
Title	Comprehending reading comprehension: An intervention in P4 reading
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This study was funded by Singapore Ministry of Education (MOE) under the Education Research Funding Programme (OER 09/10 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.

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EDUCATION RESEARCH FUNDING PROGRAMME

FINAL WRITTEN REPORT



**Comprehending Reading Comprehension: an Intervention
in P4 Reading**

By

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July 2014

EXECUTIVE SUMMARY (NO MORE THAN 5 PAGES)

Purpose / Research Question

The purpose of this project was to follow-up on a prior project¹ which investigated the use of Questioning-the-Author (QtA) (e.g. Beck & McKeown, 2002; Beck, McKeown, Sandora, Kucan, & Worthy, 1996) with negotiation for meaning (NfM) (e.g. Pica, 1994) in Singapore Primary 4 (P4) reading lessons (OER 29/08 RS). A 2-year collaborative project was undertaken to assist teachers in understanding and using QtA and negotiated discussions. The intervention also intended to lead to sustainable, school-based teacher development through introducing different 'generations' of teachers to join the project year-by-year and by encouraging the first generation (Gen 1) of teachers to act as mentors and leaders to the second generation (Gen 2).

Research Questions

1. How do teachers understand reading comprehension in the local, P4² school setting (i.e. what do teachers understand reading comprehension to be and how do they understand the development of student reading comprehension)?
2. In what ways do teacher understandings of reading comprehension change through participation in a long-term (3 year) professional development project? Specifically, in what ways do teacher understandings change at different points of time (1 year, 2 years, 3 years) and when engaged in different roles (trainee, trainer, observer, evaluator)?
3. How successful are the different stages of the intervention (Direct Instruction, Reflection & Adaptation, Lesson Study) in changing teacher classroom practices for reading comprehension?

Background

Prior research by the CRPP's Core 1 research program (Hogan, 2009a) has indicated that complex knowledge construction in Singapore classrooms is relatively weak with little opportunity for critique, comparison, interpretation and application. Teacher talk tends to dominate classroom interactions with limited extended production (oral or written) from students. In addition, results from OER 29/08 RS revealed that QtA is a strategy that is relatively unknown among primary English language teachers in Singapore but which can be integrated effectively into classroom teaching. Classroom observations and teacher interviews revealed that classroom teachers consistently use highly structured and teacher-centered strategies for teaching reading comprehension, strategies which might be effective for test preparation but which do little to keep students engaged or to encourage critical thinking (Silver, et al. 2009). In contrast, QtA actively encourages critical thinking along with reading comprehension while opening up classroom interaction to include NfM.

Participants

The participants were two 'generations' of teachers in a Singaporean neighbourhood school at the primary level. In the first year (2011) interested teachers were teaching at grades 3, 4,

¹ The impact of negotiation for meaning on reading comprehension among Singapore primary students (OER 29/08 RS). See <http://www.nie.edu.sg/research-projects/impact-negotiation-meaning-on-reading-comprehension-among-singapore-primary-students>

² As with the title, the original research questions refers to 'P4'. However, data were collected from grades 3-5 and findings refer to all three grades.

and 5 – two teachers at each grade level. In 2012, nine teachers participated, three at each grade level. Of these nine, four were teachers joining the project (Gen 2) and five were teachers continuing from the first year (Gen 1).

Research Methodology / Design

The intervention included three stages with two ‘generations’ of teachers: Direct Instruction, Reflection & Adaptation, Lesson Study. During these stages, the teachers worked collaboratively with the research team and with each other to critique and plan lessons, teach the planned lessons and receive feedback, and engage in post-observation reflective interviews. Teachers also completed two written reflections each year, focussed on their teaching, and one questionnaire each year to provide background information and comments on the intervention itself. Student tests were conducted three times each year: beginning, middle and end.

Analyses included investigation of teacher implementation of the strategies taught (QtA and NfM), evidence of teacher understanding of the strategies and of reading comprehension in general (using a neo-Bloomian taxonomy proposed by Anderson and Krathwohl (2001), and evidence of ‘teacher concerns’ (which emerged out of the analysis of teacher understanding. Student tests were scored to how evidence of change, if any, in reading comprehension.

Findings / Results

With reference to Research Question 1:

Changes in teachers’ beliefs about and understandings of reading comprehension can be important for their pedagogical practices and possible changes in those practices (e.g. Fang, 1996; Paris, Wasik and Turner, 1991). Findings from this project show that initially teachers understood reading comprehension to be based on discrete skills such as ‘scanning’ and ‘getting the main idea’. They also mentioned exam preparation. Development of student reading entailed instruction toward specific skills and exam preparation. After the intervention teachers had a broader view of reading comprehension to include ‘interpretation’ and ‘understanding of author intent’.

With reference to Research Question 2:

As above, teacher understandings did change during the intervention. However the exact periods of changes in teacher beliefs cannot be determined. Instead, analysis of teacher practices showed uptake of the features of QtA (especially initiating queries and discussion moves) at all stages of the intervention. Uptake of negotiation was also found at all stages of the intervention; however, it tended to lag behind uptake of QtA and seemed to be influenced by additional DI related to negotiation as a pedagogical strategy. Analysis of Teacher Understanding and Teacher Concern also showed that teachers’ understandings changed throughout the intervention. Examination of the results for Gen 1 and Gen 2 do not indicate particular influence of a specific stage (see Figures 1-4). Rather they suggest changes over the long term as teachers continued to work with the strategies, the research team and each other.

With reference to Research Question 3:

Findings from the study suggest that all stages of the intervention were successful in that teacher uptake of the strategies increased and the strategies were used with increasing mastery. In addition, as above, teacher understanding and the types of teacher concerns expressed showed increasing understanding of the strategies and how they might be used in the local context over the course of the study. The findings do not suggest that a particular stage was more beneficial than others. Instead, teacher comments on the study suggest that each of the stages had their own merit and participation in the different stages was

beneficial. For example, when Gen 2 teachers began their participation (Jan 2012), the research team suggested that Gen 1 move into mentoring/leadership. However, the Gen 1 teachers strongly recommended that the research team initiate the project for Gen 2 teachers with DI – repeating some of what had been done with Gen 1. Later Gen 2 teachers stated that the DI was helpful. Similarly the teachers commented that the reflections (R&A stage) helped them to see things in their lessons that they would not have seen otherwise and that working together with colleagues in the lesson study was helpful for sharing ideas and building up their confidence.

Implications to Policy Makers and Impact to Schools

Classroom interaction is the heart of educational quality, and changes in classroom interaction rely on the development of people, not programmes. There is substantial evidence that the way teachers talk to and with students impacts learning (eg., Hattie, 2009; Mercer & Hodgkinson, 2008; Nystrand, 2006; Soter, et al, 2008; Van den Branden, 2000). This study shows that the way teachers interact with students can be changed, but these changes take time. Professional development to foster changes in classroom discourse and teacher-student interaction requires a substantial commitment from teachers and mentors, over a number of years. Therefore, interventions which are serious about changing classroom discourse patterns must be given years to develop with strongly supportive professional communities.

This leads to a second implication – that intensive interventions of this type may be difficult to implement on a large-scale at multiple sites. However, it is possible that some aspects of the intervention can be ‘work shopped’ for incremental professional development. For example, the teachers’ comments that they found the DI stage – with reading of research articles, discussion and demonstration – to be useful suggests this could be taken up as shorter term intervention. However, without mentoring (through PLCs or with external mentors) and a longer-term commitment, it seems likely that ideas introduced in workshops will not be sustained over the long term.

Conclusion

Our primary conclusion is that the intervention has been highly successful in terms of teacher uptake and mastery over the strategies introduced. In addition, the project showed an almost organic growth in terms of the development of individual teachers and ‘scale up’ over time. We find it to be quite telling that at the end of two years the school, the EL HOD and the participating teachers were keen to continue to work on the strategies and to share their knowledge with other teachers. This suggests that key features of the intervention can be sustained unlike short-term interventions which might have initial uptake but lack of maintenance or further development. It seems likely that the flexible, collaborative nature of the intervention was important for maintaining the project throughout the 2-year time period.

Keywords

Classroom interaction, reading comprehension, teacher professional development

COMPREHENDING READING COMPREHENSION:
AN INTERVENTION IN P4 READING³

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INTRODUCTION

The purpose of this project was to follow-up on a prior project⁴ which investigated the use of Questioning-the-Author (QtA) (e.g. Beck & McKeown, 2002; Beck, McKeown, Sandora, Kucan, & Worthy, 1996) with negotiation for meaning (NfM) (e.g. Pica, 1994) in Singapore Primary 4 (P4) reading lessons (OER 29/08 RS). Results from that study revealed that QtA is a strategy that is relatively unknown among primary English language teachers in Singapore but which can be integrated effectively into classroom teaching at P4 level. Classroom observations and teacher interviews revealed that classroom teachers consistently use highly structured and teacher-centered strategies for teaching reading comprehension, strategies which might be effective for test preparation but which do little to keep students engaged or to encourage critical thinking (Silver, et al. 2009). In contrast, QtA actively encourages critical thinking along with reading comprehension while opening up classroom interaction to include NfM. Observations of the experimental treatment in the prior study showed that lessons planned with QtA and opportunities for NfM could encourage more open-ended, meaning-based discussion. Because QtA offers readers opportunities to

³ Although the title refers to 'P4' (primary grade 4), due to grade levels of the volunteer teachers who participated in the study, the grade levels were actually P3, P4 and P5. For details, see the Methodology section of this report.

⁴ The impact of negotiation for meaning on reading comprehension among Singapore primary students (OER 29/08 RS). See <http://www.nie.edu.sg/research-projects/impact-negotiation-meaning-on-reading-comprehension-among-singapore-primary-students>

think about texts in ways that are different from the dominant reading instruction model, teachers and administrators at the school – along with the research team – agreed that bringing QtA into the expanded teacher repertoire of classroom teachers was worthwhile as part of the teachers’ professional development. Therefore, a 2-year collaborative project was undertaken. Specifically, the intervention assisted classroom teachers in understanding and using QtA and negotiated discussions. The intervention also intended to lead to sustainable, school-based teacher development through introducing different ‘generations’ of teachers to join the project year-by-year and by encouraging the first generation (Gen 1) of teachers to act as mentors and leaders to the second generation (Gen 2).

RESEARCH BACKGROUND

School-based professional development through teacher reflection, action research (especially through Ministry of Education sponsored ‘TLLM Ignite’), ‘professional learning communities’ (as conceptualized in individual Singapore schools), and lesson study is a continuing focus of the Singapore Ministry of Education (MOE). This project took advantage of the current policy climate which encourages schools to engage in school-based innovation and curriculum development. The research team worked collaboratively with English language teachers and the English Head of Department to develop teacher expertise in leading discussions targeted at improving reading comprehension.

Prior research by the CRPP’s Core 1 research program (Hogan, 2009a) has indicated that complex knowledge construction is relatively weak with little opportunity for critique, comparison, interpretation and application. Teacher talk tends to dominate classroom interactions with limited extended production (oral or written) from students. In addition, teachers are overwhelmingly the source of authoritative knowledge, with little opportunity for students to question or contribute to that knowledge. There is little opportunity for students to engage in extended, meaningful interactions in oral communication or around

written texts. The current study addresses this issue by encouraging teachers to adopt a more thoughtful, questioning approach to reading instruction, integrated with oral interaction that encourages NfM. The research literature on reading comprehension strategies and on NfM is extensive. The brief review, below, highlights only those points which are most relevant to this project.

Negotiating for Meaning

The term 'negotiation for meaning' can be defined as the process in which interlocutors modify and restructure their conversational input in order to overcome difficulty in message comprehensibility (Pica, 1994). This occurs in non-understanding routines which Gass and Varonis define as "those exchanges in which there is some overt indication that understanding between participants has not been complete" (1985: 151). NfM strategies might include rewording, repeating, elaborating, segmenting, clarification requests, confirmation checks, and comprehension checks.

