Infusion of Critical Thinking across the
English Language Curriculum:
A Multiple Case Study of
Primary School In-Service Expert Teachers in Singapore

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ABSTRACT

Although research on critical thinking is diverse and abundant, there is very little empirical research in connection with the perspectives of teachers regarding the infusion of critical thinking and its impact on classroom practice, particularly in primary schools. Therefore, the overarching purpose of this multiple-case study was to generate explanatory theory based on the perspectives of six primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking across the English Language curriculum.

This research was a qualitative study within the interpretivist paradigm based on the conceptual framework of symbolic interactionism. A series of in-depth case studies involving six primary school expert teachers of English Language was conducted. The major sources of data collection included semi-structured interviews, non-participant observations and documentary data sources in line with the interpretivist qualitative research tradition. The data collected were analysed using grounded theory methods. Initial coding and focused coding was followed by analytic induction of the data. The analytic categories directly grounded in data were then used to develop two key theoretical propositions. These propositions together form an explanatory theory that supports the effective infusion of critical thinking by competent teachers who are committed to teaching critical thinking, a school-wide practice of critical thinking and the holistic infusion of critical thinking in all programmes, resulting in the creation of a critical thinking culture in school.

The study addressed the deficit in empirical research regarding the perspectives of teachers on the infusion of critical thinking and how this has impacted classroom practice in primary schools. The findings of this study will benefit policy makers and English Language curriculum developers, and provide primary school teachers of English Language with insights into more effective strategies for teaching critical thinking in the classroom.
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I dedicate this thesis to all my fellow primary school teachers.

Thanks Be To God!

James 1:17
ACRONYMS and ABBREVIATIONS

APA: American Philosophical Education
CCE: Character and Citizenship Education
CME: Civics and Moral Education
CIT: Critical and Inventive Thinking
CIP: Community Involvement Programme
COI: Community of Inquiry
CoRT: Cognitive Research Trust
DipEd: Diploma in Education
DOE: Desired Outcomes of Education
GEP: Gifted Education Programme
MOE: Ministry of Education
NIE: National Institute of Education
NTU: Nanyang Technology University
OTJ: On-the-job
PD: Professional Development
PDL: Professional Development Leave
PE: Physical Education
P4C: Philosophy for Children
PGDE: Post Graduate Diploma in Education
PLC: Professional Learning Communities
PSLE: Primary School Leaving Examination
QCT: Questioning Concept Thinking
RELC: Regional English Language Centre
SEAMEO: South East Asian Ministers of Education Organisation
SEAB: Singapore Examinations and Assessment Board
SIO: Specific Instructional Objectives
SSAB: Skills, Strategies, Attitudes and Behaviour
TSLN: Thinking Schools Learning Nation
UBD: Understanding by Design
VIA: Values in Action
ZPD: Zone of Proximal Development
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CHAPTER 1: INTRODUCTION

Background of Study

Developing students who are able to think critically about subject content and problems in the real world plays a crucial role in protecting a democratic society and establishing a competent workforce in a global economy (Tsui, 1999). Policy makers outlining the 21st Century Competencies in most countries, including Singapore, include critical thinking as one of the competencies as it is a skill highly valued by employers. Snyder and Snyder (2008) state that unless students are able to think critically, they will not be able to solve problems and make capable decisions. Landsman and Gorski (2007) add that teaching students to be lifelong learners with the ability to think critically is vital for survival in a globalised world. Critical thinking is particularly important in this day and age when the impact of mobile technology and the Internet raise the need for students to be ever more discerning when reading and evaluating information readily available on the web and mobile applications.

So what is critical thinking and how is it different from thinking that is non-critical? Halpern (2003, p. 7) describes non-critical thinking as “non-directed or automatic” thinking that requires very little “conscious evaluation” and is “not engaged in for a specific purpose”. It includes rote memorisation of information and a failure to use evidence to support a conclusion. She adds that the ‘critical’ part of critical thinking connotes the element of evaluation which encompasses evaluating the thinking process, the reasoning leading to the conclusion and the aspects considered in the decision-making. In short, critical thinking is thinking that is “purposeful, reasoned and goal-directed” (Halpern, 2003, p. 7).

Language plays a significant role in the development of thinking. Thinking often takes place through language which is the means by which thinking is expressed. Since all subjects in the primary school curriculum in Singapore, with the exception of Mother Tongue, are taught in the English language, the English Language curriculum supports the learning of all core subjects such as Mathematics, Science and Social Studies as well as non-core subjects such as Music, Art, Health Education, Physical Education (PE), and Character and Citizenship Education (CCE)\textsuperscript{1}. Reading involves thinking and written text such as narrative and expository texts allow room for class and group discussions of

\textsuperscript{1} CCE in Singapore is conducted in Mother Tongue. However, for students exempted from Mother Tongue, it is conducted in English.
issues and values from different perspectives. Hence, the English Language curriculum offers a vehicle for teaching critical thinking.

The term ‘curriculum’ comprises the intended curriculum, the planned curriculum and the enacted curriculum. Lim-Ratnam (2012) explains the intended curriculum as that which is explicit, and that which is stated in the Ministry of Education (MOE) syllabus. The intended curriculum shows the instructional content targets for the subject and grade levels. The planned curriculum refers to the teachers’ plans to teach content aligned with grade-level standards while the enacted curriculum is the content of instruction actually delivered by classroom teachers (Kurz, Elliott, Wehby & Smithson, 2010).

In the intended curriculum in the primary school education in Singapore, critical reading and viewing is listed as Learning Outcome 3 (LO3) in the English Language Syllabus 2010, published by the MOE, and it states: “Apply critical reading and viewing by focusing on implied meaning, higher order thinking, judgement and evaluation” (MOE, 2008, p.39). Figure 1 shows the “Skills, Learner Strategies, Attitudes and Behaviour” (SSAB) Items and Structures that English Language teachers are expected to teach in order to achieve Learning Outcome 3.

<table>
<thead>
<tr>
<th>Skills, Learner Strategies, Attitudes and Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Reading, Viewing and Appreciation</td>
</tr>
<tr>
<td><strong>Personal Response</strong></td>
</tr>
<tr>
<td>• Respond to a text with, e.g.,</td>
</tr>
<tr>
<td>– reasons</td>
</tr>
<tr>
<td>– simple judgement</td>
</tr>
<tr>
<td>– personal interpretations</td>
</tr>
<tr>
<td>• Identify and present points of view in a text</td>
</tr>
<tr>
<td><strong>Connections</strong></td>
</tr>
<tr>
<td>• Make connections between a text and personal experiences/real life</td>
</tr>
<tr>
<td>• Relate a text to a similar/contrastive work</td>
</tr>
<tr>
<td><strong>Elements of Style in a Variety of Texts</strong></td>
</tr>
<tr>
<td>• Demonstrate awareness of the organisational structure of texts (e.g., introduction, body, conclusion) and the organisational patterns in texts (e.g., cause-effect, problem-solution)</td>
</tr>
<tr>
<td>• Demonstrate general awareness of how the writer’s use of language varies according to the purpose and audience for the writing to achieve impact</td>
</tr>
</tbody>
</table>

*Figure 1. Skills, Learner Strategies, Attitudes and Behaviour (SSAB) items and structures for primary school students (MOE, 2008, p.39).*
Critical reading is indirectly defined in the syllabus in the following way:

Critical reading and viewing take place when pupils are encouraged to read between the lines and view for implied meanings, analyse the underlying meaning of visual messages, offer interpretive judgement, and question and evaluate what is read from a variety of sources, including the writers’ intentions/assumptions and soundness of argument (MOE, 2008. p. 34).

In line with Learning Outcome 3, some changes were made to the assessment format of the Open-Ended Comprehension component of the English Language Primary School Leaving Examination (PSLE) with effect from 2015. The PSLE is a high stakes national examination taken by all primary school students in Singapore during their sixth or final year in primary school. Besides the usual mix of lower order comprehension questions and higher order inferential questions, there is a 3-mark evaluation question which requires students to evaluate whether the given three statements related to the comprehension passage are true or false and to support their answers with reasons/evidence from the text. Students engage in critical thinking by looking for evidence from the text before making judgments about whether the statements are true or false. A final 2-mark question asks students for their personal opinion on an issue or question related to the text. Students could respond either positively or negatively but they are required to support their answers logically with evidence from the text. This question also promotes critical thinking as it encourages students to view the text from different perspectives and to support their views with evidence from the text.

Apart from the broad guidelines on the skills, learner strategies, attitudes and behaviour for critical reading, viewing and appreciation listed in Figure 1 in the intended curriculum stated by the 2010 MOE English Language Syllabus, there are no other guidelines for teachers on how they should teach or infuse critical thinking across the primary English Language curriculum.

With the exception of selected teachers (mostly from secondary schools) who were trained in the Thinking Programmes between 1996 and 1999, and the Gifted Education Programme (GEP) teachers who undergo explicit training in critical thinking, most primary school teachers in Singapore are not trained explicitly to teach critical thinking or to infuse critical thinking within their subject disciplines.

Despite some integration of thinking within some core modules in the Initial Teacher Preparation programmes that all pre-service teachers in Singapore have to undergo, such as the Diploma in Education (DipEd) for non-graduates and the Postgraduate Diploma in Education (PGDE) conducted by the National Institute of
Education (NIE), Nanyang Technological University (NTU), the teaching of thinking and how it can be infused within subject disciplines has not been made explicit.

Although there are no centrally-devised schemes of work (SOW) from MOE for teaching critical thinking within the English Language curriculum, it is stated in the 2010 MOE English Language Syllabus that teachers will “teach pupils to think critically and reflect on what they read and/ or view to become critical readers and viewers” (p.29). So, teachers are expected to plan and integrate thinking skills into their SOW for teaching English Language. However, the term, ‘critical thinking’ is not defined in the syllabus. Hence, how critical thinking is infused across the English Language curriculum is really dependent on the teachers’ perceptions of what critical thinking is and how they translate their planned curriculum into action by carrying out critical thinking in the classroom through their enacted curriculum.

As all teachers come from diverse backgrounds, with varied experiences, it is expected that the teaching of critical thinking in the primary schools would be uneven as it depends on the self-efficacy of teachers, their beliefs, their passion and commitment to teaching critical thinking across the curriculum. However, there is a dearth of information on how primary school English Language teachers in Singapore interpret the intended curriculum in the MOE syllabus as they go about planning and enacting the infusion of critical thinking across the English Language curriculum in their actual classroom practice. Hence, I embarked on this study to investigate how six ‘expert’ primary school English Language teachers in Singapore infuse critical thinking in the classroom. This encompasses their aims and intentions of infusing critical thinking in the English Language curriculum, the strategies they used, the significance these teachers attach to the infusion of critical thinking, the outcomes they expected from pursuing their intentions and the concerns they face in the process of infusing critical thinking across the English Language curriculum.

The term ‘expert teachers’ is defined as teachers who have received professional recognition either as recipients of the Inspiring English Teachers’ Award and/or as recipients or as finalists of the President’s Award for Teachers. They are also recognised by their principals as effective teachers who are competent, experienced and willing to contribute.

More significantly, all six participants selected for this study firmly believe in the importance of critical reading and they were already actively infusing critical thinking across the English language curriculum in their own ways. These six participants were selected from among 28 award-winning teachers who took part in an initial survey.
(Appendix D), with their principals’ approval. The initial survey was used to determine the teachers’ beliefs about critical reading and through the participants’ written examples, to look for some evidence of infusion of critical thinking within the English Language curriculum prior to the study. Hence, the six participants were selected based on their responses to the survey as well as their willingness to participate in the study.

**Rationale of Study**

Although research on critical thinking is diverse and abundant, there is very little empirical research in connection with the perspectives of teachers or the self-reporting of teachers regarding the infusion of critical thinking and how this has impacted classroom practice, particularly in primary schools. The majority of the critical thinking research studies in Singapore involve secondary school students including those in the Gifted Education Programme where there is already an emphasis on thinking skills. The percentage of research studies involving the critical thinking skills of primary school students in Singapore is relatively low in comparison. There is also very little information on teachers’ planned and enacted curriculum related to the infusion of critical thinking across the English Language curriculum. This study attempted to redress the oversight and to contribute to the body of educational research through an in-depth investigation into the perspectives of six primary school in-service expert teachers of English Language in Singapore.

It must be stated clearly at the outset that the focus of this study is on identifying the perspectives and practices of primary school in-service expert teachers of English Language in Singapore who are committed to infusing critical thinking across the English Language curriculum. It is an inquiry which documents the practices of these teachers as they evaluate curriculum tasks and the needs of students and adapt their practices to meet those needs. It should be noted that these practices are not necessarily ‘best practices’.

The main motivation for this study was the potential enhancement of professional practices of primary school English Language teachers in order to improve instructional outcomes in students’ critical thinking. Thus the rationale for this study was to identify productive pedagogical practices which could be applied by other teachers as well as the conditions which would support the engagement of critical thinking practices by all teachers of English Language. Dissemination of these practices through professional development (PD) programmes and school-based curriculum development would make the infusion of critical thinking across the curriculum more pervasive in the primary schools and this would result in raising the quality of critical thinking experiences amongst students in the classroom.
**Aim of Study**

The overarching purpose of this multiple-case study was to generate explanatory theory regarding the infusion of critical thinking by investigating the perspectives of six primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical thinking. The theoretical propositions developed would guide and support primary school teachers in Singapore in their infusion of critical thinking in the classroom.

A qualitative multiple case study design was used to examine the perspectives and practices of the six participants, who are award-winning teachers and detailed case studies of these participants were constructed. The multiple case study gave priority to the perspectives of the participants on their day to day experiences (O'Donoghue, 2007) and thus falls within the interpretivist paradigm because the theory developed was a result of the negotiation between the researcher and the researched.

**Overview of Research Methodology**

This study, located within the interpretivist paradigm, attempts to comprehend the participants’ strategies and how they infused critical thinking across the English Language curriculum through investigating their perspectives (Patton, 2002) and practices. The six participants were selected after an initial survey which revealed their firm belief in the importance of critical reading and showed that they were already infusing critical thinking within the English Language curriculum. The multiple case study sought to understand each case in-depth in its natural setting, taking into consideration its complexity and context. It also aimed to draw out the complexity of the case through constructing rich descriptions of the strategies used by the participants. As highlighted by Stake, the qualitative case researcher seeks to “preserve the multiple realities, the different and even contradictory views of what is happening” (1995, p.12). Hence, each case was introduced and described in detail separately before a cross case analysis was made. The cases were constructed through data collected in the form of a survey, semi-structured interviews, classroom observations and documents.

The documents gathered comprised participants’ lesson plans as well as students’ worksheets and journals. Non-participant classroom observations were conducted at the participants’ schools. The data gathered ensured that rich and nuanced descriptions of the six participants were constructed. The data analysis processes combined techniques from grounded theory (Strauss & Corbin, 1998; Charmaz, 2006; Punch, 2009) as well as inductive processes. Data were coded and analysed using open and focused coding.
From the coded categories, interrelated propositions were formulated and they formed the basis for generating the theory about the creation of a critical thinking culture.

**General Research Questions**

The general research questions addressed in this study were:

1. What are the perspectives of expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking across the English Language curriculum?

2. What are the concerns of expert primary school in-service teachers of English Language in Singapore who firmly believe in critical reading on the infusion of critical thinking across the English Language curriculum?

**Definition of Terms**

For the purposes of this study, the following terms were defined to provide clarity:

a. ‘In-service teachers’ were defined as teachers who have completed their DipEd or PGDE with NIE, and are currently employed in teaching.

b. ‘Perspectives’ were defined as frameworks through which people make sense of the world (Woods, 1983, p.7).

c. ‘Infusion’ was defined as direct and conscious instruction of thinking skills within subjects in line with MOE’s definition of ‘infusion’.

d. ‘Theory’ was defined as conceptual frameworks created through “building inductive analysis from the data” with the analytic categories “directly grounded in data” (Charmaz, 2006, p.187).

**Significance of Study**

Although this study is relatively small scale with only six participants comprising six distinct case studies, the in-depth qualitative study made a significant contribution in addressing the lack of research on critical thinking from the perspective of teacher practitioners in primary schools in Singapore. By examining the beliefs of the participants and how they infuse critical thinking across the English Language curriculum over a period of ten months, this study generated valuable insights into the strategies and approaches used to infuse critical thinking across the English Language curriculum by expert in-service primary school teachers in Singapore.

Insights into pedagogical practices that are effective for the infusion of critical thinking would be useful to primary school teachers teaching English Language as well as other subjects. Teachers could learn and apply more effective strategies and models of instruction to promote critical thinking in students. Through an in-depth investigation of the
perspectives of the six participants, an explanatory theory regarding the creation of a critical thinking culture in the school environment was generated with implications for professional practice, organisational policy, and further research. An understanding of this theory could provide school leaders with concrete ideas on how they could create a critical thinking culture in their schools. This study also provides useful information for policy makers within the Ministry of Education with regard to pre-service teacher education and in-service teacher professional development as well as proposals for changes to the assessment of English in the Primary School Leaving Examination.

**Contextual Background of Study**

This section provides a description of the chronological account of the teaching of English Language in the Singapore educational context and the movement towards reform in education through the implementation of the Thinking Programme in Singapore. It covers a brief description of the Thinking Programme in Singapore and the English Language Syllabi 2001 and 2010 in which the thinking skills and strategies in the Thinking Programme were incorporated.

**Teaching of English in the Singapore Context**

Historically, from British colonial rule, English Language has played an integral role as the main language for public administration, education, commerce and technology in Singapore (Lin, 2003). The standing and influence of English Language continued even after Singapore gained independence as a nation under the leadership of the People’s Action Party. English Language was viewed as a “primary utilitarian tool in Singapore’s effort to make the world its marketplace” (Goh & Gopinathan, 2006) and has been the medium of instruction for all subjects (except Mother Tongue) taught in schools and higher institutes of learning since 1979.

Goh and Gopinathan (2006) describe Singapore’s education system in 3 phases: Post-independence (1965-1978) was a survival-driven education focusing on raising the enrolment rate to prepare manpower for industrial development to build the nation’s economy. This was followed by sustainable development through an efficiency-driven education (1978-1997), targeting reduction of educational wastage due to attrition by raising the quality of teaching to cater to the diverse needs of students. The last phase of education from 1997 to the present shifted towards an ability-driven education system to maximise the development of student talent and help each child reach his/her fullest potential in a knowledge-based economy.

This paradigm shift from an efficiency-driven education to an ability-driven one was initiated in June 1997 when MOE set out the vision of Thinking Schools, Learning Nation
(TSLN), a key milestone to reform education in Singapore. The term TSLN was first introduced by then-Prime Minister Mr Goh Chok Tong in 1997, when he called for a nationwide review of education to meet the challenges of the future. TSLN was launched in response to the perceived threats and challenges confronting Singapore in the global context (Mok & Tan, 2004). The concept behind the vision statement, Thinking Schools, Learning Nation, was explained by Goh (1998), during his opening address at the 7th International Conference on Thinking, hosted by NIE-NTU. He highlighted the importance of equipping students for the unpredictable future, by ensuring that young people could think for themselves and find their own solutions to new challenges faced in the future.

