

The Reading Attainment of Hong Kong Primary Four Students: A Study of Literacy Achievements and Its Implications

Shek-Kam TSE, Sau-Yan HUI, Hung-Wai NG

*Centre for Advancement of Chinese Language Education and Research
The University of Hong Kong*

Wai-Ip LAM

*Division of Chinese Language and Literature, Faculty of Education
The University of Hong Kong*

The Progress in International Reading Literacy Study (PIRLS) is a five-yearly international study of reading attainment of Primary 4 students in different countries and regions, and investigates how it is related to their reading experiences at home and in schools. The study deploys both reading assessment tasks and questionnaires to provide a holistic picture of students' reading literacy development. Hong Kong, a region that has initiated "Reading to Learn" as one of the four key tasks in nurturing students' capability of "Learning to Learn" in the curriculum, has participated in several cycles of PIRLS study since 2001. Results to date have offered multifold implications to teachers, schools and parents to optimize pedagogy and literacy environment, and to policymakers for monitoring and evaluating the on-going curriculum reform.

Keywords: PIRLS; reading attainment; large-scale international assessment; policy implication; reading pedagogy

It is generally acknowledged that reading comprehension is one of the most essential abilities that students should develop during their schooling (Mullis & Martin, 2015a). Reading is fundamental for their learning of different subjects across the curriculum, as well as for their personal and social development (National Reading Panel, 2000; Organisation

for Economic Co-operation and Development [OECD], 2010b; Stanovich, 1986). Given its importance, the Progress in International Reading Literacy Study (PIRLS) has looked closely at the reading attainment of primary schools in a number of countries and regions around the world and explored how it is influenced by their reading experiences at home and the literacy provision in their school (Mullis & Martin, 2015a). The PIRLS cross-national study assesses students in their fourth year of schooling as this has been found to be a modal point in children's reading development, from *learning how to read* to *reading to learn from their reading*, the stage where students are generally asked independently to seek knowledge and insights through their reading (Mullis & Martin, 2015a).

Hong Kong education authorities have for many years highlighted "Reading to Learn" as one of the four key processes in students' "Learning to Learn" (Curriculum Development Council, 2001). With the great significance placed on reading ability in the primary school curriculum, Hong Kong schools were happy to participate in the PIRLS five-yearly surveys, joining in the PIRLS 2001 cycle and continuing to have their students tested in the PIRLS 2006 and 2011 surveys. Hong Kong schools will willingly take part in the forthcoming PIRLS 2016 survey.

The Progress in International Reading Literacy Study

PIRLS was first introduced in 2001 by the International Association for the Evaluation of Educational Achievement (IEA), an independent international cooperative of national research institutions and government agencies that has been conducting research on international, scholastic achievement for over five decades (Mullis & Martin, 2015a). The purposes of the PIRLS surveys of literacy attainment are manifold and include the distribution of questionnaires:

- to measure the comparative reading literacy of Grade 4 (Primary 4) students in participating countries;
- to study the impact on reading of a range of school, home, social and environmental factors;
- to study cross-national achievements and monitor students' reading attainment over time;
- to suggest possible improvements in teaching and learning in the different participating education systems.

The PIRLS evidence offers an unprecedented opportunity for participating countries to measure the effects of schools' provision for developing students' literacy progress. In the four cycles¹ of study to-date, nearly 50 countries and regions have participated. Evidence is assembled from two chief sources: from specially constructed and developed attainment tests completed by the students, and via questionnaires completed by the students, their parents, class teachers and school principal/headteacher. The reading tests are professionally developed and standardized within and across each country under the exacting scrutiny of the IEA, and are presented in booklet form (Mullis & Martin, 2015a). The literacy measures are constructed for each body of students according to a PIRLS framework for assessing reading literacy. The framework assumes that students generally read for literary experience or to gather and use information (Mullis, Martin, & Sainsbury, 2015). Hence, two broad types of reading passage feature in the booklets: (a) transactional and information giving; (b) literary, descriptive and narrative.

The comprehension processes/skills focused upon fall into four main categories:

1. focusing on and retrieving explicitly sought information;
2. making straightforward, simple inferences;
3. interpreting and integrating ideas and information;
4. examining and evaluating content, language and textual elements.

All of the texts require the reader to acquire, process, interpret and evaluate the content, the conceptual framework in the measures assuming that the reading attainment and attitudes of students are influenced by schools, teachers, parents, the students themselves as well as the educational system and cultural factors in each participating country or region.

To better understand the background and implications of the students' reading attainment in the different participating educational systems, relevant contextual data are needed alongside the test scores. As a result, PIRLS experts, local and international, have developed questionnaires to collect factual evidence and the opinions of all the personnel questioned. Taking the situation in Hong Kong as a model, four types of questionnaires were constructed and administered to the students, their parents or guardians, Chinese Language teachers, and school principals or administrators (Hooper, Mullis, & Martin, 2015). Student questionnaires were designed and administered to students in the sampled class in every sampled school. They include questions seeking demographic information, details of the students' home environment, their reading attitudes and behavior and instructional activities encountered. A home questionnaire was completed by the parents or guardians of the students. The primary purpose of this questionnaire was to gather information about

the students' support at home for literacy and their early childhood literacy experiences. A teacher questionnaire was given to the current Chinese Language teacher of each sampled class. It gathered basic demographic and background information, information about the classroom, instructional strategies used and activities employed, teacher resources and degree of parental involvement. A school questionnaire was completed by the school principal or administrator of every sampled school. It included items gathering information about the school concerned, the school and social community, the school environment and resources, instructional approaches used, and parental involvement provision.

