

---

Title	Reading discussions and reading comprehension: Sustainability in teacher development and opportunities for student learning
Author(s)	Rita Elaine Silver and Jessie Png

---

Copyright © 2020 Office of Education Research (OER), NIE

## OER FINAL REPORT SERIES

The OER Final Report series includes final reports from funds managed by Office of Education Research, National Institute of Education, Nanyang Technological University.

Reports are submitted as part of the funding review process and intended for the funding agency, local schools and educators, teacher educators, policymakers, and education scholars. They do not take the place of scholarly, peer-reviewed articles but report on the background, procedures, and major findings of the project.\*

This study was funded by Singapore Ministry of Education (MOE) under the Education Research Funding Programme (OER 40/12 RS) and administered by National Institute of Education (NIE), Nanyang Technological University, Singapore. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Singapore MOE and NIE.

\*In some cases reports show coloured font or highlights. These are an artifact of the review process and not intended to have any special weight or meaning within the report itself.

EDUCATION RESEARCH FUNDING PROGRAMME

# PROJECT CLOSURE REPORT



## **Reading Discussions and Reading Comprehension: Sustainability in Teacher Development and Opportunities for Student Learning**

By

Rita Elaine Silver

Jessie Png

National Institute of Education  
Singapore

---

## EXECUTIVE SUMMARY

### INTRODUCTION/BACKGROUND

This report focuses on the third in a series of projects launched as a collaboration between the research team and a participating school with the goal of enhancing student reading comprehension and teacher understanding of the importance of classroom discourse.

### STATEMENT OF PROBLEMS

While teachers involved in the previous intervention study displayed increased understanding of the strategies introduced, they lacked confidence in their ability to lead other teachers – a necessary component for sustainability of the intervention. In addition, they had not fully mastered some aspects of the strategies. Finally, data on student learning was incomplete.

### PURPOSE OF STUDY

The goal of this project described was to facilitate and follow-up the intervention throughout 2013. During 2013, the research team continued to lead some parts of the intervention (e.g., workshops and feedback on lesson observations) while the participating teachers worked together on lesson development and with the research team on feedback of lesson practices. During 2014, the research team progressively ‘pulled back’ in leading the intervention while encouraging the first generation of participating teachers to take on greater leadership roles. At the same time, the research team continued to monitor teacher development through observations and interviews and to examine student learning through student reading comprehension tests.

The research questions were:

1. Following an intervention in teacher professional development, to what extent do teachers
  - a. Continue to use the new strategies during a follow-up year?
  - b. Integrate the instructional strategies into their teaching across the curriculum?
2. In what ways do teachers integrate two key components in their reading comprehension lessons:
  - a. Formative assessment of learning?
  - b. Vocabulary instruction?
3. To what extent do the lower achieving students show gains on
  - a. Participation in classroom reading discussions?
  - b. Formative assessments?
  - c. Summative assessments?

### PARTICIPANTS

All participant teachers were from the same ‘neighbourhood’ school in Singapore. A total of 5 teachers continued in 2013 from the previous, *CRC*, project, and 2 new teachers joined. The new teachers constituted ‘Generation 3’. Teachers worked in small groups, with other teachers who had lessons at the same grade level or a teacher who had taught at that grade level in the previous year. One of the more experienced teachers worked with each group to share expertise from previous participation. Approximately 5 additional teachers joined in 2014 as part of a school-based professional learning circle (PLC), which will be described at

the end of this section. (Exact numbers for the PLC are difficult to report as the composition of members at meetings varied depending on teacher schedules.)

Student participants in 2013 were those in the classes of participating teachers: 1 class at primary grade 2, 2 classes at primary grades 4, 5 and 6; a total of 307 students.

### **METHODOLOGY / DESIGN**

The study made use of observation of and participation in teacher planning sessions, observation of classroom lessons, post observation interviews and teacher reflections. In addition, student test data were collected three times: beginning, middle and end of the year.

### **FINDINGS / RESULTS**

The findings showed that

RQ1. The teachers did continue to use the Questioning the Author (QtA) strategy during the follow-up year and across the curriculum. There was also evidence that all teachers used NfM in their lessons.

RQ2. In the current study, with observations in 2013, teachers led the reading discussion lessons without any worksheet or 'formal' means of formative assessment. However, we found that the teachers were thinking about students' comprehension regularly and used discussion for on-the-spot assessments of what the students did not understand some crucial information in the text, as recommended by the research intervention team.

In terms of vocabulary, few of the lessons plans noted vocabulary that needed to be addressed in order to ensure comprehension of the text. Instead, the teacher focussed their plans on understanding plot, character, factual information, and cause-effect relationships. However across reading lessons bite-sized lessons on vocabulary were integrated as needed.

RQ3 Briefly, in the QtA lessons (17 total), there was little evidence of difference between higher/lower achieving students in terms of student participation. Specifically, in each class, at least one of the lower achieving students did tend to be more reticent, but in many cases at least one student designated as 'higher achieving' was also reticent; most often the most participatory students were other students - not those designated as higher/lower achieving in reading. Taken together, this suggests that other factors were more influential than 'achievement' for participation in the teacher-led reading discussions. One factor that did seem to have an influence was seating. In brief, students at the back of the room were noticeably less participatory while the majority of highly participatory students were seated in the middle rows, with a few of them in the front row.

In terms of summative assessments, both higher- and lower-achieving students showed improvement from Test 1 to Test 2 to Test 3 (beginning, middle and end of the year, respectively). Although teachers initially felt that high-achieving students benefited more from QtA and some teachers continued to believe this through all years of the project (2011, 2012, 2013), examination of the high- and low-achieving students in 2013 shows that the low-achieving students actually had somewhat greater gains than the high achieving students. Data from the study show that use of QtA can be at least as beneficial for lower-achieving students as it is for higher- achieving students. There is no evidence to support the view that lower-achieving students would be disadvantaged or that higher achieving students benefit more from this type of instructional treatment.

**Additional findings:**

Our observations of the teachers in 2013 showed some differences between the teachers who had 3 years, 2 years or only 1 year in the intervention. Those who had 3 years in the intervention, with the support of the research team, used the new strategies more frequently and more smoothly, and with more confidence in their ability to handle the type of spontaneous responses required by reading discussion.

A final analysis was conducted to examine the results of students who had been in the intervention as students all three years (2011, 2012 and 2013), i.e. 'student longevity', and who were with Generation 1 teachers in 2013 (teachers who had three years of experience in the intervention, i.e. 'teacher expertise'). These students were compared with students of Generation 1 teachers in 2011 (i.e., one year of intervention for both teachers and students). In this case, there was a statistically significant difference for students in the intervention. This suggests a possible impact on student learning (as measured by the reading comprehension test) over time: after the teachers had had a chance to develop expertise in using the strategy and the students had had sufficient time to engage in the lessons. This finding must be viewed with caution given the relatively small sample sizes (approx 200 students in 2011 and 30 or fewer in 2013, see Figure 2) as well as the lack of controls for other variables such as student age, student gender, teachers' years of teaching experience, teachers' prior professional development.

**IMPLICATION TO POLICY MAKERS**

Our results clearly show that when new instructional strategies are introduced, teachers need time to master the strategies, to feel confident in their use, and to see student learning results. In this case, three years were needed for the teachers to develop mastery and for positive student gains as measured by formal assessments to be evident. This is understandable as we cannot expect to see gains in student performance until teachers have had an opportunity to master the new strategies. In addition, if teachers are to truly master strategies, they need time to try the out, to refine their use, and to think about how to best integrate them into their overall teaching.

**IMPACT TO SCHOOLS**

On a purely resource issue: school projectors are not optimally placed for student viewing. Currently projectors in many schools place the viewing area too low which makes it difficult for students to see what they are supposed to see.

**CONCLUSION**

The results also suggest that though school-based efforts such as PLCs can be useful, working with agents outside of the school can be beneficial for professional development. More importantly, professional development efforts must take a long term view, giving teachers time to develop mastery and confidence in the new strategies. This suggests that one-off projects or those lasting only one year are less beneficial.

In addition, student gains based on teacher professional development efforts need to be examined over multiple years. Just as teachers cannot master new strategies with one-off efforts, student gains may not be evident in the short term.

**ACKNOWLEDGEMENTS**

This study was funded by the Education Research Funding Programme, National Institute of Education (NIE), Nanyang Technological University, Singapore, project no. OER 40/12 RS.

Project Number: OER 40/12 RS  
Name of PI: Rita Elaine Silver

Project Closure Report

**2015**

---

The views expressed in this paper are the authors' and do not necessarily represent the views of NIE.

**KEYWORDS**

Reading comprehension instruction, Questioning the Author, negotiation for meaning, teacher professional development, classroom discussion

---

# **Reading Discussions and Reading Comprehension: Sustainability in Teacher Development and Opportunities for Student Learning (*RDRC-Sustainability*)**

**Rita Elaine Silver**

**Jessie Png**

National Institute of Education

## **Introduction/Background**

This project is a continuation of two projects previously funded by the ERFP:

- A pilot study, *The Impact of Negotiation for Meaning on Reading Comprehension Among Singapore Primary Students (NFM/RC)* (OER 29/08RS), which ran from March 2009 to August 2011 (Silver, Png, Rasidir, Foong, Huynh, Kogut, 2009).
- A teacher professional development intervention, *Comprehending Reading Comprehension: An Intervention in P4 Reading (CRC)* (OER 09/10 RS), which started in December 2010 and was completed in March 2013 (Silver, Png, Kogut & Huynh, 2010.)