A number of studies have shown that NfM can be beneficial for second language learners in the areas of morpho-syntax (Mackey, 1999; Mackey & Silver, 2005; Silver 2000). It may also be useful for comprehension in oral interactions (Chaudron, 1983; Long, 1985; Pica, Young & Doughty, 1987) and for vocabulary comprehension (Ellis, Tanaka, & Yamazaki, 1994; Loschky, 1994). Most relevant for this project, NfM has also been found to be beneficial for reading comprehension. Van den Branden (2000) found that students who engaged in NfM had greater overall reading comprehension as compared with those who had unmodified or premodified input. He also found that this was true for both native and non-native speakers and the effect was strongest in whole-class teacher fronted negotiations (as compared with peer negotiations).

Thus NfM can be beneficial for language learners and readers and can be used effectively in teacher-fronted interactions. However, the tightly structured, teacher dominated

discourse that is currently found in Singapore classrooms rarely allows for NfM (Silver, 2007a, 2007b).

Reading Comprehension

Reading “involves both reconstructing an author’s message and constructing one’s own meaning using the print on the page” (Hayes, 1991, p. 7). According to Harvey and Goudvis (2000), constructing meaning refers to “building knowledge and promoting understanding” (p. 9). In other words, when students read a text they should “enhance their understanding”, “acquire and use their knowledge”, “monitor their understanding” and “develop insight” (Harvey & Goudvis, 2000: 8). However, observations at the target school showed that teachers rarely encouraged students to monitor their understanding or develop insights. Teacher comments did encourage students to use their prior knowledge related to the reading topic but understanding was enhanced only to the extent of answering the pre-set reading comprehension questions – if at all. The dominant (though not only) teaching strategy was for the teacher to guide students through the text page by page, providing explanations; to direct students to read the reading comprehension questions; and look for specific information to answer the reading comprehension questions and then to write responses. Classroom discussion was limited, student questions were almost non-existent, and providing accurate answers to the reading comprehension questions was the evident purpose (rather than understanding of the passage).

In a workshop at the school (June 2009), teachers agreed that this was their dominant reading strategy and expressed interest in developing expertise in new strategies that would expand their professional horizons as well as strengthening students’ abilities. Questioning the Author (QtA) is an instructional approach to comprehension which involves collaboration and discussion (Gunning, 2014). QtA “teaches students to grapple with ideas while they read, to dig in and make sense of ideas as they initially encounter them in the text” (Beck & McKeown, 2002: 44). Students rely on texts, queries and discussions to

enhance their understanding of text ideas (Beck & McKeown, 2002). Teachers lead discussions which encourage students to explore the text, rather than seeking the correct answer to a worksheet question. Common strategies within QtA are teacher modelling of 'questioning the author' (e.g. Why do you think the author said that? Do you think the author explained that well?), use of think-alouds, and queries that encourage students to negotiate for meaning with the text, the teacher, and each other.

Research on Innovation and Intervention

Failure to successfully implement and sustain curriculum innovations in education has been well documented (Cohen & Ball, 2000; Fullan, 2007). The difficulties faced by participants at all levels of curriculum implementation have highlighted the complex nature of implementation processes (Hargreaves 1994; Marsh, 2007). Recent research has focused attention on the roles played by teachers and leaders in these processes: teachers in professional learning communities (DuFour & Eaker, 1998; Hord, 2004; McLaughlin & Talbert, 2001; Wells & Feun, 2007); teachers and their beliefs (Hargreaves & Goodson, 2006; Keys, 2007; Schraw & Olafson, 2002; Woolfolk-Hoy, Davis, & Pape, 2007); and leadership (Elmore, 2000; Marzano, Waters, & McNulty, 2005; Riley & Louise, 2004).

A variety of models or frameworks have been proposed for helping those interested in innovation to think about educational reform. These include, among others, Fullan's "System of Variables" (2007), Honig's dimensions for 'confronting complexity' (2006), and Cohen and Ball's feature model of 'adopters', 'innovations' and 'environments' (2007). Speaking specifically to literacy teaching with culturally and linguistically diverse students, McNaughton and Lai (2009) have proposed that school change requires that teachers act as adaptive experts (cf. Ball & Cohen, 1999), local evidence informs instructional design, school professional learning communities are part of the reform effort, lead teachers provide effective leadership, and existing approaches are continually fine-tuned. Many, though not all, of the crucial features in these frameworks are the same. Summarizing a large set of prior

research studies, Hogan (2009b) listed 13 features of sustainable innovation including 1) bottom-up participation, 2) in situ professional learning, 3) multi-level capacity building, 4) development of professional learning communities, 5) supportive professional networks, 6) ample pedagogical resources, and 7) multi-year improvement strategies. Desimone contends that, “there is a research consensus on the main features of professional development that have been associate with changes in knowledge, practice, and, to a lesser extent, student achievement” (2009, p. 183). She lists the five critical features as “a) content focus, b) active learning, c) coherence, d) duration, and e) collective participation” (p. 183). She also points out that successful professional development does not necessary rely on specific types of activities (e.g. workshop, written reflection, transcript analysis, collaborative lesson planning) – many different types of PD activities might be used if the critical features are addressed. Through the use of a long-term study with research-teacher-school administrator cooperation, in-school professional collaboration leading to development of a professional learning community, and school-based/content-specific curriculum development, the proposed project Desimone’s “critical features” and the points listed from Hogan’s research summary.

Research Questions

1. How do teachers understand reading comprehension in the local, P4⁵ school setting (i.e. what do teachers understand reading comprehension to be and how do they understand the development of student reading comprehension)?
2. In what ways do teacher understandings of reading comprehension change through participation in a long-term (3 year) professional development project? Specifically, in what ways do teacher understandings change at different points of time (1 year, 2 years, 3 years) and when engaged in different roles (trainee, trainer, observer,

⁵ As with the title, the original research questions refers to ‘P4’ . However, data were collected from grades 3-5 and findings refer to all three grades.

evaluator)?

3. How successful are the different stages of the intervention (Direct Instruction, Reflection & Adaptation, Lesson Study) in changing teacher classroom practices for reading comprehension?

METHODOLOGY

Prior to the intervention, baseline data were collected including a teacher background survey (Appendix A), a questionnaire on teacher views of reading comprehension instruction (Appendix B), and a baseline lesson observation which was audio and video recorded. Subsequently, the teachers were engaged in a two-year intervention. Briefly the intervention included three stages with two 'generations' of teachers. The three stages were designed as follows:

Stage 1 – Direct Instruction⁶ (DI)

- Direct instruction of the reading comprehension strategy (QtA) and of NfM in classroom interaction.
- Researcher-teacher group planning meetings led by the research team
- Classroom observation followed by feedback sessions led by the research team
- Post-observation interview to explore teacher understandings and beliefs and to encourage reflection. (See Appendix C for the interview protocols.)

Stage 2 – Reflection & Adaptation (R&A)

Reflection and adaptation with the research team and teachers working collaboratively and iteratively on

- Lesson planning
- Lesson observation
- Lesson reflection

Stage 3 – Lesson Study (LS)

- Lesson study led by the participating teachers in a collegial partnership with support as needed from the research team
- Peer observations and interview/discussions⁷

⁶ Details on the DI materials are available by request from Rita Elaine Silver, rita.silver@nie.edu.sg

⁷ In a few cases teachers were not able to arrange for a post-observation interview for the final lesson observation. In these cases, the teachers did an individual written reflection.

In addition, teachers completed two individual written reflections each year: part-way through the year and near the end of the year. Similar reflection prompts were used each time (Appendix D).

Participants

The participants were two 'generations' of teachers in a Singaporean neighbourhood school at the primary level. Neighbourhood schools are mixed-gender schools which are wholly funded by the government and typically draw their student body from the surrounding geographic area. The participating school is fairly typical in the sense that it is neither an 'elite' school nor in the lower band as defined by aggregated results in the Primary School Leaving Exam. Since a preliminary study (OER 29/08 RS) was undertaken at primary grade 4 and practice materials were prepared for this grade level, the original plan was to continue at grade 4. However, in the first year (2011) interested teachers were teaching at grades 3, 4, and 5. Therefore, these three grades were included with two classes at each grade level. Teachers planned, taught and reflected on their teaching in relation to the intervention for one class of students. (For example, if a teacher was teaching at grade 4 and grade 5, she would choose to work with either her grade 4 or 5 class for the intervention). In 2012, nine teachers participated, three at each grade level. Of these nine, four were teachers joining the project (Gen 2) and five were teachers continuing from the first year (Gen 1).

The focus of the study was on teacher professional development rather than student outcomes. Therefore, students were involved only to the extent that they participated in the observed lessons and took a reading comprehension test at the beginning, middle and end of the year.

Data Collection

Data in the form of notes, audio and video recordings, copies of materials used and produced were collected at each stage of the project. These included

- notes and audio recordings of all meetings as well as copies of materials produced. Transcripts of meetings were not made. Instead audio recordings were used to flesh out meeting notes and to provide explanations for materials produced as needed.
- notes, audio and video recordings of all lessons as well as copies of all materials used were collected. A simple field note template was used to accompany the audio and video recordings of lessons (Appendix E).

- transcripts of lessons.

Lessons conducted in 2011 were transcribed in full. As continuing full transcription was onerous and unnecessary, based on analysis of transcripts from 2011, lesson excerpts were transcribed in 2012. See Appendix F for transcription protocols and Appendix G for protocols on selecting lesson excerpts for transcription.

The transcripts were used for analysis of the classroom discourse, as described below, but also in the continuing professional development of teachers. Transcript excerpts were used in continuing teacher discussions, lesson feedback sessions and occasionally in post-observation interviews.

- post-observation interviews were audio recorded. In some cases they were also video recorded and screen capture software was used to record where lesson videos were stopped/started during the interview. Teacher interviews included viewing the video of the lesson to allow the teacher to comment as he/she saw fit and the research to ask questions as needed for clarification of any unclear points in the lesson. Appendix C provides the protocols for the post-observation interviews. All interviews were transcribed for analysis.

In addition, teachers completed an initial survey with details on their background (years of teaching, academic qualifications, etc.) and a questionnaire on teacher views of reading comprehension. The questionnaire was given at the beginning and end of each year, including the start of 2013 (to show possible changes from 2011-2012-2013).

Although student outcomes were not the focus of the project, students were given a reading comprehension test at three points, each year (beginning, middle and end of the year). Reading passages were selected for each grade level; the format of the test was the same for all grades: three passages, each passage had 4 standard reading comprehension questions (factual and inferential) following the types of questions typically used in Singapore primary schools and 4 questions following the types of questions typically asked in QtA discussions.⁸ In the first year of the project, tests were given to students of teachers participating in the project (1 class per teacher) and to 1 comparison class (taught by teachers who were not engaged in the project) for each grade level. In the second year of the project, only students of teachers participating in the project were tested.

Initial plans for data collection included copying student worksheets used in the reading lessons, if any. Since teachers did not make use of worksheets during the observed lessons, no worksheets were collected or analysed.

Table 1 summarizes data collected for analysis for 2011 and 2012.

Data Analysis

Because of the focus on teacher understandings and beliefs, as well as teacher practices, analyses relied largely on teachers' written reflections, post-observation interview comments and lesson observations. Student tests were marked, as explained below, but these results were only to ensure that there was no disadvantage to students in the project. In addition, an analysis of time spent on reading (aloud or silent) for lessons in 2011 was undertaken. Teacher interviews and reflections were analysed for evidence of teacher understandings about QtA and NfM through a coding scheme based on Anderson and Krathwohl (2001). This also led to identification of Teacher Concern – an analysis emerging out of the analysis of Teacher Understanding and subsequently undertaken using content

⁸ Copies of the tests are not included as this would preclude use of the same tests for future research. Interested parties can contact rita.silver@nie.edu.sg for further information on the tests used.

analysis (Krippendorff, 2004). Teacher questionnaires were also analysed for changes in teacher views of reading and reading instruction through thematic analysis (Berg, 2012).