The Reading Attainment of Hong Kong Students in PIRLS 2011 and Trends in Attainment Levels Since PIRLS 2001

In the PIRLS data analyses applied, the raw reading attainment scores of every student in each participating country were converted statistically to form a standardized scale for the entire PIRLS sample. The scales for each test have a mean score of 500 and a standard deviation of 100 marks. This scale was initially utilized in PIRLS 2001 and items relevant to each participating country or region were later included in order to: (a) facilitate examination of assessment profiles between the PIRLS cycles, and (b) reflect interim changes in provision in each locality. Care was taken to ensure that statistical parameters remained constant from assessment to assessment across the years and between participating countries. This enables analysts to make meaningful comparisons between the performances of students within and between participating countries, and between the attainment levels of students in each country in the various years/occasions of testing.

Table 1 presents in ranked order the average scores attained by the students of the participating countries or sub-national regions in PIRLS 2011. The students of Hong Kong attained the highest average score (571) among all participants.

In the 2006 PIRLS assessment, Hong Kong ranked second among the countries or regions, with an average score of 564, just 1 score point below that of the first country in the list, Russia. As was also the case in the current cycle, there was no statistically significant difference between the scores of students from Hong Kong and those of the three other participating countries in the top tier in 2006.

In the 2011 PIRLS cycle, the Hong Kong body of students scored significantly higher than that of the respective Hong Kong cohorts in 2006 and 2001. Table 2 presents a comparison between cycles of the performance of Hong Kong students.

Table 1: Reading Attainment of Selected Participating Countries/regions in PIRLS 2011 in Ranked Order

Ranking	Country/region	Average scale score
1	Hong Kong	571
2	Russian Federation	568
3	Singapore	567
5	United States	556
7	Chinese Taipei	553
8	England	552
12	Sweden	542
	PIRLS scale centerpoint	500

Table 2: Trends in Reading Attainment of Hong Kong Students in PIRLS

Year	Average scale score	Difference between years	
		2006	2001
2011	571 (2.3)	7 (3.3) [▲]	43 (2.6) [▲]
2006	564 (2.4)		36 (2.6) [▲]
2001	528 (1.3)		

▲ The score for the year specified in the row is significantly higher than the score for the year specified in the column (at $p < .05$ level of significance).

Note: Figures in parentheses represent the standard error of measurement.

The overall reading attainment trend is of continued improvement across the PIRLS cycles over the ten-year period. Even though the average 2011 assessment was greater than that in PIRLS 2006 by only 7 points, the increase was statistically significant ($p < .05$).

Attainment by Benchmark

In addition to the standardized score comparisons, the PIRLS surveys also report reading attainment at four points along a scale of international benchmarks (see Table 3). These benchmarks are used to separate students into groups having differing proficiency levels in reading, the general skills demonstrated by students at each benchmark being

Table 3: PIRLS International Benchmarks of Reading Attainment

Scale score	International benchmarks
At or above 625	Advanced
From 550 to below 625	High
From 475 to below 550	Intermediate
From 400 to below 475	Low

described in detail in the assessment framework (Mullis, Martin, Foy, & Drucker, 2012). Generally speaking, students at the “Advanced” benchmark are able to take the entire text into account to provide text-based support for their interpretations and explanations. Students at the “High” benchmark are able to identify significant actions and information, to make inferences and interpretations using text-based support, to evaluate content and textual elements, and to recognize salient language features. At the “Intermediate” benchmark level, students can retrieve information, make straightforward inferences, use some presentational features, and begin to recognize various language features. Students at the “Low” benchmark demonstrate some ability to utilize some of the information in a text but usually only if it is explicitly stated or is fairly easy to locate.

Table 4 shows the percentages of Hong Kong students at the different international benchmarks in PIRLS 2011 and in previous cycles. The results indicate that the percentages of students reaching each benchmark have been getting higher at all benchmark positions over the years. This pattern of change suggests that improvement in reading attainment has occurred within all ability groups and across the whole cohort. In particular, the percentages of students reaching the higher end of attainment in the 2011 assessment have significantly increased since PIRLS 2006, leaving fewer students at the lower end. In other words, the proportion of high achievers has risen across the cohort over the years. However, even with such significant progress, the proportion of Hong Kong students at the Advanced international benchmark is still less than that in several countries ranked lower than Hong Kong on the overall score (see Table 5). Although England ranks 8th overall, the proportion of her students at the Advanced benchmark is the same as that of Hong Kong. Singapore ranks 3rd, but the proportion of advanced readers heads that for Hong Kong by a margin of 6%.