These studies were built around a teacher professional development program focussing on the role of whole-class discussion for improving reading comprehension in one local primary school. The initial study (*NFM/RC*) acted as a pilot. The intervention study (*CRC*) introduced a reading and discussion strategy which had been used with success in the U.S. – Questioning the Author (Beck & McKeown, 2002; Beck, McKeown, Sandora, Kucan, & Worthy, 1996) and the idea of ‘negotiation for meaning’ (NfM) (e.g., Pica, 1994) –

---

to encourage teacher-fronted discussion to enhance critical thinking and reading comprehension skills (cf. Van den Branden, 2000).

Specifically, the school was interested in developing teacher expertise in more open-ended classroom discussions to enhance reading and thinking skills across the curriculum. The school also requested a long-term commitment from the research team (4-5 years) to foster scalability within the school (from the initial participating teachers to others in the school) and sustainability (through developing the initial teacher participants as leaders of study groups to continuously improve pedagogical practices).

With this background in mind, the goal of this project (*RDRC-Sustainability*) was to continue the research-intervention collaboration with the school throughout 2013 with support in 2014 as needed. During 2012, the research team continued to lead some parts of the intervention (e.g., workshops and feedback sessions) while the teachers continued to work together on lesson development. The research team also provided feedback on lesson practices. During 2013, the research team progressively ‘pulled back’ from leading the intervention while encouraging the first group of participating teachers (“Generation 1”, started in 2010) to take on a greater leadership role. At the same time, the research team continued to monitor teacher development through periodic observations and interviews and through student testing. Collaboration in 2014 involved intermittent consultations with the teachers including visits to the professional learning circle (PLC) which continued the project. A follow-up interview with the English Language Head of Department (18/9/2015) was also conducted to gather information on the sustainability of the project.

### **Statement of Problem**

Findings from the *CRC* project showed the following for participating teachers:

- An increase in use of whole-class discussion in reading lessons as well as use of more open-ended questions. In addition, the teachers reported that the intervention

---

influenced their teaching across subjects as they integrated more discussion in other subjects as well.

- A deeper understanding of the principles, purposes and procedures for Questioning the Author (QtA).
- High buy-in to the project with teachers from the first year continuing into the 2<sup>nd</sup> year, and positive responses from teachers starting in both year 1 and year 2.
- There were still difficulties in managing ‘discussion moves’ and NfM. Teachers felt they first had to be comfortable with the basic procedures and (pre-planned) QtA ‘queries’ before they could manage QtA discussion moves and NfM which are more reactive in nature.
- Teachers moved from regular use of comprehension worksheets as the focus of their reading comprehension lessons in the pilot study (2009) (see also Wong, 2007) to a complete absence of any formal check on student comprehension at the end of lessons by the end of the intervention (2012). There was concern that teachers were not aware of the need for on-going, formative assessment and, without some sort of on-going assessment, difficulties of weaker readers might be missed.
- Teachers de-emphasized vocabulary teaching during reading and missed opportunities to address vocabulary instruction. This is a crucial part of enhancing reading comprehension and overall English language development, and might be particularly important for lower performing students who need assistance to master the increasing vocabulary demands of upper primary.
- In terms of developing teacher expertise, after one year in the intervention, the first group of teachers (“Generation 1”) continued to lack confidence in their expertise. It was only in the 2<sup>nd</sup> year of the intervention that Generation 1 teachers started to take on leadership with the newly joining (“Generation 2”) teachers by leading in the lesson planning and feedback sessions, making more suggestions, and being more

critical in their appraisals. However, the teachers still questioned the extent to which they could lead without the support of the research team. (See Silver & Png, 2016.)

Although the focus of the intervention was on teacher development, the broader goal was to improve student outcomes. The initial *NfM/RC* project (pilot study) showed increased student participation in classroom discussion, provided qualitative evidence of critical thinking during reading lessons, and suggested some small positive outcomes for reading comprehension. Given the limited number of lessons in the initial study (3 fully-planned, observed, QtA lessons each year per teacher), evidence of student learning was limited.

The goal of the *CRC* project was to expand the teaching repertoire to include QtA and encourage teachers to use it as and when it best suited the learning goals of a lesson and student needs. At the same time, teachers were using the national primary English Language curriculum (STELLAR). QtA lessons were meant to complement, not replace, that curriculum. In addition, English Language lessons covered a variety of skills (speaking, grammar, etc.) with reading lessons approximately 1-2 times per week. Of all the reading lessons throughout the year, teachers selected a few for fully-planned QtA lessons. Integration of QtA types of queries and discussion moves in other lessons was at the discretion of each teacher. With the professional development given during the second project (*CRC*), participating teachers were able to start incorporating QtA and NfM throughout the academic year rather than in isolated lessons. The teachers felt they had more complete mastery of the strategy by the end of 2012. Thus, a better picture of long-term student learning could be developed by tracking students who had been engaged in lessons with participating teachers over several years.

### **Purpose of Study & Research Questions**

The project described in this report (*RDRC-Sustainability*) facilitated and followed up on the earlier intervention. During 2013, the research team continued to lead some parts of

the intervention (e.g., workshops and feedback on lesson observations) while the participating teachers worked together on lesson development and with the research team on feedback of lesson practices. During 2014, the research team progressively 'pulled back' in leading the intervention while encouraging the first generation of participating teachers to take on greater leadership roles. At the same time, the research team continued to monitor teacher development through observations and interviews and to assess student learning through reading comprehension tests.

The research objectives were:

1. To follow up and support teachers' developing leadership skills while assessing within-school scalability and sustainability of the project.
2. To investigate whether and to what extent teachers implemented features of QtA and NfM in lessons other than reading comprehension.
3. To assess student gains in reading comprehension, especially those students considered to be 'lower achieving'.
4. To investigate the continued development of the participating teachers in three areas that had been shown to need further support: teaching of vocabulary, formative assessment, and making use of reactive discussion moves and NfM.

## **Research Questions**

The research questions were:

1. Following an intervention in teacher professional development, to what extent do teachers
  - a. Continue to use the new strategies during a follow-up year?
  - b. Integrate the instructional strategies into their teaching across the curriculum?

2. In what ways do teachers integrate two key components in their reading comprehension lessons:
  - a. Formative assessment of learning?
  - b. Vocabulary instruction?
3. To what extent do the lower achieving students show gains on
  - a. Participation in classroom reading discussions?<sup>1</sup>
  - b. Formative assessments?
  - c. Summative assessments?

## Methodology/Design

All participating teachers were from the same neighbourhood primary school in Singapore. A total of 5 teachers continued in 2013 from the previous, *CRC*, project<sup>2</sup>, and 2 new teachers joined. These new teachers constituted 'Generation 3'. Teachers worked in small groups, with others teachers who had lessons at the same grade level or a teacher who had taught at that grade level in the previous year. One of the more experienced teachers (Generation 1 or 2) worked with each group to share expertise from previous participation. Approximately 5 additional teachers<sup>3</sup> joined in 2014 as part of a school-based Professional Learning Community – a standard feature of Singapore's teacher development plan.<sup>4</sup>

Student participants in 2013 were those in the classes of participating teachers: 1 class at primary grade 2, 2 classes at primary grades 4, 5 and 6; a total of 307 students. (See Appendix A, for details.) As with the previous *CRC* study, these students took a reading comprehension test at the beginning, middle and end of the year. In 2014, only the teachers' PLC was considered; therefore, there were no student participants in 2014.

A teacher background questionnaire was conducted with the Generation 3 teachers at an introductory meeting. A written questionnaire of teacher beliefs about reading

instruction was also given. The teacher background questionnaire and reflection were the same as those used in the *CRC* project (Appendices B and C, respectively). The study made use of observation of and participation in teacher planning sessions, observation of classroom lessons, post-lesson interviews and reflections, and student test data.

### **Teacher Planning Sessions**

In 2013, the research team participated in 14 group meetings with the teachers including an introductory meeting, 2 meetings to provide 'direct instruction' on the concepts of the QtA and NfM strategies and 10 sessions for lesson planning and practice. The team had initially planned only to sit in on 4 lesson planning sessions. However, at the specific suggestion of the Generation 1 and 2 teachers, the team led the two direct instruction sessions and sat in on most lesson planning and feedback sessions throughout 2013.

### **Lesson Observations**

All participating teachers (Generation 1, 2, and 3) were observed in example lessons. (For information about observation procedures, see Silver, 2011.) Each Generation 3 teacher (i.e., those who were newest to the project) was observed a total of four times during the year: one baseline observation prior to learning the new reading strategy and three lessons while implementing the QtA strategy. Each Generation 1 and 2 teacher was observed four times including:

- at least one pre-planned QtA reading comprehension lesson, to determine ability to continue to use the strategy and develop further expertise;
- at least one reading lesson which was not pre-planned as a QtA lesson, to see if teachers implemented some of the QtA techniques without planning for QtA;
- at least one lesson with the same group of students in another subject (e.g., Social Studies, Maths, Science, and in one case, Grammar), to see if teachers incorporated any of the techniques from QtA into these other lessons;

- one other lesson with the same group of students (QtA, reading [but not pre-planned as a QtA lesson] or another subject) depending on the teacher's preference.