QtA and NfM

Classroom observations were analysed for a) following QtA procedures, b) match with QtA principles and goals, and c) examples of NfM.⁹ Lesson transcripts (or transcript excerpts, as above) were used to analyse use of QtA and NfM. Identification of QtA procedures and match with QtA principles and goals was done based on features described in Beck and McKeown (2006) and in Beck, McKeown, Sandora, Kucan, and Worthy (1996). Analysis focused on use of QtA ‘queries’ and ‘discussion moves’ following procedures detailed in Raslinda, Foong and Silver (2012). Identification of NfM and missed opportunities for NfM were analysed following procedures laid out in Silver and Huynh (2009).

As explained in the Silver and Huynh (2009, pp 2-3) “negotiation” is enacted through a sequence of adjacent or nearly adjacent conversational exchanges. These sequences can revolve around negotiation for meaning, negotiation for content, and/or negotiation for form. Negotiation for meaning (NfM) centres on what was said/what was meant; negotiation for content (NFC) focuses on requests for more details/ additional information; and, negotiation for form (NFF) addresses the felicity of linguistic forms. In all three cases, negotiation sequences encourage linguistic modifications within more extended, meaning-based, communicative interactions (cf. Varonis & Gass, 1985).

Training for these two categories had been undertaken as part of an earlier study (OER 29/08 RS). Therefore, for this study, coders revisited the earlier coding and used a subset of data to confirm intercoding agreement with a Cohen’s Kappa of at least .80 for each category. Individual coders proceeded by specialising in specific areas of coding as follows:

⁹ The analysis of negotiation for meaning included analyses of ‘negotiation for content’ and ‘negotiation for form’ as described in the coding manual (Silver & Huynh, 2009).

Coder A: QtA and negotiation for content
Coder B: Negotiation for meaning
Coder C: Negotiation for form

Teacher Understanding and Teacher Concerns

For our purposes, Teacher Understanding means the way teachers understand reading comprehension, QtA, classroom interaction and NfM and the level to which they understand those based on Cognitive and Knowledge Dimensions (Anderson and Krathwohl, 2001). It comprises not only evidence of teachers' understanding of the aforementioned categories but also what they understand about them, how they understand them as well as how deeply they understand them. After discussion on the overall concepts and main coding categories, practice coding sessions and the development of a coding manual (Silver, Kogut, & Huynh, 2014), inter-coder agreement was checked for Teacher Understanding (as the main category relevant to the research questions) with a subset of the data. With a high agreement of at least .80 (Cohen's Kappa) for each category, Coder C conducted the analysis for the remaining material.

The analysis of Teacher Concerns emerged out of the analysis for Teacher Understanding. Looking at teacher comments during DI sessions, teacher planning sessions, teacher feedback sessions and in teacher reflections (written and from post-observation interviews), it was evident that the participating teachers had a number of re-occurring concerns related to what they were learning and understanding in the intervention. Therefore, an analysis was undertaken to identify patterns of teacher concerns and how these patterns changed as the teachers continued with their training and practice. The two RAs working on the Teacher Understanding simultaneously coded for Teacher Concerns during coding training. However, it became clear that coding for both simultaneously had a negative impact on coding efficiency and consistency. Therefore Coder B became the main coder for Teacher Concerns, further developing the coding scheme in collaboration with the project PI using principles of content analysis (Krippendorff, 2004). In particular, the focus

Table 1. *Summary of data collection*

	2011 - Generation 1		2012 - Generation 1		2012 - Generation 2	
Teacher background survey	1 per teacher	beginning of the year	N/A		1 per teacher	beginning of the year
Teacher questionnaire (beliefs about reading comprehension)	1 per teacher	beginning of the year	1 per teacher	beginning of the year	1 per teacher	beginning of the year
Lesson observations	4 per teacher	1 baseline (pre intervention); 1 'reading lesson' (post DI stage but not a planned QtA lesson); 2 intervention lessons	5 per teacher	4 planned QtA lessons and 1 lesson which was not planned as a QtA lesson	4 per teacher	1 baseline (pre intervention); 3 intervention lessons
Written reflections	4 per teacher	end of term 1, term 3, term 4	3 per teacher	end of term 1, term 2, term 3, term 4	4 per teacher	end of term 1, term 2, term 3, term 4
Student tests	3 times per year: beginning, middle, end of the academic year					

was on categories “emerging in the process of a researcher analyzing a text” (p. 19). This included iterative coding, development of categories, confirming and disconfirming in other data examples, and refining categories. Because Teacher Concerns was an emergent category and not necessary for addressing the research questions, definitions and sample coding were agreed through iterative checks of data samples and consensus decisions between Coder B and the project PI with no independent inter-coder agreement check. Details on the coding can be found in Huynh and Silver (2014). Summary information is given here.

Teacher Understanding

Teacher understanding refers to how teachers understand reading comprehension, QtA, classroom interaction and NfM. Analysis was based on Anderson and Krathwohl’s neo-Bloomian taxonomy (2001) which plots understanding on a two-dimensional grid of ‘Cognitive’ and ‘Knowledge’ Dimensions. Each dimension has multiple components. The four components of the Knowledge Dimension are Factual, Conceptual, Procedural and Metacognitive knowledge. The Cognitive Dimension has six components: Remember, Understand, Apply, Analyse, Evaluate and Create.

Each post-observation interview transcript and teacher reflection (written) was analysed for evidence of understanding based on these two dimensions and their components. Since the taxonomy is intended to help teachers assess *student* understanding and the purpose of our project was to examine *teacher* learning and understanding of QtA, NfM and Reading Comprehension, the definitions in Anderson and Krathwohl were adapted to our purposes. For example, one component of the Cognitive Dimension is ‘Apply’. The original taxonomy broke this down into two sub-categories: executing and implementing. In analysing teachers’ comments, we found that distinctions between these sub-categories could not be made reliably but evidence of understanding applications was abundant. Therefore, the definition was modified to cover a broader area as well as referencing it to the

content of teachers' comments. Table 2 provides an example, showing the original definitions from Anderson and Krathwohl (2001) as well as the modified definition used in our analysis for the component 'Apply'.

Table 2. *Definitions for 'Apply' as Evidence of Teacher Understanding (based on Anderson and Krathwohl, 2001)*

Original sub-categories and definitions		Modified definition
Executing	Carrying out a procedure when confronted with a familiar task. Executing, the use of skills and algorithm rather than techniques and method (procedural knowledge). Skills and algorithm (1) consist of a sequence of steps that are generally followed <i>in a fixed order</i> (2) when the steps are performed correctly; the end result is a predetermined answer.	Apply: using or discussing use of relevant knowledge through real or hypothetical applications. This covers carrying out familiar or unfamiliar tasks, activities, strategies. This includes when teachers talk about how they have applied the knowledge, how they want to apply the knowledge, how they might apply the knowledge in their classroom teaching.
Implementing	Selecting a using a procedure to perform an unfamiliar task. Because selection is required, students must possess an understanding of the type of problem encountered as well as the range of procedures that are available.	

Example 1 provides an example of data coding using the component 'Apply'. In this example the teachers are critiquing their own lesson plan in preparation for teaching.¹⁰ At one point they discuss how they will apply the new knowledge gained in the initial workshops (as part of DI). In lines 1 and 3, Abe¹¹ refers to concepts from QtA (discussion of what the author is trying to say and linking ideas through teacher-led discussion) and how they might be applied in the lesson. Thus, these turns, shown in bold, were coded as reflecting teacher understanding > Cognitive Dimension > Apply.

¹⁰ Data from lesson planning and critique sessions were used as part of the process of setting definitions for Teacher Understanding and establishing intercoder agreement. However, as these pre-lesson transcripts do not reflect what teachers did in lessons or their reflections on the lessons and their learning, they are not used as part of the main analysis.

¹¹ All names are pseudonyms chosen on alphabetical principles (1st teacher name starts with A, 2nd teacher name starts with B). They are not intended to reflect the ethnicity or gender of the participants.

Example 1

- 1 Abe **[So what is the author trying to say,] ya, ok. Then we expect them to give this answer ah of course.**
- 2 Bala Hmm...
- 3 Abe **Then how are we going to link, that means the question we should ask is, so why do you think...**

Teacher Concerns

Teacher concerns are divided into 4 broad areas:

Concerns over Students: Teachers express concerns over student abilities as well as behaviors in QtA lessons. It's a description of how students participate in QtA lessons and factors that hinder/help students achieve their comprehension skills while teachers carry out QtA lessons. [what 'they' are doing/learning]

Concerns over Teachers: Mostly expressions that show how teachers feel about themselves when applying QtA strategies, whether they felt at lost and didn't know what to do when first carrying out QtA lessons or how comfortable they became after some practice. [what 'I' am doing/learning]

Concerns over Techniques and Procedures: The area of concern that deals with classroom techniques which teachers might apply in QtA lessons. This includes all concerns over classroom techniques and procedures expressed by teachers during their reading lessons and not limited to QtA techniques. Concerns over techniques and procedures show how teachers handled their reading lessons, what difficulties they encountered and maybe how they overcame these problems. [How it is done]

Concerns over Texts and Materials: Teacher concerns in selecting reading materials (text, passage, story) that fit best with QtA strategies. (we can consider whether this should be expanded to include related 'resources' such as the slides, formatting, projector or whether it is best to keep this category more narrowly focused on the reading materials) [What it is done with/ what is used]

Each of these categories was further divided into sub-categories. For example, 'Concerns over Students' had the following sub-categories: motivation for students to participate, student ability, student being able to answer comprehension questions, student being able to ask questions, student being able to connect with the text, student being able to discuss, students being able to link ideas, students being able to understand the text.

Teacher Questionnaires

The short, written questionnaires (Appendix B) were intended to elicit teacher views about reading and reading comprehension in general. They were not targeted at teacher understanding of QtA or NfM, the focus strategies of the intervention. These questionnaires were analysed using thematic analysis (Berg, 2012), to tease out the dominant themes in teacher responses and whether there were changes from the beginning of the study as compared with subsequent years.

Student Reading Comprehension Tests

Student tests were marked by two members of the research team with pairs 'specialising' on a particular grade level (eg., one pair marked all of the P3 tests, one pair marked all of the P4 tests). Each question was marked on a 0-2 scale (0 = in correct; 1 = partially correct; 2 = correct). Marking guides were prepared by the research team and standard procedures for establishing and verifying inter-coder agreement were followed for each testing period (beginning, middle, end of each year) prior to marking tests. As student test results were not the focus of the study, simple agreement checks were used to verify inter-scorer agreement. With 80% or higher agreement on a subset of at least 5 tests, individual scorers completed the scoring.

ETHICS

Ethical procedures as required by the Office of Educational Research, the National Institute of Education and Nanyang Technological University were followed including obtaining Institutional Review Board approval and approval of the Ministry of Education, Singapore, for data collection in schools. In addition, copies of all transcripts, audio and video recorders were given to individual teachers as part of their professional development and for their own information. By agreement with the school, these materials were not for assessment or evaluation but only for the use of the individual teacher for their professional development.