Attainment in Terms of Reading Purpose and Process

The *PIRLS 2011 Assessment Framework* (Mullis, Martin, Kennedy, Trong, & Sainsbury, 2009) classifies texts into two overarching purposes or reasons for reading. As mentioned earlier, one refers to reading for literary experience and is concerned with texts such as fables, stories and narrative passages. The second is concerned with acquiring and using information in transactional, information-giving passages, for example the comprehension of timetable information, recipes, and scientific, technical and procedural accounts. In all three cycles of PIRLS, test material relating to the two broad purposes is given equal weighting. In other words, the scores allocated to each of the two types of

Table 4: Trends in Percentage of Students Reaching Each International Benchmark

	2001	2006	2011
Advanced (625)	5 (0.6) [▲]	15 (1.0) [▲]	18 (1.2)
High (550)	39 (1.9) [▲]	62 (1.6) [▲]	67 (1.5)
Intermediate (475)	81 (1.5) [▲]	92 (0.8)	93 (0.8)
Low (400)	97 (0.6) [▲]	99 (0.2)	99 (0.2)

[▲] The 2011 percentage is significantly higher than that of the year specified in the column (at $p < .05$ level of significance).

Note: Figures in parentheses represent the standard error of measurement.

Table 5: Performance at the International Benchmarks of Reading Attainment of Selected Countries/regions (%)

Country/region	Advanced (625)	High (550)	Intermediate (475)	Low (400)	Below 400
Singapore	24	62	87	97	3
Russian Federation	19	63	92	99	1
England	18	54	83	95	5
Hong Kong	18	67	93	99	1
United States	17	56	86	98	2
Chinese Taipei	13	55	87	98	2
International average	8	44	80	95	5

passages (narrative and informational) comprise 50% of the overall score. Another dimension of the *Assessment Framework* refers to the comprehension processes involved in the reading of text. The *Assessment Framework* separates reading comprehension into the four processes outlined in the previous section.

Two reading attainment scales have been constructed to categorize student performance with regard to reading comprehension. The “Retrieving and Straightforward Inferencing” scale (or the retrieval-inferencing scale) is a combined measure of processes 1 and 2, while the “Interpreting, Integrating, and Evaluating” scale (or the integrating scale) is a combined measure of processes 3 and 4. Again, each of the two scales comprises 50% devoted to measuring foundational reading comprehension processes.

Table 6 summarizes Hong Kong students’ overall reading attainment scores together with the corresponding subscale scores across the three cycles. It can be seen that the pattern is fairly stable across the years. In terms of the reading purpose, Hong Kong students have consistently done better at processing informational text across PIRLS cycles. However, internationally the pattern is fairly balanced between performance levels relating to the two purposes of reading. In other words, students in some countries perform better at

Table 6: Trends in Reading Attainment of Hong Kong Students by Reading Purpose and Process

	Average scale score				
	Overall	Reading purpose		Comprehension process	
		Literary	Information	Retrieving and straightforward inferencing	Interpreting, integrating, and evaluating
2011	571 (2.3)	565 (2.5) [▽]	578 (2.2) [▲]	562 (2.0) [▽]	578 (2.4) [▲]
2006	564 (2.4)	557 (2.6) [▽]	568 (2.3)	558 (2.5)	566 (2.4)
2001	528 (1.3)	518 (3.1) [▽]	537 (2.9) [▲]	522 (3.2)	533 (4.0)

▲ Subscale score significantly higher than the overall score of the same year;

▽ Subscale score significantly lower than the overall score of the same year.

Note: Figures in parentheses represent the standard error of measurement.

understanding informational text while others are better with literary text. The pattern of performance relating to the comprehension dimension is similar to that of the purpose dimension, with Hong Kong students consistently obtaining an integrating scale-score level somewhat higher than the overall scale score in each of the PIRLS surveys. In contrast, the general international pattern exhibits a degree of balance, with some countries performing better on one subscale and others on the other.

Gender Differences in Attainment

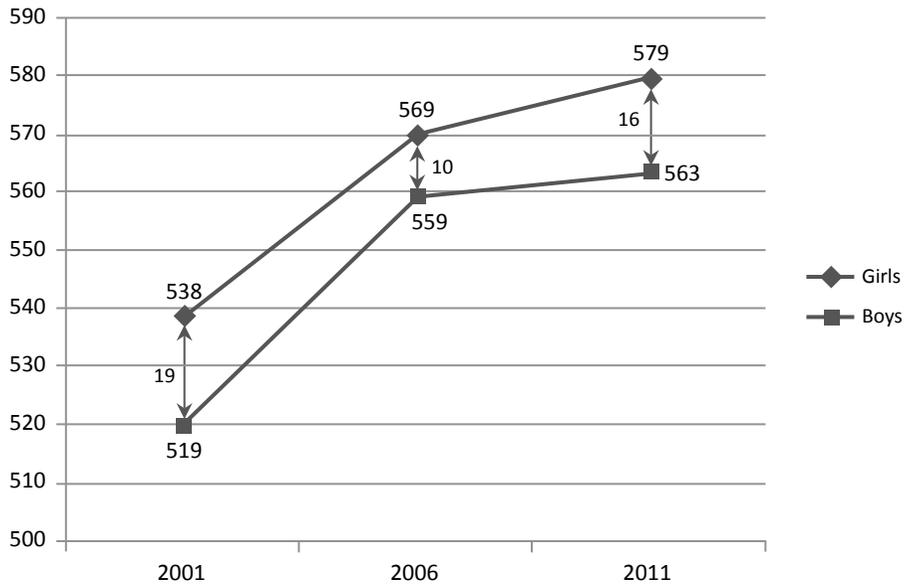
It has long been a worldwide finding that girls tend generally to have an advantage over boys in terms of reading performance.² Table 7 shows that this advantage of girls over boys, to varying extents, is evident in all 45 participating countries and regions. For Hong Kong,