Initially the plan was to observe units of lessons, with a unit of work designated as 'the sequence of lessons needed to cover one set of material'. For example, if the teacher was using QtA to teach one passage, the initial lesson might last two hours on one day. The next day the teacher and the students might re-read the passage to address vocabulary or grammar in a one-hour lesson. The initial idea was to capture this sequence of instruction. However, the participating teachers found the multiple observations too constraining and individual lessons were observed instead. This decision helped to off-set the additional time the team spent with the teachers in group meetings (as above); however, it might have limited the opportunity to see vocabulary instruction (discussed below).

All lessons were audio and video recorded; copies of the recorded materials were given to participating teachers for collegial sharing/feedback, used in post observation interviews (described below), and analysed for evidence of professional development/teacher learning. Following the protocols established for the *CRC* project, excerpts of approximately 10 minutes in length from three points in the lesson were selected for transcription and analysis. (Details can be found in Silver, 2013.)

Since teachers were self-selecting into the project and students were assigned to classes by the school, there was no opportunity to match higher- / lower-achieving classes at the same grade level. Instead, the participating teachers identified three relatively higher- / lower-achieving focal students in each class to consider the possible differential effects for student participation and achievement. To address Research Question 3, these focal students were observed during lesson observations and 'participation' indicated as answering a question, asking a question, or raising a hand was used as a rough measure of participation. A seating chart for each class and lesson was prepared and ticks (✓) were

---

marked for each sign of participation by any student in the class, focal students were also indicated on the seating chart. See Appendix D for an example.

### **Post Observation Interviews**

All participating teachers were interviewed at least three times during the year, each time after a lesson observation. Following the protocols established in the *CRC* project, excerpts of the lesson videos were shown along with the use of reflective prompts to encourage teachers to comment and reflect on their own lessons. Feedback on specific points of the intervention (e.g., use of QtA queries, use of NfM, integration of vocabulary instruction) was integrated into the interviews as needed. (See Silver & Png, 2012, for the interview protocols.) The interviews were audio-recorded and transcribed for analysis. A subset of interviews was also video-recorded and tracking software was used on computers for a micro-analysis of the interactional features; results of that analysis are reported in Kim and Silver (2016).<sup>5</sup>

### **Teacher Reflections**

Each teacher completed at least two written reflections, one at the beginning of the year and one near the end of the year. While the interviews were intended to give teachers an opportunity to reflect on their lessons, the written reflections were intended to encourage the teachers to reflect on the project as a whole. (Details for interview procedures can be found in Silver & Png [2012]; for details of the written reflections see Appendix E.)

### **Student Tests**

Students were given a reading comprehension test at three points during the year. The test had previously been piloted and used for the *CRC* study. One version for each grade level in the study had been previously prepared, versions for primary grades 2 and 6 were added for this study as those grade levels had not participated in the earlier studies.

Each version of the test included three reading passages with reading comprehension questions of the type typically used in school assessments: at least one 'factual', one 'inferential', and one 'applicative' question for each passage. The test materials were sourced separately from the reading materials used in lessons (e.g. STELLAR materials) to ensure they were not familiar to the students. Suitability was determined by three former primary school teachers in Singapore schools (members of the research team) and checked with the participating teachers. Passages were also checked for 'readability' by comparing readability scores from four readability assessments (Fry, Gunning Fog, Flesch, and Power Sumner Kearsley) and found to be appropriate for these grade levels (see Foong & Silver, 2016 for details).<sup>6</sup>

Each test also included four questions modelled on QtA queries (e.g., What do you think the author wants you to understand from this section of the text? What would you like the author to explain more clearly in this section?).

## **Data Analysis**

Data analysis procedures followed those established for the CRC project. This involved the following:

Field notes taken during teacher planning sessions. As the teacher sessions were not a primary site of data collection but were used instead to advance teacher professional development, these field notes were considered to be supplementary data and are not discussed in this report.

Lesson observations were considered the primary sources of data for examining the teachers' pedagogical practices and for evidence of the sustainability of the intervention. Lesson observations were video and audio recorded. The audio recordings were used in conjunction with the collaboratively-prepared lesson plans to select three points in the lesson for transcription. Field notes were also taken during the lesson to indicate any points in the

lesson which were especially noteworthy (e.g., a teacher achieves a goal set out in the lesson plan, a teacher misses an opportunity to negotiate the meaning of a key vocabulary word). These points were transcribed in addition to or in lieu of the points determined by examining the lesson plans. The excerpted transcripts were analyzed for teacher use of QtA queries and discussion moves and for evidence of NfM. (Details for QtA coding can be found in Rasidir, Foong & Silver (2012) and for NfM coding in Silver & Huynh, 2010.) Our assumption was that if these appeared in the excerpted transcripts, it would confirm a teacher's use of the strategies. Appendix F and Figure 1 provide summaries of the definitions for the coding for QtA. The transcripts and lessons were also analyzed for teaching of vocabulary.

Excerpts of the lesson observation videos were used in the post observation interviews but were not coded as separate data sources. Post observation interviews were transcribed in full and analyzed for evidence of 'teacher understanding' based on Anderson and Krathwohl's (2006) neo-Bloomian taxonomy of educational objectives. As evidence from the observations, teacher interviews and reflections was sufficient to answer Research Questions 1 and 2, the data on teacher understanding is not addressed in this report.

Student tests were marked by two markers (see Silver, Png, Kogut & Huynh, 2014). Standard procedures for checking inter-coder agreement were used: the same two markers marked the student test at a given grade level for all tests during this study (and in the preceding studies). For each testing period, a sample of prior tests was blind-coded to check continuing agreement. If agreement was not at least .80 (Cohen's Kappa), the duo re-trained using previously prepared training materials and a second sub-set of tests was used to check agreement. Inter-rater agreement was checked for the score overall and for individual items at this stage. After the duo had obtained a sufficiently high level agreement, they proceeded to code the tests; each coder taking half of the remaining tests.

All answers were marked on a 3-point scale. Hence, a correct answer would be awarded 2 marks, a partially correct answer, 1 mark, and an incorrect answer, 0 marks. In addition, students were not penalized for grammatical or spelling errors as these do not reflect incomprehension. In analysing the student scores and possible improvement, data from previous years (2011 and 2012, using the same test at the same grade levels) were used for comparison. To the extent possible, comparisons were made for higher- /lower- achieving students. For details see Foong and Silver (2016).

To gather some information on possible impact on student progress, student scores on the reading comprehension test designed for the study were used. As there was no comparison group in 2013, comparisons were made between improvement on test scores during the year 2013 (intervention group) with improvement on test scores during the year 2011 (comparison group). Students in P2 were not used for comparisons of student learning as this was a small group of students (N=29) and the teacher was involved for only part of the year due to an approved leave-of-absence from the school. As a result, numbers for comparison were not large (all 2011 comparison students = 236; all 2013 intervention students = 278) and involved students at different grade levels/ ages (P3, P4, P5 for the intervention students; P4, P5, P6 for the comparison students).

## **Findings / Results**

For the sake of brevity, results are limited to those that directly relate to each research question. In addition, because the focus was on the teachers' continued professional development, the findings tend to focus on results for the Generation 1 and 2 teachers (5 total). Where findings are directly relevant to Generation 3 teachers (who started in 2013), this is noted. Some noteworthy findings for student participants are also included although, given the sample sizes and the way comparison are done, these should be interpreted with caution.

---

## **Continued and extended use of the instructional strategies**

The findings show that the teachers did continue to use the QtA strategy during the follow-up year and across the curriculum. There was also evidence that all teachers used NfM in their lessons. Details are given below.

### Use of the new strategies during the follow-up year: Planned QtA lessons

Across all teachers, all years and all generations, evidence from classroom observations showed that the QtA strategy was used though there was variation in the ways in which it was used, as explained below.<sup>7</sup> There was also some evidence that the teachers in Generation 1 and 2 introduced elements of the strategy across the curriculum (i.e., in their other subject lessons). Below, we summarize the finding by different types of lessons (baseline, planned QtA, reading lessons that were not planned for QtA, and lessons in other subjects) and by type of evidence for use of QtA (i.e., queries and discussion moves, see Figure 1).

Baseline lessons, conducted before the teachers started the intervention, were transcribed in their entirety to capture any use of QtA. Across all teachers, all generations (including previous years), there was no evidence of use of QtA type 'queries' but there was evidence of some 'discussion moves' during the baseline lessons. In general, queries can be planned for the lessons based on teachers' expectations of students' comments and possible misunderstandings. However, discussion moves are primarily reactive and cannot be planned in advance. Thus, their use depends on a variety of factors in each lesson (e.g., student questions and comments). In the baseline lessons, the discussion moves were almost exclusively composed of 'turning back to students'. Four of the teachers used 'turning back to text', though there were only a few examples per teacher; four teachers had examples of 'revoicing' (with 1, 2, or 3 examples in the entire baseline lesson), two teachers

Queries <sup>8</sup>	Queries are intended to start the exploration of the text by asking questions such as "Now, why do you think the author chose this title? What do you think the author wants you to understand from this book?"
Discussion Moves	Actions taken by the teacher to encourage participation and student thinking.
Annotating	An option for teacher to fill in an information gap that would assist student comprehension (e.g. a short teacher explanation).
Marking	The teacher highlights or 'marks' information from a student comment that is particularly important or relevant.
Modeling	The teacher gives an affective response to the text or calls attention to something that is not clear in the text; a sort of mini 'think aloud' which shares the teacher's thoughts, as a reader, with the students (e.g., "I'm not clear on that. I wonder why the author doesn't give more explanation?")
Recapping	Summarising major ideas that students have developed so far.
Revoicing	When the teacher tries to interpret and re-phrase a struggling student's question/comment so it can become part of the whole-class discussion.
Turning back: Turning back to students Turning back to text	A response to a student comment or question by Asking the student to elaborate on a comment made Turning the students' attention to the text

Figure 1. Possible Query and Discussion Move Types in a QtA Lesson

used 'modeling', 'marking' or 'annotation'. None of the teachers used 'recapping' in the baseline lessons.

