adjust for the intentional over- or undersampling of certain sectors of the population, school or student nonresponse, or errors in estimating the size of a school at the time of sampling. Survey weighting for the entire international PIRLS 2006 sample was carried out by Statistics Canada. Because PIRLS used clustered sampling, conventional formulas for estimating sampling variability that assume simple random sampling and hence independence of observations are inappropriate. For this reason, PIRLS used a jackknife repeated replication method (Johnson and Rust 1992) to estimate standard errors that capture the sampling variance.

Data Limitations

As with any study, there are limitations to PIRLS that researchers should take into consideration. Estimates produced using data from PIRLS are subject to two types of error: nonsampling errors and sampling errors. Nonsampling errors can be due to errors made in the collection and processing of data. Sampling errors can occur because the data were collected from a sample rather than a complete census of the population. Readers are cautioned that large apparent differences may not be measurably different due to large standard errors. In addition to sampling errors, researchers should also be aware of missing data issues and how these issues were addressed.

In PIRLS, background data were not imputed for cases with missing data. Item response rates for variables presented in this analysis exceeded the NCES minimum standard of 85 percent (weighted) to report without qualification.

Readers should note additional limitations of the PIRLS teacher background questionnaire data used in this analysis. First, teachers' responses to questionnaire items are self-reported and may not reflect their actual practices. In addition, due to varying cultural contexts, teachers asked the same question in one jurisdiction may interpret it differently than teachers in another jurisdiction. The validity of across-jurisdiction comparisons cannot be determined from the data presented in this brief.

Two additional limitations arise based on analytic decisions specific to this brief. First, student achievement data is not included in this report, as the report is purely descriptive of teacher strategies for helping students who fall behind in reading. Therefore, no conclusions can be drawn from this report regarding the relative merits of any given strategy.

Second, all analyses conducted for this report are bivariate comparisons of the extent to which teachers of fourth-graders reported using various strategies. It does not examine more complex questions, such as teachers' use of certain combinations of strategies. These questions can be explored using PIRLS data; however, they were beyond the scope of this analysis.

Statistical Comparisons

Comparisons made in this report have been tested for statistical significance at the .05 level using the student's t statistic to ensure that the differences are larger than those that might be expected because of sampling variation. For example, in the comparison of percentages within the United States, the following formula was used to compute the t statistic:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where E_1 and E_2 are the estimates being compared (e.g., percentage of U.S. fourth-graders whose teachers indicated that they ask the parents to help versus the percentage of U.S. fourth-graders whose teachers reported working with students individually when attempting to help students falling behind in reading), and se_1 and se_2 are the corresponding standard errors of these percentages.

References

Green, P.J., Herget, D., and Rosen, J. (2009). *User's Guide for the Progress in International Reading Literacy Study (PIRLS): 2006 Data Files and Database with United States Specific Variables* (NCES 2009-050). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

- Johnson, E.G., and Rust, K.F. (1992). Population Inferences and Variance for NAEP Data. *Journal of Educational Statistics*, 17(2): 175–190.
- Kennedy, A.M., Mullis, I.V.S., Martin, M.O., and Trong, K.L. (Eds.). (2007). *PIRLS 2006 Encyclopedia: A Guide to Reading Education in the Forty PIRLS Countries*. Chestnut Hill, MA: TIMSS and PIRLS International Study Center, Lynch School of Education, Boston College.
- Martin, M.O., Mullis, I.V.S., and Kennedy, A.M. (2007). *PIRLS 2006 Technical Report*. Chestnut Hill, MA: TIMSS and PIRLS International Study Center, Lynch School of Education, Boston College.
- Mullis, I.V.S., Martin, M.S., Kennedy, A.M., and Foy, P. (2007). *PIRLS 2006 International Report: IEA's Progress in International Reading Literacy Study in Primary Schools in 40 Countries*. Chestnut Hill, MA: TIMSS and PIRLS International Study Center, Lynch School of Education, Boston College.
- United Nations Educational, Scientific, and Cultural Organization (UNESCO). (1999). *Operational Manual for ISCED-1997*. Paris: UNESCO Institute for Statistics.

Appendix A. Standard Error Table

Table A-1. Standard errors for the percentage of fourth-graders with teachers who cited using various strategies to help students falling behind in reading, by strategy and jurisdiction: 2006