Table 7: Average Reading Attainment by Gender

Country/region	Girls	Boys	Girls – Boys
United States	562 (1.9)	551 (1.7)	10 (1.8)*
Chinese Taipei	561 (2.1)	546 (2.1)	15 (2.1)*
Hong Kong	579 (2.3)	563 (2.5)	16 (2.2)*
Singapore	576 (3.5)	559 (3.6)	17 (2.6)*
Russian Federation	578 (2.8)	559 (3.1)	18 (2.3)*
England	563 (3.0)	540 (3.1)	23 (3.0)*
International average	520 (0.5)	504 (0.5)	16 (0.5)*

* Girls' score is significantly higher than the corresponding score of boys.

Notes: (a) Figures in parentheses represent the standard error of measurement; (b) minor discrepancies occur due to rounding error.

Figure 1: Trends in Reading Attainment by Gender of Hong Kong Students

the gender difference (girls outperforming boys) is the same as that for the international average (16 points), as is also the case in Singapore and Chinese Taipei. In Hong Kong's case, the superiority is statistically significant and has persisted over the three PIRLS cycles (see Figure 1). Moreover, the gender gap has widened since 2006.

The percentages of girls at the Advanced and High benchmarks are significantly greater than the corresponding percentages of boys, whereas at the Low and Intermediate benchmarks, the gender differences are reversed (see Table 8). Comparing the benchmark distributions of the 2011 and 2006 results, it is apparent that the increased gender difference in the 2011 assessment is due to some boys falling from the High and Intermediate benchmarks to the Low benchmark and below. Moreover, the girls' advantage over boys applies also to subscales relating to reading purpose and process (see Table 9).

The Reading Pedagogy and Teaching Practices in Hong Kong

Teacher Training of Reading Strategies

Regarding the choice of instructional objectives and favored methods, the Hong Kong teachers surveyed in PIRLS 2011 said that they placed considerable emphasis on frequently and regularly teaching reading comprehension strategies. Specifically, all of the teachers

Table 8: Students at International Benchmarks by Gender of PIRLS 2011 and PIRLS 2006

International benchmark	No. of students		Percentage of students		
	Girls	Boys	Girls	Boys	Girls – Boys
2011					
Advanced (625)	371	312	20.7 (1.6)	15.3 (1.4)	5.4*
High (550)	919	962	51.4 (1.8)	47.0 (1.6)	4.4*
Intermediate (475)	413	591	23.1 (1.5)	28.9 (1.6)	-5.8*
Low (400)	76	158	4.3 (0.7)	7.7 (0.8)	-3.5*
Below 400	9	22	0.5 (0.2)	1.1 (0.4)	-0.6
2006					
Advanced (625)	371	338	16.5 (1.3)	14.3 (1.3)	2.3
High (550)	1,176	1,160	52.5 (1.6)	48.9 (2.3)	3.5
Intermediate (475)	605	715	27.0 (1.5)	30.2 (1.8)	-3.2
Low (400)	85	146	3.8 (0.6)	6.2 (0.9)	-2.4
Below 400	5	12	0.2 (0.1)	0.5 (0.3)	-0.3

Notes: (a) Figures in parentheses represent the standard error of measurement; (b) an asterisk represents significant difference; (c) minor discrepancies occur due to rounding error.

Table 9: Reading Attainment for Purposes and Processes by Gender

	Reading purpose				Comprehension process			
	Literary		Informational		Retrieving and straightforward inferencing		Interpreting, integrating, and evaluating	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
2011	577 (2.8)*	555 (2.7)	582 (2.5)*	574 (2.3)	569 (2.4)*	556 (2.5)	588 (2.6)*	570 (2.7)
2006	564 (2.6)*	551 (3.3)	572 (2.2)*	564 (2.8)	562 (2.5)*	554 (3.0)	572 (2.6)*	560 (2.8)
2001	528 (3.4)*	507 (3.4)	546 (2.8)*	529 (3.6)	531 (3.2)*	514 (3.6)	543 (3.2)*	523 (3.8)

* Girls' score is significantly higher than the corresponding score of boys.

Note: Figures in parentheses represent the standard error of measurement.

said they repeatedly required students to locate information from within text; 96% said they occupied students every week in identifying the main ideas in text and in supporting their understanding of what they had read; and over 80% asked students to compare what they had read with their own experiences, make generalizations, draw inferences and identify the writer's perspective or intentions (see Table 10). The present study found that the incidence of Hong Kong teachers' engagement in the teaching of reading strategies was lower than that for teachers in Singapore and Russia, but was greater than that for teachers in Chinese Taipei. Hong Kong primary school teachers were clearly using a wider range of pedagogic approaches in reading lessons.