The TSLN vision statement is explained on the MOE website http://www.moe.gov.sg/about/ as follows:

This vision describes a nation of thinking and committed citizens capable of meeting the challenges of the future, and an education system geared to the needs of the 21st century.

Thinking schools will be learning organisations in every sense, constantly challenging assumptions, and seeking better ways of doing things through participation, creativity and innovation. Thinking Schools will be the cradle of thinking students as well as thinking adults and this spirit of learning should accompany our students even after they leave school.

A Learning Nation envisions a national culture and social environment that promotes lifelong learning in our people. The capacity of Singaporeans to continually learn, both for professional development and for personal enrichment, will determine our collective tolerance for change.

Ee and Tan (2008) state that Mr Goh saw the value of transforming a generation of thinkers and dedicated citizens who are able to make good decisions for the future of Singapore. They add that the four key strategies of educational reform to meet the changing learner needs brought about by globalisation include:

1) the explicit teaching of critical and creative thinking skills;
2) the reduction of subject content;
3) the revision of assessment modes; and
4) a greater emphasis on processes instead of outcomes when appraising schools (Ee & Tan, 2008, p. 57).

As a result of the TSLN initiative, the emphasis of education in Singapore shifted from content knowledge to interpreting knowledge critically (Tan & Cheah, 2002). The purpose of the reform is to develop independent thinkers who are flexible, able to generate
ideas, analyse information, define problems and find solutions to these problems (Han, 1998).

To work towards achieving the TSLN vision, MOE re-examined the goals and purpose of Singapore’s education and the Desired Outcomes of Education (DOE), were formulated in 1997, stating the end-objectives of formal education and the skills and values regarded as crucial for students in a globalised economy. The Desired Outcomes for primary school pupils comprise developmental skills including thinking, language and communication skills for students at the end of primary school as abilities to:

- distinguish right from wrong
- learn to share and put others first
- build friendships with others
- have a lively curiosity about things
- think for and express themselves
- take pride in their work
- cultivate healthy habits
- love Singapore

In tandem with the Thinking Schools, Learning Nation vision and the Desired Outcomes of Education, the entire education system was reviewed, particularly in curriculum and assessment to develop creativity and promote independent learning among students. This was followed by implementation of a master plan for ICT in education, establishment of an overarching approach for national education, and strengthening of school management structures through school autonomy.

To ensure continued relevance, these desired outcomes were reviewed and refreshed in 2009 (MOE, 2009). The Key Stage Outcomes spell out what the MOE aspires to develop in students through Primary, Secondary, and Post-Secondary education. Sequentially, each educational level builds upon the previous stages and lays the foundation for subsequent ones. Notably, one of the eight outcomes focuses on critical thinking where pupils are expected to think for and express themselves confidently at the end of primary school; to appreciate diverse views and communicate effectively at the end of secondary school; and to think critically and communicate persuasively at the end of post-secondary education.

**Thinking programme in Singapore.** The Cognitive Research Trust (CoRT) Thinking Programme, a stand-alone approach developed by Edward de Bono was introduced to secondary schools (for secondary 1 & 2 students) in 1987. Although students became more systematic in their thinking as a result of CoRT, they viewed
thinking skills as separate from the curriculum and were unable to transfer them into subject content areas. In response, a Thinking Programme based on the Dimensions of Learning Framework developed by Marzano (1992) was adopted. The Dimensions of Learning Framework was then adapted by encompassing the CoRT tools into the learning framework. The Learning Framework was piloted in five secondary schools in 1996 before the Thinking Programme was implemented over a two-year period (1997 to 1999), to Secondary 1 and 2 students.

The Thinking Programme sought to develop critical thinking skills in students and help them to become better thinkers and learners (Gee, 1996). Students need to “think rationally about issues, to approach problems creatively, and to make decisions based on sound judgment” (Chua & Leong, 1998, p.77). Specifically, the objectives of the thinking programme were as follows:

- enable pupils to acquire and understand the core thinking skills and the processes involved in using them;
- apply these skills to the learning of content subjects and to real-life decision-making and problem-solving situations;
- develop positive habits which would help them become critical, creative and self-regulated, thinking learners (Mok, 2000, p. 174).

The Thinking Programme (MOE, 1999) incorporated eight core thinking skills from the Dimensions of Thinking model into the Dimensions of Learning framework (Marzano, 1992) encompassing:

- positive attitudes and perception about learning;
- thinking involved in acquiring and integrating knowledge;
- thinking involved in extending and refining knowledge;
- thinking involved in using knowledge meaningfully; and
- productive habits of mind (Mok, 2000, p. 175).

Two concurrent approaches were used to teach students the core thinking skills in the Thinking Programme. The eight core thinking skills comprising focusing, information-gathering, remembering, organising, analysing, generating, integrating and evaluating (Marzano et al., 1988) were taught explicitly in non-curricular contexts for one period (35 minutes) per week and the thinking skills were infused into about 30% of the curriculum time for the core subjects including English, Science, Mathematics, Geography and History (Chua & Leong, 1998). The stand-alone instruction of thinking skills was eventually phased out as teachers did not find it helpful to teach the thinking skills apart from subject content.
Following the implementation of the Thinking Programme for Lower Secondary students, a series of workshops focusing on the infusion of thinking skills across the curriculum was conducted for some primary school teachers. The Thinking Programme has since morphed into the application of critical and creative thinking skills through Project Work which has been carried out in all schools in Singapore since 2000. Instead of explicitly teaching specific thinking skills, the current focus is on project work as a platform for the teaching and application of critical and creative thinking to real-life situations, self-regulation as well as problem-solving.

In 2010, the 21CC framework which was introduced to emphasise the value of developing 21CC skills includes Critical and Inventive Thinking (CIT) as one of the domains. The components of CIT comprise sound reasoning and decision-making, reflective thinking, curiosity and creativity, and managing complexities and ambiguities. Thinking Schools, Learning Nation “continues to be the overarching descriptor of the transformation in the education system, comprising changes in all aspects of education” (MOE, 2010).

**English Language Syllabi 2001 & 2010.** In line with the TSLN initiative, it was recommended that the eight core thinking skills in Marzano’s Dimensions of Learning Framework be incorporated in the revised subject syllabuses from 2000 onwards so that teachers could develop students’ thinking within subject disciplines. The 2001 English Language Syllabus was conceptualised and implemented by the English Unit of the Languages and Literature Branch of the Curriculum Planning & Development Division of the Ministry of Education from 2001 to 2009. The overarching goal was that the English Language curriculum would help students “become independent lifelong learners, creative thinkers and problem solvers who can communicate effectively in English” (MOE, 2001, p.2). An integrated approach to language and literacy development was promoted in the syllabus with the aim of helping students “become competent and critical listeners and readers” (MOE, 2001, p.7). Core thinking skills listed in The Thinking Programme were explicitly assimilated into the learning outcomes of the English Language Syllabus 2001 in the listening and speaking, reading and writing components.

Building on the 2001 syllabus which was replaced by the English Language Syllabus 2010, the national initiative of thinking skills was woven into the 2010 Syllabus. Under Learning Outcome 3 on Reading and Viewing in the Syllabus (Figure 1), teachers are expected to teach pupils to think critically and reflect on what they read and/or view to become critical readers and viewers. In line with the focus on critical reading advocated in the 2010 English Language Syllabus, this study aimed to develop explanatory theory
based on the perspectives of expert primary school in-service teachers of English Language in Singapore regarding the infusion of critical thinking across the English Language curriculum.

**Teacher Education Programmes**

Due to the reform towards thinking, NIE, the only tertiary institution in Singapore for teacher-training, had to prepare pre-service teachers to comprehend and implement the new desired outcomes as a result of the TSLN initiative in 1997 (Chang, 2001). Hence, a Thinking Education Committee was set up for the review of changes to the Educational Modules, Instructional Science Modules, Curriculum Modules, and Practicum (Chang & Hung, 1999). Although some instruction on thinking was incorporated into some of these modules, the infusion of critical thinking has not been taught explicitly within each of the subject disciplines.

**GEP Thinking Programmes**

From 1984, students selected for the Gifted Education Programme (GEP) were given exposure to a variety of thinking and problem-solving skills to nurture good thinkers (Chang, 2001). Since 2000, GEP teachers have been trained to teach the three main approaches used for developing thinking in GEP students, including:

1. development of interdisciplinary thinking through cross-disciplinary macro-concepts, such as change, system and conflict;
2. pervasive use of Richard Paul’s Reasoning Model in all subjects to cultivate rigorous thinking;
3. use of Habits of Mind, taught explicitly in the Civics and Moral Education (CME) curriculum and infused in the other subjects.

Teachers play a key role in the infusion of critical thinking in the English Language curriculum. However, a review of literature showed little empirical data on how teachers implement critical thinking in the classroom. This study examined how expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical reading, infused critical thinking across the English Language curriculum and provided insights into their pedagogical practices.

**Structure of the Thesis**

This chapter provides an overview of the entire thesis beginning with the background to the study, outlining the rationale and aim, as well as describing the context of the study. Chapter 2 provides the conceptual framework for the study by examining pertinent literature regarding two cognate fields of knowledge, namely, teacher identity and critical thinking, identifying the dominant themes and concerns of previous research in
these fields. Chapter 3 then deals with the research methodology of this study. Chapters 4 and 5 present the findings of six individual case studies in detail. Chapter 6 conducts a cross case analysis of the participants’ perspectives based on the data collected. Chapter 7 discusses the development of two propositions and presents the explanatory theory generated regarding the creation of a critical thinking culture in schools. Chapter 8 is the final chapter and it details the implications for professional practice, organisational policy, and directions for further research.
The study focused on the perspectives of primary school in-service expert teachers of English Language in Singapore. These participants were experienced teachers with strong pedagogical content knowledge and a positive teacher identity. They were also teachers who firmly believe in the importance of critical reading and hence were committed to infusing critical thinking across the English Language curriculum in their own unique ways. Hence the literature review in this chapter drew from two cognate fields of knowledge, namely, that of ‘teacher identity’ and ‘critical thinking’, which form the conceptual framework of this study.

Part 1 of the literature review pertains to teacher identity, as the consideration of the roles of the teacher, their beliefs, their commitment, how they structure their English Language lessons and pedagogical practices which support the infusion of critical thinking are key features in this study. Part 2 of the literature review relates to critical thinking. The purpose of this review is to synthesise theory and research relevant to teacher identity and critical thinking to form a conceptual framework for this study.

Part 1: Teacher Identity

The literature review on teacher identity includes literature from both general teacher education as well as language teacher education as the concepts, theories and research findings in general educational research are applicable to language teacher education. The first segment of the literature review on teacher identity focuses on research methodologies and conceptual frameworks used in teacher identity. This is followed by conceptualisations and definitions of ‘teacher identity’ in educational research. Next, there is an exploration of the relationship between teacher identity and each of the factors that shape its development, namely contextual factors, emotion, narratives, reflection, agency, change/reform, language learning, professional development, and commitment to teaching.

Research Methodologies in Teacher Identity

An assortment of research methodologies has been used to study different aspects of teacher identity. A summary of three of the most frequently used research methods for studying teacher identity is given in order to locate the theoretical framework used in this study:
Discourse analysis. Discourse analysis with its roots in discourse theory has been used by Alsup (2006) and Clarke (2008) as a conceptual framework in the examination of teacher identity. Clarke (2008) states that the term ‘discourse’ has been used in varied ways but is seldom defined. He adds that discourse can refer to language beyond sentence level as well as “linguistically embodied systems of meaning, knowledge and belief” (p.15). MacLure (1993) asserts that identity is developed, sustained, and negotiated to a large extent through language and discourse. Alsup (2006) created the term ‘borderland discourse’ in her study on teacher identity with pre-service English teachers from secondary schools. She defines 'borderland discourse' as transformative and presenting a holistic view as it incorporates the cognitive, the physical and the emotional self. Starks and Trinidad (2007) explain that discourse analysis “is concerned with language-in-use; that is, how individuals accomplish personal, social, and political projects through language” (p. 1374). In discourse analysis, the articulation of participants is analysed mainly as texts and appears impersonal as it does not deal with an in-depth examination of the participants’ perspectives and beliefs (Bukor, 2011).

Narrative inquiry. Narrative inquiry focuses on the personal aspects of the teachers’ lives and how their experiences influence their teaching practices. MacLure (1993) uses the term “biographical attitude” to present the researcher’s interest in the “informal and person-oriented genres such as biography, autobiography, life history, narrative and anecdote” (p.311). Connelly and Clandinin (2006) define narrative inquiry: Narrative inquiry, the study of experience as story, then, is first and foremost a way of thinking about experience. Narrative inquiry as a methodology entails a view of the phenomenon. To use narrative inquiry methodology is to adopt a particular view of experience as phenomenon under study (p. 375).

Connelly and Clandinin (2006) considered narrative inquiry as an open-ended, experiential research methodology. They assert that experience is interconnected with life and education and stories are the closest means to expressing one’s experiences to others. Narrative inquiry is a way of inquiring into experience through “collaboration between researcher and participants, over time, in a place or series of places, and in social interaction with milieus” (Clandinin & Connelly, 2000, p. 20).

Constructivist approaches. Researchers have also adopted the social constructivist and socio-cultural perspectives rooted in the socio-cultural theory as a conceptual framework (Lantolf & Pavlenko, 1995; Cross & Gearon, 2004). Cross and Gearon (2004) assert that the term ‘socio-cultural’ is a reflection that “truth is only relative to the thoughts, practices, values and ideology of any one particular people, time or place:
the social and cultural milieu...” (p. 5-6). The socio-cultural theory is based on the concept that “individual consciousness” is developed from the outside through social interaction with others (Vygotsky, 1986).

Research in language education by Varghese, Morgan, Johnson and Johnson (2005) in connection with the socio-cultural approach revealed that race, gender and sexual orientation affect the development of teacher identity. Varghese et al. (2005) assert that teacher identity is an essential part in determining the way language teaching is conducted. They advocate the need to understand the professional, cultural, political, and individual identities of teachers to understand language teaching and learning. Three different theoretical frameworks, namely, Tajfel’s (1978) social identity theory, Lave and Wenger’s (1991) theory of situated learning and Simon’s (1995) concept of the image-text have been used to examine different substantive and theoretical aspects of language teacher identity (Varghese et al., 2005).

In view of the different research methodologies used in the study of teacher identity, it is expected that different aspects of and interpretations of teacher identity will result from the different emphasis of each methodology. As the symbolic interactionism theoretical framework within the interpretivist paradigm used in this study is consistent with Vygotsky’s (1978) social cultural theory of cognitive development, the constructivist approach is most suitable for this study. Hence, constructivist grounded theory research methods, which is consistent with the interpretivist paradigm, were also used for data analysis and developing explanatory theory in this study.

**Concept of Teacher Identity**

**Self and identity.** Teacher identity and language teacher identity are topics of growing interest in recent research on language teacher education and teacher development (Morgan, 2004; Varghese et al., 2005; Cross, 2006; Beauchamp & Thomas, 2009). In Singapore, interest in teacher identity in recent years is seen from several NIE research projects exploring various aspects of teacher identity (Alsagoff, 2013). These research projects include developing an identity as a teacher; lived experiences of English teachers; developing as a teaching professional; a community of teaching professionals and teacher beliefs in changing times.

Although research on teacher identity emerged only in the recent two decades, the concept of identity has long been used by Mead (1934) in conjunction with the concept of self which is developed through interactions with the environment and social communication. The concepts of self and identity are interchangeable in literature pertaining to teacher education (Day, Kington, Stobart & Sammons, 2006). Erikson (1968),
concentrated on the formation of identity in social contexts and the stages people go through as a result of physical and psychological maturation. Erikson’s concept of identity is one that changes throughout life as the individual interacts with his environment. Beijaard, Meijer and Verloop, (2004) note that despite differences in meaning regarding the concept of identity in literature, what is common seems to be that identity is not a “fixed attribute of a person but a relational phenomenon” (p.108). Gee (2001) adds that identity development is an ongoing process of interpreting self and being acknowledged as such.

**Teacher identity.** Teacher identity plays an important role in teacher development as an understanding of teacher identity will result in more effective teacher education programmes (Beauchamp & Thomas, 2009). Day and Hadfield (1996) see a teacher’s professional identity as comprising three different selves: the actual self (teacher’s perception of current abilities and roles), the ideal self (teacher’s perception of the perfect teacher) and the transitional self (teacher’s progress from actual self to ideal self). Most researchers view teacher identity as an “ongoing process of integration of the ‘personal’ and the ‘professional’ sides of becoming and being a teacher” (Beijaard et al., 2004, p.113).

The personal aspects of identity comprise the teacher’s life outside school including family and social life (Day & Gu, 2007). It involves aspects of being male/female, the roles as parent, son/daughter and partner, health issues, family support and demands (Sammons et al., 2007).

The professional aspects of identity encompass professional knowledge such as the teacher being a “subject matter expert”, a “pedagogical expert”, and a “didactical expert” (Beijaard, Verloop & Vermunt, 2000, p.750). Beijaard et al., (2000) found that the teaching context, teaching experiences and biography influences the development of teachers’ professional identity. They add that pre-service teachers’ biographies and their personal beliefs and values related to these biographies which began at home are considered significant elements which form their initial professional identity. Professional identity is associated with teachers’ self concepts or images which shape how they teach, how they develop and their attitudes towards changes in education (Nias, 1989). Tickle (2000) adds that professional identity is also influenced by the expectations of others on what a teacher should know/do and what teachers themselves consider significant in their professional work according to their background and experiences.

Kelchtermans (cited in Day et al., 2006, p.603-604) proposes five interrelated parts of the professional self:

- **Self-image:** how teachers describe themselves through their career stories;
• Self-esteem: the evolution of self as a teacher, how good or otherwise as defined by self or others;
• Job-motivation: what makes teachers choose, remain committed to or leave the job;
• Task perception: how teachers define their jobs;
• Future perspective: teachers’ expectations for the future development of their jobs.

Professional identity is also linked to the roles of teachers (Volkmann & Anderson, 1998) in connection with reflection (Cooper & Olson, 1996). However, Day and Kington (2008) stress that professional identity should not be mixed up with role. They define identity:

Identity is the way we make sense of ourselves to ourselves and the image of ourselves that we present to others. It is culturally embedded. There is an unavoidable interrelationship, also, between the professional and the personal (Day & Kington, 2008, p. 9).