FINDINGS AND DISCUSSION

Briefly, the findings for the study were positive in all areas of teacher professional development. Teachers increased their use of the strategies taught (QtA and NfM) as part of the intervention, especially use of the QtA queries and discussion moves. Teacher understandings reflected growing understanding of the strategies and of issues around reading comprehension instruction. Teacher concerns, broadly speaking, shifted from concerns about practical, logistical issues (eg., classroom management) and teacher competence at implementing the strategies to issues of student learning and more critical thinking about use of the strategies. The teacher questionnaires also showed shifts in teacher views of reading comprehension with less emphasis on specific skills and more emphasis on literary concepts. Details on these findings are given below, with reference to the stages of the intervention.

Questioning the Author (QtA)

The analysis of QtA examined the extent of teachers' use of specific QtA features during teacher-led discussions. These included 'initiating queries' which are intended to

launch discussion and awaken students to the notion that an author is putting forth ideas and ‘follow-up queries’ which are intended to keep discussion moving along the most productive lines and help students elaborate and integrate ideas. ‘Discussion moves’ are “actions that teachers take to help orchestrate students’ participation and the development of ideas” (Beck & McKeown, 2006, p.92). Each of these features can be broken down into sub-components. For the sake of brevity, the sub-components are not presented here. Table 3 shows the overall results for Gen 1 and Gen 2 teachers and their use of QtA features as they progressed through the intervention.

Table 3. *Overview of teacher use of QtA features*

Gen	Year	Stage	Initiating Query	Follow-up Query	Discussion Moves	Total use of QtA
Gen 1	2011	Baseline	0.00	0.00	6.44	6.44
Gen 1	2011	1 (DI)	0.62	0.56	8.13	9.31
Gen 1	2011	2 (R&A)	0.81	0.76	9.59	11.17
Gen 1	2012	LS	2.01	0.93	19.01	21.94
Gen 2	2012	Baseline	0.00	0.00	4.77	4.77
Gen 2	2012	1 (DI)	3.34	1.28	16.25	20.86
Gen 2	2012	2 (R&A)	2.68	0.22	25.07	27.97

What is evident from these findings is that the teachers were already using some types of discussion moves in the Baseline stage, as expected. However, there was no evidence of QtA type queries when teachers started the study. Queries are a hallmark of QtA, intended to

- assist student in understanding, rather than assessing understanding
- facilitate discussion about author ideas including teacher-student and student-student interaction, rather than focussing on teacher-fronted interactions with individual student responses
- be used during reading, rather than after reading.

Thus, increased use of queries indicates teacher adoption of this strategy in their lessons. However, it is also noted that the teachers were more likely to use initiating queries, which were written into their lesson plans, than follow-up queries, which require spontaneous responses. Instead, teachers tended to move from initial queries to discussion moves – encouraging students to develop their own ideas about the text. Discussion moves and follow-up queries are difficult to pre-plan as they must respond to student comments. However, their purposes are somewhat different. Follow-up queries are intended to encourage readers to try to ascertain author meanings and reasons or to link ideas within the text and, as such, are important for improving students' reading skills. Discussion moves are also crucial for encouraging students to develop and articulate their ideas and to highlight key ideas in the text on which they base their own ideas. Therefore, the increased use of discussion moves from stage-to-stage is taken as a very positive sign of developing teacher proficiency in managing reading comprehension discussions, including use of spontaneous questions to explore student ideas.

Negotiation

As shown in Table 4, teachers made use of negotiation throughout the project, including at the Baseline observations. There was increasing use of negotiation as teachers moved through the study. However, Gen 1 teachers did not show much increase in use of negotiation until the LS stage. Gen 2 teachers, on the other hand, showed increased use of negotiation earlier, during the DI stage but had a reduction in the use of NfM during the R&A stage.

Table 4. *Overview of teacher use of negotiation features*

Gen	Year	Stage	NFF Sequence	NFC Sequence	NfM Sequence
Gen 1	2011	Baseline	0.44	7.75	6.9
Gen 1	2011	1 (DI)	1.22	16.48	6.55
Gen 1	2011	2 (R&A)	2.13	28.24	6.34

Gen 1	2012	LS	1.89	33.91	18.06
Gen 2	2012	Baseline	1.14	10.56	7.86
Gen 2	2012	1 (DI)	3.16	36.32	18.61
Gen 2	2012	2 (R&A)	0.41	38.82	8.59

For Gen 1 teachers, the increase in use of negotiation (especially of NfM) during LS follows initial analysis by the research team of teacher use of NfM in lessons. That initial analysis showed that teachers were not using much negotiation, and discussions with teachers suggested they had a weak understanding of negotiation at that point. Therefore, a workshop focussing on negotiation and highlighting NfM was offered. Subsequently, as seen in Table 4, use of NfM and NFC increased. As Gen 2 teachers joined the project at about the time the negotiations workshop was offered, they were exposed to a greater emphasis on negotiation from early in their intervention. Therefore, we speculate that the timing of the negotiation workshop influenced teachers' update of this strategy. We also note that use of NfM dropped off for the Gen 2 teachers during the R&A. This might be due to a lesser emphasis on this strategy – as compared to QtA – during the R&A sessions.

Teacher Understanding

This analysis was based on teachers' spontaneous comments during post-observation interviews and in their written reflections. Therefore, the analysis reflects what teachers were talking about with reference to their own lessons and their own learning and how their talk demonstrated their developing understanding.

From Figures 1 and 3, we can see that there was little discussion related to procedural knowledge (how to do it) for Gen 1 or Gen 2 teachers. Their comments were more likely to reflect Factual, Conceptual and Metacognitive Knowledge. Somewhat surprisingly, comments related to Conceptual Knowledge—more complex organized knowledge including evidence of knowledge of theories, models, classifications, categories and generalizations – was also less frequent as the intervention progressed. Instead,

teachers were much more likely to make comments reflecting growing Metacognitive Knowledge. Our interpretation is that this reflects greater awareness of their own understanding of QtA, NfM, reading comprehension and classroom interactions, as well as awareness of their own practices and performance.

For example, Carol, a Gen 1 teacher, made no comments reflecting Metacognitive Knowledge during the first year of the intervention. Instead her comments were most likely to reflect her concerns or perceived problems (discussed below) or to be straightforward descriptions of the lesson, with very few comments about her own or the students' learning. However, in the second year, Metacognitive Knowledge was reflected in all of her interviews. For example, in her final interview of the 2nd year, she commented on the need to listen to her students' comments and questions in order to find out what they did/did not understand. Later she commented on whether a discussion on a key idea in the passage (whether Greek gods could be 'mortal') went on too long and said she felt she should have "pulled [the students] back" sooner. Finally she stated that she "did try to do it" but "didn't do it properly" – reflecting awareness of the importance of exploring student ideas but also of managing the discussion effectively.

In terms of the Cognitive Dimension of the taxonomy, as shown in Figures 2 and 4, teacher comments were initially focussed on applying the new knowledge they were gaining, and on broad understanding of the concepts. These comments tended to decrease overtime while teachers made more analytical and evaluative comments about what they were learning. We take this to show that the teachers were able to think more analytically and critically about their learning and how to shape the strategies in ways that they felt were appropriate for their students and their teaching context. For example, Denise, a Gen 1 teacher, spoke consistently about her concerns about how the new strategies might be applied in class, indicating her understanding of the application but also potential problems.

In her first interview, for example, she said

Ok it's not gonna be really easy, because our classroom is quite big. My P1s is no problem, it's the P4s. Because erm, they erm they have different abilities, so usually the vocal ones they will tend to be very loud. So what I will do is I will, I will tell them that doesn't mean you raise your hand I will call you. I will even call those who are not raising their hands. So they are on their toes.

She included a few comments reflecting 'understanding' and 'remembering' as well.

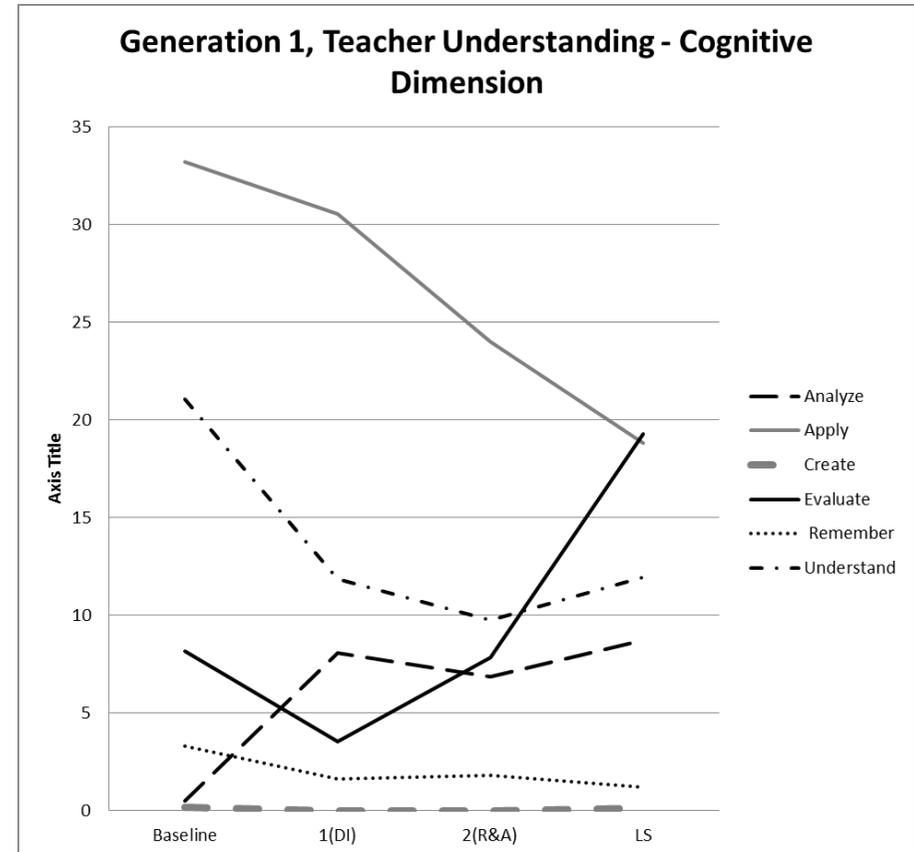
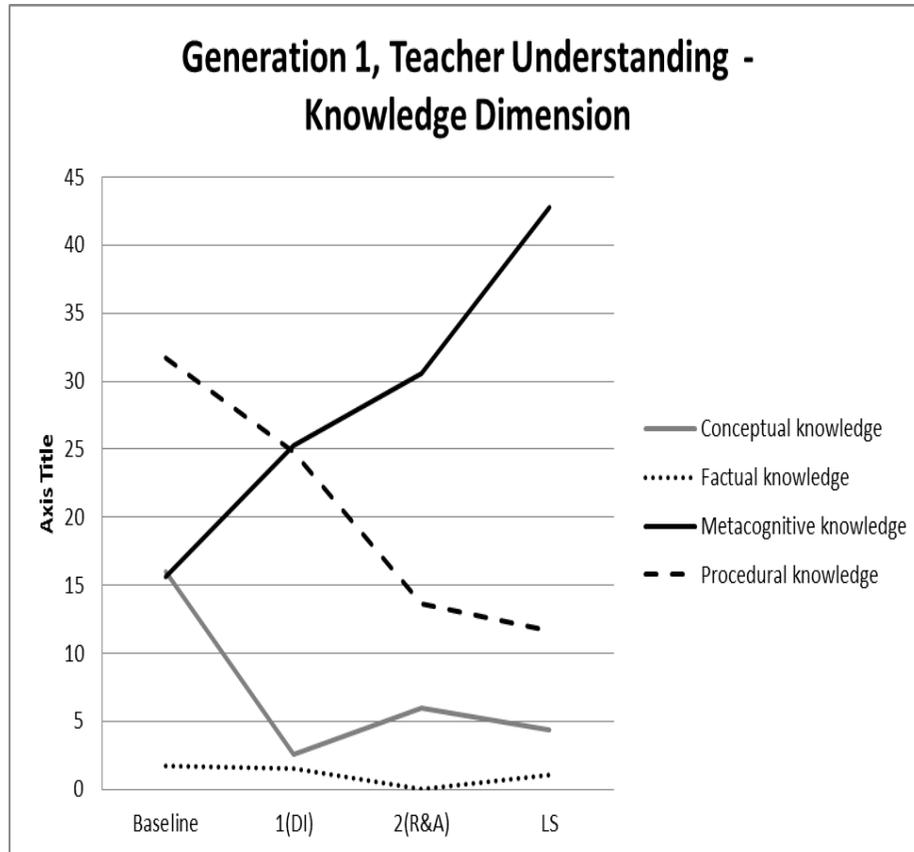
In the 3rd term of the 2nd year, however, her comments reflected knowledge related to Applications, Analysis, Evaluation, Remembering and Understanding. The only type of understanding not reflected in her comments was 'Create' which, as shown in Figures 2 and 4, was hardly mentioned by any teachers throughout the project. Evaluation and Analysis were particularly prominent as Denise noted that even when teaching with another reading comprehension strategy, she still asked the student to consider the author, what the author might or might not have written clearly, and why the author might have written in particular ways. In evaluating her own discussion with the students she noted that "it's not wrong to use the word 'author'" even when she was not teaching a QtA lesson because it still important for students to know they are "free to ask 'why did the author write like that?'"¹²