Table 10: Teachers Develop Students' Reading Comprehension Skills and Strategies of Selected Countries/regions

Country/region	Students whose teachers ask them to do the following at least weekly (%)					
	Locate information within the text	Identify the main ideas	Explain or support their understanding of what they have read	Compare what they have read with experiences they have had	Make generalizations and draw inferences	Determine the author's perspective or intention
Hong Kong	100	96	96	81	84	82
Russian Federation	100	99	99	92	98	96
United States	99	99	99	95	71	74
England	97	97	95	78	93	72
Singapore	95	95	95	89	90	72
Chinese Taipei	89	87	73	65	62	66
International average	96	95	95	81	80	63

To specifically examine the relationship between reading instruction and students' reading attainment in Hong Kong, further analysis has been conducted. The analysis of variance revealed a significant difference of the frequency of doing reading activities on students' reading score at the $p < .001$ level. *Post hoc* comparisons using the Dunnett's T3 test indicated that the mean score for the students who were "asked to read aloud" "every day or almost every day" is significantly different from the other three groups. The *post hoc* test also revealed that the mean score for the group who were taught "new vocabulary systematically" "once or twice a week" significantly differs from the others (see Table 11).

The analysis of variance revealed a significant difference of the frequency of developing reading skills or strategies on students' reading score at the $p < .001$ level. *Post hoc* comparison conducted with the Dunnett's T3 test indicated that students with teachers who would "explain or support their understanding of what they have read" at least "once or twice a week" achieved significantly better than the students who received the instruction "once or twice a month." Another strategy which is preferable for developing students' reading comprehension is "making generalizations and drawing inferences." The group in which teachers asked students to do it at least "every day or almost every day" or "once or twice a week" performed significantly better than the other groups (Table 12).

The Sharing of Good Practices in the Teaching and Learning of Reading

The results reflect an impression that school initiatives promoting reading implemented

Table 11: Analysis of Variance (ANOVA) Between Reading Activities Hong Kong Teachers Do With Students and the Students' Reading Attainment

Reading activities that teachers do with students	Average score				F
	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never	
Read aloud to the class	572	570	552	565	5.219**
Ask students to read aloud	574	566	543	—	26.668***
Ask students to read silently on their own	572	573	546	541	18.256***
Give students time to read books of their own choosing	573	568	565	—	8.020***
Teach students strategies for decoding sounds and words	572	572	550	548	13.986***
Teach students new vocabulary systematically	567	577	538	—	30.415***
Teach or model skimming or scanning strategies	568	570	567	—	14.578***

** $p < .01$; *** $p < .001$

Table 12: Analysis of Variance (ANOVA) Between the Development of Students' Reading Comprehension Strategies and the Students' Reading Attainment

Reading comprehension skills or strategies that teachers ask students to do	Average score				F
	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never	
Locate information within the text	573	564	—	—	18.388***
Identify the main ideas	575	570	529	—	44.739***
Explain or support their understanding of what they have read	572	571	546	—	12.728***
Compare what they have read with experiences they have had	576	571	561	567	8.977***
Make generalizations and draw inferences	576	572	567	553	12.063***
Describe the style or structure of the text they have read	573	574	559	564	13.470***
Determine the author's perspective or intention	577	572	557	543	20.313***

*** $p < .001$

by schools had had a positive impact on students' reading attainment. These initiatives include extra sessions on reading instruction (in addition to regular Chinese Language lessons), the presence of reading clubs in the school, morning or lunch-time reading sessions, the involvement of parents in promoting students' reading, and reading across the whole school curriculum.

The Development of School-based Reading Curricula

The Hong Kong Education Bureau has suggested a literacy curriculum for all primary schools to follow. A weakness here is that the suggested curriculum (a) does not stretch children in all schools in Hong Kong, while (b) is too challenging for the intake in other schools. Schools have the option to adjust curriculum content and provision to suit particular intakes, and a number of schools have adjusted the curriculum to cater for their own staffing strengths on the one hand, and student characteristics on the other. Survey analyses clearly suggest that students did best in schools that had taken steps toward constructing a reading curriculum that appeals to and suits children in their own particular school (see Table 13). Hong Kong education authorities have noted this trend and a number of educational institutions have provided guidance to assist schools to construct their own school-based programs that cater for the needs of all students, and for recommended attainment targets to be achieved by all.

Table 13: Hong Kong Primary Schools With School-based Reading-related Programs

School-based reading programs	School	Average score
Yes	130	566
No	1	542

Reading Across the Curriculum

In the PIRLS 2011 survey, Hong Kong primary teachers were found to use textbooks as the most frequently used reading resource in Chinese reading lessons. Specifically, 96% of the teachers used textbooks as the key resource (4% more than in PIRLS 2006), 69% of the teachers saying that they also used children's reading series as supplementary material. In terms of the reading curriculum adhered to in school, the reading attainment of students was highest (average of 566 marks) where schools were using their own school-based curriculum rather than the model recommended by the Education Bureau.

Students' With Low Interest, Motivation and Confidence in Reading

The figures suggest that Hong Kong students' reading attainment is strongly related to their reading attitudes, determined on the basis of whether they like reading, how motivated they feel about reading, their confidence in their reading ability, and how engaged they feel in reading lessons. In all cases, the trend was for students with stronger attitudes in these areas to obtain higher PIRLS reading scores. However, compared with other countries and regions, students were ranked 39th in terms of liking reading; 45th in their motivation toward reading; 44th in their reading confidence; and 42nd in feeling engaged in reading lessons. These figures reflect the impression gained by schools that Hong Kong students have no great liking for reading for fun or enjoyment. Their high reading attainment score tends to rise due to the contribution of other factors.