Alsup (2006) considers that disregarding either the personal or the professional aspects of a teacher’s identity could result in unsuccessful teacher education. She adds that the process of a holistic integration of the personal aspects of the self with professional expectations is complex as the personal ideologies of some teachers may clash with the perceived professional expectations. Hence, she argues the need to address teacher identity concerns during teacher education courses for pre-service teachers. Pre-service teachers, who are not able to conform to professional expectations, while remaining true to themselves, may become frustrated and end up leaving the profession. To avoid such situations, she suggests that these teachers create an identity space in the “so-called borderland between identity positions or situated discourses” which is a space of “continual becoming rather than an endpoint culminating in a singular identity construction” (p. 7). Alsup’s (2006) idea of the term ‘discourse’ is congruent with Gee’s (1999) definition of discourse:

Different ways in which we humans integrate language with non-language “stuff”, such as different ways of thinking, acting, interacting, valuing, feeling, believing, and using symbols, tools and objects in the right places at the right times so as to enact and recognize different identities and activities, give the material world certain meanings, distribute social goods in a certain way, make certain sorts of meaningful connections in our experience and privilege certain symbol systems and ways of knowing over others (p. 13).
Based on Gee’s (1999) definition, discourse comprises activities and actions related to the mind, body and spirit. Alsup contends that since teacher identity is holistic encompassing the cognitive, the emotional, the bodily and the creative, there is a need to provide opportunities for teachers to talk about why and how such issues are important to them. She adds that finding the borderland between two or more discourses and “speaking from this new space, the site of alternative discourse” brings about “metacognitive awareness and identity growth” (2006, p.9).

Professional identity is “not fixed, stable, unitary, and internally coherent phenomenon but is multiple, shifting, and in conflict” (Varghese et al., 2005, p.22). In her study on the impact of policy changes in the lives of secondary school teachers, Maclure (1993) defines identity as a “a continuing site of contestation, struggle and reworking” (p. 45) and argues that identity should not be perceived as something that one has but something that one uses to “justify, explain and make sense of themselves in relationship to other people, and to the contexts in which they operate” (p.312).

Professional identity is ongoing and always in the process of evolving (Beijaard et al., 2004). It is a complicated and dynamic equilibrium in which the professional self image is balanced with the varied roles that teachers have to play (Volkman & Anderson, 1998). Coldron and Smith (1999) highlight the tension between agency (the personal dimension in which the teacher chooses professional development in line with personal goals) and structure (the social aspect). Professional identity is multifaceted, as a teacher’s sense of self is impacted by historical, sociological, psychological and cultural factors (Cooper & Olson, 1996). Gee (2001) proposes that while one might have a “core identity”, one is a “kind of person” in a specific context and hence one has multiple forms of this identity in different contexts (p. 99). He suggests that one’s identity derives from nature (our natural state), institution (based on position recognised by authority), discourse (based on what others say about oneself) and affinity (one’s practices with external groups). Sachs (2005) sums teacher professional identity in the following way:

Teacher professional identity then stands at the core of the teaching profession. It provides a framework for teachers to construct their own ideas of ‘how to be’, ‘how to act’ and ‘how to understand’ their work and their place in society. Importantly, teacher identity is not something that is fixed nor is it imposed; rather it is negotiated through experience and the sense that is made of that experience. (p. 15)

Sachs’ (2005) view of identity incorporates the personal and professional elements of identity and focuses on the evolving process of negotiation of identity through
experience. Teacher professional identity is only a facet of individual capacity comprising “personal commitment, a willingness to learn about instruction and to view learning as ongoing, and substantive knowledge about reform ideas” (Spillane & Thompson cited in Lasky, 2005). Individual capacity also includes beliefs, identity, values, subject area and pedagogic knowledge, experiences with reform in the past (Stoll, 1999), emotional well-being (Hargreaves, 1998), and vulnerability (Shapiro, 2010).

Akkerman and Meijer (2011) argue that a dialogical approach to conceptualising teacher identity depicts more comprehensively the complexity of identity. In this approach, ‘being someone who teaches’ or ‘teacher identity’, is not seen as an end point, but as “an ongoing process of negotiating and interrelating multiple I-positions in such a way that a more or less coherent and consistent sense of self is maintained throughout various participations and self-investments in one’s (working) life” (p. 317-318).

Besides the integration of the personal and professional elements of self, identity shifts take place throughout a teacher’s career (Beauchamp & Thomas, 2009) as it is impacted externally by the context of the teacher’s experiences at work and life (Sachs, 2005) and internally by emotions (Zembylas, 2003) as well as many other factors which are elaborated in the following section.

Factors Shaping Teacher Identity

Teacher identity and contextual factors. Contextual factors play a key role in influencing the professional lives of teachers. Teacher identity is developed “as the result of an interaction between the personal experiences of teachers and the social, cultural, and institutional environment in which they function on a daily basis” (Sleegers & Kelchtermans, 1999, p. 579). Beauchamp and Thomas (2009) add that besides the school environment, the type of students, the influence of colleagues and school leaders and the teacher’s own experiences are involved in shaping teacher identity. Tension occurs between the political, societal and personal expectations about what teachers should know and do resulting in disputable ideas about the professional roles of teachers (Bodman, Taylor & Morris, 2012).

Varghese et al. (2005) assert that the choice of teaching discipline may also shape identity, as disciplines have particular teaching cultures of their own. Beijaard (1995) notes that teachers having poor relationships with their students view themselves negatively while teachers with a positive school culture and teachers involved in extra-curricular activities and in the development of school policy-making view themselves positively. The teachers’ agency, well-being and sense of vulnerability are influenced positively or negatively by these varied contextual factors and the teacher’s capacity to manage them.
(Sammons et al, 2007). The teacher’s capacity to manage these factors “vary according to life experiences and events, the strength and conviction of their educational ideals, sense of efficacy and agency and the support of leaders and colleagues” (Sammons et al, 2007, p.691).

**Teacher identity and emotion.** Nias (1989) emphasizes the value of studying teachers’ emotional experiences as they cannot be extricated from the personal lives of teachers. Emotions and feelings are important as empirical research findings show that emotions are essential for rational decision making (Damasio, 1994). Emotions also affect teacher cognition and motivation (Sutton & Wheatley, 2003). Zembylas (2003) explains that “teacher emotion is embedded in school culture, ideology, and power relations, through which certain emotional rules are produced to constitute teachers’ emotion and subjectivity” (p.120). He adds that these rules manage emotional responses and determine how teachers display appropriate emotions in line with their expected role as teachers. Zembylas (2003) suggests that having an awareness of the “technologies that govern one’s emotions and subjectivities” and “creating strategies of resistance and self-formation through reformulating emotion discourses and performances” (p. 127) can help teachers arbitrate new emotional rules in their teaching profession.

Shapiro (2010) describes the tendency for teachers to create two mutually exclusive identities as a fallible human and as a ‘model teacher’ who suppresses emotions during interactions with other teachers. This dichotomy results in tension in their emotional identity. She adds that the ideal teacher myth “comprises a disciplining mechanism, maintaining an impossible expectation that serves to prevent teacher resistance” (p. 619). Hence, teachers need to deal with this myth and explore their emotional experiences. Shapiro (2010) argues that recognising emotional identity would be the best tool of resistance to the constant dehumanisation of the teaching profession as teacher identity needs to incorporate the emotional realities of being human.

**Teacher identity and narratives.** Teacher identity is not only shaped but also shared through narratives (Connelly & Clandinin, 1999) when teachers talk about their work with their school leaders, colleagues, students and people outside the education context. Hence, the scrutiny of teacher narratives provides a peek into the nature of teacher’s work and the multifaceted nature of their professional identity. The self of a person is intimately connected to the person’s narratives or life stories which are a means of articulating identity (Kerby, 1991).

Carter and Doyle (1996) assert that “the process of learning to teach, the act of teaching and teachers’ experiences and choices are deeply personal matters inexorably
linked to their identity and life story” (p.120). Hence, learning to teach encompasses the construction of personal stories or personal narratives. Sfard and Prusak (2005) maintain that besides the storyteller, “collective storytelling” (p. 21) encompasses those who heard the story and those who in turn would tell the story. Hence, identity is “interpreted and constructed through the stories that one tells oneself and that others tell” (Rodgers & Scott, 2008, p.737). Beauchamp and Thomas (2009) add that “embedded with narrative and discourse as central to the discussion of identity is the use of metaphor to explore and give expression to identity” (p.181).

**Teacher identity and reflection.** Beauchamp and Thomas (2009) consider reflection as one of the main ways in which teachers become “more in tune with their sense of self and with a deep understanding of how this self fits into a larger context which involves others” (p.182). They assert that reflection is an effective way for teachers to examine their teaching identities in-depth. Korthagen (2001) adds that teachers integrate that which is socially appropriate into their images of self through self-reflection. Eraut (1994) advocates that besides technical and procedural knowledge and prior experience, the seminal role of reflection before, during and after practice forms part of professional knowledge. Reflection is essential in teacher learning as it promotes the examination of the personal and professional aspects of teachers’ lives both in teacher education and professional development (Korthagen & Vasalos, 2005).

**Teacher identity and agency.** Professional identity can be set off and maintained through the establishment of agency (Beijaard et al., 2004). Agency is defined as “one’s ability to pursue the goals that one values” (Archer, 2000). It refers to teachers as “active agents who play decisive roles in determining the dynamics of social life and in shaping individual activities” (Sfard & Prusak, 2005, p.15). Beauchamp and Thomas (2009) add that a teacher’s awareness of his or her identity, in performance within teaching contexts, may give rise to a sense of agency, “of empowerment to move ideas forward, to reach goals or even transform the context” (p.183).

Agency could be engaged in the sustaining or shaping of teacher identity (Day, et al., 2006). Day and Gu (2007) note that a positive, stable identity is closely related to self-efficacy and agency due to the teachers’ belief that they could impact the learning and achievement of their students. Hence, when teachers perceive that they are unable to make pedagogic decisions in the classroom contrary to current policy, agency is threatened (Bodman et al., 2012). Teacher identity and agency are essential to teachers’ “motivation, commitment, well-being, and capacity to teach to their best” (Day, 2012, p.19).
Williams (2007) argues that researching teacher identity concepts would result in valuable insights into factors which influence a teacher’s attitude and decision-making.

**Teacher identity and change / reform.** In her study of enhancers and inhibitors of teacher risk taking, Ponticell (2003) showed that teacher risk taking during programme change was affected by their perceptions of uncertainty, loss and the gravity of the loss. She noted that positive emotions promote the risk-taking necessary for change but negative emotions prevent such behaviour. When faced with the uncertainty of change during periods of school reform, teachers’ emotional reactions shape their risk-taking, learning and development as well as identity formation (Reio, 2005). Hence, he argues that the implementation of reform should take into consideration the fact that teachers’ natural emotional reactions to change have positive and negative effects on their identity. In his proposed conceptual model, reform affects teacher identity directly. Identity then impacts one’s emotional reactions to reform. Emotions influence both risk taking behaviour and learning and development which in turn impacts teacher identity.

Lasky (2005) adds that changes in the perceptions of teachers regarding their agency during reform can influence their emotional reactions, willingness to take risks, vulnerability and teaching practices. Findings in her study showed that political, social, and economic mediational systems which influence reform policies in school had less impact on reshaping professional identity that was firmly established than forming teacher identity.

**Teacher Identity and language learning.** Varghese et al. (2005) listed “marginalization, the position of non-native speaker teachers, the status of language teaching as a profession and the teacher-student relation” (p.35) as the four areas of interest in research related to language teacher identity. In schools, language teachers invariably encounter professional and social marginalization. One key issue often discussed in research literature pertaining to teacher identity and language learning relates to that of native and non-native speakers of English (Varghese et al. (2005); Davies, 1995; Liu, 1999). Liu (1999) defines a native speaker of a language as “someone who binds the language with social identity, cultural affiliation, language competence, and confidence” (p. 94). Davies (1995) proposes six criteria that portray a native speaker: childhood language acquisition, intuitions about the grammar, intuitions about the standard language, the capacity to produce fluent spontaneous discourse, creativity with the language, and the capacity to interpret and translate into the first language. Kramsch (1997) contends that acknowledgment and acceptance as a native speaker by a particular speech community is more significant than questions regarding birth and competence.
Hence, social perceptions, encompassing ethnicity, physical features and other perceptually relevant factors, are critical in determining who is or is not a native speaker.

The development of teacher identity is impacted by the advantages and disadvantages in being a non-native speaker of English (Reves & Medgyes, 1994). Non-native English-speaking teachers portray a more attainable model for language learners (Cook, 1999). They are also competent in strategies for teaching language learning, anticipating language difficulties and more inclined to show empathy. However, non-native English-speaking teachers may be less linguistically competent and they may experience “inferiority complex” and foreign language anxiety (Reves & Medgyes, 1994). However, in the Singapore context, almost all teachers in the local schools are non-native speakers and hence, this factor does not have much impact on teacher identity.

Teacher identity and professional development. Olsen (2008) regards teacher identity as a useful “research frame” and a “pedagogical tool” that can be used by those involved in teacher education and professional development “to make visible various holistic, situated framings of teacher development in practice” (p.5). The importance of teacher identity to teacher development and teacher education is highlighted by Hammerness, Darling-Hammond, and Bransford, (2005):

Developing an identity as a teacher is an important part of securing teachers’ commitment to their work and adherence to professional norms...the identities teachers develop shape their dispositions, where they place their effort, whether and how they seek out professional development opportunities, and what obligations they see as intrinsic to their role (p.383–384).

A critical aspect of how professional identity is constructed is determined by teachers’ orientations (including beliefs, perceptions, values, motivation, job satisfaction and morale) to professional development and knowledge (Opfer, Pedder & Lavicza, 2011). Teacher beliefs play a significant part in teacher identity as these core beliefs are the lens through which teachers see the world and the decisions they make (Liang, 2013). ‘Beliefs’ is defined as “one’s convictions, philosophy, tenets, or opinions about teaching and learning” (Haney, Lumpe & Czerniak, 2003, p. 367). Teacher beliefs play a crucial role in times of curricular innovations (Van Driel, Bulte & Verloop, 2007) and it is unlikely for curriculum reform to succeed when teachers’ beliefs, intentions and attitudes are not taken into consideration (Tobin & McRobbie, 1996).

Opfer et al. (2011) found that professional learning is a complex process and not a sequential process in which an assumption that a change in belief would lead to a change in practice or vice versa. Instead, professional learning involves “a complex interaction
between changes in belief, changes in practice and changes in students, which depended significantly on teachers’ orientation to learning” (Bodman et al., 2012).

Day (2012) points out that learning does not end when one becomes an expert and hence it is essential for sustained commitment to learning throughout teachers’ professional career. The teachers’ sense of commitment also influences their attitudes and capacities for professional learning (Day & Gu, 2007). Teacher professional learning is essential as it enhances the knowledge base of teachers, improves their practices, promotes their effectiveness and commitment as well as develops their personal and professional selves (Day & Gu, 2007). Teacher identity is correlated to the competencies of the teacher as competent teachers are confident teachers with a very positive sense of identity (Low, 2013).

Factors that affect the professional learning of teachers include their perceptions of the school environment, the gains of participation, the backing of the senior leadership, their sense of positive professional identity, self-efficacy, career advancement ambitions, and life events beyond school (Maurer & Tarulli, 1994). Day and Gu (2007) stress that these factors influence the motivation and commitment of teachers to their professional learning and growth and the gains that they might obtain as a result. Wenger (1998) asserts that teacher participation in a community of practice results in the development of a new identity. In his concept of negotiated experience, teachers who are actively involved in a professional community take on a collective identity of “what we think or say about ourselves” (p. 151) as identity development involves the lived experience and intentional negotiation, or deliberate reflection on the significance of the experience. Wenger (1998) adds that professional experiences occur within larger communities of practice, in which experienced members function competently in familiar contexts and are aware of how to communicate with members.

There are three approaches related to the practice of professional development in English Language teaching: the individual approach, the institutional professional approach and the teacher-led approach (Mora, Trejo & Roux, 2014). In the individual approach, teacher professional development is seen as something driven by the teacher’s motivation from within and hence, it is reserved for those with career ambitions (Craft, 2000). Edge (2002) notes the limitations despite the approach being connected to personal development and hence is gratifying to teachers who are committed to teaching.

In the institutional professional approach, the policy makers such as ministries of education, school districts or individual schools offer teachers professional development opportunities to improve their professional practice (Mora et al., 2014). While this
approach produces noticeable changes within a short time period, it is a top-down approach that may lower the morale of teachers and result in stress to teachers (Craft, 2000).

In the teacher-led approach, teachers actively take part in their own professional development by “designing paths based on their preferences, beliefs and perceived needs” (Mora et al., 2014). Fullan and Hargreaves (1992) argue that there must be a balance between meeting individual and institutional needs. In this approach, the teachers’ contributions to the institution are valued and the changes that emerge from the professional development are more lasting as it is based on the interests of teachers (Kohonen, 2002).

Bodman et al. (2012) emphasised that the approach to professional learning “can either enable or impede teacher agency” (p.15). They explain that the way that teacher professional development evolves, whether it is self-initiated or top-down, whether it is in an individual or a social context may result in the growth or decline of teacher agency and decision-making. Recognising that high quality decision-making is based on teachers’ knowledge and their capacity to reflect critically on the knowledge application, they conclude that effective professional learning designs should have developing and sustaining agency as one of its central purposes.

**Teacher identity and commitment to teaching.** Findings from a 4-year study, Variations in Teachers’ Work and Lives and Their Effects on Students (VITAE), that tracked 300 teachers in 100 schools in England showed that teacher commitment (to students, subject and school) is a crucial factor in the quality of teaching, the capacities of teachers to adapt well to change and the retention of teachers, as well as the learning outcomes of students (Day, Sammons & Gu, 2008).

Teacher commitment is defined as the degree of psychological attachment that teachers have to their profession (Chapman, 1982) and it is the main factor which influences the identity and effectiveness of teacher performance (Kushman, 1992). Darby (2009) sees commitment as two imperatives driving teachers’ practice: a pedagogical imperative and a personal imperative. A pedagogical imperative pertains to a commitment to students’ success as teachers take on their teaching responsibility earnestly. For example, a study of the beliefs of 75 Singaporean teachers revealed that more primary school teachers than secondary teachers espoused the belief that helping students pass examinations is the purpose of teaching (Liang & Dixon, 2010). A personal imperative pertains to a commitment to the subject in view of the teacher’s interest in it. Darby (2009)
adds that passions are connected to these imperatives comprising a passion for students, a passion for the subject and a passion for engaging students in the subject.

The commitment of teachers is manifested in their involvement and work activities over and above the job requirements. Teachers who are committed are “motivated, willing to learn, and believe that they can make a difference to the learning and achievement of students” (Sammons et al., 2007, p.696). The VITAE study revealed that teacher commitment is positively correlated to teacher effectiveness in terms of promoting students’ academic outcomes. In addition, findings showed that teacher commitment may increase, be maintained or decrease according to the factors in the teachers’ personal and professional lives and their situated workplace, including national and local interventions in the curriculum and governance of schools, and how they managed the situations encountered. Sammons et al. (2007) concluded that teachers’ effectiveness is influenced to a large extent by their sense of positive professional identity and their well-being.

Day et al. (2006) note that unlike secondary school teachers whose subjects and their status are closely related to identity, the primary school teachers’ “personal and professional identities are closely connected and that they contribute to motivation, commitment and job satisfaction” (p. 610). MacLure (1993) asserts that despite the growing constraints faced by teachers, agency continues to be exercised when teachers persist in teaching within the constraints of the school environment or set of policies or initiatives, and when they are able to manoeuvre within these constraints.