Teacher Concerns

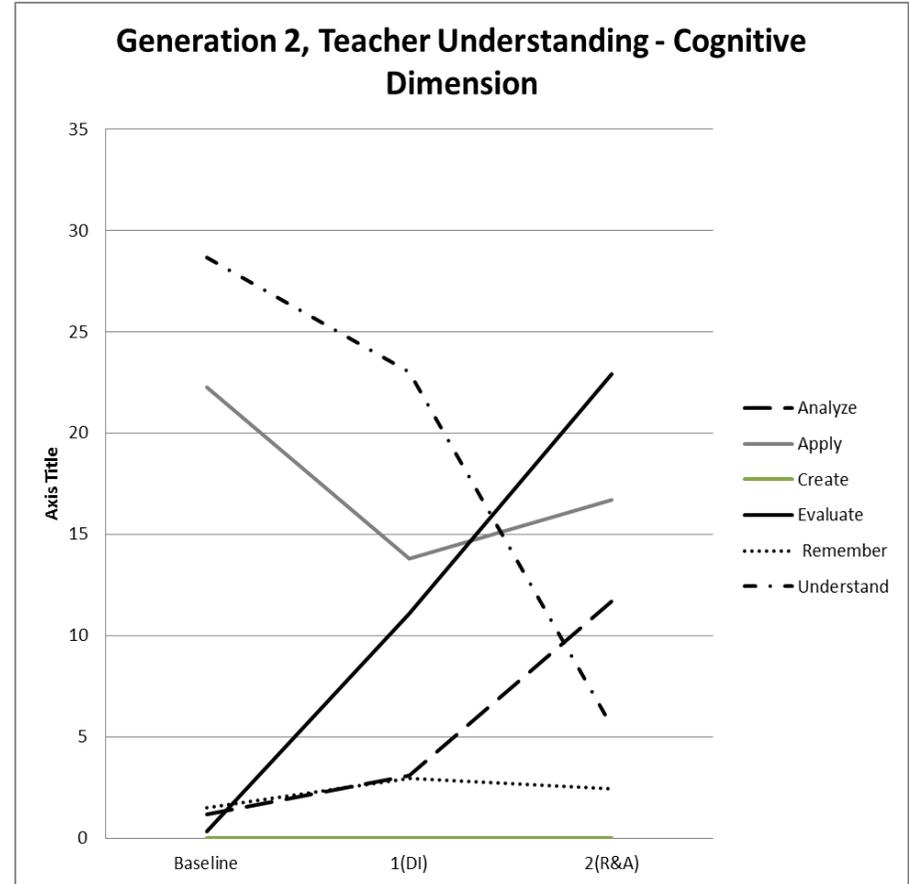
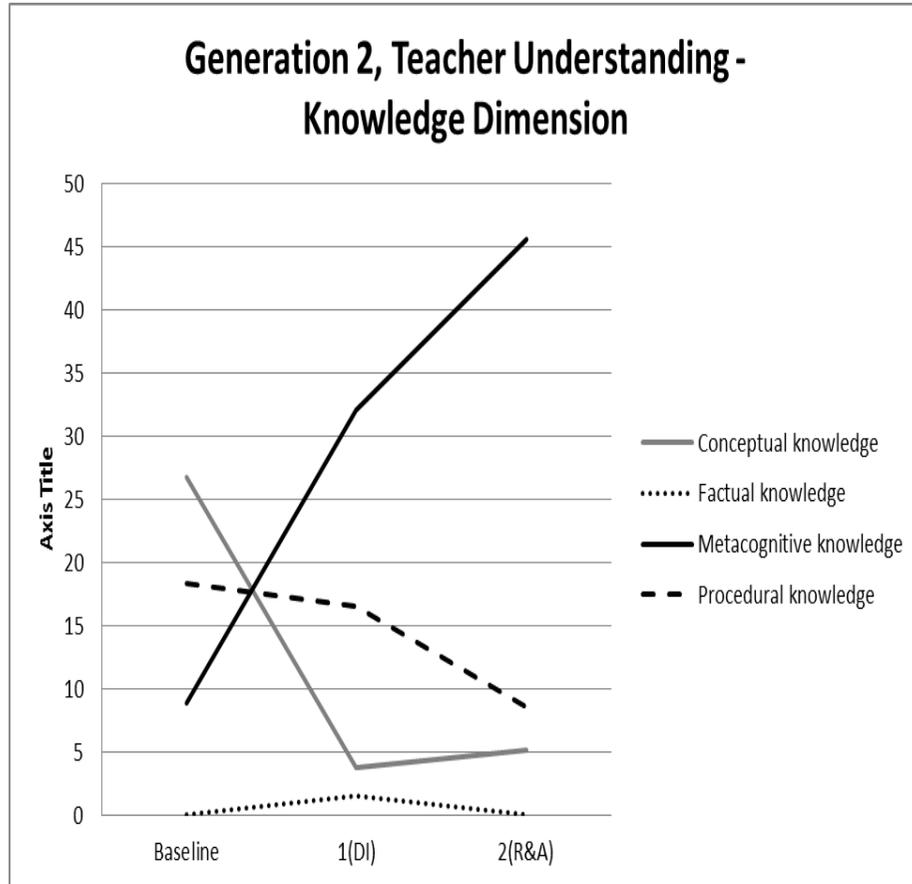
As above, Teacher Concerns emerged as a special category of the analysis of Teacher Understanding. These comments could reflect understanding of the strategies introduced in the intervention, but could also show concerns the teachers had or problems they perceived. Concerns were particularly likely to emerge as the teachers moved through the intervention (Table 5), somewhat more so for Gen 1 than Gen 2. We see these concerns not as problematic for the intervention but as indicators of the teachers' thinking about the strategies in more detail, with greater awareness of how the strategies might be used, improved, or better aligned with the local context and their specific classes of students. For

¹² A fundamental principle of QtA is author fallibility which implies that lack of understanding of a text is not always due to reader problems. See Beck & McKeown (2006) for details.

Figures 1 and 2. Generation 1, Teacher Understanding



Figures 3 & 4. Generation 2, Teacher Understanding



example, returning to the case of Carol, concerns for students, techniques, and her own skills emerged part-way through the 1st year.

Table 5. *Overview of Teacher Concern comments, by percentage of all teacher comments*

Gen	Year	Stage	Students	Teachers	Techniques & Procedures	Texts & Materials
Gen 1	2011	Baseline	2.9	2.76	2.81	0.9
	2011	1(DI)	0.29	0.05	9.75	1.01
	2011	2(R&A)	4.77	1.73	8.72	0.69
	2012	LS	3.17	2.8	11.14	2.52
Gen 2	2012	Baseline	0.82	0.47	0.16	0
	2012	1(DI)	3.04	1.7	9.11	0.18
	2012	2(R&A)	4.3	0.87	11.02	0.14

A few other points about teacher concern statements are worth noting. First, teachers showed concern for students especially in two areas: student ability (including student ability to answer comprehension questions) and motivating students to get involved. The former was primarily a concern of the Gen 1 teachers during the Baseline and the R&A stages. This was also a concern of the Gen 2 teachers though it emerged especially in the DI and R&A stages. As for motivating students to be involved, Gen 1 teachers were most concerned about this during the LS while Gen 2 teachers were most concerned about this during R&A suggesting a possible sparking of concern across generations. Similarly teacher preparation was a concern for both generations, primarily during the Gen 1 LS and the Gen 2 R&A.

There was some concern for 'time factor' for both generations, but this was especially evident for the Gen 2 teachers during the R&A. There was also some concern for Teacher Preparation - mainly among the Gen 1 teachers during DI and R&A.

Three areas were of increasing concern for both groups as the study continued. These were 'Techniques and procedures', 'Teacher interference', and 'How to explore student thinking and check understanding'. We take these as indicators of growing interest in mastering the techniques and procedures which were different from their usual teaching practices, especially in the area of allowing discussion to develop without teacher

interference, as well as awareness of the importance of ascertaining student comprehension during lessons -- a focus of the study.

Teacher Questionnaires

In response to an initial questionnaire early in 2011, teachers mentioned that reading comprehension encompasses summarizing, getting the main idea, scanning, etc. Thus, their responses were focused on the acquisition of specific reading comprehension skills. Some of the teachers also mentioned that reading comprehension in the Singapore context means reading the passage and answering questions – reflecting importance of reading comprehension as a focus of examinations.

In their responses on the same questionnaire at the end of 2012, teachers made more reference to understanding, interpretation and author intent/purpose – showing less emphasis on isolated skills or examinations and more focus on broad literacy concepts they hoped to develop in their students.

Student Test Results

As explained above, students were given a reading comprehension test at the beginning, middle and end of each year of the intervention. In the first year of the study, tests were given to the students of the teachers engaged in the intervention (2 classes each at P3, P4 and P5, 6 classes total) and to comparison classes at each grade level (2 classes each at P3, P4 and P5, 6 classes total), thus a total of 12 classes were involved in the testing in the first year of the intervention. Due to the difficulties of carrying out the testing with comparison classes, including the difficulty of separating students from intervention/comparison classes in 2011 as they moved to intervention/non-intervention classes in 2012, only students in the intervention classes were tested in the second year of the study: 3 each at P3, P4 and P5 (9 classes total). Table 6 shows the total number of participating students by grade, group (intervention/comparison) and year (2011, 2012).

Table 6. *Total no of participating students by grade, group and year*

Grade level	Comparison students, 2011	Intervention students, 2011	Intervention students, 2012
P3	72	73	91
P4	82	80	91
P5	82	83	105
Total	236	236	287

Gains in student test scores were not expected during the intervention as it was expected that impact on student learning would appear only over the long-term, especially given the longitudinal nature of the intervention. Implementation of the intervention was expected to be gradual, only as teachers gained enough self-confidence and skill to be able to justify and adopt the intervention strategies as appropriate within the national curriculum.

As shown in Table 7 mean scores for all groups and both years are quite similar at all three test points, with similar gains from Test 1 to Test 2 to Test 3. The comparison students in 2011 started slightly higher than the other students, and the intervention students in 2012 ended slightly higher than the 2011 students (comparison and intervention). The intervention students showed slightly higher gains overall. Wilks' Lambda showed a significant difference between Test 1, Test 2 and Test 3 for all groups. This difference can be explained by overall improvement during one year of instruction. The difference between groups was not significant. (See Table 8.)