In contrast, all of the planned QtA lessons, including those with fully transcribed lessons and those for which only excerpts were transcribed, showed teachers making use of queries, as well as a quantity and variety of discussion moves. This was important for showing success of the intervention as one reason for extending the study into 2013 was the earlier finding that teachers felt comfortable with the queries, which could be pre-planned, but not with the discussion moves, which are more reactive. Of the discussion moves used,

turning back to students was the most common (as in the baseline lessons) followed by turning back to text, which became quite common in the planned QtA lessons. All of the teachers used turning back to text in multiple, planned QtA lessons, though there were 5 lessons (out of 47 planned QtA lesson across 2011, 2012, 2013) which did not. All of the teachers used revoicing in at least two lessons; recapping, marking and annotating were used somewhat less but were evidenced by all teachers in at least one lesson. Modeling was very rare – evidenced in only 3 lessons over all, each time by a different teacher. Along with this, we note that we did not see the teachers use variations of 'think aloud' to voice reader thinking or model reading processes in observed lessons.<sup>9</sup>

#### Use of the new strategies during the follow-up year: Reading lessons not planned as QtA

EL reading lessons which were not specifically planned as QtA lessons were observed and recorded for Generation 1 and 2 teachers (7 teachers). Three of these teachers made use of QtA type queries even though they were not intentionally using QtA for these lessons. All seven teachers made use of discussion moves including turning back to students, turning back to text, and revoicing. Three teachers made use of recapping or annotating; marking was used by only two teachers (in one lesson each) and modeling only once by one teacher.

#### Integrating the instructional strategies across the curriculum

Each teacher was observed for a non-EL lesson (math, social studies, science) depending on what other subject the teacher taught with the same group of students (e.g., the same students for EL and Math). Each of these lessons involved some reading though it might be reading from a worksheet and, in general, was not extended text. There were no examples of queries used in these lessons but some examples of discussion moves, almost exclusively turning back to students. There was some use of recapping (two teachers) and marking (two teachers). The data set for examining non-EL lessons was very small – one

lesson per teacher and with excerpted transcripts; therefore, it is interesting to see that even in this limited data set, there was some variety in the use of discussion move types, tending to support the teachers' contentions, stated in interviews and informal discussions, that they made use of some elements of QtA in lessons in other subjects.

### Use of NfM

Though we refer to negotiation for meaning (NfM) which specifically means checking for was said/what was meant, we also analysed all lessons (planned QtA, reading not planned as QtA, and lessons in other subjects) for negotiation of content (NfC) (requests for more details/additional information) and negotiation of form (NfF) (concerning language forms such as accurate grammar, pronunciation, or word choice). With lessons focussing on meaning and encouraging students to explore their ideas, we expected to see more of NfM and NfC than NfF. This proved to be the case. All teachers (and all generations), across all lessons incorporated NfM and NfC. All teachers also incorporated NfF into the discussions but not in all lessons and with lesser frequency than NfM and NfC.

### **Integration of Formative Assessment and Vocabulary Instruction**

The focus of this question is on Generation 1 and 2 teachers as the research team had discussed integration of formative assessment and vocabulary instruction with them prior to and at the beginning of this study.

### Formative assessment

Based on observations in 2011 and 2012, we found that when the participating teachers started to implement QtA, they moved from having a worksheet acting as assessment in every lesson (i.e., to determine how well the student had understood the text for that lesson and to determine how students were progressing across reading lessons) to having no worksheets and no way to confirm if students did/did not understand the text and

were/were not progressing in their reading comprehension skills. In addition, we saw that vocabulary was de-emphasized and opportunities for teaching vocabulary during discussion were often missed.

In the current study, with observations in 2013, teachers continued to lead discussion without any worksheet or ‘formal’ means of formative assessment. However, we found that the teachers were thinking about students’ comprehension regularly and, in particular, when using the discussion move ‘turning back to text’ this was based on on-the-spot assessment that the students did not understand some crucial information in the text. For example, in one lesson a class was reading a fictional story about two girls: Jade who had no calculator and Kayley who had a new one that she had stolen from a shop. The teacher engaged the students in an extended discussion of how Kayley, the thief, might have felt and asked them to provide evidence from the text including what Kayley had said to Jade and how Kayley looked in the illustrations. The students concluded that Kayley seemed to be happy with what she had done. The discussion then turned to Jade feeling “jealous”. This difference was important for story comprehension because the character Jade later recalled the conversation and Kayley’s seeming pleasure in contrast with Jade’s continuing feelings of envy; all of this persuaded Jade to try to shoplift. These important clues to the characters’ feelings and motivations were implied by the words and visuals in the text. Through discussion the teacher was able to discern that the students initially were not thinking about the characters feelings and motivations – a sort of ‘on the spot’ assessment of what the students were/were not understanding – and address it. The same teacher, in her final written reflection (written at the end of the year), commented on a contrasting case– when the word ‘notorious’ came up in the text. One student was able to give a short explanation “being well-known in a bad way”. Since this explanation fit the meaning of the word, the teacher did not pursue it. However, the teacher’s reflection noted that she later realized she had not linked up the meaning of the word within the context of the story about a moray eel;

therefore, she was not sure if the students had understood that part of the story. These two examples illustrate how the teachers began to see the discussion itself as a type of on-going, formative assessment.

### Vocabulary instruction

In terms of vocabulary, few of the lessons plans<sup>10</sup> noted vocabulary that needed to be addressed in order to ensure comprehension of the text. Instead, the teachers focussed their plans on understanding plot, character, factual information, and cause-effect relationships. However across planned QtA and reading lessons that were not planned for QtA, bite-sized lessons on vocabulary occurred. For example in one lesson, the teacher queried the students on the authors' purpose for describing living conditions in a crowded kampong with a public standpipe as the only running water. Starting with "What is the author telling us here?" and then building on student responses to explore the use of the public standpipe, and comparisons between living conditions past and present, the teacher elicited comments from students on water use, toilets, and "dirty" living conditions. The teacher then asked the students "Dirty? What other words can come to your mind?" which elicited "embarrassing," "untidy," and "unhygienic". Using the discussion move of 'marking', the teacher commented "Unhygienic. CBT<sup>11</sup> said unhygienic. Would you agree?" Then when the students all agreed, the teacher asked, "Ok. Who knows what's unhygienic? Who does not know what's unhygienic?" She then asked for examples from the passage that suggested the living conditions were unhygienic. Later, in the post observation interview, the teacher commented that she was sure at least a few students knew the word 'unhygienic' but probably not all, so this was a good opportunity to address this vocabulary item. This type of spontaneous, vocabulary instruction occurred in most, but not all lessons. In general, it seemed that the teachers did not plan to incorporate vocabulary instruction in the reading lessons but addressed it on an 'as needed' basis.

---

## **Gains by Lower Achieving Students**

Results for this question address findings from teachers in Generation 1, 2, and 3.

### Student participation

Briefly, in the QtA lessons (17 total), there was little evidence of difference between higher/lower achieving students in terms of student participation. It must be remembered that the school had already 'banded' the students into classes based on formal assessments from the previous year. The higher achieving students at each grade level were in classes with other higher achieving students. All other classes were considered to be 'mixed ability' (those who had not tested as 'higher achieving' in their grade level the previous academic year). Thus, within any given class, the teachers did not consider there to be a great difference among the students. However, teachers did identify some students perceived to be somewhat higher/lower achieving in reading relative to other students in the class (3 each per class, though not all of these students were present for each observed lesson).

Based on behavioural evidence of participation (asking/ answering questions, raising hands, volunteering to answer), the most participatory students were not necessarily the higher or lower achieving students. Specifically, in each class, at least one of the lower achieving students did tend to be more reticent, but in many cases at least one student designated as 'higher achieving' was also reticent; most often the most participatory students were other students - not those designated as higher/lower achieving in reading. Taken together, this suggests that other factors were more influential than 'achievement' for participation in the teacher-led reading discussions.