At the start of their teaching career, it is observed that beginning teachers are intrinsically motivated and emotionally committed to provide the best care for their students. However, Day and Gu (2007) add that to keep on exercising care for students throughout a teacher’s career requires substantial commitment both intellectually and emotionally. In order to sustain “motivation, self-esteem or self-efficacy, job satisfaction, and commitment to teaching”, it is crucial for teachers to maintain a positive sense of self-efficacy to their subjects, students, relationships and roles (Day et al., 2006, p. 614). Day and Gu (2007) note that the teachers’ ability to remain committed to teaching is affected by their professional life phases and their identities which in turn were influenced by the contexts in which they lived and worked.

In school environments where the leadership provides sustained support to teachers on a personal and professional level, teachers tend to maintain commitment and competence, a sense of well-being, a positive professional identity and resilience even in challenging circumstances (Day, 2012). Day (2012) adds that besides support from school leaders, support from colleagues and personal support are viewed as instrumental in
developing a positive sense of agency, resilience and commitment by teachers from the various professional life phases.

Day and Gu (2007) divided the teachers' professional life into 6 phases according to their years of teaching from 0-3 years in phase 1 to more than 31 years in phase 6. They found that professional, personal and workplace conditions which differ in the various life phases influence teachers’ commitment and resilience which in turn affects their effectiveness:

Situated factors were more likely to affect teachers’ commitment and professional life trajectories in their early years. The combined impact of positive professional and situated factors, such as promotion, leadership and collegial support, and teachers’ increased self-efficacy, was potentially important in determining the commitment and effectiveness trajectories of mid-years teachers. For teachers in the final phase of their professional lives, in-school support had a significant role to play in helping promote their sense of resilience, agency and well-being and sustain their commitment and effectiveness (p.438).

In view of this, Sammons et al. (2007) stress that the strategies to maintain commitment in continual professional development programmes should address the different needs of teachers in the different phases of their professional lives. Day and Gu (2007) suggest that school leaders and policy makers give responsive and differentiated support to cater to the professional and personal learning needs of teachers at appropriate times to influence their professional commitment positively.

An understanding of teacher identity literature, in particular, how agency, professional development and commitment shape the development of teacher identity had been invaluable as it provided the lens through which the researcher was able to recognise that teachers who were committed to infusing critical thinking were able to exercise agency in teaching critical thinking despite the lack of explicit curricular guidelines for the infusion of critical thinking across the English Language curriculum. The awareness that the attitudes and beliefs of teachers influence the decisions they make regarding professional development and curricular innovations also made it possible for the researcher to provide feasible suggestions related to the implications of this study.

**Summary of Part 1 of Literature Review on Teacher Identity**

**Teacher Identity.** Teacher identity is essential as it recognises what teachers should know and do as well as what they consider significant in professional work according to their personal backgrounds including their self-image and self-esteem as well as their experiences related to job movements, task perception and future expectations.
Factors Shaping Teacher Identity. In addition to the tension between political, cultural and social environments and the perception of colleagues, school leaders and the teachers’ own experiences which shape teacher identity; how teachers’ emotions affect their cognition, motivation and their ability to narrate and reflect also help them stay passionate and committed as well as empower them to take the necessary risks to pursue their goals.

Part 2: Critical Thinking

This section provides a conceptual understanding of critical thinking, the issues pertaining to critical thinking and a review of empirical literature related to teaching critical thinking.

Conceptual Understanding of Critical Thinking

Critical thinking is a complex concept which has been conceptualised in a myriad of ways. The diverse definitions of critical thinking provide insights into an understanding of what critical thinking really entails. This section reviews some of the definitions of critical thinking found in the literature and several perspectives on conceptualising critical thinking in order to locate the definition of critical thinking in this study.

Concept of critical thinking based on the philosophical approach. Dewey (1910) described three kinds of thoughts namely conscious thought, imaginary thought and reflective thought. Conscious thought is everything “that goes through our heads” while imaginary thought is thought not based on observation but composed of a “note of invention” and they “do not aim at knowledge, at belief about facts or in truths” (Dewey, 1910, p.2). Dewey viewed “reflective thought” (a term for critical thinking) as evident when “the ground or basis for a belief is deliberately sought and its adequacy to support the belief examined” (1910, p.2). Reflective thought, regarded by Dewey as the only type of thinking of educative value, is defined as:

- active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends (1910, p.6).

Critical thinking is deliberate, with the aim of examining logic and evidence to support beliefs (Dewey, 1910; Ennis, 1985; Brookfield, 1987). Ennis (1985) highlights the need to judge the credibility of sources in the process of supporting one’s point of view with reasons. Brookfield (1987) adds that critical thinking goes beyond logical analysis to questioning the assumptions underlying thought and action by examining different perspectives, and being willing to think and act differently on the basis of critical questioning. Brookfield defines critical thinking as
a process by which people become aware of the assumptions underlying their habitual actions, ideas and judgments and by which they examine these assumptions for their accuracy and validity (1987, p.29).

Brookfield (1987) saw critical thinking as a continuous process rather than an outcome. He also described critical thinking as manifesting in different ways according to the context in which it took place. He asserted that though negative events cause people to question previously trusted assumptions, critical thinking could also be triggered by positive events. He added that through the process of critical thinking, it is possible to develop an awareness of the “diversity of values, behaviours, social structures, and artistic forms in the world” and to become aware that others “have the same sense of certainty we do – but about ideas, values, and actions that are completely contrary to our own” (p.5).

The multitudes of definitions and conceptualisations of critical thinking reveal the complexity of critical thinking. However, a few consensus reports on critical thinking have been presented in the literature, the best known being reviewed in the section below.

A national study was commissioned in 1988 by the American Philosophical Association (APA) to establish consensus among a panel of 46 experts (with recognized expertise in critical thinking, instruction, theory, and assessment) on the role of critical thinking in assessment and instruction. The outcome was known as the Delphi Report (APA, 1990). In the report, by consensus, critical thinking is defined as purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based (APA, 1990, p.3).

The cognitive skills and related subskills (not in order of skill hierarchy) for thinking critically that were agreed upon are:

- Interpretation: categorisation; decoding significance; clarifying meaning;
- Analysis: examining ideas; identifying arguments; analysing arguments;
- Evaluation: assessing claims; assessing arguments;
- Inference: querying evidence; conjecturing alternatives; drawing conclusion;
- Explanation: stating results; justifying procedures; presenting arguments;

Ennis (1991) defines critical thinking as “reflective and reasonable thinking that is focused on deciding what to believe or do” (p.6). He focuses on decision-making related to belief and action as a result of reflection and reasoning rationally. Case and Wright (1997)
elaborate on Ennis’ definition by focusing on when critical thinking occurs. Hence, they define critical thinking as “thinking through any ‘problematic’ situation where the thinker needs to make a judgment about what it would be sensible or reasonable to believe or do” (pg 3). Paul and Elder (1996) define critical thinking as “the art of analyzing and evaluating thinking with a view to improving it” (p. 2). They add that critical thinking has to be broad, encompassing the logic of everyday thinking and the logic of the disciplines.

Like Dewey (1910) and Brookfield (1987), Gabennesch (2006) took a wide view of critical thinking as a social asset on which democracy is based. He defines critical thinking as “the use of rational skills, worldviews, and values to get as close as possible to the truth” (p.38).

Gabennesch proposed three components which make up critical thinking: rational skills, worldviews and values. The rational skills include analysis, synthesis, interpretation, explanation, evaluation, generalisation, abstraction, illustration, application, comparison and recognition of logical fallacies (Gabennesch, 2006, p. 38). Besides cognitive thinking skills, he perceived worldviews and values as vital to the conception of critical thinking. The worldview component would provide an epistemological basis for discerning reality, as he believed that by examining his worldview, a critical thinker would come to the realisation that the world might not be as it appeared to be. Consequently, the critical thinker would learn not to take things at face value and he would not be “easily swayed by conventional wisdom” (Gabennesch, 2006, p.39). The values component ensured an ethical commitment to the intellectual pursuit, which would increase the “likelihood of finding the truth” (p. 40), based on informed and rational judgement.

Currently, in the intended curriculum, critical thinking is not defined in the 2010 MOE English Language Syllabus, A proposal is to adopt Case and Wright's definition of critical thinking for primary schools as it is practical, with a focus on ‘problematic’ situations or controversial issues which is implementable and the terminology used is not too difficult for primary school teachers and students to comprehend.

**Dispositions of Critical Thinking**

Critical thinking comprises not just cognitive skills but also dispositions. Dispositions refer to habits of the mind and the attributes that make a person more inclined to use critical thinking skills. Besides cognitive skills, the Delphi project also resulted in a list of dispositions that were agreed upon by the experts as core components of critical thinking. The dispositions are:

- The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases,
prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (Facione, 1990, p.3).

The Delphi panel emphasised the importance of dispositions, self-examination and self-correction in the critical thinking process. It must be noted that the conceptualisation of critical thinking skills and dispositions in the consensus statements represents that of an ideal thinker and is meant as a goal for educators to strive towards. Educating good critical thinkers requires the combination of developing critical thinking skills and nurturing the dispositions which “are the basis of a rational and democratic society” (Facione, 1990, p.3). Although Paul was in the Delphi panel, he subsequently used the term ‘intellectual traits or virtues’ instead of dispositions and they comprise intellectual humility, intellectual courage, intellectual empathy, intellectual autonomy, intellectual integrity, intellectual perseverance, confidence in reason, and fair-mindedness (Paul & Elder, 1996).

In concurring that critical thinking cognitive skills could be taught and critical thinking dispositions fostered, the Delphi panel advocated the need for efforts to create learning environments conducive to teaching and promoting both critical thinking skills and dispositions in students (Facione, 1990).

**Brief Comparison of Philosophical Approach with Other Approaches**

Contrary to the philosophical approach of the APA which focuses on the ideal thinker, the cognitive psychological approach focuses on how people think critically in reality through the use of their actions or behaviours (Lai, 2011). In line with the cognitive psychological approach, Sternberg (1986) defines critical thinking as “the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts” (p. 3). Willingham (2007) defines critical thinking as “seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems, and so forth” (p. 8).

Philosophers censured the cognitive psychological approach as reductionist; reducing a complicated orchestration of knowledge and skills into a compilation of discrete steps or procedures (Sternberg, 1986). Facione (1990) warns that critical thinking should not be confused with its component skills. Bailin (2002) contends that one could go ahead with all the steps of critical thinking and yet not be thinking critically.
In the educational approach, the three highest levels of Bloom’s taxonomy for information processing skills (1956), analysis, synthesis and evaluation, are often considered as representing critical thinking (Kennedy, Fisher & Ennis, 1991). Although the educational approach is grounded on classroom observations of student learning, the taxonomical concepts are not clear enough to provide direction for effective instruction and assessment (Sternberg, 1986). Nevertheless, Lai (2011, p.9) argues that researchers from all three schools of thought agree on the following:

- analyzing arguments, claims, or evidence (Ennis, 1985; Facione, 1990; Halpern, 1998; Paul, 1992);
- making inferences using inductive or deductive reasoning (Ennis, 1985; Facione, 1990; Paul, 1992; Willingham, 2007);
- judging or evaluating (Case, 2005; Ennis, 1985; Facione, 1990; Lipman, 1988; Tindal & Nolet, 1995); and
- making decisions or solving problems (Ennis, 1985; Halpern, 1998; Willingham, 2007)

Lai (2011, p.9) also listed the following dispositions that are commonly cited by researchers from the different schools of thought:

- open-mindedness (Bailin, Case, Coombs & Daniels, 1999; Ennis, 1985; Facione, 1990, 2000; Halpern, 1998);
- fair-mindedness (Bailin et al., 1999; Facione, 1990);
- the propensity to seek reason (Bailin et al., 1999; Ennis, 1985; Paul, 1992);
- inquisitiveness (Bailin et al., 1999; Facione, 1990, 2000);
- the desire to be well-informed (Ennis, 1985; Facione, 1990);
- flexibility (Facione, 1990; Halpern, 1998); and
- respect for, and willingness to entertain others’ viewpoints (Bailin et al., 1999; Facione, 1990).

**Critical Thinking in Relation to Other Concepts**

In the process of defining critical thinking, philosophers and educators have made connections between critical thinking and other concepts such as critical reading, metacognition, motivation and creative thinking. Each of these relationships will be discussed as follows:

**Critical thinking and critical reading.** Reading is not decoding but the process of constructing meaning from text as readers examine the text through the lens of their prior knowledge and experience (Rosenblatt, 1978). Thus, the more prior knowledge and experience the reader has that is associated with the text being read, the better he or she
comprehends the text. In view of this, Collins (1993) emphasises that reading presents the potential for promoting higher order thinking. She adds that problem solving and learning to reason through reading are two techniques for developing critical reading skills. Paul and Elder (2003a) assert that a natural relationship exists between critical thinking and reading. Hence, improving the way readers think about what they read will improve their reading. To put it simply, critical reading is applying critical thinking to the reading process or teaching students to think while reading (Worden, 1980; Collins, 1993).

Smith (1963) and Spache (1963) define critical reading as going beyond literal comprehension and interpretation to evaluation, making personal judgment on the quality, the value, the accuracy, and the truthfulness of what is read. Spache (1963) adds that critical reading also encompasses “distinguishing between fact and opinion, recognising the author’s purpose or point of view” and it involves an “active integration of the author’s facts and the reader’s insights into new understanding and interpretation of the material” (p.82-83). Carr (1988) asserts that evaluating, inferencing, and arriving at conclusions should be based on evidence. The critical reader “checks the authenticity of the materials, evaluates the author’s credentials, looks for errors in reasoning and develops sensitivity to the rightness or wrongness of what is presented” (Dechant, 1973, p. 269-270). Critical reading skills also include being able to interpret propaganda techniques, the ability to solve problems, being able to differentiate relevant and irrelevant information and the ability to make decisions regarding the trustworthiness of the author (Cheek & Cheek, 1983). The definition of critical reading in the 2010 MOE English Language Syllabus (stated on p.2-3) encompasses all the different aspects of critical reading mentioned in this paragraph. However, as Smith (1963) aptly puts it, it might it be useful to view critical reading as reading involving personal judgment and evaluation for the sake of having clear-cut objectives in teaching.

Riecken and Miller (1990) argue that students’ thinking develops as they learn to infer, conclude and appraise evidence through viewing literature from the perspective of problem-solving. They suggest exposing students to different ways of solving problems and making decisions through reading and discussing the diverse problem settings found in children’s literature. They opine that as children identify personally with the problems experienced by the main character in the story, it makes that decision-making or problem-solving experience more relevant and engaging for them.

Verbal exchanges by students during literature discussions also foster learning and promote thinking (Marzano, 1992). Discussing different points of view and working together to solve problems foster development of logical reasoning skills and students
involved in daily discussions about what they read tend to become critical learners and thinkers (Sweet, 1993). Critical readers “question, confirm, and judge what they read throughout the reading process” (Collins, 1993, p. 4).

As Taglieger (2003) puts it, there is great similarity in the ways that critical thinking and critical reading are defined. Thistlethwaite (1990) highlights that critical thinking skills often listed in textbooks for teaching critical thinking are the same as those listed in reading texts as critical reading skills. Commeyras (1990, p.201) adds that reasoning is an essential part of reading:

Critical thinking, which involves reasoning, is the process the reader uses to determine which interpretations are consistent with textual evidence and background knowledge.

Flynn as cited in (2003, p.142) states that critical reading involves an interactive process using several levels of thought simultaneously as for example, analysis – the clarification of information by examining the component parts; synthesis – the combining of relevant parts into a coherent whole; and evaluation – which involves establishing standards and then judging ideas against the standards to verify their reasonableness.

As explained in the previous section, these levels of thought comprising analysis, synthesis and evaluation are often considered as representing critical thinking. It is no wonder that Newton (1985, p.26) explicitly states that to “read critically is to think critically”.

Hence, for this study critical reading and critical thinking is regarded as synonymous (Thorndike, 1917; Smith, 1968; Neilsen, 1989, Taglieger, 2003).

**Critical thinking and metacognition.** The simplest definition of metacognition is “thinking about thinking”. Flavell (1979) sees metacognition as comprising both metacognitive knowledge and metacognitive regulation. Flavell sub-divides metacognitive knowledge into three categories: knowledge of person variables, task variables and strategy variables. Metacognitive regulation involves the use of metacognitive strategies (sequential processes) to control cognitive activities and ensure that a cognitive goal has been met. Halpern (1998) defines metacognition as “what we know about what we know and the ability to use this knowledge to direct and improve the thinking and learning process” (p.454).

There are diverse views regarding the relationship between critical thinking and metacognition. Flavell (1979) and Kuhn (1999) view critical thinking as a type of metacognition, Kuhn (1999) conceptualises critical thinking as encompassing metacognitive knowing (operating on declarative knowledge), meta-strategic knowing.
(operating on procedural knowledge), and epistemological knowing (incorporating how knowledge is produced). The panel involved in the APA Delphi report (Facione, 1990) lists self-regulation as a component skill of critical thinking and hence they see self regulation as the relationship between critical thinking and metacognition. Halonen (1995) and Halpern (1998) see metacognition as the capacity to monitor the critical thinking process for accuracy and progress toward the goal through self-assessment. Van Gelder (2005) and Willingham (2007) consider metacognition as subsumed under critical thinking. They assert that metacognitive strategies that are learnt or deployed enable one to think critically.


**Critical thinking and motivation.** Halonen (1995) argues that not all students with the skills to think critically are motivated to do so unless they have the predisposition to use these skills. She proposed a framework comprising the cognitive and propensity elements of critical thinking to demystify critical thinking. In her framework, the propensity elements which motivate critical thinking are emotion, attitude and physiological readiness. Halonen (1995, p.77) illustrates that surprise triggers critical thinking as the thinker “engages in critical thinking to reduce the feeling of being off balance or confused”. She adds that emotions that are well-managed promote critical thinking.

As for attitude, personal relevance (Petty & Cacioppo, 1984) motivates students to think critically about issues. Hence, teachers should take the effort to make lessons personally relevant to students. Teachers could tap on the experience of misconceptions such as discrepancies between scientific knowledge and students’ naive psychology as they promote critical thinking (Halonen, 1986). Students are also motivated to think critically when they perceive that the given task is important (Maheswaran & Chaiken, 1991).

Critical thinking is influenced positively or negatively by physiological factors. Halonen (1995) illustrates that hunger, fatigue and strain affect critical thinking negatively. Lawrence et al. (2008) add that other factors which motivate critical thinking include students’ interest in the topic and the instructor’s enthusiasm in the course material.
Facione, Facione and Giancario (2000, p.65) define the disposition to think critically as the “consistent internal motivation to engage problems and make decisions by using critical thinking”. In doing so, it is implied that motivation is necessary for critical thinking. Lai (2011) concludes that motivation supports critical thinking as unmotivated students are unlikely to engage in critical thinking.