Table 7. *Mean scores for participating students by group and year*

	T1TotalScore	T2TotalScore	T3TotalScore	Total gain
2011, Comparison	21.31	23.57	25.20	3.88
2011, Intervention	20.00	23.72	24.49	4.49
2012, Intervention	20.40	23.35	25.66	5.26

Table 8. *Mean scores for participating students by group and year*

Effect	Value	F	df	Sig.	Partial Eta Squared
Student Results	0.722	69.587 ^b	2	0	0.278
Student Results * Group	0.987	2.402 ^b	2	0.092	0.013

^a Exact statistic

The results show clearly that the type of discussion and strategies introduced in the intervention can be effectively integrated into primary school instruction in Singapore without any detriment to student learning. Ideally an intervention of this nature would also deliver discernable, positive results in student outcomes. However, as above, with the intervention beginning in year 1 and starting to take hold only in year 2, we did not anticipate significant gains in student test scores. To see increases in this area would require a longer tracking of the intervention as teachers would first have to use the strategies effectively and consistently before student learning gains would be evident. This topic is taken up in the discussion.

Responding to the Research Questions

1. How do teachers understand reading comprehension in the local, P4 school setting (i.e. what do teachers understand reading comprehension to be and how do they understand the development of student reading comprehension)?

Findings from this project show that initially teachers understood reading comprehension to be based on discrete skills such as ‘scanning’¹³ and ‘getting the main idea’. They also mentioned exam preparation. Development of student reading entailed instruction toward specific skills and exam preparation. After the intervention teachers had a broader view of reading comprehension to include ‘interpretation’ and ‘understanding of author intent’. Changes in teachers’ beliefs about and understandings of reading comprehension can be important for their pedagogical practices and possible changes in those practices (e.g. Fang, 1996; Paris, Wasik and Turner, 1991).

2. In what ways do teacher understandings of reading comprehension change through participation in a long-term (2 year) professional development project? Specifically, in what ways do teacher understandings change at different points of time (1 year, 2 years, 3 years) and when engaged in different roles (trainee, trainer, observer, evaluator)?

¹³ Single quotation marks (‘’) are used to show paraphrase, rather than direct quote, of teacher comments.

As above, teacher understandings did change during the intervention. However the exact periods of changes in teacher beliefs cannot be determined. Instead, analysis of teacher practices showed uptake of the features of QtA (especially initiating queries and discussion moves) at all stages of the intervention. Uptake of negotiation was also found at all stages of the intervention; however, it tended to lag behind uptake of QtA and seemed to be influenced by additional DI related to negotiation as a pedagogical strategy.

Analysis of Teacher Understanding and Teacher Concern also showed that teachers' understandings changed throughout the intervention. Examination of the results for Gen 1 and Gen 2 do not indicate particular influence of a specific stage (see Figures 1-4). Rather they suggest changes over the long term as teachers continued to work with the strategies, the research team and each other.

3. How successful are the different stages of the intervention (Direct Instruction, Reflection & Adaptation, Lesson Study) in changing teacher classroom practices for reading comprehension?

Findings from the study suggest that all stages of the intervention were successful in that teacher uptake of the strategies increased and the strategies were used with increasing mastery. In addition, as above, teacher understanding and the types of teacher concerns expressed showed increasing understanding of the strategies and how they might be used in the local context over the course of the study. The findings do not suggest that a particular stage was more beneficial than others. Instead, teacher comments on the study suggest that each of the stages had their own merit and participation in the different stages was beneficial. For example, when Gen 2 teachers began their participation (Jan 2012), the research team suggested that Gen 1 move into mentoring/leadership. However, the Gen 1 teachers strongly recommended that the research team initiate the project for Gen 2

teachers with DI – repeating some of what had been done with Gen 1. Later Gen 2 teachers stated that the DI was helpful. Similarly the teachers commented that the reflections (R&A stage) helped them to see things in their lessons that they would not have seen otherwise and that working together with colleagues in the lesson study was helpful for sharing ideas and building up their confidence.

IMPLICATIONS TO POLICY MAKERS AND IMPACT TO SCHOOLS

Classroom interaction is the heart of educational quality, and changes in classroom interaction rely on the development of people, not programmes. There is substantial evidence that the way teachers talk to and with students impacts learning (eg., Hattie, 2009; Mercer & Hodgkinson, 2008; Nystrand, 2006; Soter, et al, 2008; Van den Branden, 2000). This study shows that the way teachers interact with students can be changed, but these changes take time. Professional development to foster changes in classroom discourse and teacher-student interaction requires a substantial commitment from teachers and mentors, over a number of years. Therefore, interventions which are serious about changing classroom discourse patterns must be given years to develop with strongly supportive professional communities. They require time to ripen and bear fruit through the growth of individual professional expertise and confidence. This has additional implications for the ways schools implement action research and professional learning circles as short-term projects (eg., changing year-by-year and with a limited amount of professional development time for each project).

This leads to a second implication – that intensive interventions of this type may be difficult to implement on a large-scale at multiple sites. It is possible that some aspects of the intervention can be ‘work shopped’ for incremental professional development. For example, the teachers’ comments that they found the DI stage – with reading of research articles, discussion and demonstration – to be useful suggests this could be taken up as shorter term

intervention. Similarly, some aspects of the teaching strategies introduced (eg., chunking of texts, determining 'major understandings' and teaching of discussion moves) might be taught in workshop. However, without mentoring (through PLCs or with external mentors) and a longer-term commitment, it seems likely that ideas introduced in workshops will not be sustained over the long term.

CONCLUSION

Our primary conclusion is that the intervention has been highly successful in terms of teacher uptake and mastery over the strategies introduced. In addition, the project showed an almost organic growth in terms of the development of individual teachers and 'scale up' over time. We find it to be quite telling that at the end of two years the school, the EL HOD and the participating teachers were keen to continue to work on the strategies and to share their knowledge with other teachers. This suggests that key features of the intervention can be sustained unlike short-term interventions which might have initial uptake but lack of maintenance or further development. It seems likely that the flexible, collaborative nature of the intervention was important for maintaining the project throughout the 2-year time period. While the teachers were able to bring in their specific, contextual knowledge, the research team was able to bring in external knowledge and expertise. This was a successful combination for fostering change in classroom interaction.

Despite the strength of the intervention, the findings suggest two areas for possible improvement:

1. It is surprising to us that 'conceptual understanding' (as part of Teacher Understanding) was reflected on a limited basis as the study continued. It is not clear if this was an artefact of the research design (perhaps the focus of reflections on taught lessons was unlikely to elicit the sort of comments that would show conceptual understanding), the way conceptual understanding was coded for this study, or if

teachers truly were not thinking along these lines. Since conceptual understanding brings together knowledge of theories, models, classifications, categories and generalizations, it seems important to see evidence of this during the intervention.

This merits further investigation.

2. In addition, the findings show that as part of the QtA implementation, teachers were more likely to make use of initial queries and discussion moves than follow-up queries. We suspect this is because initial queries, as a key feature of QtA, and discussion moves, which are important in QtA but also useful with other instructional strategies, were frequent foci of discussion across all stages. However, follow-up queries which encourage readers to think about the author's meanings or reasoning and to explicitly link ideas are also important parts of reading comprehension. These are also features of the current EL syllabus and important for national examinations. Therefore, follow-up intervention or further professional development would do well to place more stress on these feature of reading instruction.

ACKNOWLEDGEMENTS

We would like to acknowledge funding support from the Office of Educational Research at the National Institute of Education, Singapore. In addition, significant administrative assistance was given by our Project Manager, Kumutha Malar d/o KRISNAN. Two Research Associates worked with us on this project. We gratefully acknowledge their contributions in planning, data collection and data analysis: FOONG Poh Yi and Raslinda A. R. In addition, ZHANG Dongbo offered advice on research design and statistical procedures. Two anonymous reviewers of the original proposal offered helpful suggestions for the intervention. Finally, this project could not have taken place and would not have been as successful without the significant and continued support of the teachers and school administrators at the school in which we worked. We are thankful for the opportunity to work with this group of dedicated professionals.

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LIST OF APPENDICES

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Appendix A. 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

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

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 B. 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 C. Teacher Post-observation Interview/Reflection Protocol

Introduction

Teachers will be observed while teaching the QtA/NfM lesson they have planned. Each lesson will be audio and video recorded using standard procedures for the CRC study. After each lesson, a member of the research team will meet with the teacher for an interview/reflection. The purpose of the interviews are three-fold:

1. To foster reflection (see 'the 4-step Reflection Process, J. Png, adapted from York-Barr, Sommers, Ghore & Montie, 2006)
2. To incorporate feedback (as a continuation of the training component of the intervention)
3. To ascertain developing teacher understanding (following the CRC coding scheme for Teacher Understanding, based on Anderson, et al. 2006)

Preparation

The trainer who is working with the individual teacher will watch the video and prepare for the interview.

1. Watch the lesson as a whole. Take notes of positive features related to what we have been teaching (or other positive features), points in the lesson where you think feedback is required to encourage the teacher to make changes (related to QtA/NfM), and any points in the lesson that you don't understand or have questions about.
 - a. Be sure to note the time stamp for these points.
2. Based on what you have seen in the video and your notes,
 - a. identify patterns that are related to the research project – either patterns of points that the teachers have successfully picked up or patterns of classroom interaction that believe need further work.
 - b. identify any individual points that seem to be particularly important for some reason (an exemplary example, a particularly unusual example that you think is worth exploring for some reason, a point that is unique but sufficiently problematic that you feel it must be addressed).
3. From the video-viewing, note taking and your own thinking, select several 'intervention points' in the video that you feel should be highlighted to the teacher. Give the interview time frame of 2 hours, you will probably have about 5 intervention points although this is just an estimate – there might be more or less depending on what you feel needs to be highlighted. For example, if you feel something is a pattern that needs further attention, you might want to show 2 or 3 examples rather than just one, so that the teacher can see if it a pattern and not an isolated case. There is no set formula, for the selections – this is where your expertise as a trainer must come in as you make decisions of what to highlight and how many excerpts to bring in. However, bear in mind that these intervention points are only one aspect of the interview – the other part of the interview is allow the

teacher to watch him/herself, highlight or question what he/she notices, and reflect on what is viewed.

4. You might also want to listen to excerpts of the teacher audio recording. Do not try to do a transcript of the whole lesson as that would be too time-consuming! However, there are parts of the lesson that seem particularly interesting or important (e.g., the student look very excited [an interesting topic?], there is a lot of student discussion [T has used a clear query or good example of some discussion move or NfM?], a series of very short responses from student [possible indicating a series of factual questions from T?]), you might want to listen to the T audio file and make a note of what was said. You can transcribe these bits to show the teacher.

Interview Procedure

1. All interviews will be audio-recorded. You will need **two** audio recorders for each interview: one for the teacher and one for the researcher.
2. Record the entire interview from the time you enter the room until you leave. You should have the teacher's recorder 'on' for recording when you greet him/her if possible and keep it recording until you leave. This is because the teacher might make 'incidental' comments outside of the time that you consider to be the actual interview.