One factor that did seem to have an influence was seating. Prior research has shown some conflicting results but for the most part, investigations of seat placement have shown that performance (as evidence by course grades or marks) is not significantly affected by seating placement but participation is (e.g., Cox, Cody, Fleming, & Miller, 2012; Parker,

---

Hoopes, & Eggett, 2011; Meeks, et al., 2013). Koneya (1976) referred to a “triangle of centrality” for classroom interaction when students were seated in traditional row-and-column seats – with the highest participation through the front row (base of the triangle) angling into the middle of the room (to form the apex). We found that students at the back of the room were noticeably less participatory while the majority of highly participatory students were seated in the middle rows, with a few of them in the front row. So, while there was no evident ‘triangle’, centrality did seem to play a part. In addition, there was considerable variety across lessons. In most of the QtA lessons there was relatively high participation, with teachers noting that one positive impact of the intervention was increased student participation (see Png, 2016); only one lesson had very little student participation.

One other comment should be made about seating, the classroom arrangement and the possible impact on participation. Because P3-P6 teachers<sup>12</sup> showed the reading text projected on a screen at the front of the room, students were sometimes moved to seats other than their usual seats to facilitate viewing. In some cases, students moved chairs between the usual row and columns so that students were seated more closely to each other than usual. In at least two lessons, some students sat on the floor at the very front of the room. These movements were due to the difficulty of seeing the projected image which was, in turn, caused by the projections being quite low. It is not clear how greater-than-usual proximity to other students or moving to new seating position might have impacted participation.

### Formative Assessment

As above, to the extent that there was formative assessment, it was informal, on-the-spot, and addressed within the whole-class reading discussion. This was a reasonable decision on the part of the teachers as part of the reason for introducing QtA was to address possible lack of comprehension during the reading, rather than assessing reading at the end

of the lesson. However, it was not possible to distinguish how the lower achieving students fared separately from the other students in this setting.

### Summative Assessments

In terms of summative assessments, both higher- and lower-achieving students showed improvement from Test 1 to Test 2 to Test 3 (beginning, middle and end of the year, respectively). Although teachers initially felt that high-achieving students benefited more from QtA and some continued to believe this through the sequence of projects (2011, 2012, 2013), examination of the high- and low-achieving students in 2013 showed that the lower-achieving students actually had somewhat greater gains than the higher-achieving students (Table 1).

Table 1. Means of all grade levels High and Low Achieving Students total test scores, 2013 (Pre Test, Post Test and DPT)

	T1TotalScore	T2TotalScore	T3TotalScore
High Achieving	26.28 (n=18)	27.06 (n=16)	28.63 (n=16)
Low Achieving	23.11 (n=18)	26.24 (n=17)	29.28 (n=18)

We believe this supports the view that QtA can be at least as beneficial for lower-achieving students as it is for higher-achieving students. In fact, the strategy was originally designed to support struggling readers and has been shown to be beneficial to weaker readers in studies conducted in the U.S. (Beck, McKeown, Sandora, Kucan & Worthy, 1996). Given this background and the means shown in Table 1, it might be tempting to read the data as showing that lower achieving students can out-perform higher achieving students with the sort of instructional treatment used in this study. We would discourage interpretation of the data in this way for several reasons, as detailed below.

First, as explained above, based on the schools' banding system, it is not clear that there are substantial differences between the students designed at 'lower' and 'higher' achieving in each class. Second, with 3 students per class designated as 'higher' or 'lower', these findings are based on analysis of only 21 students – a rather small sample for

comparison. Third, data from our prior study shows, and common sense would suggest, that students with reading instruction for a full year would show gains. A comparison of scores across all of the years that we worked on the related projects in this school supports this (Table 2). Taken together, we believe, as above, that the data show that use of QtA can be at least as beneficial for lower-achieving students as it is for higher-achieving students. There is no evidence to support the view that lower-achieving students are disadvantaged or that higher achieving students benefit more from this type of instructional treatment.

Table 2. Total All Grade Levels Means for 2011, 2012 and 2013 (Pre Test, Post Test and DPT)

	T1TotalScore	T2TotalScore	T3TotalScore
2011, Overall	20.66 (n=446)	23.64 (n=432)	24.85 (n=401)
2012, Overall	20.43 (n=287)	23.30 (n=255)	25.61 (n=252)
2013, Overall	24.04 (n=226)	25.64 (n=205)	28.85 (n=219)

However, the student test results bring up a crucial point that goes beyond the original research questions of the study, that is: What role does teacher expertise (in use of the instructional strategies) play in student gains in reading comprehension? This question arises because our prior results showed that students in the intervention in 2011 (with teachers beginning to learn QtA) and comparison students in the same year (with teachers who were not learning QtA) had similar gains with no significant difference for the intervention students. This result suggested an effect for instruction in general, rather than an impact for use of QtA (Silver, Png, Kogut & Huynh, 2014). However, the earlier results also showed that teachers in the first year of the study (2011) had had little opportunity to master the new instructional strategy, much less implement it regularly. In their second year of the intervention (2012) the first group of teachers (Generation 1) had more opportunity to implement the strategy (more frequency); evidence from classroom observations also revealed that they improved in their ability to implement the strategy (greater competence). However, as explained in the introduction to this report, even at that point – after two years in the project – the teachers were only beginning to develop confidence in their ability to use

---

QtA effectively and, as discussed below, the strategies were still not used with great frequency as the teachers were expected to make use of the national curriculum and its accompanying instructional strategies throughout the year.<sup>13</sup> (See, also Silver & Png, 2016.)

In the *RDRC-Sustainability* study, our observations of the teachers in 2013 showed some differences between Generation 1, 2, and 3, with Generation 1 teachers using QtA type queries and discussion moves more frequently, integrating them into the lessons more smoothly, and with more confidence in their ability to handle the type of spontaneous responses required by reading discussion. While there was variation across individual teachers, we found that all Generation 1 teachers who continued for three years showed overall greater facility with the strategy year by year; and that Generation 2 teachers showed improvement in their second year (2013) as compared with their first year (2012). This led to the question of possible impact of teacher expertise.

### **Teacher Expertise**

For our purposes, we consider teacher expertise to be expertise with the strategies introduced in this series of studies, as developed year by year. Thus, Generation 1 teachers in their first year (2011) would be considered as novices, as would Generation 2 teachers in 2012 and Generation 3 teachers in 2013 – the first year of the study for each generation. Teachers would gain expertise year by year so that in 2013 – the final year – the Generation 1 teachers would be considered to have expertise. Not surprisingly, findings from the earlier *CRC* study found no significant difference for intervention and comparison students in 2011, though all students improved over time (from Test 1 to Test 3 in that year). A summary of the statistical analysis is presented in Appendix G.

As 2011 was the only year with a comparison group (students at the same grade levels who were not in the intervention but who took all three tests), we could not make the same sorts of comparisons in subsequent years.<sup>14</sup> However, as one measure of the possible

---

impact of teacher expertise, we compared all students of Generation 1 teachers in 2013, whether those students had been in the intervention for one or more years, with the comparison students of 2011. Again, there was a significant difference for time (i.e. learning throughout the year for all students), but no statistically significant difference for student in the intervention.

A final analysis examined the results of students who had been in the intervention all three years (2011, 2012 and 2013) and who were with Generation 1 teachers in 2013 (teachers who had three years of experience in the intervention). These students (grade levels P4, P5, P6) were compared with students of Generation 1 teachers in 2011 (i.e., one year of intervention for both teachers and students) (grade levels P3, P4, P5). In this case, a statistically significant difference for students in the intervention was found (Figure 2). Based on teacher reports that students learned to participate more in discussions over time (see Png, 2016) and prior research done in the US with students at different grade levels, reading abilities and of different economic status which also showed greater student engagement as students learned to 'question the author' (e.g. Beck, et al 2006; Beck & McKeown, 2002; McKeown, Beck & Worthy, 1993) we suggest that student longevity also had an impact. Specifically, this result suggests that the intervention might have an impact on student learning (as evidenced by the reading comprehension tests), but only after the teachers had had a chance to develop expertise in using the strategy (teacher expertise) and students had had sufficient time to engage in the lessons (student longevity). It must be noted that a variety of other student factors could not be controlled (e.g. overall achievement, age, interest in reading) due to the study design and the emphasis on teacher professional development. Any of these factors, or a combination of these factors, could have had an impact on the results. Though the comparison has limitations, it does suggest several implications for policy makers and schools.

## Implications for Policy Makers

The results show success for the intervention as measured by teachers' ability to learn to use the strategies, to integrate them into their teaching even when full lessons are not intentionally planned for QtA, and to incorporate useful parts of the strategies across the curriculum. The results also show success for student learning in terms of student participation. In addition initial results (from the prior study) showed that the strategies could be integrated into lessons (to enhance participation and discussion) without jeopardizing student learning (as measured by reading comprehension tests). However, we feel the more important results are those related to learning over time, as both teacher and student learning developed.