Out-of-school-support strategies					
Ask parents to help student with reading		Assign homework to help student catch up		Wait to see if performance improves with maturation	
Jurisdiction	s.e.	Jurisdiction	s.e.	Jurisdiction	s.e.
International average	0.3	International average	0.5	International average	0.5
Denmark	0.5	Georgia	0.6	Hong Kong SAR ³	2.5
Sweden	0.5	Bulgaria	1.8	Chinese Taipei	2.4
Norway ¹	0.5	Indonesia	1.9	Latvia	1.9
Slovenia	0.5	Macedonia	1.9	Qatar	0.2
Latvia	0.6	Russian Federation	1.7	Iran, Islamic Republic of	3.4
Austria	0.6	Morocco	2.1	Russian Federation	3.2
Moldova	0.9	South Africa	1.4	Morocco	4.2
England	0.8	Romania	2.9	Macedonia	3.7
Russian Federation	0.8	Iran, Islamic Republic of	2.3	Belgium (French)	4.0
Poland	0.7	Qatar	0.1	Singapore	2.9
Spain	0.9	Moldova	3.2	South Africa	3.0
Netherlands ²	1.2	Latvia	3.2	Georgia	4.1
Germany	1.0	Spain	3.2	Lithuania	3.5
Slovak Republic	0.8	Hungary	3.1	Italy	3.8
Georgia	0.9	Trinidad and Tobago	3.4	Austria	3.7
Lithuania	1.0	Sweden	3.5	Canada, Quebec	4.9
Canada, Alberta	1.2	Kuwait	3.3	Indonesia	3.5
Iceland	0.1	Iceland	0.3	Luxembourg	0.2
Hungary	1.0	Lithuania	3.0	Belgium (Flemish) ²	4.0
South Africa	0.8	Chinese Taipei	3.4	France	3.6
Qatar	0.1	Italy	3.6	Moldova	3.7
United States²	1.1	Austria	2.8	Bulgaria	4.1
Iran, Islamic Republic of	1.4	Scotland ²	4.0	Romania	3.8
Bulgaria	1.4	Germany	5.1	Canada, British Columbia	3.8
Canada, Quebec	1.0	Hong Kong SAR ³	4.0	England	4.0
Canada, British Columbia	1.4	Canada, Ontario	4.7	Hungary	4.3
Canada, Nova Scotia	1.7	Netherlands ²	4.4	Denmark	3.6
Scotland ²	1.8	Poland	3.8	United States²	3.4
Indonesia	1.9	Slovenia	3.3	Canada, Alberta	3.6
Trinidad and Tobago	2.0	Canada, Alberta	3.3	Sweden	3.3
Canada, Ontario	2.4	Israel	3.6	Kuwait	3.7
Macedonia	2.0	Canada, Nova Scotia	4.4	Canada, Nova Scotia	3.3
Romania	2.6	Singapore	2.9	Iceland	0.4
Belgium (French)	1.9	Luxembourg	0.2	Spain	3.7
New Zealand	1.2	New Zealand	3.1	Germany	3.5
Italy	1.7	United States²	4.3	Trinidad and Tobago	3.0
Chinese Taipei	2.2	Belgium (Flemish) ²	3.8	Slovak Republic	3.3
Belgium (Flemish) ²	2.1	Canada, British Columbia	4.3	Norway ¹	3.2
Israel	2.7	England	4.0	Canada, Ontario	4.1
Morocco	2.6	Canada, Quebec	4.5	New Zealand	2.5
Luxembourg	0.1	Belgium (French)	3.9	Israel	3.6
France	2.5	Norway ¹	3.4	Netherlands ²	3.1
Hong Kong SAR ³	3.4	Denmark	3.9	Scotland ²	3.7
Kuwait	3.1	Slovak Republic	3.3	Poland	3.2
Singapore	2.5	France	3.1	Slovenia	2.1

See notes at end of table.

Table A-1. Standard errors for the percentage of fourth-graders with teachers who cited using various strategies to help students falling behind in reading, by strategy and jurisdiction: 2006—Continued