**Critical thinking and creative thinking.** Bailin (2002), Paul and Elder (2004) regard critical and creative thinking as intricately linked. Paul and Elder (2004) assert that “creativity requires the expansive empowerment of sound critical thought” and “critical thought requires the will to create and improve” (p.21). They summarise the essence of critical thinking as follows:

- **Critical thinking is the art of thinking about thinking in such a way as to:**
  1. identify its strengths and weaknesses
  2. recast it in improved form (where necessary) (p.21)

They explain that for the first characteristic, the thinker has to be skilled in analytic and evaluative thinking but for the second characteristic, the thinker has to be skilled in creative thinking. Paul and Elder (2004) conclude that critical thinking comprises the analytic, the evaluative and the creative and each must be integrated with the other two for instruction to be effective. Hence, the *Elements of Thought* is also applicable to creative thinking.

**Issues Pertinent to Critical Thinking**

**Goal versus achievement of critical thinking.** Neilsen (1989) asserts that an educational system that does not teach students to think critically fosters dependence and results in students becoming susceptible to the advice of others. Critical thinking empowers students to be independent thinkers who are able deal with problems encountered and make responsible, unbiased decisions (Shakirova, 2007; Carroll 2007; Snyder & Snyder, 2008). Hence, the eventual goal of educators is to inculcate critical thinking skills in all students to help them deal with the uncertainties of a rapidly globalised world.

However, Walsh and Paul (1986, p.1) contend that “although most school systems espouse the goals of reasoning, inquiry and critical thinking, few systems accomplish these goals”. Sultana (2001) revealed that 41.3% of the teaching objectives of first and second year teachers were at the knowledge (lowest) level of Bloom’s taxonomy (1956). The remaining objectives were mostly at the comprehension (second) level and application (third) level. Only a small percentage was at the higher levels of analysis,
synthesis and evaluation. He came to the conclusion that few new teachers were able to teach higher order thinking skills and further training was needed to equip them to do so.

The research of Fogarty and McTighe (1993), and White (2001) also confirmed the need for in-service teacher professional development to develop their competency in teaching critical thinking skills effectively. Torff (2005) further recommends that the pre-service education curriculum be revamped to encompass critical thinking instruction as well as making available professional development on critical thinking skills.

Teaching children critical thinking. An issue of contention often brought up in the literature is whether critical thinking can be taught and learnt. The issue is related to the current study as it involves teachers of primary school students. Piaget's (1969) stages of development seem to imply that young children are not proficient in formal operations and hence not ready for critical thinking. However, Lipman (1980) argues that for effective internalisation, critical thinking should be developed early in elementary school. Like Walsh and Paul (1986), Heyman (2008) concurs that children’s critical thinking skills are not a result of general maturation processes. Lipman (1988), Ennis (1989) and Sternberg (1990) assert that critical thinking can be taught as it is not a fixed entity. Schaferman (1991) adds that children are not born with the power to think critically, and critical thinking is a ‘learned ability’ that has to be taught.

In their study, Riesenmy, Mitchell, Hudgins and Ebel (1991) found that fourth and fifth grade students who were trained in self-directed critical thinking skills achieved higher retention and transference scores than students in the control group. It was discovered that when the application of critical thinking was taught to children at a young age, they were able to apply critical thought processes in situations that they had not encountered earlier (Carroll-Johnson, 2001). Lutz and Keil (2002) found that children as young as 4 years seemed to be cognizant that people own differing domains of expertise and that these areas of expertise are associated with their credibility on certain issues. For example, they considered a car mechanic’s evaluation of car trouble to be more credible than a doctor’s. Willingham (2007) noted that children as young as three years old have been observed to be thinking critically. Based on studies which showed that children’s reasoning about the claims of others is significantly influenced by their social experiences, Heyman (2008) argues that there is “evidence of a link between critical thinking and children’s social experiences” (p.346).

The APA Delphi report proposed that “from early childhood, people should be taught, for example, to reason, to seek relevant facts, to consider options, and to understand the views of others” (Facione, 1990, p. 27). Likewise, Bailin et al. as cited in
Lai (2011) suggest that critical thinking instruction for children in primary school include the following:

- value reason and truth;
- respect others during discussion
- be open-minded;
- be willing to see things from another’s perspective;
- perceive the difference between definitions and empirical statements;
- use cognitive strategies, such as asking for examples when something is unclear; and
- use principles of making a decision (p. 24).

In teaching children to think critically across the English Language curriculum, some suggested activities include: developing multiple perspectives on any given issue (Nielsen, 1989); helping students make connections with the text using prior knowledge (Morgan & Saxton, 1991); getting students to do argumentative writing (Wade, 1995); distinguishing fact from opinion (Richards & Rodgers, 2001); assessing the validity of statements, news, arguments and research and evaluating their worth, accuracy, or authenticity (Day, 2004); defining their stand on controversial issues (Limbach & Waugh, 2005); and involving students in evaluating the relevancy of materials read (Bataineh & Zghoul, 2006).

To promote the development of critical thinking in children, researchers are generally of the view that instructional strategies such as explicit instruction (Facione, 1990; Paul, 1992; Halpern, 1998; Case, 2005), modelling (Paul, 1992; Facione, 2000), collaborative or cooperative learning (Abrami et al., 2008) and constructivist approaches (Paul, 1992; Bonk & Smith, 1998) are essential in the promotion of critical thinking skills. Heyman (2008) emphasises that social experiences help develop children’s reasoning about the trustworthiness of claims.

Literature findings cited above suggest that critical thinking skills can be developed and enhanced in children through the use of a variety of instructional strategies. Hence, there is a need for primary school teachers to foster critical thinking skills early in the child’s education.

Transfer of learning. Transfer of learning is a contentious issue pertaining to the extent to which critical thinking skills can be transferred from one context to another. McPeck (1990a) does not rule out transfers of critical thinking skills learnt within a school setting to problems encountered in daily life when instruction involves authentic or real life learning activities. Kennedy et al. (1991) contend that transfers are possible if students are
given the opportunities to apply critical thinking skills in different contexts and domains and if they were taught to transfer those skills. Findings on the transfer of learning have been contradictory. For example, Halpern (2001) found that some college students were able to apply reasoning skills learnt from a specific discipline to a non-academic topic several months later. Willingham (2007), however, observed that students who displayed critical thinking skills in one domain were unable to do so in another. Lai (2011) concludes that “transfer to new problems within the same domain is more likely than transfers to new disciplines” (p.16).

In order for transfer of learning to take place, students need to be given opportunities to apply critical thinking skills in diverse contexts and different subject areas. Instruction should focus on metacognitive skills, such as goal-setting, planning, and monitoring progress toward goals (Kennedy et al., 1991). Halpern (1998) stresses the need for students to actively retrieve thinking skills they have learnt in multiple contexts, regardless of content area. She suggests that teachers make the structural aspects of problems and arguments salient so that students could use them as retrieval cues. This will help students transfer their learning in novel contexts where these structures are noticed.

**Assessment of critical thinking.** There are a variety of published instruments for the assessment of critical thinking including the Ennis-Weir Critical Thinking Essay Test (Ennis & Weir, 1985), the California Critical Thinking Skills Test (Facione, 1990), the Cornell Critical Thinking Tests (Ennis & Millman, 2005). However, these instruments assess generic critical thinking skills. They are not based on subject disciplines and do not cater for students below the fourth grade (Kennedy et al., 1991). Despite the many tests available for assessing middle and high school students in critical thinking, teachers were able to use only the multiple choice tests as considerable training was needed for the essay tests and the modified multiple choice tests with justification (Ennis, 1993).

For guidelines on designing assessment tasks, Norris (1989) asserts that valid assessments of critical thinking should permit the examinee’s reasoning to be made visible. Hence, open-ended questions would be more suitable for assessing critical thinking than multiple choice questions. Ku (2009) adds that open-ended questions are more sensitive to the dispositional facets of critical thinking. Kennedy et al., (1991) suggests modifying multiple-choice tests by requiring students to give a justification for their choice while Ku suggests using a mixture of multiple choice and open-ended questions. Moss and Koziol (1991) propose that assessment tasks be designed with more than one plausible answer and sufficient information and evidence be provided to permit
pupils to support multiple views. They also add that assessment tasks should allow pupils to draw inferences or make evaluations. Moss and Koziol (1991) recommend that students be evaluated on the merits of their arguments for their positions. Assessment tasks should also simulate authentic real-world issues in order to focus on application in real-world settings (Linn & Gronlund, 2000).

Critical thinking requires the use of criteria to evaluate arguments and evidence in order to make judgments and decisions (Lipman, 1988; Case, 2005). Lipman (1988) contends that appropriate criteria are dependent on the domain of interest as the criteria needed to evaluate a piece of architecture are different from those required to evaluate a legal document. Case and Wright (1997) add that it would be counterproductive for students to assess pro and con arguments on an issue if they are not even aware of the standards to use in the critique of opposing pieces of evidence, as that may result in augmenting closed-mindedness, bias, ethnocentrism and thoughtless generalisations.

**Paul and Elder Critical Thinking Framework.** Currently, apart from the published instruments for assessing critical thinking described above, the Paul and Elder (2008) Critical Thinking Framework is the only assessment tool available with which teachers can use to assess students' critical thinking skills. The Paul and Elder (2008) Critical Thinking Framework for teaching and assessing critical thinking comprises the *Elements of Thought* which can be assessed using the *Intellectual Standards* with the goal of developing the *Intellectual Traits*. The *Elements of Thought* (also known as Paul’s Wheel of Reasoning) as shown in Figure 2 is a model to teach critical thinking in a concrete manner. Paul and Elder (2008) elaborate:

There are eight basic structures present in all thinking: Whenever we think, we think for a purpose within a point of view based on assumptions leading to implications and consequences. We use concepts, ideas and theories to interpret data, facts and experiences in order to answer questions, solve problems and resolve issues (p.28).
Hence, teachers need to explicitly teach students the *Elements of Thought* so that they could analyse their own reasoning through identifying the elements and questioning its elemental structures. For example, they can ask questions like “What is the purpose of what I am doing? What is the main question that I need to answer?”

Paul and Elder (2008) assert that criteria or standards are necessary for “making sound judgments or for reasoning well, for forming knowledge (as against unsound beliefs), for intelligent understanding, for thinking rationally and logically” (p. 16). They propose that students be taught to understand and apply the following *Intellectual Standards* (Figure 3) to the *Elements of Thought* to assess the quality and extent to which they are reasoning critically. In doing so, students can make judgments about their own reasoning. Through the process of using the *Elements of Thought* and applying *Intellectual Standards* to these elements habitually, students would begin to develop *Intellectual Traits* of humility, autonomy, integrity, courage, perseverance, empathy, confidence in reasoning and fair-mindedness.
Empirical Literature

The focus of this segment is on empirical research pertaining to the instruction of critical thinking, teacher beliefs about critical thinking and instructional practice as the study is related to the perspectives of primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking across the English Language curriculum.

Approaches to the instruction of critical thinking skills. Almost all researchers agree that teaching critical thinking skills is important but how to teach such skills effectively is debatable (Tsui, 2002). Some argue that critical thinking is best taught by
integrating it within specific disciplinary content knowledge. This is commonly known as the infusion approach. The term ‘infusion’ was described by Swartz, Fisher and Parks (1998, p.3) as an approach to teaching thinking “based on the natural infusion of information that is taught in the content areas” with forms of critical thinking that should be used every day. Implied in this definition is the need for critical thinking to be explicitly taught. Their rationale for infusing critical thinking into content instruction is three-fold. Firstly, the impact on students is greater when the teaching is more explicit. Secondly, students will be more open to valuing good thinking when the classroom instruction incorporates an increasing atmosphere of thoughtfulness. Thirdly, students will think more about content learnt when the teaching of thinking is integrated into content instruction.

Another approach is the stand-alone approach in which generic critical thinking skills are taught separately from subject matter. Nisbet and Davies, as cited in Wilson (2000) identified more than 30 programmes of such an approach in the instruction on thinking skills but they estimated that there were more than a hundred such programmes in USA alone! One of the largest stand-alone programmes for direct teaching of thinking as a skill is the Cognitive Research Trust (CoRT) programme developed by Edward De Bono. The CoRT programme comprises six sections, each consisting of ten lessons. Each section covers one aspect of De Bono’s definition of thinking: breadth, organisation, interaction, creativity, information, feeling and action. The aim of the programme is to translate thinking through the use of structured exercises (De Bono, 1991).

In addition to the above two approaches, Angeli and Valanides (2009) describe a third approach known as the immersion approach in which the promotion of ideas rather than thinking skills is emphasised. In this approach, critical thinking skills are not made explicit and students are engaged in dialogue and encouraged to think about, analyse and evaluate diverse perspectives. Students are expected to pick up critical thinking skills as a natural outcome of engaging with the subject matter (Ennis, 1989). The immersion approach correlates with the theoretical conceptualisation of critical thinking stated in the consensus statement of the Delphi Report. However, Ennis (1993) opined that without a clear understanding of critical thinking skills, students would have difficulty transferring to other domains. Another approach is a mixed approach which is a combination of both generic and subject-specific approaches.

The contentious issue regarding the use of the stand-alone programme or infusion approach is whether critical thinking is domain-specific. Most researchers see critical thinking as domain-specific including McPeck (1990b) who views critical thinking as comprising a knowledge component which is domain specific and a critical component
involving the ability to question effectively and withhold judgment or belief until there is enough information to make a valid judgment. Costa (2001) is also of the view that content should be used as a channel for developing critical thinking skills through the integration of discipline-specific knowledge with critical thinking instruction. Most researchers agree that background knowledge is necessary for critical thinking and understanding of a field is essential to critically thinking in the field (Kennedy et al., 1991; Case, 2005; Willingham, 2007). Willingham (2007) asserts that it is easier to think critically within a certain domain and “there is not a set of critical thinking skills that can be acquired and deployed regardless of context” (p.17).

However, those who are of the view that critical thinking skills are not domain-specific include Halpern (2001) who contends that instruction in generic thinking skills taught as a “broad-based, cross-disciplinary” course is highly effective and Van Gelder (2005) who asserts that critical thinking is generic in nature.

Yet other researchers who are of the view that critical thinking comprises both general and domain-specific components include Ennis (1990) who notes that although critical thinking is domain specific based on observations that critical thinking differs from field to field, there are aspects of critical thinking that are common across the disciplines. Likewise Paul (1992) recognises critical thinking as thinking within specific disciplines but he highlights that critical thinking can be taught using generic critical thinking courses.

Hatcher (2006) identifies the constraints in both the stand-alone and the infusion approaches. In the stand-alone approach, the concerns are on transferability and uptake by students from diverse disciplines while in the infusion approach, the constraints include competing demands of teaching critical thinking skills and subject content, teacher readiness (whether teachers are willing and able to integrate critical thinking skills), student readiness (to learn critical thinking skills) and the readiness of the institution to foster and sustain the integration of critical thinking skills across the curriculum.

Hatcher's comparative longitudinal study (2006) focused on the improvements in critical thinking skills from freshmen to senior years as a result of the stand-alone programmes and integrated/infusion approaches to teaching critical thinking skills in a General Education Programme at Baker University incorporating three custom-designed core units. Two of these focused on critical thinking and effective writing. In the last unit, students were required to write and defend their positions on a public policy related to science and technology. The programme focused on the repeated application of critical thinking skills based on the materials read by students and their written argumentative essay. The findings revealed that the infusion approach produced higher pre-test to post-
test improvements in standardised critical thinking test scores than the stand-alone approach. Stand-alone approaches were found less effective in transfers than approaches which integrate instruction into discipline-specific courses. It may be concluded that through the stand-alone critical thinking programme, students learnt about critical thinking rather than how to think critically.

In another study, Angeli and Valanides (2009) compared the effects of the stand-alone, infusion and immersion approaches to teaching critical thinking on critical thinking skills development among undergraduates. The impact of the three different approaches on the conceptual understanding of the students was assessed using an evaluation questionnaire given to students at the end of the intervention. The findings revealed that the critical thinking performance of students involved in the infusion and immersion approaches was significantly greater than those in the stand-alone or control groups. Students who participated in any of the three intervention approaches demonstrated a better understanding of critical thinking than those in the control group when their written conceptualisations of critical thinking were content analysed. From the study, it was evident that the three different approaches to teaching critical thinking had some influence on the development of students’ critical thinking skills. In addition, the students performed most effectively as critical thinkers when some explicit instruction on critical thinking skills was given and when they were involved in debating the purpose and application of critical thinking.

Abrami et al. (2008) carried out an analysis of 117 studies on instructional interventions on the effects of critical thinking skills and the results showed that majority of the studies were positive. However, Behar-Horenstein and Niu (2011) state that a huge number of empirical studies have looked at the effects of different instructional strategies and interventions to promote critical thinking skills among college students but the results in terms of effectiveness have been inconclusive. Tsui (1999) concurred that critical thinking related pedagogical approaches have produced inconsistent results.

**Critical thinking approaches for primary school students.** This section of the review deals with interventions on critical thinking in elementary students through the use of Socratic seminars and Philosophy for Children (P4C). These studies were selected for discussion as students of the teachers in this study are primary school children.

**Socratic seminars.** Socratic seminars, a critical thinking programme which capitalized on the natural eagerness of young students to question and discuss many things, incorporate critical thinking skills into grade level content knowledge, including English Language. They are based on Socrates’ teachings with the aim of helping
students become better thinkers as they engage in independent learning to create meaning and improve reasoning skills (Schwarze & Lape, 2001). Socrates inculcated in his students the habit of asking questions that probed thinking at a deep level and he questioned their beliefs and assumptions before accepting their ideas as worthy of belief. His method of questioning known as "Socratic questioning" focuses on thinking for clarity and logical consistency. It is a method of questioning which advocates seeking evidence, scrutinizing reasoning, questioning assumptions, analyzing basic concepts, and understanding the implications of what was said and done (Paul, Elder & Bartell, 1997).

During a Socratic seminar, literature is used to provide opportunities for students to develop critical thinking skills and comprehension skills. The process of Socratic seminars described in this paragraph was proposed by Tredway (1995). Students were given a piece of literature to read before the seminar. After the students have read the text, the teacher asks a text-related opening question that requires students to “evaluate opinions and make decisions” (p. 26). Students participate in a conversation about the opening question using evidence from the text to support their thinking as they agree or disagree with other group members. Students are encouraged to listen carefully and paraphrase what was said by someone before responding in support or disagreement (StudyGuide.org, 2000). The remaining questions would then be based on students’ ideas in response to the opening question.

Through the process of asking questions about information presented, students develop critical thinking skills as they learn to make judgments about a topic (Wilson & Smetana, 2009). Socratic seminars foster open-mindedness in students as they engage in deep, thoughtful conversations with others in diverse ways that enable them to see different possibilities (Schwarze & Lape, 2001).