	TeacherExpertise	N	Mean	Std. Deviation	Std. Error Mean
ZT1TotalScore Zscore (T1TotalScore)	1.00 Gen 1 - 1 Year	212	-.1198656	1.05625706	.07254403
	3.00 Gen 1 - 3 Years	30	.2678161	.49839921	.09099483
ZT2TotalScore Zscore (T2TotalScore)	1.00 Gen 1 - 1 Year	204	.0091819	1.04055814	.07285364
	3.00 Gen 1 - 3 Years	27	.3859955	.44144774	.08495666
ZT3TotalScore Zscore (T3TotalScore)	1.00 Gen 1 - 1 Year	191	-.1119844	1.03882917	.07516704
	3.00 Gen 1 - 3 Years	23	.2841898	.79760325	.16631177

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ZT1TotalScore Zscore (T1TotalScore)	Equal variances assumed	20.217	.000	-1.977	240	.049	-.38768167	.19612347	-.77402483	-.00133851
	Equal variances not assumed			-3.331	73.498	.001	-.38768167	.11637309	-.61958644	-.15577690
ZT2TotalScore Zscore (T2TotalScore)	Equal variances assumed	22.513	.000	-1.857	229	.065	-.37681355	.20293383	-.77666976	.02304265
	Equal variances not assumed			-3.367	73.228	.001	-.37681355	.11191643	-.59985099	-.15377612
ZT3TotalScore Zscore (T3TotalScore)	Equal variances assumed	3.490	.063	-1.766	212	.079	-.39617425	.22434552	-.83840795	.04605946
	Equal variances not assumed			-2.171	31.753	.038	-.39617425	.18250942	-.76804744	-.02430106

Figure 2. Intervention students & teachers with 1 year in the intervention compared with 3 years in the intervention

## The 3:3 Result

Our results clearly suggest that when new instructional strategies are introduced, teachers need time to master the strategies, to feel confident in their use, and to see student learning results. In this case, three years were needed for the teachers to develop mastery and for positive student gains, as measured by formal assessments, to be evident. We refer to this as the “3:3 result” – 3 years for teacher expertise to develop and 3 years of student

longevity (engaging with these teachers in this type of discussion). We believe this serves as a useful reminder that immediate assessments of teacher or student learning may not reveal positive gains which could accrue if given time.

This result is understandable as we cannot expect to see gains in student performance until teachers have had an opportunity to master the new strategies. If teachers are to truly master strategies, they need time to try them out, to refine their use, and to think about how to best integrate them into their overall teaching. For example, in the prior study we initially saw teachers try to follow their planned QtA lessons rigorously. However, both QtA and NfM require reactive responses from teachers which cannot be pre-planned: i.e., spontaneous reacts to student comments and questions. This is a strength of the strategies – that they adapt to immediate evidence of student understanding/misunderstandings – but these strategies require teachers to ‘think on their feet’, adapt on the spot, and feel confident that they can continue to move the lesson forward, else the strategies are likely to be abandoned before they can show potential benefits.

## **IMPACT TO SCHOOLS**

### **Scalability**

An implicit goal in the series of projects was that knowledge and use of the strategies would scale up over time – spreading to other teachers in the school. This was achieved through workshops given at the school each year, to introduce new teachers to the strategies. However, as our results showed the importance of support from the research team and time for mastery to develop, two crucial aspects of scalability emerged: 1) new teachers joined the project year by year to work with the research teams and earlier generations of teachers, and, 2) over time the earlier generations of teachers became more confident in sharing their expertise with other teachers who were interested in learning. This also led to sustainability in teacher professional development in the series of projects.

---

## **Sustainability**

Feedback from teachers in the previous study (*CRC*) and in this one (*RDRC-Sustainability*) suggested that short-term interventions (one year or less) can be problematic because teachers learn the procedures of the new strategies but do not necessarily learn to integrate them into their teaching or develop confidence in their use. In 2014 some of the participating teachers chose to continue working together as part of a professional learning circle, bringing in new teachers (Generation 4). It was only at this point that the earlier generations of teachers felt sufficiently confident and competent to take on a leadership role. It was also at this point that the project became sustainable – as the teachers took on further collaborative training within the school, without relying on the external research team. An interview with the English HOD in 2015, indicated that the teachers continued to use the strategy in their teaching two years after the intervention had ended, and to share it with other teachers in the school (personal communication, Sept, 2015).

## **CONCLUSION**

This is the final project in a series of three which took place over a period of five years (excluding the piloting of materials). The series was initiated in collaboration with the then-Principal of the school who specifically requested that the research team commit to “3-5 years with the school”. This was done based on prior work which had shown short-term gains (for students and teachers) but lack of scalability and sustainability once the research team withdrew. We suggest that the continued support of the teachers and the school was a crucial factor in the success of the series of projects. Final comments from teachers are in Appendix H.

---

## ACKNOWLEDGEMENTS

Our deep appreciation to the participating teachers who shared their time, their thoughts and their expertise with us throughout the years. Our thanks also to the school principal, current and former, who supported the projects. We also thank Galyna Kogut, Thi Canh Dien Huynh and Raslinda Rasidir who worked with us as Research Associates on this project.

Finally our grateful thanks to the Office of Educational Research, National Institute of Education (NIE), Singapore for funding the project. All opinions expressed in this report are our own and do not necessarily represent those of the NIE.

## NOTES

- 
- <sup>1</sup> The sequence of presentation for this research question has been changed for ease in presenting the results. In addition, earlier wording as 'lower ability' has been changed to 'lower achieving'. Otherwise, the content of the question is unchanged.
  - <sup>2</sup> Four teachers did not continue in this final project for various reasons: 1 had left the service; 1 was on long-term family leave; 1 was on maternity leave and 1 was on medical leave. 1 teacher planned to continue and was observed for one lesson, but then had to go on leave and missed other observations. For this reason, her one observation is not included in the data analysis.
  - <sup>3</sup> Exact numbers for the PLC are difficult as the composition of members at meetings varied depending on teacher schedules.
  - <sup>4</sup> See <http://www.academyofsingaporeteachers.moe.gov.sg/professional-growth/professional-learning-communities>
  - <sup>5</sup> These data were used as part of a micro-analysis of the interactional features under SUG7/12 KYH.
  - <sup>6</sup> A copy of the student test are available upon request from the project PI (rita.silver@nie.edu.sg)
  - <sup>7</sup> Quantitative comparisons would not be appropriate because this study used excerpts of lessons for analysis, not full lessons (i.e., the length of the excerpted transcripts varied from lessons to lesson and so quantitative analyses would not be an accurate

---

representation of the data). In addition, the research questions addressed whether or not the strategy was used, not the quantity of use with a given lesson.

- <sup>8</sup> There can be ‘initiating queries’ and ‘follow-up queries’. For the sake of this discussion, these are not reported separately.
- <sup>9</sup> For an explanation of Think Aloud as a reading instruction strategy, see [http://www.readingrockets.org/strategies/think\\_alouds](http://www.readingrockets.org/strategies/think_alouds)
- <sup>10</sup> The planned QtA lessons had detailed lesson plans prepared collaboratively by the teachers. Other reading lessons were usually based on the national curriculum which had designated readings with suggested discussion prompts and lesson activities. Therefore, in general, teachers did not make detailed lesson plans for these ‘non-QtA’ reading lessons.
- <sup>11</sup> Anonymized student name
- <sup>12</sup> For reading with P2, students were often seated on the floor in a designated area so the teacher could sit on a low chair in front of them all could see a an oversized ‘Big Book’ for reading.
- <sup>13</sup> The national curriculum, known as STELLAR, recommends several instructional strategies for fiction and non-fiction reading at upper and lower primary. Information is available at <http://www.stellarliteracy.sg/>
- <sup>14</sup> There were several reasons for this. The primary one was the difficulty of determining which students could be comparison students as they moved up year by year (e.g., from P3 to P4 to P5) and had different teachers. For example, some students might have been in the intervention with one teacher in 2011 but not in 2012 and then in the intervention again in 2013. Others might have been in a class with a participating teacher only in 2012.

---

## REFERENCES

- Anderson, D., & Krathwohl, L., (Eds.) (2000). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Boston: Allyn and Bacon.
- Beck, I. L., & McKeown, M. G. (2002). Questioning the author: Making sense of social studies. *Educational Leadership*, 60(3), 44-47.
- Beck, I. L., McKeown, M. G., Sandora, C., Kucan, L., & Worthy, J. (1996). Questioning the author: A yearlong classroom implementation to engage students with text. *The Elementary School Journal*, 96(4), 385-414.
- Cox, J., Cody, J., Fleming, J. & Miller, M. (2012). Seat assignment contribution to student performance in an information technology classroom. 2012 ASEE Northwest Section Conference. Lowell, MA: University of Massachusetts.
- Foong, P.Y. & Silver R. E. (2016). Scoring student tests in reading comprehension (OER 09-10 RS & OER 40-12 RS). Singapore: National Institute of Education.
- Kim, Y-h., & Silver, R. E. (2016). Provoking reflective thinking in post observation conversations. *Journal of Teacher Education*, 67(3), 203-219.  
doi:10.1177/0022487116637120
- Koneya, M. (1976). Location and interaction in row-and-column seating arrangements. *Environment and Behaviour*, 8(2), 265-282.
- Meeks, M., Knotts, T., James, K., Williams, F., Vassar, J., & Wren, A. (2013). *Education Sciences*, 3, 375-386.
- Parker, T., Hoopes, O., & Eggett, D. (2011). The effect of seat location and movement or permanence on student-initiated participation. *College Teaching*, 59, 79-84.
- Pica, T. (1994). Research on negotiation: What does it reveal about second-language learning conditions, processes, and outcomes? *Language Learning*, 44(3), 493-527.