Regarding students' interest in reading, the study found that 21% of Hong Kong students said that they liked reading, these students gaining an average reading performance score of 596 for the test. The percentage of students who said that they somewhat liked reading was 62% and their average attainment score was 568. For the remaining 16% of the students (who had said that they did not like reading), their average score was 550, the lowest among the three groups (see Table 14).

Regarding students' motivation toward reading, the average score was 577 for the 52% of the Hong Kong sample who said that they felt motivated to read. For the 34% of students identified as being somewhat motivated, the average score was 570. The average score was 551 for the 15% of students identified as feeling unmotivated about reading (see Table 15).

Regarding students' confidence in their reading, the 20% of students who said they were confident in reading had an average attainment score of 601. The 62% of students who said they were somewhat confident had an average score of 571. The 18% of students saying they were not confident in reading had an average score of 538. This pattern was similar to the ones found for students in Singapore and Chinese Taipei (see Table 16).

PIRLS 2011 collected information about the perception of student engagement in learning, intended to reflect the interaction between the student and the subject matter and content. Analyses of the "Engaged in Reading Lessons Scale," specially developed for the present study, showed a positive relationship between the extent of students' report about being more engaged and higher average reading attainment (Mullis, Martin, Foy, & Drucker, 2012)

Table 14: Students Like Reading of Selected Countries/regions

Country/region		Like reading	Somewhat like reading	Do not like reading
United States	% of students	27	51	22
	Average score	586	551	536
Russian Federation	% of students	26	61	13
	Average score	587	564	554
England	% of students	26	53	20
	Average score	589	545	519
Chinese Taipei	% of students	23	57	20
	Average score	585	550	523
Singapore	% of students	22	63	15
	Average score	610	560	538
Hong Kong	% of students	21	62	16
	Average score	596	568	550
International average	% of students	28	57	15
	Average score	542	506	488

Note: Minor discrepancies occur due to rounding error.

Table 15: Students Motivated to Read of Selected Countries/regions

Country/region		Motivated	Somewhat motivated	Not motivated
Russian Federation	% of students	83	15	2
	Average score	571	565	—
United States	% of students	71	23	6
	Average score	560	557	530
England	% of students	65	28	7
	Average score	551	559	531
Chinese Taipei	% of students	62	27	12
	Average score	566	542	512
Singapore	% of students	60	31	8
	Average score	576	562	533
Hong Kong	% of students	52	34	15
	Average score	577	570	551
International average	% of students	74	21	5
	Average score	518	503	474

Note: Minor discrepancies occur due to rounding error.

Table 16: Students Confident in Reading of Selected Countries/regions

Country/region		Confident	Somewhat confident	Not confident
United States	% of students	40	49	11
	Average score	588	545	503
England	% of students	37	53	10
	Average score	589	539	483
Russian Federation	% of students	28	59	14
	Average score	601	564	526
Singapore	% of students	26	61	13
	Average score	607	565	504
Chinese Taipei	% of students	21	57	22
	Average score	585	554	520
Hong Kong	% of students	20	62	18
	Average score	601	571	538
International average	% of students	36	53	11
	Average score	547	502	456

Note: Minor discrepancies occur due to rounding error.

Regarding Hong Kong fourth graders' engagement in their reading lesson, 24% of students who said they were engaged in reading had an average attainment score of 578. The 58% of students who said they were somewhat engaged had an average score of 571. The 18% of students saying they were not engaged in reading had an average score of 563. Engaged students achieved better than counterparts who said that they were only somewhat engaged; students who said they were not engaged were the lowest achievers. This pattern was similar to those found for students in Chinese Taipei and Singapore (see Table 17).

Tse and Xiao (2014) used multilevel regression analysis to find out how affective factors and school context could predict the likelihood of students being either high-proficiency or low-proficiency readers based on PIRLS data. Results indicated that high self-sufficiency was associated with reading attitude, reading motivation, reading self-concept, peer bullying, school bullying, and school socio-economic status (SES). On the other hand, it is surprisingly that reading attitude and reading motivation were not the predictors of low reading proficiency, but reading self-concept and peer bullying may be the predicting factors of poor reading performance.

Table 17: Students Engaged in Reading Lessons of Selected Countries/regions

Country/region		Engaged	Somewhat engaged	Not engaged
Russian Federation	% of students	53	42	5
	Average score	571	567	560
United States	% of students	43	49	8
	Average score	565	554	539
England	% of students	34	57	9
	Average score	551	554	541
Singapore	% of students	31	57	13
	Average score	575	568	554
Chinese Taipei	% of students	31	54	14
	Average score	561	555	531
Hong Kong	% of students	24	58	18
	Average score	578	571	563
International Average	% of students	42	50	8
	Average score	519	510	494

Note: Minor discrepancies occur due to rounding error.