In Socratic seminars, the teacher often responds to a student’s question with a question to encourage him/her to think on his/her own and bring about thoughts leading to the answer (Tredway, 1995). Socratic seminars also involve self-questioning by students. Langrehr (2001) adds that asking questions and self-questioning help students to connect new information to their prior knowledge. Reid (2010) conducted a quasi-experimental quantitative study to determine the effect of the implementation of Socratic seminars on Language Arts test scores of second grade students. The study examined the difference in mean test scores to identify the effectiveness of the independent variable, a critical thinking program in the form of Socratic seminars, in relation to the dependent variable, student achievement. In her study, pre-tests were given to a control group of 14 second grade students and the treatment group of 14 second grade students with Socratic
seminars implemented which required the students to use higher-level thinking skills to answer questions and learn grade level content standards. After 18 Socratic seminars over a period of six weeks were conducted in the treatment group, all the second-grade students were given a post test. The findings showed that adequate test scores were maintained with the implementation of Socratic seminars but the scores dropped significantly in the control group when Socratic seminars were not implemented. The results of this study which revealed that critical thinking is effective in maintaining adequate test scores provide tenuous evidence which supports the use of Socratic seminars as a strategy to develop critical thinking skills in children.

**Philosophy for Children (P4C).** P4C founded by Matthew Lipman (1988) and further developed by Fisher (1990) is another programme used to develop critical thinking in children. P4C is based on a curriculum that fosters reasoning skills through discussing philosophical topics using specially written novels which provide models for thinking and inquiry for children. To Lipman, critical thinking takes place within and as a result of interaction with peers, especially through philosophical dialogue within a community of inquiry (COI). In a COI, all members work at common objectives, share ideas and information with one another, and try to be objective in their mutual criticism. Members of a COI are expected to respect differences of perspective, monitor their thinking, as well as critique the views of the other members (Lipman, 1988).

Dialogue, comprising both teacher-led Socratic questioning and children’s dialogue as they work together in collaborative groups, is the means to developing concepts and reasoning skills as the programme is centred on discussion skills. The powerful role that dialogue plays in exploring possibilities, discovering alternatives, recognising the perspectives of others and establishing a community of inquiry is asserted by Lipman (1980). Besides motivating children to engage in critical questioning and inventive reflection, the P4C programme encourages them to look for underlying assumptions, guiding reasons, possible implications and alternative criteria for evaluation.

In a study by Scholl, Nichols and Burgh (2009) to measure the effect of facilitating a community of philosophical inquiry, on perceptions of teaching practice, teacher thinking, and student engagement, two groups of primary school teachers, 59 in total, were involved in a comparison of pedagogical transformation between teachers who implemented P4C and teachers who used thinking tools (graphic organisers) for conceptual exploration. The data showed that the implementation of P4C resulted in improved student thinking and engaged student learning as well as an improved metacognitive awareness among teachers. It was concluded that participation in Philosophy for Children lessons enabled
teachers and students to be involved in deep thinking, questioning, metacognition and reflection within classroom environments that are democratic and supportive.

**Questioning and critical thinking.** Most educators believe that one of the most effective ways to develop critical thinking skills is to engage students through questioning especially with the use of higher cognitive-level questions (Elder & Paul, 2003b). Instruction that promotes critical thinking makes use of questioning techniques that require students to analyse, synthesise and evaluate information to solve problems and make decisions (Snyder & Snyder, 2008).

Research studies on teachers’ use of questions in the language classroom focusing on the types of questions asked, the cognitive levels of questions as well as the correlation between the cognitive levels of questions asked by teachers with the cognitive levels of responses by students have been plentiful. Lynch (1996) asserts that students make better progress in language ability as well as in interactive and critical thinking skills when more opportunities are provided for them to express personal opinions and ideas in response to teacher questioning. However, as Beyer (1998) puts it, not all questions result in students engaging in higher order thinking as the outcome depends on the kinds of questions that teachers ask of students. He suggests that teachers ask thoughtful higher order questions.

Nunan and Lamb (1996) examined teachers’ use of questions in the language classroom and found that majority of the questions asked were low-cognitive level questions that did not promote higher order thinking skills. Studies by Thamaraksa (1997) showed that teachers asked more display questions than other types of questions in English classes at the university level. A qualitative study by Hussin (2006) on teacher questioning in the language classroom in Malaysia produced similar results. The results showed that most of the questions asked by English as a Foreign Language (EFL) and Science classes taught in English were low level recall questions that did little to foster critical thinking skills.

Students’ critical thinking development is often correlated to the extent that they engage in higher level cognitive thinking through higher order thinking questions (Clasen & Bonk, 1990) involving interpretation, application, analysis, synthesis or evaluation. Pascarella and Terenzini (2005) highlight the need for teachers to ask challenging questions, and encourage students to provide reasons and evidence in order to develop students’ problem solving and critical thinking skills. Hence, the types of questions asked by teachers were observed in this study on the infusion of critical thinking across the English curriculum.
Findings on the correlation between the cognitive levels of teachers’ questions and students’ responses have been mixed. In several studies by Mills, Rice, Berliner and Rosseaus (1980), matching the level of teacher questions with the level of students’ responses showed a correspondence of only 53%. Renaud and Murray (2007) conducted three studies to examine the validity of higher-order questions on tests and assignments as a process indicator by comparing it with gains in critical thinking skills among college students as an outcome indicator. The higher order questions used in this study correlated with the top four levels within Bloom’s (1956) taxonomy educational objectives namely, application, analysis, synthesis, and evaluation. The first study compared the quantity of higher-order questions on tests and assignments in actual classes to pre-test –post-test gains in critical thinking, while in the other two experimental studies, one compared students given lower versus higher-order review questions in actual classes while the other compared students given lower versus higher-order questions in actual classes to pre-test-post-test critical thinking gains while controlling for confounding variables. Gains in critical thinking were measured using test items adapted from the Watson-Glaser Critical Thinking Appraisal. The findings showed that students who have answered higher-order questions in their coursework were more likely to improve in their critical thinking skills. It was concluded that the frequency of higher-order questions is a valid process indicator as it is related to gains in students’ critical thinking skills.

Although there is a diverse and significant amount of research related to critical thinking, very little of the research deals with the enacted curriculum. It is noted that in most of the studies referred to above, teachers’ questions were analysed without the investigation of the perspectives of the teachers. Hence, the investigation reported in this thesis would add to the current research base.

**Teacher beliefs about critical thinking and instructional practice.** Paul, Elder and Bartell (1997) studied 38 public and 28 private colleges and universities to assess current teaching practices and critical thinking knowledge among the faculty, to determine model teaching practices that promote critical thinking and to make policy recommendations based on the results. The findings revealed that even though 89% of the faculty asserted that critical thinking is a key instructional objective, only 19% could explain what critical thinking is and only 9% were involved in teaching for critical thinking on a regular day in class.

In a similar but smaller scale grounded theory study, Barnes (2011) examined seven education faculty members’ beliefs about critical thinking, and their motivations for implementing critical thinking skills training within their pre-service teacher education...
classrooms. Like Paul et al. (1997), findings from Barnes’ study showed that although educators agree that critical thinking should be a goal of education, not all educators possess a conceptual understanding of what critical thinking is or how to promote it within the classroom. Paul et al. (1997) opine that educators may profess commitment to teaching critical thinking but lack extensive exposure to research on critical thinking and are unsure of what is needed for critical thinking instruction to be carried out effectively. Hence, this study sought to identify effective pedagogical practices and strategies used by the participants to infuse critical thinking across the English Language curriculum.

Teacher beliefs play a crucial role in determining the way instructional practices are planned and carried out within the classroom (Grove, Dixon, and Pop, 2009). Thus, it is essential to understand the beliefs that expert teachers hold regarding critical thinking as that impacts how they prepare lessons that equip students for problem solving and decision making in the real-world. Hence, this study seeks to develop explanatory theory through understanding the beliefs that expert teachers hold regarding critical thinking.

Malaysian researchers (Hashim & Hussein, 2003) sought to determine the thinking skills, the levels of critical thinking and the strategies that teachers in a Selangor secondary school asserted that they have used in fostering students’ critical thinking. The purpose of the study was to inform secondary school teachers especially those in Selangor about teaching strategies in critical thinking as well as to provide policy makers with data on the differences between teachers’ perceptions and practices in fostering critical thinking among teachers from 28 secondary schools and 4 religious schools (Hashim & Hussein, 2003). The results showed that English Language teachers were not ready to teach thinking by the infusion method despite recommendations in the policy documents as they felt that they were not accustomed to the teaching strategies. Hashim and Hussein (2003) concluded that the individual teacher’s approach to teaching critical thinking skills was dependent on their personal beliefs and perspectives.

In another study conducted by the South East Asian Ministers of Education Organisation Regional English Language Centre (SEAMEO, RELC), English Language teachers were asked about their core beliefs about the processes of teaching and learning, how they saw their teaching as having changed over time and the sources of change (Richards, Gallo & Renandya, 2001). A questionnaire was administered to 112 teachers teaching English as a second language, most of whom were from Southeast Asian countries (including 48% from Singapore) and 14 from Australia.

A total of 207 summary statements were recorded and put into 13 categories. Topping the list of teachers’ most important beliefs about language teaching and learning...
was the role of grammar and grammar teaching, followed by their beliefs about learners and language skills (Richards et al., 2001). The study concluded that since teachers’ beliefs about effective language teaching and learning form the core of their teaching behaviour and changes in practices stem from changes in their beliefs, providing teachers with teacher development courses which enable them to reflect on their beliefs and make those beliefs explicit are more likely to result in professional development. Considering that just three years before the study, a major reform in education emphasised thinking skills, it is surprising that none of the teacher-participants from Singapore mentioned critical thinking skills as an important belief about language teaching and learning.

An interpretivist study related to the infusion of critical thinking across the English Language curriculum in Singapore was carried out by Fernandez (2006). However, the participants of her study were primary school contract teachers who had neither experience nor qualifications in teaching as they had not undergone the teacher training course. Findings from her study revealed that untrained primary school contract teachers’ perspectives of the constraints that resulted from their circumstances led them to carry out critical thinking skills in the primary school English curriculum on an ad-hoc basis. Unlike the contract teachers who had little or no knowledge about critical thinking, the participants in this study were not only trained in-service teachers but they also firmly believed in the importance of critical reading and hence were more likely to infuse critical thinking in their enacted curriculum. This study aimed to develop explanatory theory related to the perspectives of these teachers regarding the infusion of critical thinking across the English Language curriculum.

Summary for Part 2 of Literature Review on Critical Thinking

Critical thinking is intentional reflective thinking that goes beyond logical analysis to questioning the assumptions underlying thought and action by examining multiple perspectives and it encompasses the ability to interpret, analyse, evaluate, infer as well as explain the evidences needed to justify and present the arguments.

The ideal critical thinker has a positive disposition that is consistently inquisitive, open-minded, flexible, truthful in confronting personal prejudice, cautious in making judgments, willing to reconsider judgment in the light of new evidences, clear about issues, systematic in complex matters, diligent in seeking suitable information, sensible in selecting criteria, fixed in inquiry and persevering in seeking results.
Conclusion

Personal identity, beliefs and values significantly influence the development of teachers’ professional identities. The degree of congruence between teachers’ personal identity, beliefs and values and the requirements of their professional identity will influence the extent to which they are committed to the implementation of curricular change or reform. The capacity to implement curricular change or reform will be influenced by the competence and confidence of teachers in their capacity and preparedness to do so.

Critical thinking has been almost universally acknowledged as a desirable 21st Century competency, but the literature review reveals a great divergence on the definition of critical thinking; the lack of subject-specific assessment tools and the contention on how critical thinking skills can be transferred from one context or domain to another. Ambivalence on these issues may have contributed to paucity in pre-service teacher education programmes on critical thinking, leaving in-service professional development to the initiative of individual teachers or to the school leadership. As critical thinking is not defined in the intended curriculum, it is proposed that MOE adopt Case and Wright’s definition of critical thinking for the primary schools to provide teachers with some direction in instructional focus.

Although the literature on critical thinking suggests that it can be successfully developed in very young children, there is relatively little empirical research regarding the teaching of critical thinking in primary schools in Singapore, particularly from the perspective of teachers. The study reported in this thesis was an attempt to fill this apparent gap by investigating the ways in which expert primary school in-service teachers who firmly believed in the importance of critical reading infused critical thinking into the English Language curriculum in Singapore. Hence, this study contributes to the literature by developing an empirical base in the context of Singapore.

Complex theoretical understandings of teacher identity and critical thinking, gained from this literature review provided a conceptual framework informing the practice of classroom teachers and provided justification and theoretical support for the discussion in the later chapters. This review has made explicit the factors shaping teacher identity, what critical thinking entails and approaches for teaching critical thinking to primary school children. The following chapter presents a detailed description of the methodology chosen for this study.
CHAPTER 3: RESEARCH METHODOLOGY

This chapter explains the theoretical framework and the research design and methodology for the study which is aimed at generating explanatory theory regarding the perspectives of six primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking across the English Language curriculum. The first section explains and justifies the use of the theoretical framework in which the relationships between perspectives, beliefs and practices are delineated. The next section presents the research questions and the guiding questions. This is followed by a description of the chosen research strategy design and the rationale and an explanation of the selection of participants. Next, there is a discussion regarding the data collection and data analysis procedures. Finally, there is an explanation of the trustworthiness and the ethical considerations associated with the study.

Research Paradigm

As the aim of the study was to generate explanatory theory regarding the perspectives of expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical reading, the method of investigation selected is one in which the interpretation of social phenomena is feasible. In view of the need for a thorough understanding of a specific issue from the perspectives of the participants, the study adopted a qualitative approach to inquiry based on the interpretivist paradigm (Creswell, 2003).

The interpretivist paradigm was selected to underpin this study as the focus was on revealing the different meanings constructed by people in a social context (Gubrium & Holstein, 2005). The interpretivist paradigm regards the individual and society as inseparable units whereby an understanding of the society in which the individual is located is necessary to generate an understanding of the individual and likewise, an understanding of the individual is needed in order for the society in which the individual lives to be understood (O'Donoghue, 2007).

A fundamental principle of interpretivism is that all human actions are meaningful and needs “to be interpreted and understood within the context of social practice” (Usher, 1996, p.18). This means that research within the interpretivist paradigm is a method of investigation, encompassing everyday activity of individuals and society in the context of freedom, the interactions between a person and others and the negotiation of meaning in these interactions (Blackledge & Hunt, 1989). The interpretivist paradigm enabled the
researcher to learn what primary school in-service expert teachers in Singapore understood about the phenomenon of the infusion of critical thinking across the English Language curriculum (Litchman, 2006), thus unveiling their perspectives on this phenomenon (O’Donoghue, 2007).

**Theoretical Framework**

Within the interpretivist research paradigm, the theoretical perspective of symbolic interactionism provided the framework for the study as it enabled the researcher to uncover the perspectives of the participants. A theoretical framework is the “philosophical stance lying behind a methodology” which provides the research context and defines the researcher’s view of the world (Crotty, 1998, p.66). The theoretical framework of symbolic interactionism is consistent with Vygotsky’s (1978) social cultural theory of cognitive development.

Vygotsky believed “that all higher order cognitive skills originate in, and develop by the internalization of individuals’ interactions with others” (Schoenfeld, 1987, p.210). He highlighted the value of experience, prior knowledge, society and culture in promoting cognitive development (Dahms et al., 2008). He valued the development of higher-level thinking and problem solving in education. Vygotsky argued that effective educators design situations that require students to think critically and meaningful new knowledge is developed only when student’s thought processes are being challenged (Dahms et al., 2008). Vygotsky (1978) developed the concept of the zone of proximal development (ZPD) which refers to:

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (p. 85-86).

In other words, students perform better through the scaffolding provided when working with knowledgeable others. Scaffolding is the approach to assisting learning and development of individuals within their zone of proximal development. In the perspective of Vygotsky, the ideal role of the teacher is to provide scaffolding through collaborative dialogue to aid students on tasks within their zones of proximal development (Hamilton & Ghatala, 1994, p.277).

The term ‘symbolic interactionism’ was first coined by Herbert Blumer, a sociologist from Chicago in 1937, and this approach involved the study of people in their natural environment (Woods, 1992). It is an approach to the study of human behaviour and is a social theory suitable for underpinning projects aimed at generating rich data such as is
necessary in this study. In symbolic interactionism, individuals engage in an interpretive process to determine the meaning of others’ actions. It examines the symbolic and the interactive together, as they are experienced and established in everyday situations. It places primary importance on the social meanings people attach to the world around them and how they respond to these meanings (Taylor & Bogdan, 1998). This framework is appropriate as the focus of the study was to understand expert teachers’ perspectives, their beliefs about critical thinking and the way they infused critical thinking skills across the English Language curriculum. Blumer (1969) proposed three principles of symbolic interactionism:

1. human beings act toward things on the basis of the meanings that the things have for them;
2. the meanings of such things are derived from or arises out of the social interaction that one has with others; and
3. meanings are handled in and modified through an interpretive process used by the person in dealing with the things encountered (p.2).

Blumer’s (1969) three principles outlined above are an attempt to unravel strands in symbolic interactionism’s central notion of interdependency between the individual and society. The researcher used this approach to uncover the patterns of action and interaction between and among the actors in relation to the particular phenomenon which is the focus of the study (Strauss & Corbin, 1994). Based on these principles, people construct and interpret meaning through the process of their social interaction with others. Meaning is negotiated through the individual’s experience of the situation and is constantly evolving or changing as a result of our engagement with the world around us (Woods, 1992).

The key concept in this study is the concept of perspectives. Woods (1983 p.7) defined perspectives as ‘frameworks through which people make sense of the world’. Blackledge and Hunt (1989, p.234) expanded on this definition by listing the following key components that further define perspectives:

- Aims and intentions of participants in a particular situation
- Strategies that participants use to achieve their aims
- Significance that participants attach to the situation
- Outcomes which participants expect from achieving their aims
- Reasons that individuals give for the aims, strategies, significance and expected outcomes of a particular situation
These components provided a framework to guide the study with the aim of generating explanatory theory regarding the perspectives of expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical thinking, on the infusion of critical thinking across the English Language curriculum.

**The Research Questions**

This study addressed the following research questions:

A. What are the perspectives of expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical reading on the infusion of critical thinking across the English Language curriculum?

This research question is accompanied by the following guiding questions:

1. What are the aims or intentions of expert primary school in-service teachers of English Language in Singapore who firmly believe in critical reading regarding the infusion of critical thinking across the curriculum? What reasons do they give for these aims?

2. What strategies do expert primary school in-service teachers of English Language in Singapore use to infuse critical thinking across the curriculum and why do they use these strategies?

3. What significance do expert primary school in-service teachers of English Language in Singapore attach to the infusion of critical thinking across the curriculum and what reasons do they give for this?

4. What outcomes do expert primary school in-service teachers of English Language in Singapore expect from pursuing their aims or intentions and why do they expect these outcomes?

B. What are the concerns of expert primary school in-service teachers of English Language in Singapore who firmly believe in the importance of critical reading on the infusion of critical thinking across the English Language curriculum?