- Rasidir, R., Foong, P.Y., & Silver, R. E. (2012). *CRC annotation manual. Coding for Questioning the Author (QtA) features: QtA queries and discussion moves (OER 09/10 RS)*. Singapore: Office of Educational Research, National Institute of Education, Singapore. <http://hdl.handle.net/10497/17704>
- Silver, R. E. & Huynh, T. C. D. (2010). *Manual for coding negotiation for meaning in classroom interaction*. Singapore: Centre for Research in Pedagogy and Practice, National Institute of Education, Singapore.
- Silver, R. E. & Png, J. (2012). *Comprehending Reading Comprehension (CRC) teacher interview/reflection: protocols for post observation interviews*. Singapore: National Institute of Education. <http://hdl.handle.net/10497/17119>
- Silver, R. E. & Png, J. (2016). Learning to Lead Reading Comprehension. *RELC Journal*, 47(1), 71-78. Doi: 10.1177/0033688215609217
- Silver, R. E. (2011). *Classroom observation procedures & fieldnote template*. Singapore: National Institute of Education.
- Silver, R. E. (2013). *Protocol for selection of transcript excerpts, 2012. Comprehending Reading Comprehension (OER 9/10 RS)*. Singapore: National Institute of Education, Singapore. <http://hdl.handle.net/10497/17703>
- Silver, R. E., Png, J., Kogut, G. & Huynh, T. C. D. (2010). *Comprehending Reading Comprehension: An intervention in P4 reading. Research Brief 15-005*. Singapore: National Institute of Education. [http://www.nie.edu.sg/docs/default-source/Research-Brief-Series/nie\\_research\\_brief\\_15\\_005-pdf.pdf?sfvrsn=0](http://www.nie.edu.sg/docs/default-source/Research-Brief-Series/nie_research_brief_15_005-pdf.pdf?sfvrsn=0)
- Silver, R. E., Png, J., Kogut, G. & Huynh, T. C. D. (2014). *Comprehending Reading Comprehension: an intervention in P4 reading. Final Report*. Singapore: National Institute of Education, Singapore.

Silver, R. E., Png, J., Rasidir, R., Foong, P. Y., Huynh, T. C. D., Kogut, G. (2009). *The impact of negotiation of meaning on reading comprehension among Singapore primary students. Final Report*. Singapore: National institute of Education.

Wong Y. L. R (2007). Reading is usually a passage followed by a set of questions for the kids: Primary 3 reading lessons in Singapore. In V. Vaish, S.Gopinathan, and Y. Liu (Eds.) *Language, Capital, Culture: Critical Studies of Language in Education in Singapore*. Rotterdam: Sense Publishers, 103–16.

Van den Branden, K. (2000). Does negotiation of meaning promotes reading comprehension? A study of multilingual primary school classes. *Reading Research Quarterly*, 35(3), 426-443.

## Appendix A: Student Participant Details

The number of student participants in the earlier CRC study (2011 and 2012) and in the current study (2013) are shown in Table 1. There were both intervention and comparison groups in 2011; there were no comparison groups in 2012 and 2013 (Table 2). Age levels for participating students were approximately: P2 – age 8; P3 – age 9, P4 – age 10, P5 – age 11; P6 – age 12.

Table 1. No of participating students by year

Year	Number of student participants
2011	472
2012	287
2013	307
Total	1066

Table 2. Grade of participating students by year of participation

	P2	P3	P4	P5	P6
2011	0	145 72 (I); 73(C)	162 82 (I); 80 (C)	165 82 (I); 83(C)	0
2012	0	91	91	105	0
2013	29*	0	80	119	79

(I) = intervention group  
 (C) = comparison group

### Comparisons:

To gather some information on possible impact on student progress, student scores on the reading comprehension test designed for the study were used (see below for a summary explanation of the test). As there was no comparison group in 2013, comparisons were made between improvement in test scores during the year in 2013 (intervention group) with improvement in test scores during the year in 2011 (comparison group). Students in P2 were not used for comparisons of student learning as this was a small group of students (N=29) and the teacher was involved for only part of the year due to an approved leave-of-absence. As a result, numbers for comparison were not large (comparison students = 236; intervention students = 278) and involved students at different grade levels/ ages (P3, P4, P5 for the intervention students; P4, P5, P6 for the comparison students).

### Summary of reading comprehension assessment:

As part of the study, we also tracked student learning via a reading comprehension test given 3 times each year: beginning, middle and end. The test was designed by the team, following the standard test type used in the school with additional questions following the model of the 'queries' used as part of the teaching strategies teachers adopted in the intervention. Each test was made up of 3 passages; each passage had 8 questions worth 0, 1, or 2 marks each. Total possible score 24. The passages in the test were checked for 'readability' (appropriate grade level) for each student grade.

The same test was given each time (beginning, middle, end) and each year, e.g., P5 students had the P5 test 3 times during the year they were in P5. When those students moved to P6, they had the P6 test 3 times. Therefore, evaluation of student learning from year to year was based on reading passages which were increasingly difficult, but deemed appropriate for the grade level.

## Appendix B. Teacher Background Survey

Dear Teachers,

Thank you for agreeing to participate in our study! We would like to ask you to answer the following questions so we know a little more about you. Many thanks!

### Contact Information

Name:

---

How shall we address you?

---

MOE email:

---

Preferred email (if different than MOE email):

---

Mobile phone:

---

*Please answer the following questions about your teaching/training background:*

Highest educational qualification achieved \_\_\_\_\_

What was your specialisation or 'AS' (e.g., English, PE, Maths)

---

Years of teaching experience \_\_\_\_\_ Years of teaching experience at this school \_\_\_\_\_

Subjects you are currently teaching

Grade levels currently teaching

Subjects you are currently teaching	Grade levels currently teaching

In the past three years, have you had additional professional development for teaching reading comprehension?                      Yes    No

If yes, what training did you receive? Who offered the training?

---

Have you been involved in any school-based projects on reading comprehension (e.g., TLLM Ignite, PLC, AR)?                      Yes    No

Project Number: OER 40/12 RS  
Name of PI: Rita Elaine Silver

Project Closure Report

2015

If yes, what did the project involve?

---

---

---

*Currently for your EL classes what is the*

Textbook used

---

If no textbook is used for EL, what are the main resources?

---

What supplementary books are used for EL?

---

*Please answer the following questions about your own language use:*

Language(s) most commonly used at home (list in order of most commonly used to least commonly used)

---

Language(s) most commonly used at work with the colleagues (list in order of most commonly used to least commonly used)

---

Language(s) most commonly used with the students outside class (list in order of most commonly used to least commonly used)

---

---

*Please answer the following questions about your own reading habits:*

How many hours do you read for

	Day	Week	Month	N/A
Work or professional reasons (excluding any current coursework)				
Current coursework				
Pleasure				

---

## Appendix C. Questionnaire of Teacher Views on Reading Comprehension Instruction

In your opinion,

1. What is the role of the author in facilitating comprehension by readers?
2. What is the role of the reader in understanding a written passage?
3. What is the role of the teacher in reading instruction?
4. What is the role of the learner in reading instruction?
5. Is there a difference between 'reading instruction' and 'reading comprehension instruction'? If yes, what ways are they different?
6. What is the best way to help primary school children improve in reading comprehension (i.e., what can the teacher do to help children improve)?
7. What should children do to improve their own reading comprehension?

Complete this sentence: "Reading comprehension" means ...