School-support strategies					
Spend more time working with student individually		Have other students work with student having difficulty		Have student work in the regular classroom with a teacher-aide	
Jurisdiction	s.e.	Jurisdiction	s.e.	Jurisdiction	s.e.
International average	0.4	International average	0.5	International average	0.5
Poland	0.6	Iran, Islamic Republic of	1.1	England	4.3
Hungary	0.9	Chinese Taipei	2.3	Scotland ²	4.3
Bulgaria	1.4	Trinidad and Tobago	2.6	Israel	4.4
Lithuania	1.0	South Africa	2.0	Norway ¹	4.4
Macedonia	1.6	Singapore	2.2	Canada, Alberta	3.5
Slovenia	1.1	Indonesia	3.1	New Zealand	3.2
Norway ¹	1.2	Italy	3.1	Iceland	0.4
Romania	1.9	Qatar	0.2	Canada, British Columbia	4.1
Georgia	1.5	New Zealand	2.1	Iran, Islamic Republic of	3.3
Slovak Republic	1.4	Netherlands ²	3.3	Canada, Nova Scotia	3.5
Canada, Nova Scotia	1.5	United States²	3.3	Canada, Ontario	3.9
Canada, Ontario	1.9	Moldova	3.3	Sweden	4.1
Netherlands ²	1.9	Morocco	3.7	Kuwait	4.4
New Zealand	1.4	Canada, Alberta	3.1	South Africa	2.9
Moldova	2.4	Belgium (Flemish) ²	3.7	United States²	4.2
Italy	2.2	Canada, Ontario	4.4	Denmark	3.5
Scotland ²	1.9	Israel	3.9	Russian Federation	3.4
Israel	2.4	Canada, Quebec	3.8	Indonesia	3.6
Canada, Alberta	2.4	Canada, Nova Scotia	3.4	Qatar	0.2
Sweden	2.5	Georgia	3.5	Canada, Quebec	3.8
Iran, Islamic Republic of	2.5	Hong Kong SAR ³	4.6	Belgium (French)	2.8
South Africa	1.6	Germany	3.9	Italy	3.2
Trinidad and Tobago	2.4	Russian Federation	3.0	Georgia	3.3
Russian Federation	2.4	Canada, British Columbia	3.9	Austria	2.4
Canada, British Columbia	2.7	Romania	3.7	Belgium (Flemish) ²	3.4
United States²	2.5	Kuwait	3.8	Luxembourg	0.1
Spain	2.8	Austria	3.3	Spain	2.7
Belgium (Flemish) ²	2.9	France	3.5	Slovenia	2.0
Austria	2.4	Macedonia	4.3	Hong Kong SAR ³	2.8
Kuwait	2.8	Latvia	3.2	Netherlands ²	2.4
Morocco	3.3	Hungary	4.1	Trinidad and Tobago	2.7
Chinese Taipei	2.9	Bulgaria	4.6	Macedonia	3.0
Indonesia	2.8	Lithuania	3.6	Chinese Taipei	2.6
Denmark	2.6	Slovenia	3.1	France	2.2
Latvia	3.0	Slovak Republic	3.9	Slovak Republic	2.0
France	2.9	England	4.6	Lithuania	2.0
Hong Kong SAR ³	3.1	Belgium (French)	3.5	Moldova	2.4
Qatar	0.2	Poland	4.3	Germany	1.8
Germany	3.3	Luxembourg	0.2	Singapore	1.6
Iceland	0.3	Scotland ²	4.7	Latvia	1.3
Singapore	2.3	Spain	3.9	Bulgaria	1.2
England	3.4	Denmark	4.2	Poland	1.2
Belgium (French)	3.3	Sweden	3.4	Morocco	1.4
Luxembourg	0.2	Norway ¹	4.0	Hungary	1.0
Canada, Quebec	4.0	Iceland	0.3	Romania	0.4

See notes at end of table.

Table A-1. Standard errors for the percentage of fourth-graders with teachers who cited using various strategies to help students falling behind in reading, by strategy and jurisdiction: 2006—Continued

School-support strategies			
Have student work in a remedial classroom with a reading specialist		Have student work in the regular classroom with a reading specialist	
Jurisdiction	s.e.	Jurisdiction	s.e.
International average	0.5	International average	0.4
Iceland	0.2	Canada, Quebec	4.6
Denmark	3.2	Kuwait	4.3
Netherlands ²	3.7	Spain	4.0
Sweden	3.0	Belgium (Flemish) ²	3.3
Spain	3.9	England	4.2
Poland	3.8	Canada, British Columbia	4.0
Belgium (Flemish) ²	3.7	Israel	3.9
Canada, Nova Scotia	3.6	Denmark	3.5
Canada, British Columbia	4.3	Iran, Islamic Republic of	3.2
Israel	4.4	Canada, Nova Scotia	3.5
Slovenia	3.3	Scotland ²	3.6
Norway ¹	3.9	Iceland	0.3
Scotland ²	4.2	Sweden	3.2
United States²	4.0	Canada, Alberta	2.9
England	4.1	Slovenia	2.3
New Zealand	2.5	United States²	2.8
Canada, Alberta	3.8	Canada, Ontario	3.0
Canada, Ontario	4.5	France	2.5
Canada, Quebec	4.3	Slovak Republic	2.6
Kuwait	4.1	Indonesia	3.0
Germany	3.1	Poland	2.4
Lithuania	3.0	Qatar	0.1
Russian Federation	3.6	New Zealand	1.7
Hungary	3.5	Georgia	2.4
Iran, Islamic Republic of	3.4	South Africa	2.1
Chinese Taipei	3.6	Belgium (French)	2.0
France	3.0	Austria	1.8
Austria	3.1	Norway ¹	2.1
Belgium (French)	2.8	Chinese Taipei	2.1
South Africa	2.3	Macedonia	2.5
Luxembourg	0.1	Netherlands ²	1.9
Qatar	0.2	Latvia	1.7
Latvia	2.9	Singapore	1.5
Trinidad and Tobago	3.1	Russian Federation	1.6
Singapore	2.2	Germany	1.5
Macedonia	3.1	Moldova	1.9
Slovak Republic	2.1	Trinidad and Tobago	2.0
Georgia	2.8	Luxembourg	0.1
Indonesia	2.9	Hong Kong SAR ³	1.7
Bulgaria	2.1	Lithuania	1.2
Romania	2.0	Bulgaria	0.7
Moldova	2.2	Hungary	0.8
Hong Kong SAR ³	2.0	Romania	0.7
Italy	1.6	Italy	0.8
Morocco	1.3	Morocco	#

Rounds to zero.

¹ Did not meet guidelines for sample participation rates after substitute schools were included.

² Met guidelines for sample participation rates only after substitute schools were included.

³ Hong Kong SAR is a Special Administrative Region (SAR) of the People's Republic of China.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2006.

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