**Research Strategy Design**

To investigate the perspectives of each of the six expert teachers of English Language who firmly believe in the importance of critical reading, on the infusion of critical thinking across the English Language curriculum, this study was designed as a multiple case study. This study aimed to present the voices of the participants to understand their beliefs about critical thinking, how they infuse critical thinking across the English Language curriculum and their concerns regarding the infusion of critical thinking. The “importance”
of critical reading refers to the efficacy of critical reading practices in promoting the infusion of critical thinking. The following related issues were of high salience to the researcher:

- What do participants think is the connection between critical reading in English and the development of critical thinking skills?
- How do they use critical reading practices to promote the infusion of critical thinking?
- Do the participants expect to see the transfer of critical reading practices to other learning areas or life in general?

Thomas (2011) states that for a participant to be a “case”, it should be clear at the outset what the person is a case of, which forms the focus of the study. In other words, a case study comprises two parts: a subject and an analytical frame or object. In this study the subject is the expert teacher and the analytical frame is how he/she infuses critical thinking strategies across the English Language curriculum due to his/her belief in the importance of critical reading.

The case study design was selected as the study sought to provide a rich and in-depth understanding of the situation and its meaning for the expert teachers involved and an elaborate account of a contemporary phenomenon within their school context (Punch, 2009; Yin, 2009). This case study design is deliberately structured to fill the knowledge gap between the intended curriculum and the planned and enacted curriculum related to the infusion of critical thinking across the English Language curriculum. Merriam (1998) portrays the case study design as unique as it provides “intensive descriptions and analyses of a single unit or a bounded system” (p.19), which enables considerable information to be obtained with the “intent of interpreting or theorising the phenomenon” and it also has a significant role in expanding and accelerating the knowledge base of a field (p.28). The case study design also encompasses an in-depth understanding of the case while conserving its wholeness in the natural school setting, thus acknowledging “its complexity and its context” (Punch, 2009, p. 119). The case study is the “primary vehicle for emic inquiry” as “it builds on the reader’s tacit knowledge” (Lincoln & Guba, 1985, p. 359).

In addition, Yin (2009, p.2) states that the case study is appropriate when “how” or “why” questions are being posed. A qualitative case study also provides the “thick description” (Geertz, 1973) which is necessary for this study. Hence, the case study method is suitable as this study sought to answer research questions related to ‘how’ expert primary school in-service teachers of English Language in Singapore, who firmly
believe in the importance of critical reading, infuse critical thinking skills across the English Language curriculum and ‘why’ they use those strategies. In addition, the relevant behaviours of the expert teachers in this study could not be manipulated by the researcher and the study involved a contemporary event (Yin, 2009). The case study design also made it possible for the researcher to “retain the holistic and meaningful characteristics of real-life events” (Yin, 2009 p. 4) and provides the capacity to handle a variety of proofs including documents, interviews and observations.

The research design selected was a multiple case study as it involved an investigation of six cases of expert primary school in-service teachers teaching English Language in Singapore. Miles and Huberman (1994) assert that multiple cases enable the researcher to have a “deeper understanding of processes and outcomes of cases” (p. 26). Yin (2009) states that a multiple case study is more robust as the evidence is more significant than that of a single case. To develop an in-depth understanding of the teachers’ beliefs about critical reading and the infusion of critical thinking across the English Language curriculum, attention was centred within the individual cases at the beginning. When the individual cases were fully established, a cross-case comparison and analysis was made to gain insights into wide-ranging and collective issues (Stake, 1995) with regard to expert teachers’ beliefs about critical reading and the infusion of critical thinking across the English Language curriculum. The multiple case study complied with all national and UWA guidelines for confidentiality, anonymity and informed consent.

The multiple case study for this research is also an instrumental study (Thomas, 2011). It must be reiterated that this study focuses on the classroom practices of six expert teachers and it is not intended as a study on ‘best practices’ pertaining to the teaching of critical thinking. Rather, the purpose of this study is to provide primary school English Language teachers with insights into the development of more effective strategies and models of instruction for teaching critical thinking in the classroom as well as make recommendations based on research findings for the benefit of policy makers and English Language curriculum developers.

Another area of concern regarding case study research is that there is not much ground for generalisation. Yin (2009, p. 15) counters this view by stating that case studies are “generalisable to theoretical propositions” and the researcher’s aim is to “expand and generalise theories (analytic generalisation)” rather than to “enumerate frequencies (statistical generalisation)”. Punch (2009) asserts that “properly conducted case studies, especially in situations where our knowledge is shallow, fragmentary, incomplete or non-existent, have a valuable contribution to make” (Punch, 2009, p. 123). He adds that
discovering the significant features, developing an in-depth understanding of them, and conceptualizing them for additional study is often best accomplished through the case study strategy.

**The Participants**

In order to learn the most about the phenomenon being studied, participants in this research were selected by means of purposive sampling (Merriam, 1998). Purposive sampling involves a deliberate selection of participants in this study according to the purpose of the research (Punch, 2009). A survey (Appendix D) was used to select as carefully as possible participants who were in the best position to provide the necessary information available about the planning and practising of critical thinking (Creswell, 2007). The survey elicited from a pool of 28 award-winning teachers the way they defined critical thinking, examples of how they implemented critical thinking in the classroom and why they think critical thinking is important. The responses of those who took part in the survey revealed their knowledge base, the strategies used to infuse critical thinking and the rationale of their critical thinking practice. Their commitment to teaching critical thinking was also recognised from the frequency of use of strategies related to critical thinking practices which were integrated in their planned curriculum.

**The sample.** The participants in the study comprised a group of expert teachers of English Language from different primary schools. The term “expert teacher” was defined as a teacher who had received a teaching award as a form of recognition for his or her teaching expertise. The expert teachers in this study were either awardees or finalists of the President’s Award for Teachers, the pinnacle national award in Singapore, or they were recipients of the Inspiring Teacher of English Awards given by the Straits Times and the Speak Good English Movement, and supported by the Ministry of Education. A summary of the six expert teachers’ background and experiences is consolidated in Table 1:
From Table 1, it is observed that the six participants, aged from the late 30’s to the 50’s, have between 11 to 30 years of teaching experience. Three of them have Master’s degrees while the other three have basic degrees. Their interest and commitment to teaching critical thinking was apparent from the fact that five out of the six participants had attended some form of training courses related to critical thinking. With the exception of a mixed progress lower primary class, the rest of the students observed for this study were all upper primary students ranging from low progress to high progress students and students from GEP.

The rationale for the selection of expert teachers is the idea of learning from the best in order to share these effective practices with the rest of the fraternity. Observing expert teachers is an often used strategy for inducting beginning teachers in many countries in the world. Carolan and Guinn (2007, p. 44) assert that a “close study of the daily practice of expert teachers is a key though under-used resource” in developing teachers.

**Sampling strategies.** The procedure for the selection of the six cases (teachers) was as follows:

- A name list of finalists / awardees of the President’s Award for Teachers, who are primary school English Language teachers, was collated from information obtained
from the website:
http://www.academyofsingaporeteachers.moe.gov.sg/professional-excellence/professional-recognition/president-s-award-for-teachers/presidents-award-for-teachers-

- The names of the primary school teachers who had won the Inspiring Teacher of English Award were also obtained from the website:
  http://www.inspiringenglishteacher.sg/about-the-award/

- After obtaining permission from their principals, an email was sent requesting the teachers to fill in an initial survey (refer to Appendix D) to determine their beliefs regarding critical reading and the infusion of critical thinking across the English Language curriculum.

- From the survey, teachers who firmly believe in the importance of critical reading and showed some indications that they had actively infused critical thinking across the English Language curriculum (from the written examples of the strategies used) were shortlisted.

  The six teachers were selected from the shortlisted teachers based on their willingness to participate in the study. As Isenburg (1990) puts it, teacher beliefs influence their classroom practice and their decisions concerning instructional strategies. These selected teachers were among those who firmly believe in the importance of critical reading and hence, they were likely to infuse critical thinking skills across the English Language curriculum.

Data Collection

Data collection appropriate for the study on teachers’ beliefs comprised interviews, observations and documents in three phases. Phase 1 consisted of an in-depth semi-structured interview with each case study teacher. Phase 2 consisted of classroom observations and document analysis. This was followed by interviews to clarify matters arising from the observations and document analysis in Phase 3.

Interview. The interview is one of the main data collection tools in qualitative research. It was an important research tool for data-gathering in connection with the research objectives of this study. As defined by Cohen, Manion and Morrison (2001), research interview is “a two-person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information, and focused by him on content specified by research objectives of systematic description, prediction, or explanation. It involves data gathering through direct verbal interaction between individuals” (p. 269).
An interview is an apt way of gathering people’s “perceptions, meanings, definitions of situations and constructions of reality” and one of the most effective ways of understanding them (Punch, 2009, p. 144). In qualitative interviewing, the researcher listens carefully to hear the “meaning” of that which is being conveyed (Rubin & Rubin, 1995, p. 7), and responds appropriately with further probe questions. Interviewing is necessary when the focus of the study deals with thoughts and feelings which are not observable (Merriam, 1998).

In this study, semi-structured interviews were used as a means of probing teacher beliefs. This interviewing style required the researcher to develop some rapport with the participants during the interview. It is essential to develop rapport with participants and provide an environment that encourages participants to share their experiences in open-ended discussions thus permitting the researcher to gain insights into their perspectives.

The goal of qualitative interviews is to see the research topic from the perspective of the participants and to understand how and why they developed this particular perspective (King, 2004). The interview provides “an open-ended, in-depth exploration of an aspect of life about which the interviewee has substantial experience, often combined with considerable insight” (Charmaz, 2000, p. 676). Thus, responses to the open-ended interview which provided insight into the factors which shaped the teachers’ pedagogical approaches, perspectives and expectations of their students’ practice were gathered through the interview. As each teacher would “attach meaning to, and act towards, particular objects and phenomena” in teaching in his or her own way (O’Donoghue, 2007, p. 26), it was expected that the participants would offer relatively different strategies for infusing critical thinking in the English Language curriculum.

**Preparation for interviews.** In the preparation of interview questions, considerable care was taken in crafting the open-ended questions, and in anticipating the participants’ responses. The interview schedule or initial interview questions (Appendix E) consisted of a pre-determined set of open-ended questions as a guide to facilitate flow during the interview and ensure that information captured was efficient and comprehensive. These questions increased the new researcher’s confidence and enabled her to concentrate on participant responses instead of focussing on what to ask and how to ask the next question (Charmaz, 2006). Open-ended questions allowed participants to elaborate on perspectives of critical reading and practices to infuse critical thinking across the English Language curriculum.

Although there was a pre-determined set of questions, the interview was semi-structured as other questions emerging from the dialogue between the interviewer and
interviewee were also discussed. The choice of semi-structured interviews as the data collection method has a number of benefits. Firstly, through having a question bank, the researcher may select questions best suited to the direction of the interview. The approach allowed for some flexibility, with the participants being able to pursue topics and themes of interest, while fulfilling the purpose of seeking teachers’ perspectives on the infusion of critical thinking (Creswell, 2005). Another benefit of semi-structured interviews was that it permitted the researcher to tailor the questions to enquire in greater depth to elicit more information about topics raised by the participants. The interviewees’ responses to these questions added to the richness of the data collected for this qualitative research.

King and Horrocks (2010) assert that the physical environment in which the interview is held can influence how the interview proceeds and they stress the importance of “comfort, privacy and quiet” (p. 42). In view of this, the researcher interviewed the participants in a private place within the participants’ schools for their convenience as they were comfortable talking about important issues there.

Before the interview, the selected participants were contacted by telephone for the purpose of making introductions and discussing the study briefly. After the initial conversation, an information sheet and a consent letter were sent explaining the purpose of the study, expectations of participants and issues of confidentiality. Participants were informed that their participation in the study would be anonymous through the use of pseudonyms, and no information relating to them would be released at any time. A second telephone conversation verified that the consent form had been signed and an interview time was arranged with each participant. Each participant was interviewed for approximately one hour before the classroom observations took place.

Participants were given a semi-structured interview schedule one week before the interview to allow them time to reflect on the questions. The interview schedule included questions related to the participant’s beliefs about critical reading, how critical reading is related to critical thinking, the significance of infusing critical thinking, infusion strategies, the preparations involved, outcomes expected, constraints faced and concerns related to the infusion of critical thinking. Follow-up interviews with each participant were conducted after each of the two observations to further examine teacher beliefs as well as follow up on issues arising from the observations. This improved triangulation in the data collection process and augmented the research rigour of the study.

**Interview procedure.** At the beginning of the interview, time was spent building rapport with the participants to help them feel at ease. Fontana and Frey (2000) add that the researcher should put himself in the shoes of the participant and see the situation from
the participant’s point of view. The interview was digitally recorded with the permission of the participant. During the interview, communication skills, listening skills and follow-up questioning skills are essential (Punch, 2009). Punch suggests that retrospective notes on the body language and attitude of the interviewee and the environment, recorded after an interview can illuminate contextual influences on social behaviour. Corbin and Strauss (2008) state that observations offered insights to the qualitative researcher and observer notes which supplemented the recording of interviews were also used to provide clarification to the interview transcripts.

The pre-determined questions were asked in the same order for each participant. However, the researcher allowed room for flexibility to discuss questions as they emerged from the dialogue. During the interviews, probes and prompts were used to get as much information from the participants as possible. King and Horrocks (2010) use the term ‘probes’ to refer to follow-up questions to encourage the interviewees to elaborate on their initial responses given in general terms in order to get more depth in their responses while ‘prompts’ refer to short supplementary questions to clarify the type of information sought when the interviewees appear uncertain about the initial question (p. 40). While using probes and prompts, the interviewer kept in mind the dangers of “leading questions, over-complex and multiple questions, judgmental responses and a failure to listen to the interviewee” (King & Horrocks, 2010, p. 51).

At the close of the interview, the participants were informed that the interview would be transcribed and the verbatim interview transcripts would be given to them to check for misinterpretations and modify where necessary as this provides the best data base for analysis (Merriam, 1988). The participants were told that they would receive an e-mail from the researcher a week after receiving the transcript to see if there was anything they would like to add or delete. Participants were free to elaborate, refine or change their transcripts until they were satisfied that the views in the transcripts accurately reflected their perspectives.

O’Donoghue (2007) states that this strategy called ‘member checking’ is beneficial in developing the internal validity and coherence of the study. According to Charmaz (2006) ‘member checking’ is the process where the researcher takes “ideas back to the research participants for their confirmation” (p. 111) to ensure that an accurate representation of the interview is made. Lincoln and Guba (1985) add that this process is “the most crucial technique for establishing the credibility of qualitative studies” (p. 314). Supplementary questions that arose in the process of data analysis were also asked during this time. Follow-up interviews were carried out to further clarify concepts raised in
the initial interviews as well as clarify matters arising from the observations and document analysis.

**Non-participant classroom observations.** Observations enhance the researcher’s understanding of the cases studied (Stake, 1995). Two non-participant observations of one hour each enabled the researcher to observe the enacted curriculum of participants as they infused critical thinking in their English Language lessons.

The observation lessons were audio-taped so that reference could be made to observational data during the interview to enrich the data collection. Field notes on teachers’ responses to students’ questions were taken during the observations (Creswell, 2005) to record data relevant to the topic of study. The researcher did not interact with the students or teacher during the observation to minimise lesson disruptions.

It is essential in case studies formulated within the symbolic interactionism research tradition that meanings and actions are consistent. The main purpose of observation is to view how teachers’ meanings are translated into strategies practised in the classroom. Consequently, lessons selected for observations were those in which diverse strategies to infuse critical thinking were intended in the participants’ planned curriculum. The observations served to confirm interview data and surface any disparities between the actions undertaken by the participants and the meanings they attributed to that situation previously in the semi-structured interviews. O’Donoghue (2007) state that researchers should try to note actions which are inconsistent with participants’ stated perspectives and investigate the reasons for the inconsistencies. This requires giving teachers the opportunity to explain the situation by engaging them in further conversations to ensure that they have not been misunderstood. After the observations, the researcher wrote reflections of the classroom practices observed in the lessons. The “descriptive and reflective field notes” contributed to the data collection process (Crewell, 2005, p.222).

Types of questions asked and questioning techniques used by teachers to foster critical thinking were observed. Through the direct observations and document analysis, the teachers’ use of learning activities which promoted critical thinking such as “guided discussion, debates, role-playing, problem-solving, case studies, group projects, simulations, model building, project design, performances, presentations, experiments, research and interview” (Bowers, 2006, p. 20) were noted.

**Documents.** Another rich source of data for education and social research are documents, both historical and contemporary (Punch, 2009). They provided the ‘conceptual density’ that is required for authentic research (Strauss, 1987, p.1). They are useful for triangulation, where an intersecting set of various methods and data types are
used in a single project (Denzin, 1989; Hodder, 1994). The nature of documents collected and analysed for the study included teaching materials, lesson plans prepared by participants, worksheets related to lessons observed as well as their students’ journals and worksheets.

Employment of a variety of methods (survey, interviews, classroom observations, document collection) and sources (survey results, interview transcripts, field notes, documents) for data collection allowed room for triangulation which enabled the researcher to develop findings with data that were credible, dependable and complete (Merriam, 1998). The process of triangulation using “multiple perceptions to clarify meaning” by identifying the variety of ways in which the phenomenon was seen (Stake, 2000, p. 443-444) improved the rigour of the study.

**Positivist and Constructivist Positions of Grounded Theory Methods**

Data comprising interview transcripts, field notes and documents were analysed using Grounded Theory methods of data analysis, consistent with the principles of interpretivism (Corbin & Strauss, 2008). Grounded theory (Glaser & Strauss, 1967) provides a clear basis for systematic qualitative analysis, offering a method with a “solid core of data analysis and theory construction” (Bryant & Charmaz, 2007, p.4). However, as Bryant and Charmaz (2007) put it, the key weakness in Glaser and Strauss’ Grounded Theory methods lies in their positivist, objectivist orientation. Subsequently, Glaser and Strauss disagreed on the application of grounded theory methods. Strauss and Corbin’s (1990) publication resulted in the methodological divergence in Grounded Theory.

Even as Charmaz (2000) describes Glaser’s position as that of traditional positivism and Strauss and Corbin’s position (1990) as post-positivism, she proposes a constructivist approach to grounded theory to validate the study of people in their natural environment and move qualitative study away from positivism. Charmaz (2000) asserts that the constructivist grounded theory “takes a middle ground between postmodernism and positivism” (p. 510). Contrary to the objectivist positivist position where the theory emerging from the data is separate from the researcher, constructivist grounded theory acknowledges that the “narrowing of research questions, the creation of concepts and categories, and the integration of the constructed theoretical framework reflect what and how the researcher thinks and does about shaping and collecting the data” (Charmaz, 2000, p. 522). The researcher concurs with Charmaz that the interpretation of reality is co-constructed through the researcher’s experience and the participant’s depiction of the experience. Hence, for this study, the constructivist approach to grounded theory was adopted.
Grounded theory methods comprise “systematic yet flexible guidelines for collecting and analysing data to construct theories ‘grounded’ in the data themselves” (Charmaz, 2006, p. 2). Grounded theory methods do not dwell on data collection techniques and the focus is on moving the process of analysis toward the “development, refinement, and interrelation of concepts” (Charmaz, 2000, p. 510).