At the interview location

1. Find/use a suitable interview location (little ambient noise or likelihood of interruptions).
2. Turn off your handphone – silent mode can still interfere with the concentration of participations so handphones should be switched off. Ask the teacher to turn off his/her handphone as well in order to avoid disruptions.
3. Note interview details by stating the following at the beginning of your recording:
 - Date
 - Time
 - Interviewer
 - Interviewee
 - Project number or name
4. Introduce the reflective purpose of the interview:
Say something like:
We are going to watch a video of QtA lesson. This is an opportunity for professional reflection as well as feedback. At this point in the project, we want to move into more reflection and self-learning, rather than the sort of direct instruction we have done so far. Today, watching your first QtA lesson together is a chance to move into that more reflective stance.
5. Give the teacher a copy of the 4-Step Reflective Cycle (attached). Point out that during the interview the two of you will focus on the four questions, but the reflection process will continue as the teacher continues to develop and teach QtA/NfM lessons .
6. Tell the teacher that he/she can stop/start the video whenever he/she wants to comment on something or ask about something. Get the video ready and place the

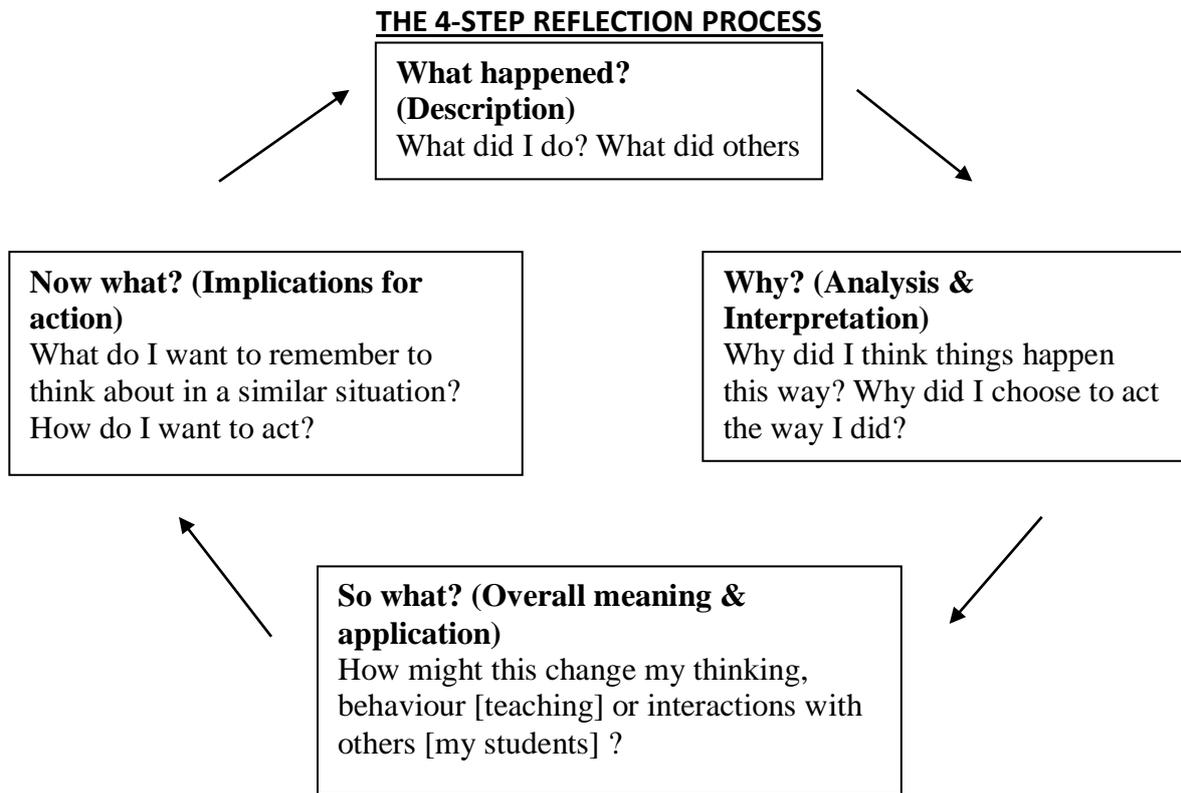
laptop in front of the teacher, making sure the teacher knows how to stop/start. Let the teacher commence with the viewing.

7. Reiterate that the teacher should comment freely while viewing.
5. Let the teacher watch the video. Allow the teacher to watch a few minutes (2-3) and then, if the teacher does not comment or react, ask, "Is there anything you want to comment on?" There is no need to stop the video at this point unless you come across one of the intervention points or the teacher wishes to stop and discuss. If not, allow the teacher to continue watching.
6. Initially the teacher might not have much to say. If so, observe the teacher and when he/she reacts to the video (laughs, shakes head, rewinds to watch something again), ask "What is happening?" and "Why did you _laugh/ shake your head/etc. _ at that point?" If there are no comments, no reactions and no intervention points in 10 minutes time, pause the video and ask the teacher "What have you seen so far?" "What has happened in the lesson?"
7. When the teacher comments, pause the video to allow the discussion to develop. Encourage the teacher to think in terms of the reflection cycle by asking question such as:
 - What is happening here? OR What happened at this point? OR What was happening that you reacted to? (step 1)
 - Why do you think that happened? OR Why did you choose to do that? OR Why do you think the student might have done/said that? (step 2)
 - Was that what you expected? OR How is that different from what you expected? Or How might that change your thinking about the lesson/QtA/ negotiation for meaning? (step 3)
 - What do you want to remember from this for next time? OR Would you do it the same way again? OR How might you do it differently next time? (step 4)
 - Note that you should ask questions for at least steps 1 and 2 each time you stop to discuss with the teacher. However, it might not be appropriate to ask the teacher to go through all four steps at each stopping point. This will depend on the reason for stopping at that point, evidence of 'reflection fatigue' from the teacher, the amount of time remaining, etc. Again, you must use your judgement as a trainer to adapt as the interview/reflection develops.
8. Listen carefully to the teacher and do not interrupt him/her but ask for clarifications or elaborations where necessary.
9. Throughout, give the teacher time to think rather than prompting continuously. React supportively. Listen with understanding, provide suggestions and feedback if asked and at points that you have selected for intervention. Since this is an intervention project, the teachers do expect feedback (positive, negative, and especially in the form of suggestions). Do highlight evidence of 'progress' in the sense that the teacher has taken on board some of the crucial features taught, adopted suggestions offered earlier in the project, or come up with relevant, creative ideas. Do highlight evidence of student learning, comprehension, engagement. Also highlight those features of the lesson that need continued improvement.

10. Conduct the interview until the video viewing finishes. Ideally, you will watch the entire lesson with the teacher. If it is clear that there is insufficient time, ask the teacher if it is ok to use fast forward. Also, ask if there are specific points he/she would like to see. In this way, you can move forward to the intervention points but you must also avoid taking over the entire viewing sessions – as much as possible, keep the interview/reflection on the teacher’s interests.
11. At the end of video viewing ask, “What did you see that you would like to remember for the future?”
12. Leave a disk copy of the video with the teacher. Tell him/her that we will provide a transcript as soon as possible. Note that transcripts take time to prepare so it might be a few weeks before we have the transcript. Note: we will also provide the teacher with a transcript of the interview/reflection session though that might take up to a month after the session since we have other, on-going transcription to do.

After the interview

1. Save all materials with appropriate file names.
2. Back up all files on EHD
3. Remove batteries from recorder. Sign in equipment
4. Write up your own brief field notes about the interview and file those on EHD and SP as well.



Adapted from York-Barr, Sommers, Ghere & Montie (2006) by Dr. Jessie Png for OER 09/10 RS

Appendix D. Written Reflection Prompts

Reflection 1 (mid-year)

- 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 (end of year)

- 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 E. Field note Template

Date _____ Venue _____	Event Type (e.g. teacher meeting, classroom observation, interview): _____	Participants: _____ _____ _____
Time 0:00-0:00	Event/Description (What is happening?)	Observations (Your personal observations, comments, notes re what is happening, what is not happening or anything else you think of)

Appendix F. Protocols for Lesson Transcription

The transcription conventions are quite simple (see below). Be as accurate as possible in your transcription – if students say “What he is?” write “What he is?” not “What is he?” You do not need to worry about trying to catch idiosyncratic pronunciation (‘Dis’ instead of ‘this’ or ‘k’ instead of ‘ok’). Field notes, collected along with the data, will indicate the approximate time that the lesson begins/ends and the approximate time the peer work begins/ends. The transcriber does not need to be concerned with the field notes but copies are available if you think the information would be helpful to your transcription.

Transcripts will cover the entire lesson unless otherwise advised. The transcript will include all of the teacher’s talk (whether to whole class, groups or individuals) throughout the entire lesson. The teacher transcript will ALSO include any and all student talk during whole class discussion to the extent possible.

The transcriber will need to listen to the teacher audiofile and one or more student audiofiles to construct the transcript.

Procedures for transcription are:

- Use MS word for transcription,
- Listen to and transcribe the teacher audiofile to create the initial draft transcript.
- Listen to and transcribe one or more class audiofiles, as needed. Insert additional classroom discussion to the transcript. Include as much of the student talk as possible!
- Be as accurate and detailed as possible. Transcribe exactly what is said. In other words, if the teacher says “You say what?” transcribe “You say what?” do not change it to “What did you say?”
- Depending on the amount and communicative importance of non-English speech, some transcripts may be translated. This will be decided on a case-by-case basis. For the initial transcript, if there is any use of languages other than English, write ‘non-english’ in the transcript at the relevant point.

Transcription and Formatting

Use Time New Roman, 12 point font.

Do not use any special formatting features, columns, tab settings, etc.

Don’t worry about including line numbers. If we need them, we will add them later.

Details

- 1 There will be no header or footer in these files, no page numbers, etc.
- 2 The name of the transcript will be marked as the first line of the transcript.
- 3 All turns must be marked for speaker and who is being spoken to using the abbreviations below. No other abbreviations can be used. Format the turns as follows:
speaker <tab> to whom <tab> what is said

For example (→ indicates a tab)

CLT→CLS→weoruworieuwporieuwpoeiupwoeiu

Do not include any spaces, colons, dashes, or any other punctuation of any type when indicating who is speaking to whom. These are ‘costly’ because they must be edited out at the proofreading stage.

List of abbreviations for speakers in transcripts

Abbreviation	Meaning
CLT	Class teacher
RST	research assistant
CHP	Children, plural (but not the whole class)
CLS	class (all)
GRP	group (all or most)
CIN	Child, individual
C01, C02, C03, etc.	Identifies a specific student when we can recognize the voice but do not know the student's name
C_2initials_ (can be created randomly)	Identifies a specific student when we know the student's name from the conversation
MIC	microphone (only for speaking to)
SLF	him/herself
UNK	Unknown

- 4 For lines that require a comment when there is no speaker, use NNN to mark the 'turn'. This will occur in these cases:
- At the top of the teacher transcript, put the name of the teacher transcript.
 - At the top of the peer work transcript, put the name of one of the student transcript used.
 - At the end of the transcript put: Transcribed by YY, month, year

Use NNN and a comment in parenthesis to mark multiple pair activities within one transcript.

5 **Maintaining anonymity**

In keeping with the principle of anonymity, when a real name is used during the class, do not transcribe the real name. Instead,

for the teacher name, use CLT;

for the class name, use ClassName (no spaces, no underscore, caps as indicated to make it easy to understand as a name and not regular text);

for a student name, use C plus two letters of your own choosing (for example, if the teacher says, "Xin Yi, it is your turn to present", you would transcribe

CLT CXY CXY, It is your turn to present

or other letters as you like (instead of CXY you might prefer CXX, or whatever). Be sure to use C as the first letter to identify a 'child' and to use three letters so our naming system is consistent.

Other Formatting

Indicate pauses with a full stop. One '.' indicates approximately 5 seconds. Rough estimates are fine; you do not need to 'count' the pauses. If there is a whole class pause (after the teacher tells the class to do something, for example), it might be better to put (pause) or (long pause)

Indicate overlapping speech with []

X indicates one word that is unclear. Use multiple Xs for multiple words and (unclear) if you are not even sure of how many words.

Use a ? to indicate questions and rising intonation. For example:

CLT CLS Are you ready?

CIN CLT Now?

Interruptions, loud talk, laughter, movement in the classroom, non-English speech, emphatic speech, angry tones, or any other information can be included in parenthesis () with NNN to mark the ‘turn’.