The Implications of PIRLS Results for the Education Sector in Hong Kong

As pointed out above, Hong Kong has participated in several cycles of PIRLS and the results suggest that students have made substantial progress in reading attainment scores over the years since 2001. In PIRLS 2011, students' reading attainment reached a mean score of 571, making Hong Kong the highest achieving region among the 45 participating countries and regions. The Hong Kong Government has become increasingly more interested in the findings of large-scale international attainment surveys, regarding them as capable of providing data for trend studies and comparing the performance of students in Hong Kong with counterparts in other places of the world. The excellent performance of Hong Kong students in different large-scale international assessments, for example, ranking fourth in reading literacy, third in both mathematical and scientific literacy in the Programme for International Student Assessment (PISA) 2009 (Education Bureau, 2010; Hong Kong Centre for International Student Assessment, 2011; Lau, 2011), and Primary 4 students ranking third and Secondary 2 students ranking fourth respectively in mathematics in the Trends in International Mathematics and Science Study (TIMSS) 2011 (Education Bureau, 2012; Martin, Mullis, Foy, & Stanco, 2012; Mullis, Martin, Foy, & Arora, 2012), provided

supporting evidence that Hong Kong students' academic performance is one of the best among the education systems in the world (Pearson, 2014).

Participating schools and teachers are also in a position to benefit from the outcomes, and several have used the evidence to justify a review of the school's own literacy curriculum, teaching material and resources, and the choice of instructional methods to be used in the school. Undoubtedly, the results of the PIRLS surveys have far-reaching educational implications for both policy making and teachers' choice of pedagogy.

Policy Implications

Evaluating and monitoring educational policy is one of the foremost tasks of the Education Bureau in Hong Kong. As mentioned earlier, teaching students to use their "Reading to Learn" has been recognized as a key task confronting primary school teachers. This objective was stressed as an essential foundation for fostering students' long-term capability of "Learning to Learn" in the 2000 curriculum reform in Hong Kong (Curriculum Development Council, 2001). This has implications for all involved in reaching this objective: schools, parents, the wider society and the students themselves. Hong Kong's participation in the PIRLS surveys and the success schools have obtained have been welcomed by society and widely publicized in the media (Ho, 2013; Metro, 2012; Ming Pao, 2012; Wong, 2013). Success has also drawn attention of all concerned to the purposes of recent changes to educational practices and reforms. In other words, the Education Bureau and the public better understand the long-term importance for students of being able to learn independently and efficiently. This has life-long implications for the students, their post-primary school education, and Hong Kong's economic capability. However, although students' reading achievements have been widely welcomed, success has come at a price. Responses on the PIRLS questionnaires completed by students indicate that the intensive instruction and frequent practice students experience in school and at home has left them disinterested in reading and poorly motivated to regard reading as a pleasurable activity and pastime (Ming Pao, 2012). Hong Kong participants in PISA achieved top performance in reading above the OECD average (OECD, 2010a). On the other hand, Hong Kong displayed weak association between enjoyment of reading and reading performance, and the percentage of students with low levels of enjoyment of reading was higher than OECD average across all levels of reading proficiency (OECD, 2010b). Low achievers in particular have poor concepts of themselves as readers and low reading motivation and interest in reading.

Schools have had to seek to improve the reading habits of students and to liaise with parents to make reading at home purposeful but pleasurable (OECD, 2010c).

It is also evident that data from the international assessments have provided the Government with information about future policies and evaluations of the work they expect to be carried out in schools. A major concern of the education community is teacher training and professional development. The PIRLS data provide a very accurate picture of teaching and learning effectiveness. Although the results from large-scale cross-national assessments provide rich and comprehensive data about students' academic successes, they also draw attention to ensuring that teachers' professional development and training are able to sustain and even improve students' performance. For example, when teaching reading comprehension, teachers now have to focus beyond the common practice of systematically taking students step by step through prescribed textbooks. Teachers are now expected to seize every opportunity to teach higher-order reading skills: the third and fourth processes of reading in the PIRLS assessment framework. Teachers whose students do not reach these objectives are unlikely to be promoted. There is a growing discrepancy between the short- and long-term objectives. Teachers' professional training and development have always been shaped by what is happening in the classroom, with teacher training institutions seeking to equip teachers with the necessary knowledge and skills to foster desirable classroom approaches and strategies. The problem is that children's reading motivation and pleasure in reading are in danger of being neglected.

Following the satisfactory results of the first phase of curriculum reform since 2000, the Education Bureau has sought to promote the second stage of educational reforms, aiming at further improving the quality of education students receive, to have a balanced development of their physical and psychology well-being (Curriculum Development Council, 2014). Satisfactory progress has been made, as several studies, such as PIRLS, TIMSS and PISA, indicated improvement on reading literacy, mathematics and science (Curriculum Development Council, 2014). Schools are expected to equip students with fundamental skills for life-long learning and for surviving in the ever-changing economic complexity of Hong Kong society. Needless to say, among all the desired abilities school leavers need to possess, the ability to understand the written word is vital for their future exploration of new knowledge and technical developments in society. Although society will rejoice about students' reading performance, schools and teacher educators should avoid being complacent about students' performance in PIRLS 2011. Effective pedagogy should be developed that constantly raises their reading ability. The Government should make use of

the results of PIRLS not only to sustain success but to envisage potential obstacles to progress in future educational reforms and to focus public attention on the wider, possibly aesthetic values of school leavers who are literate and able to use their literacy skills as vehicles for learning.