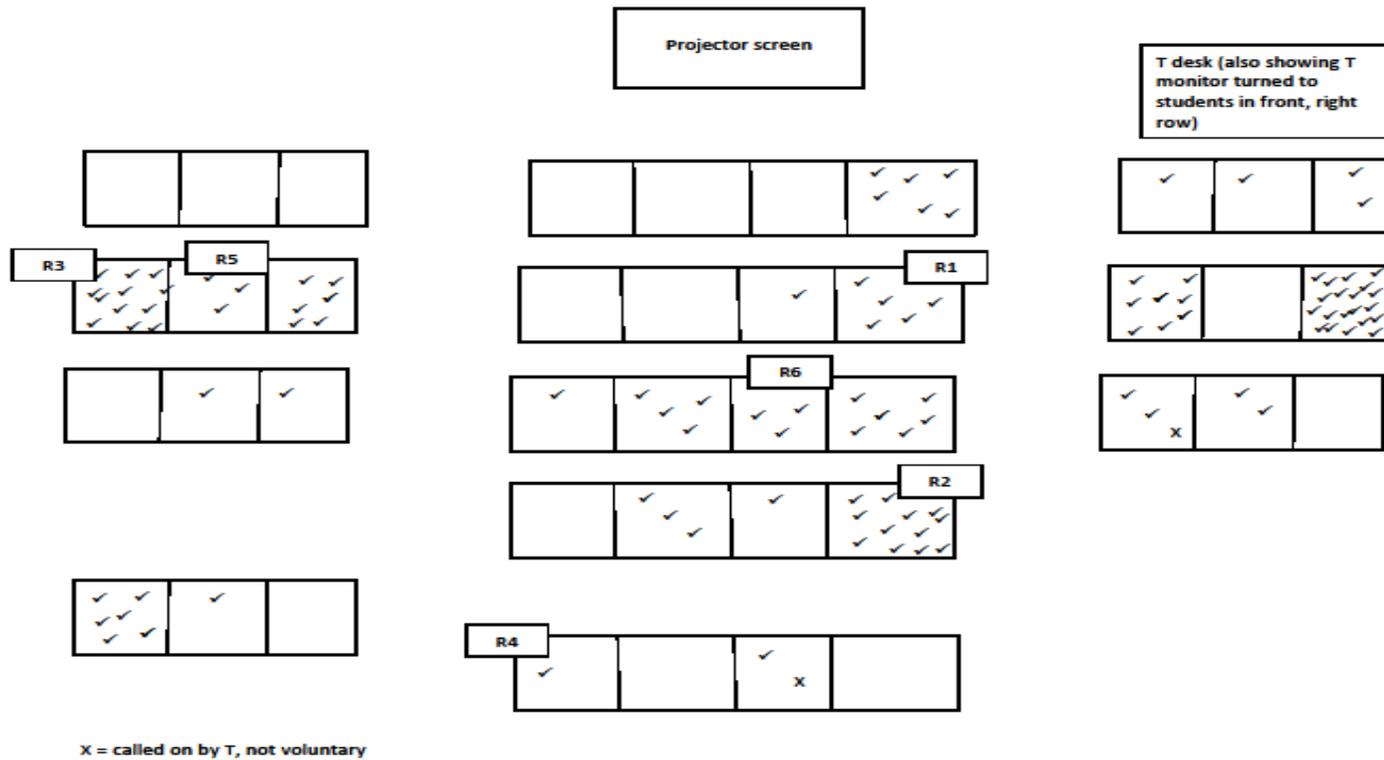
---

---

---

---

### Appendix D. Observational Seating Chart Example



---

## Appendix E. Teacher Written Reflection Prompts

### Teacher Reflection 1, July 2013

- 1a) What have I learned so far from my participation in this project?
- 1b) What are the specific activities which we have done together and which have helped me learn in this project?
- 1c) Why have those activities been useful?
- 2a) How are the principles and practices (activities, techniques, materials, etc.) that I am learning different from what I usually do in my classroom?
- 2b) How might those differences influence my ability to carry out the new techniques I am learning in this project?
- 3) What do I hope to gain from this project in the next three months?

### Teacher Reflection 2, November 2013

- 1 What have I learned so far from my participation in this project?
- 2 In what way(s) are my teaching principles and practices
  - a) different from when I started this project (changed)?
  - b) the same as when I started this project (i.e., unchanged)?
  - c) Why?
- 3 At this point, in what way(s) do I think QtA is
  - a) useful for teaching my students?
  - b) not useful for teaching my students?
- 4 What does 'negotiation for meaning' mean to me? How does it relate to what I have been doing this year on reading comprehension?
- 5 Has participation in this project changed my way of teaching in lessons other than the ones with the prepared lesson plans? Why or why not?
- 6 How/where would I like to go on from here (concerning the work I have been doing with this project)?

---

## Appendix F. Coding for QtA and NfM

### Types of queries

There are two types of Queries: Initiating queries and Follow-up queries.

1. **Initiating queries** launch discussion and awaken students to the notion that an author is putting forth ideas.
2. **Follow-up queries** keep discussion moving along the most productive lines and help students elaborate and integrate ideas.

### Types of discussion moves

Distinct from Queries, Discussion Moves are “actions that teachers take to help orchestrate students’ participation and the development of ideas” (Beck & McKeown, 2006, p.92). There are six types of Discussion Moves. We code for the following types:

1. Marking: responding to students’ comments in a way that draws attention to certain ideas and signaling that an idea is of particular importance to the discussion.
2. Turning back
  - (a) to text: when a student has clearly misread or misinterpreted something in the text and needs to be re-directed towards something in the text.
  - (b) to students: to support students’ building on what they say in service of developing a coherent representation of the text.
3. Revoicing: interpreting what students are struggling to express and rephrasing the ideas so that they can become part of the discussion.
4. Recapping: summarising major ideas that students have developed so far, when they have grasped the essential meaning and are ready to move on in the text.
5. Modeling: “making public” some of the processes in which experts or mature thinkers engage.
6. Annotating: providing information to fill in gaps during a discussion

From Rasidir, Foong, & Silver (2012)

## Appendix G. Summary of statistical analyses from the CRC study:

### Student test results

#### 1. All Students in 2011 only – Comparison and Intervention

Students in Intervention or Comparison Groups

	Value Label	N
Group Interv or Compar	1 Intervention	178
	2 Comparison	187

Descriptive Statistics

	Group Interv or Compar	Mean	Std. Deviation	N
ZT1TotalScore Zscore(T1TotalScore)	1 Intervention	-.0743985	1.04709271	178
	2 Comparison	.1007997	1.09427494	187
	Total	.0153606	1.07364267	365
ZT2TotalScore Zscore(T2TotalScore)	1 Intervention	.0527789	1.01693726	178
	2 Comparison	.0832607	1.05707907	187
	Total	.0683956	1.03638571	365
ZT3TotalScore Zscore(T3TotalScore)	1 Intervention	-.1071279	1.04020952	178
	2 Comparison	-.0095994	1.01663220	187
	Total	-.0571612	1.02794257	365

A Repeated measures test was performed to analyse if there were any differences in the test scores of the participating students over time and if their group membership (intervention or comparison group) had a significant impact overall.

The results suggest no interaction effects (group\*time), but test score performance did improve significantly over time, as below.

**Multivariate Tests<sup>a</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>c</sup>
time	Pillai's Trace	.038	7.096 <sup>b</sup>	2.000	362.000	.001	.038	14.192	.929
	Wilks' Lambda	.962	7.096 <sup>b</sup>	2.000	362.000	.001	.038	14.192	.929
	Hotelling's Trace	.039	7.096 <sup>b</sup>	2.000	362.000	.001	.038	14.192	.929
	Roy's Largest Root	.039	7.096 <sup>b</sup>	2.000	362.000	.001	.038	14.192	.929
time * Group	Pillai's Trace	.012	2.255 <sup>b</sup>	2.000	362.000	.106	.012	4.509	.458
	Wilks' Lambda	.988	2.255 <sup>b</sup>	2.000	362.000	.106	.012	4.509	.458
	Hotelling's Trace	.012	2.255 <sup>b</sup>	2.000	362.000	.106	.012	4.509	.458
	Roy's Largest Root	.012	2.255 <sup>b</sup>	2.000	362.000	.106	.012	4.509	.458

- a. Design: Intercept + Group  
 Within Subjects Design: time  
 b. Exact statistic  
 c. Computed using alpha = .05

## 2. Students with Generation 1 teachers in 2013 compared with the students in the comparison group (2011).

	Value Label	N
Group Interv or Compar	1	49
	2	187

**Multivariate Tests<sup>a</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>c</sup>
time	Pillai's Trace	.024	2.916 <sup>b</sup>	2.000	233.000	.056	.024	5.831	.565
	Wilks' Lambda	.976	2.916 <sup>b</sup>	2.000	233.000	.056	.024	5.831	.565
	Hotelling's Trace	.025	2.916 <sup>b</sup>	2.000	233.000	.056	.024	5.831	.565
	Roy's Largest Root	.025	2.916 <sup>b</sup>	2.000	233.000	.056	.024	5.831	.565
time * Group	Pillai's Trace	.016	1.862 <sup>b</sup>	2.000	233.000	.158	.016	3.724	.386
	Wilks' Lambda	.984	1.862 <sup>b</sup>	2.000	233.000	.158	.016	3.724	.386
	Hotelling's Trace	.016	1.862 <sup>b</sup>	2.000	233.000	.158	.016	3.724	.386
	Roy's Largest Root	.016	1.862 <sup>b</sup>	2.000	233.000	.158	.016	3.724	.386

- a. Design: Intercept + Group  
 Within Subjects Design: time  
 b. Exact statistic  
 c. Computed using alpha = .05

Again there is a statistically significant results for time but not for time\*group, suggesting no significant impact for students of Generation 1 teachers in 2013 as compared with the comparison students of 2011.

---

## Appendix H: Final Comments from Teachers

In their final questionnaire done, in answer to the question “What have I learned from my participation in this project?” all teachers responded with specific ways in which they felt their teaching had improved:

- *My QTA sessions with the pupils were enjoyable and satisfying and it made me want to carry out more QTA sessions with them. The pupils were enthusiastic and responsive. In essence, QTA made my pupils think and invoking critical thinking is one of the key skills that should be harnessed in children at this age.*
- *The techniques for QtA to better engage my pupils in understanding comprehension passages. It also taught me to give opportunities and trained my patience in waiting for the pupils to volunteer/give their response when reading comprehension passages.*
- *I learnt to pause and give longer wait time, probe deeper as my students might have other reasons why they volunteered a particular answer, let go of the urge/ for need teacher-led lessons/ discussions to a more student-centric lesson.*
- *I also saw the benefits of which lessons, where we 'test' out our lessons so that we can spot the areas that we were lacking in ( questioning, prompts, chunking, etc.)*
- *PLC helps to enhance our subject knowledge and pedagogy as we take time to think more deeply about the lesson and its implications on student learning. We should consider the ways in which we, as teachers, can handle classroom interaction during a reading comprehension lesson, to move pupils towards understanding the passage while reading.*
- *I have learned is that trs much know how to ask good questions. They promote thinking and trigger students' schema. Finally, to me it's really not about how many passages we do with the students but how much they have understood of what they had read.*
- *This project has also taught me how to probe deeper into the passage and to question the author in the process of doing so. I learnt that having a set of pre-empt questions is beneficial to the teaching of my lesson and to expect the most unexpected answers from pupils at times.*