Do not use any other sort of formatting (e.g. no curly brackets {, hyphens, dashes, slashes, etc.) as these may be ‘misread’ by the computer program.

Example

CLT CLS This one. (pause) This one? This one? This one? This one? (Teacher is repeating many times; maybe to different individuals)
 CLS CLS (long pause)
 CLT CLS On Monday or Tuesday you all need to hand back the carnival ticket or money.
 NNN NNN (Dictation starts again)
 CLT CLS Places to the reader spinning and trading
 CIN CLT trading?
 CLT CLS Yes. I repeat the last paragraph again. During the dance comma X and on the ground full stop the dancers then stepped and jumped over this traffic post comma spinning and trading places to the rhythm of the music.
 CIN GR You hear all right?

Deciding about Comments and Turns

Comments are any additional information that is included in the transcript but is not talk. In general, it is not necessary to put each comment on a new line – this generates unnecessary ‘turns’ in the transcript. However, in a few cases it does make sense to put a new comment on a new line.

For example,

NNN NNN (teacher does answer checking)
 NNN NNN (group work for 2 minutes. Students think of a sentence, using the word chortle)

Distinguishing these two comments on two different lines (which comes out as two different turns) makes sense because Trn 0136 is related to what the teachers does while Trn 0137 is related to what the pupils are doing.

However in another transcript we have

NNN NNN (Group work begins about here).
 NNN NNN (The students are working in groups for about 14 minutes, the teacher started talking to individual students).

In this case, the 2nd turn is not necessary because both of these comments relate to what the students are doing. The two comments can be joined as followed:

NNN NNN (Group work begins about here. The students work in groups for about 14 minutes. The teacher talked to individual students).

In some cases several things might need comments but as long as they all relate to what the teacher is doing, they can be joined in one comment as follows:

NNN NNN (students give the teacher ways to start a composition. The teacher then reads what students wrote as an introduction part in their composition. He gives comments on what the students wrote. End of lesson introduction. Instructions for group work.)

Rather than:

NNN NNN (students give the teacher ways to start a composition. The teacher then reads what students wrote as an introduction part in their composition. He gives comments on what the students wrote.)

NNN NNN (End of lesson introduction)

NNN NNN (Instructions for group work)

Final Steps

Spell check your document, accepting any odd spellings you have used to try to capture class speech but changing others. You can use either US or UK spelling.

Check for any use of double spaces; change to single space.

Check for any use of space instead of tab.

Check for any places where speaker and to whom are not marked or are marked incorrectly (for example, with two letters instead of three or with an incorrect abbreviation)

Check for any use of <tab><space> ; remove the extra space

Part-timers should post a copy of the transcript in the DropBox folder and send an email to Rita to say that the transcript is complete. Also be sure to update the Excel record sheet for transcript progress

Ethics

- All materials are considered to be the property of CRPP and must be returned at the end of the work assignment.
- Materials cannot be used for any other purpose or shared with others outside of the project.
- Anonymity of the participants should be maintained at all times, therefore all final versions of the transcripts should have only T, C, or initials. If the teacher or children use each others' names in class, transcribe with initials only. Likewise when the children use the teacher's name, transcribe as T.

Appendix G. Protocols for Selection of Transcript Excerpts, 2012

General Guidelines

Excerpts of lesson observation transcripts will be created and analysed. In a prior study (OER 29/08), full transcripts were made for analysis in order to determine if teachers were able to implement the use of QtA queries, turning back moves and Negotiation for Meaning (NfM), to what extent this was done, and how students responded. Based on those transcripts, it is clear that teachers can make use of QtA queries, turning back moves and NfM throughout the lessons. Therefore, full transcripts were deemed unnecessary for the Comprehending Reading Comprehension study as the goal is to determine if there is evidence of developing understanding and use of these new techniques, not to gauge frequency or percentage of use in each lesson.

The goal of the transcript excerpts is to capture the points where it is most likely that there will be open-ended discussion. We do not expect to show all use of QtA or NfM but only to show that it occurs (if it does) and how it is handled. Therefore three time points for each lesson are transcribed, near the beginning, middle and end. In general, the first and last 5 minutes of the lesson are excluded because the first five minutes is usually devoted to classroom management (e.g. student seating, getting students settled for the lesson) and the last five minutes is often rushed (as the teacher tries to complete the lesson) or again classroom management (as the students go back to their seats, pick up bags, etc.). In addition, our observations from year 1 suggested that slightly different things are going on at these different times. Typically near the beginning the teachers are engaging in pre-reading discussions with title, cover, and /or visuals. Near the middle of the lesson they are typically more engaged with text and the ideas of the reading. Near the end of the lesson the teachers might be wrapping up or recapping the reading. Table 1 shows a likely selection of excerpts for a 1-hour lesson: **X** indicates points that are not transcribed; **+** indicates most likely points for transcription. The breakdown assumes approximately 5 minutes at the beginning of the lesson (often pre-reading), 10 minutes at the mid-point of the lesson when discussion is expected to be underway, and 5 minutes near the end of the lesson.

Table 1. Breakdown of a 1-hour lesson

5 min	classroom management (anticipated)	X
5 min	5 min only at pre-reading T led	+
5 min		
5 min		
5 min	Anticipated discussion of passage (text)	+
5 min		
5 min		
5 min		
5 min	Approx 5 min for additional example of discussion	+
5 min		
5 min		
5 min		X

Excerpts are selected based on the premise that we are not trying to capture all uses of QtA queries, turning back moves and NfM, but only examples (as evidence of use). Three segments of 5-10 minutes for each 1-hour lesson will capture 25%-50% of each lesson. These segments should also be long enough to show the development of a particular topic or idea over several turns. The lesson observer makes the final decision on which parts of the lesson to be transcribed, following the guidelines below.

These same principles are used to select excerpts for all lessons conducted in 2012 – Gen 1 and Gen 2, ‘QtA lessons’ and ‘Reading lessons’ (which are not specifically planned for QtA). A few selected lessons (all from Aug-Sept 2012) will be transcribed in full for a separate project which is doing a secondary analysis of the teacher interviews (Kim & Silver). Those lessons are transcribed in full but excerpts will be chosen (following the principles outlined here) for data analysis (QtA and NfM).

Specific Guidelines for Selection of Excerpts (QtA and non-QtA lessons)

1. Excerpts of QtA lessons

Since QtA lessons are planned by teaching teams at the same grade level with detailed lesson plans (LP), excerpts are selected according to the lesson plans and the major understandings (MUs) given by teachers in those lesson plans. These are pre-selected by the research team with the aim of transcribing similar points in lessons using the same passage (to the extent possible).

Prioritize the major understanding. Teacher lesson plans tend to state that a specific segment of the passage, usually designated with a given PowerPoint ‘slide’, will be used to address a given MU. However, the actual discussion of that MU might be at a different point – starting before or ending after the slide designated in the lesson plan. If the teacher does not address that MU (for whatever reason), transcribe the MU before or after the one that was not addressed. For example, if the teacher was going to talk about ‘difficulty in deciding on building a train system’ at Slide 10 but did not have time to cover that, the MU that came before that in the LP would be the point of transcription. For this reason, it is likely the transcription points across QtA lessons will not be identical even though the same lesson plans are used.

Since transcribers should follow the discussion which relates to an MU stated in the lesson plan, not the ‘slide number’ given in the lesson plan, observers must make the final decision on which points of the lesson will be transcribed. A table based on the lesson plan and fieldnotes, indicating the specific points for transcription, will be prepared for each lesson, see Table 2.

2. Transcription of non-QtA/ reading lessons

Since there is no detailed lesson plan for the ‘non-QtA’ (aka ‘reading’) lessons, excerpts are chosen by the observer for each individual lesson, looking for segments at the beginning, middle and end of the lessons when open-ended discussion is used. Since the goal is to examine use of QtA, turning back moves and NfM, the observer should select excerpts when these are used, if possible. As in the QtA lessons, the observer must prepare a transcript selection table to indicate the selected transcription points (excerpts). Since there are no designated ‘major understandings’ for the non-QtA lesson, the observer must provide the time stamp and information on the topic discussed to help the transcriber find the correct

points in the audio recordings. For research purposes, the observer must also state the reason why each excerpt was chosen for the non-QtA lessons, see Table 3.

Table 2. Example of the Transcript Selection Table (QtA lessons)

CRC_S9_5D_AI_Obs1_06.03.12	Selection	Major Understanding	Audio time stamp
Excerpt 1	p. 1, 2nd row, slide 2 Beginning of lesson	Describe the transportation of the future	10:00 – 28:00 (based on T audio)
Excerpt 3	p. 4, 2 nd row. Slide 6 Middle of lesson	It is important for ... Description of a good transportation system Author's fallibility	46:30 – 51:30 (based on T audio)
Excerpt 3	p. 6, 2nd row, slide 10 End of lesson	Difficulty in deciding on building a train system	AI didn't do this slide in this lesson Not covered and so a different MU was selected
Excerpt 3			
Suggested audio files: XXXXX XXXXXX XXXXX			

Table 3. Example of the Transcript Selection Table (non-QtA lessons)

CRC_S9_5D_AI_Obs1_06.03.12	Topic	Why selected?	Audio time stamp
Excerpt 1			
Excerpt 3			
Excerpt 3			
Suggested audio files: XXXXX XXXXXX XXXXX			

Preparation of the Transcript Selection Table

For each transcript, use MS Excel to prepare a table (i.e. Tables 2 & 3) to show the expected selection point, MU (if a QtA lesson) or topic (if a non-QtA lesson), and time stamps for the points to transcribe. Time stamps are based on the teacher's audio recording. When transcribing, the transcriber will always start with the teacher audio recording and then seek for related points in the student audio recording to complete the transcript. (See the transcription protocols for this project).

For QtA lessons, the softcopy of the teachers' lesson plan can be used to create the first draft of the Transcription Selection Table. If the information varies from the pre-selected transcription points (i.e. if it is a different MU or the chosen MU appears at a different point in the lesson), be sure to note this in the table by crossing out the details of the lesson plan which are not relevant. (See Table 2, row 3, '~~Excerpt 3~~'). The observer should also indicate the suggested audiofiles to use for transcription (the teacher recording and 2-4 student recordings to be chosen based on selection around the room, see below).

In the top row of the table, include the transcript name. In the final row of the table (in the leftmost cell) list the recommended audio files to be used for transcription. Any additional notes which might be useful to the transcriber can be included in the observation field notes. In general, the transcriber is the observer but this is not always the case, thus when creating the table and finalizing the field notes, the observer must consider what information would be useful to a transcriber who has not seen the lesson.

Preparing the Transcript

Follow the standard transcription protocols for a simple transcript of the lesson. Use the standard abbreviations and formatting guidelines (see Trans_Protocols_SOG.Rev.10.12.2012)

When creating your transcript, you will have three excerpts. Label them in the transcript as Excerpt 1, Excerpt 2, Excerpt 3 along with the time stamp from the teacher audio recording (e.g. 'Excerpt 1, 7:10-12:20' indicates that the first excerpt was chosen from 7:10-12:20 of the teacher's audio file). Do not type the MU or topic into the transcript as this inputs extraneous information into the transcript.

File naming

For purposes of file names, follow the standard conventions for OER 9/10 RS:

- Transcript file names end with TRANS
- Field notes end with FN
- The Transcript Selection Table will be designated as TES.
- See Table 4 for an example.

Table 4. File Naming Protocols for transcripts, field notes and transcription selection table

CRC_S9_5D_AI_Obs1_06.03.12	Observation information
CRC_S9_5D_AI_Obs1_06.03.12_TRANS	Transcript
CRC_S9_5D_AI_Obs1_06.03.12_FN	Field notes
CRC_S9_5D_AI_Obs1_06.03.12_TES	Transcription Selection Table