Implications for Pedagogy

In the past cycles of PIRLS, it was apparent that girls constantly outperformed boys in reading. In PIRLS 2011, the results indicate that girls yet again have better performance than boys in nearly all of the participating countries and regions. In fact, since 2001 only marginal improvement has been made on reducing the gender achievement gap (Mullis, Martin, Foy, & Drucker, 2012). The phenomenon has highlighted the pressing need to devise effective strategies to enhance boys' reading attainment. It is recommended that besides novels, teachers should choose types of reading material that better trigger boys' reading interest. In class, more opportunities could be offered to boys for them to share their reflections after reading, and schools might establish reading groups among boys and encourage them to exchange views about the books they have enjoyed reading. It is essential that boys' involvement in reading activities should be boosted, perhaps by using current information technology devices more and more in the classroom (Tse & Loh, 2012). The consistent superiority of girls' reading performance over boys was displayed in PISA 2009, which also showed that boys are more interested in online reading than girls (OECD, 2010b). Teachers and parents are advised to provide more assistance for boys to ensure the development of their reading literacy as well as their interest in and motivation for reading (Tse & Loh, 2012).

The PIRLS research team is also concerned about the nurture of students' reading habits. Talks and workshops for primary school teachers about improving reading habits, reading attitude and motivation were jointly organized with the Education Bureau. Schools are encouraged to build up good reading environment and, if possible, to set up "morning reading" or "lunch reading" sessions on school days (Tse & Loh, 2012).

To foster students' deep understanding of text and complex reading materials, it is important to nurture their higher-order reading skills and ability to regard reading as a channel for learning about matters that interest the reader. Students need to be able to evaluate the content of text and to form opinions about its value and quality. It is essential to move on from the prevailing teaching involving passing on to learners knowledge in a ready-made, pre-digested format. Creative methods should be explored to facilitate students'

independent exploration of the world, and the ability to cope with the questions and issues they themselves have discovered.

Despite the outstanding performance that Hong Kong students displayed in PIRLS 2011, the results reveal that the reading motivation of Hong Kong students and their engagement in reading lessons are comparatively low. Teachers are thus facing the task of maintaining standards while also getting students more engaged in reading. Teachers need to depart from using a single textbook and trying to move all learners along at the same pace. In addition to formal teaching and textbook-focused instruction in class, teachers should make use of different reading activities and resources to encourage and enable students to read and attain objectives that they themselves have set. In this connection, schools need to liaise with parents about the reading possibilities at home so that smart phone-like options are offered to students at home and in reading lessons in school.

Conclusions

The PIRLS initiative reliably and validly measures the reading attainment of Primary 4 students in participating countries and regions, investigates the contextual factors that influence students' reading performance, and monitors developmental trends in students' reading ability. PIRLS evidence not only makes available objective evidence about how well students from different education systems perform on formal reading assessment tasks, but also provides information about the impact of the learning conditions provided to learners for developing their reading literacy. Such data serve as feedback to students and their teachers, schools and parents on how effective present-day mechanisms are for building up students' reading capability. Through participating in several cycles of PIRLS, education authorities in Hong Kong have obtained a holistic picture of the development of students' reading literacy, and have made efforts to maintain and upgrade students' reading performance. Implications from PIRLS for policy and pedagogy in terms of promoting students' reading performance, interest in reading as well as reading motivation are worth further consideration. It is crucial that schools assist students to learn from their reading, whatever the source, in this ever-challenging century.

Notes

1. PIRLS 2016 is the fourth assessment in the current trend series, following PIRLS 2001, 2006, and 2011. Hong Kong has participated in all previous assessment cycles since 2001.

Hong Kong will have the opportunity to assess the progress in reading proficiency across four time points: 2001, 2006, 2011, and 2016 (Mullis & Martin, 2015b).

2. This is evident in the findings of previous PIRLS cycles, as well as in those of another international assessment, Programme for International Student Assessment (PISA), which is a 3-yearly survey of the performance of 15-year-old students beginning in the year 2000.

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香港小四學生閱讀成就：閱讀素養的研究和啟示

謝錫金、許守仁、吳鴻偉、林偉業

摘要

全球學生閱讀能力進展研究（Progress in International Reading Literacy Study, PIRLS）是一項五年一度的國際閱讀素養和能力大型研究。這項研究以全球多個國家或地區的小學四年級學生為對象，調查學生在校內和家庭的閱讀經驗與學生閱讀能力表現的關係。本研究透過閱讀理解測卷和問卷調查收集數據，對學生的閱讀素養發展作出完整描述。香港教育局以「從閱讀中學習」為 2000 年「學會學習」教育改革的四大關鍵項目之一；同時自 2001 年起，香港參加了多屆 PIRLS 閱讀研究。本研究的結果和發現，對學校閱讀課程、閱讀環境和氛圍、語文教師的閱讀教學法，以至教育當局監察和審視教育改革的發展，都具有重要的參考價值和啟示作用。

關鍵詞：全球學生閱讀能力進展研究；閱讀成就；大型國際評鑑；政策啟示；閱讀教學法