**Data Analysis**

Constructivist grounded theory research methods were used for data analysis and developing explanatory theory in this study as they are consistent with the interpretivist paradigm. Charmaz (2006) adds that grounded theory provides a comprehensive systematic framework for generating theory inductively from the data.

The analysis of data in this study comprised at least two phases of coding, namely open coding or initial coding and focused coding or selective coding. Memos which are notes of ideas about the data and the coded categories were also used in the data analysis (Charmaz, 2006). Coding refines and sorts data, enabling comparisons to be made and patterns to emerge while being subjected to questioning and it is the first step in going beyond concrete statements in the data to making analytic interpretations (Charmaz, 2006).

The transcripts were read multiple times by the researcher in order to be fully immersed in the data. For open coding, each interview transcript was coded independently line-by-line with ample space provided in the margins for the codes which depicted what the segment was about (Charmaz, 2006). Line by line coding is a strategy which enables the researcher to study the data closely. A sample of the open coding for a segment of the interview transcript is shown in Appendix F. Selective or focused coding uses open codes which are significant or appear repeatedly, to sort and synthesize huge amounts of data into clusters or concepts, which were constantly interrogated and compared (Charmaz, 2006).

The foci of the interview questions, namely, the conceptual understanding of critical thinking, strategies for teaching critical thinking, and concerns related to the infusion of critical thinking provided the initial broad categories for organising data across the cases. Using the constant comparative method, the focused codes within each case were analysed iteratively to look for themes. The themes were then used to construct the individual case studies utilising multiple sources of data in order to develop a comprehensive understanding of the expert teachers’ perspectives on the infusion of critical thinking across the English Language curriculum. The penultimate draft of each case study was returned to the relevant participants to see if there was anything they
wished to elaborate on or if they would like to propose alternative interpretations of the data. Participants were asked to verify individually the accuracy of the researcher’s representation of their views through the process of ‘member checking’ as the case studies represented the voices of the teachers and their practices in the classroom.

After verifying the information, a cross-case analysis was made. Data from the six individual case studies were compared and interpreted to make meaning of the findings. As themes common to all cases were identified in the cross-case analysis, tentative categories were developed and the data were analysed to refine and confirm some of these as key categories. When the same focused code emerged from the transcripts of all six participants, it was raised as a key category. Examples and samples of analysis are shown in Appendix F. However, two themes which did not appear in the transcripts of all six participants were also inductively raised as key categories as they were found to be significant as a result of the review of emerging literature. Through the process of data reduction using inductive analysis, five key categories were produced. The key category is at a “higher-order conceptualisation of the theoretical codes, around which the theory is built” (Punch, 2009, p.183). Once a key category has emerged, it is “elaborated in terms of its properties and systematically related to other categories in the data” (Punch, 2009, p.188). The five key categories are ‘being competent in critical thinking’, ‘being pedagogically competent in teaching critical thinking’, ‘being committed to teaching critical thinking’, ‘having a school-wide practice of critical thinking’ and ' infusing critical thinking holistically in all school programmes’.

The key categories identified based on the perspectives of the participants formed the groundwork for propositions which were developed using both inductive and deductive analytical processes. The propositions led to the development of an explanatory theory about a critical thinking culture.

**Trustworthiness of the Study**

As the research was a qualitative, interpretivist study, it was fitting to use the criteria of the interpretivist study to evaluate its trustworthiness. The principles of such criteria are transferability, dependability, credibility and confirmability, all of which are concerned with the honesty of the data collected from, and about the participants and the extent to which the researcher can have confidence in the results of the study (Lincoln & Guba, 1985). Each of these criteria is now examined in the light of the study:

**Transferability.** Lincoln and Guba (1985) refer to transferability as the extent to which the findings of the study are substantiated by, or applicable to, a different group of people, or in another setting from where the data is collected. O’Donoghue (2007, p. 197)
adds that external validity relates to the extent to which the study’s findings relate to the reader’s own situation. In order to enhance the possibility of this kind of generalisability, it is imperative that the study provided a rich, ‘thick description’ of the phenomenon in question. Obtaining rich data that were detailed, focused and full resulted in ‘thick description’ which is described by Lincoln and Guba (1985) as a way of attaining transferability.

In addition, the descriptions of the phenomenon being studied needed to give a full picture of the situation so that a reader obtained a holistic and comprehensive picture of the project in its context (Punch, 2009). In this study, the number of teachers was kept small enough for the development of rich data regarding their perspectives. The combination of thick description, semi-structured interviews, observations, and the close analysis of relevant documents resulted in a holistic understanding of the phenomenon.

**Dependability.** Dependability of a study pertains to the amount of rigour that is related to the consistency of findings (Guba, 1981). Compiling an audit trail is the usual means to accomplish this. The detailed notes of interviews, notes taken during the conversation with the interviewees, digital recordings, transcripts of all the interviews and observation lessons as well as emails were documented and filed. Samples of the transcripts are included in the appendices.

**Credibility.** Credibility of findings was assured through the extensive amount of time the researcher spent observing the setting, creating rapport, talking with the participants and developing relationships. Such development of rapport and trust promoted understanding and co-construction of meaning between the researcher and participants. Member checking of the interview transcripts and case study write-up were carried out to build trust and ensure that accurate representations were made.

**Confirmability.** Confirmability of the study was achieved by ensuring that all matters pertaining to the research were detailed in the construction of an audit trail consisting of the research steps taken in the study from the start of the research project to the development and reporting of findings. The records provide a clear description of the research including research design, data collection decisions, and the steps taken to manage, analyse and report data.

**Recording and Storage of Data**

All interviews were recorded and will be stored carefully for a period of five years. The interview transcripts were transcribed and coded in electronic format and stored in a computer accessible only by the researcher. All data were stored carefully within the
researcher’s home. Information related to the identity of participants was also kept securely.

**Ethical Considerations**

**Participants’ consent and protection.** The researcher applied for and obtained permission from the Ministry of Education to conduct this research in Singapore schools, and from individual principals (Appendix A) to carry out research on their school sites before inviting prospective participants to fill in a survey using Google docs. Selected participants were contacted by email to ascertain their willingness to take part in the study before seeking permission for an interview. Details of the study were given to potential participants through a participant information form (Appendix B) outlining the nature of the study, their role in the study, the data collection and processing. Participants who indicated a willingness to take part in the study were required to sign written consent forms (Appendix C). The original and signed consent forms were kept in a secure place and a photocopy of the form was given to all participants for their personal records. To ensure participants’ privacy, all personal data and any information including recordings and transcripts provided by the participants were securely stored. Pseudonyms were used in place of the names of participants.

**Conclusion**

This chapter explained the research paradigm that determined the research design and research method used in the study. The study, located within the interpretivist paradigm and the theoretical framework of symbolic interactionism, was used to generate explanatory theory on the creation of a critical thinking culture. The participants’ perspectives and experiences were examined using their own voices and context in this multiple case study research method. Data collected from multiple sources were triangulated according to the Constructivist Grounded Theory method of data analysis to produce creative interpretations and propositions which formed the theory on a critical thinking culture. Issues of research credibility and ethical considerations were also addressed. The findings of the case studies are presented in Chapters Three and Four.
CHAPTER 4: CASE STUDIES OF THREE EXPERT TEACHERS

Introduction

The purpose of this multiple-case study is to generate explanatory theory regarding the perspectives of six primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking across the English language curriculum. Three of the case studies are presented in this chapter and the other three in the next chapter to illustrate the range of ways in which critical thinking is infused and the variation in the frequency or density with which the infusion occurs. The three case studies described in this chapter are placed together as all three teachers made use of annotating text as a strategy to infuse critical thinking across the English Language curriculum. The remaining three case studies are then placed in the next chapter.

The case studies are presented in a standard manner. The participants’ background details are provided (age, marital status, educational qualifications and years of service) followed by a summary of their professional experiences including the courses related to Critical Thinking that they have taken and the profile of the class observed. This includes some information on the school demographics. However, more explicit information was excluded to prevent the identification of the participants or their schools.

Following the background information, each case will address the central research questions according to three broad headings namely:

- Conceptual Understanding of Critical Thinking
- Strategies to Teach Critical Thinking
- Concerns Related to the Infusion of Critical Thinking

These headings comprise broad categories derived from the interview questions. Using the constant comparative method, the focused codes within each case were analysed iteratively to look for themes. Within each heading, there are sub-headings comprising themes which vary from participant to participant except for the themes ‘Definition and Value of Critical Thinking’ and ‘Working for Transfer of Learning’ which are common for all six cases.

The cases are built using a considerable amount of direct quotation from the participants so that their voices could be captured. Direct quotation enables participants to share their experiences in their own words, depicting their personality and emotion as well as demonstrating their unique nuances.
Melissa

Melissa’s Background.
Melissa is a single female in her late 30s with a Master of Arts (English Language) degree. She has been teaching for 14 years including 4 years as a Senior Teacher (Curriculum), her current designation. Melissa has been teaching Upper Primary (Primary 5 & 6) pupils English Language (Standard) for the last 14 years in a neighbourhood government coeducational school. She has attended 24 hours of workshops/seminars related to Critical Thinking under the GEP programme conducted by the GEP Branch. Her class has 40 High Progress (HP) pupils of which 37 are from English speaking homes.

Conceptual Understanding of Critical Thinking

Definition and value of critical thinking. Melissa defines critical reading as reading “with deep understanding” which includes understanding the author’s intended purpose and the evaluation of the author’s message. To her, critical thinking is “the ability to think clearly with depth”. She sees critical reading and critical thinking as closely intertwined as both involve challenging assumptions instead of taking things at face value, striving for deep understanding and making evaluations.

She passionately believes in the importance of critical thinking and this conviction was developed through her personal experience. Melissa seeks to infuse critical thinking as often as she can, whenever the opportunity arises. Her reason for doing so is:
..because it is important and it makes the class more lively. Plus, I am dealing with high ability kids. They need to be stimulated. If not, I am going to get kids complaining that it is a super boring lesson because they are not stimulated in their thought. Whenever it is possible, I try. For all subjects, not just English... even Form Teacher Guidance Period (FTGP).

She sees the value of teaching pupils to read critically as “pupils with poor thinking skills have poor reading comprehension”. The pupils’ “depth of analysis” could be determined by their level of reading comprehension. She also relates the quality of the pupils' writing to critical thinking:

You use the language to express opinions so if you don’t teach them how to think critically, it’s probably going to affect the quality of their writing. Eventually, because they are tied, you will see that deficiency surfacing when they go for papers like General Paper.²

² In Singapore, General Paper is taken by students during their Pre-University Education. It requires students to achieve an understanding and usage of the English language to express arguments, ideas and opinions in a reflective and academic manner.
Writing is seen as more than just language skills, grammar and structure as she perceives critical thinking as essential in the expression of ideas during writing. She believes that having multiple perspectives on an issue enables pupils to weigh the pros and cons before deciding on what is best for the given situation:

- I always marvelled at people who could write and their opinions just flow so well.
- They have so many perspectives. At the end of the day, it is not about siding with this or that. It is coming up with what is best for the situation. So from personal experience, I feel that it is important and I would like my kids to be imparted with that kind of skills.

Hence, by thinking critically about an issue, pupils are able to express their opinions more clearly in writing.

**Infusing critical thinking through real world interactions.** Melissa sees critical thinking as real-world problem solving. Infusing critical thinking would then involve applying the same thinking process in every lesson or situation. Hence, when she teaches situational writing, for example writing a complaint letter, her focus is more than just teaching her pupils the task of writing a letter of complaint. When focusing on the audience and purpose of the writing, she engages the pupils to think critically about the interactions between the reader and the writer in the real world and how the interactions are conditioned by the approach that the initiator takes. Through role-play, the pupils think about how the reader of the letter of complaint would think by putting themselves in his shoes. Then she gets them to focus on how the letter writer could start the letter in such a way that the reader would view the incident in a positive light:

- For situational writing, I got them to think about why for complaint letters I don't begin with “Dear Manager, I am writing to complain.” I want them to know why certain letters start in this manner also. Get them to think, “Oh it sounds very rude to begin with that.” But if it is a compliment, I can start with “Dear Manager, I am writing in to compliment. Why? So they start to think, “Is there something to do with etiquette?”

She concludes that learning is more ‘internalized’ when pupils think through the reasons why they do certain things in a particular way.

**Using a constructivist approach.** Melissa helps her pupils to construct their own understanding through the use of Socratic questioning and cognitive dissonance. By asking questions that are intentionally meant to mislead them and playing the devil’s advocate, she provokes them to think. The pupils respond to the challenge presented by
Melissa and are actively engaged in the thinking process instead of being passive. She adds:

I was doing Chinese Cinderella with my class and when going through the text, we will start to think more critically about the setting there and then. Kind of through the story, decipher more about the character that the author is trying to portray. Again there is a lot of questioning involved. I just do a lot of Socratic questioning.

Melissa encourages pupil engagement by praising pupils when they raise questions and respond to the challenging ideas raised by their peers during class discussion:

Also, I can take the opportunity to praise them as this is the kind of learning behaviour that I am expecting. Not just passively sitting there and listening to me.

She also spurs them to do research:

I may not always have the answer. I just come up with the questions but not the answers. We discuss and affirm our discussion through proper research online. So they will go back and do their research when there is no time (available in class). So the next day they will come back and share their findings.

**Working for transfer of learning.** Melissa’s conceptualisation of developing critical thinking includes creating a mindset in children that learning could be transferred or applied to other subject areas and circumstances in life, rather than limiting it to a particular area or setting:

I think it’s not just teaching the content because when you teach the thinking process, it’ll spill over. That kind of learning can be applied across the board for any other subject – not even a subject – it could be a situation, you know...so to me, that is really real learning – you kind of extrapolate the learning outcomes - not just meeting the Specific Instructional Objectives (SIO) per se.

Melissa deliberately builds in opportunities for learning transfers. She gave the example of a class project where pupils were involved in raising funds for the disabled by making wallets out of cartons. They encountered a lot of problems along the way and they were confronted with decisions to make. Through questioning to get them to think critically, she led them to pre-empt problems and foreseeable issues so that they could make sound decisions. She sees transfer of learning as a long term goal which might not be realised while they are still in primary school.

**Strategies to Teach Critical Thinking**

**Modelling thinking.** Melissa sees modelling thinking as an important strategy to teach critical thinking. Hence, she takes a conscious effort to think critically herself by
evaluating what she reads. She does thinking aloud with her pupils to make thinking visible for them:

I will share with them this issue I encountered and the factors that came to my mind and how I eventually arrived at a certain decision. So I model this quite often in class.

For example, when she was confronted with a real-life issue of being asked to sell her flat for a handsome profit, she shared with her pupils how she evaluated all the push and pull factors and how she arrived at the decision of not selling her flat.

**Using Socratic questioning.** Melissa uses Socratic questioning as a tool to teach critical thinking in her class. She provokes pupil thinking through questioning. For example:

When I show them some compositions that are bad or good, I get them to think what the author might be thinking of achieving through writing in this manner... and the plot.

Melissa capitalises on the use of controversial issues to get pupils to evaluate the writer’s opinion in order to gain an understanding of the writer’s rationale and perspective:

When we talk about a newspaper article, or a forum article - if I were to present a forum article, usually it is very opinionated. So I will say, “this particular person wrote in and tends to favour this particular policy” which is something easy for the kids to understand...maybe public transport. And then I will get the kids to evaluate this person’s opinion. Why do you think this person gave such solutions? From whose perspective?

Through the use of Socratic questioning in class, she gets pupils to think about and discuss foreseeable issues. She adds that “it’s always good to get kids to see multiple perspectives”.

**Annotating questions.** Whenever they do open-ended comprehension, Melissa gets the pupils to look at the comprehension questions to get an overview of the text and what to look out for in the passage. In doing so, she is using the questions as an advanced organiser and pre-conditioning students to think about how the questions are directing them. Then she gets them to annotate the comprehension questions before they read the passage. Annotating questions includes writing new questions and their predictions about the text above or next to the related questions. By making predictions based on the questions, pupils are eager to read the passage to find out if their predictions are correct. Melissa’s focus on the annotation is on content rather than grammar and she explains her rationale of annotating the questions as follows:
I told the pupils it is like giving you a 500 piece jigsaw puzzle. If I ask you to put the pieces together without telling you what the picture is supposed to look like, it is going to be really tough. So if I give you the box cover, you know that all the pieces of similar colours are to be pooled at this corner. Then it makes things easier. So it is the same concept. You read the questions first; you get a feel and a gist of what it is about. Not 100% accuracy, but it will enhance your understanding when you read the text.

A brief sample of a pupil’s annotation of questions is shown in Figure 4.

**Figure 4.** Sample of pupil’s annotated questions

**Annotating text.** Melissa models and demonstrates detailed annotations of comprehension passages using the projector so that the pupils could see how she annotates as she reads the passage. She clarifies and analyses the meaning of selected words or phrases with the class and writes down questions that come to her mind as she reads the text. She also connects the answers found in the text with the relevant questions by looping them. By getting the pupils to focus on annotating content rather than grammar, Melissa is developing them as critical readers through a critical appraisal of text. Pupils are expected to annotate the comprehension passages individually.

During the second lesson observation, Melissa shared some research findings as shown in Table 2 to emphasize to her pupils the value of annotating text as a
comprehension strategy as she noticed that some of them had not annotated their comprehension passage for a revision paper.

Table 2

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Annotations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing research findings to emphasize the value of annotating text as a comprehension strategy</td>
<td>This is the research findings: No of passes pre-test before the strategies (of annotation) were taught – 16.7% pass.</td>
</tr>
<tr>
<td></td>
<td>After teaching the strategies, when students begin to use the strategies themselves, the number of passes increased to 72.2%. This is taken from a credible research paper.</td>
</tr>
</tbody>
</table>

She used questioning to get pupils to reflect on their comprehension monitoring skills. She explained the difference between good readers and poor readers and gave examples of ‘fix-it’ strategies to reinforce the need for them to annotate the questions and the text. Being a strong advocate of annotations, Melissa took the class through the process of critically reading the passage again to reinforce the practice.

Melissa annotated the passage with her class paragraph by paragraph. Pupils who had not annotated their text and those who had already annotated the passage previously added annotations made by the class that they had left out (indicated in green in Figure 5). With each paragraph, the class raised questions they had about the text line by line. As questions were raised, some pupils responded to the questions with their interpretations and predictions of the text and inferences while others paraphrased segments of the text or stated key ideas in the text. At certain points, Melissa used examples to direct their thinking or clarify the meaning of a phrase.

She also demonstrated visualization as a strategy by getting the pupils to illustrate part of the text. Occasionally, she would probe for details, ask clarifying questions, and get pupils to support their answers with information from the text. She would ask for a more precise word to describe an action or object and help pupils make connections to the text. Cognitive strategies such as making comparisons, stating differences, summing up, using contextual clues, testing predictions, stating implications, looking at things from different perspectives were also observed. When asking pupils to give a rationale for their answers, Melissa highlighted that the evidence should be based on information from the text rather than their prior knowledge. A brief sample of a pupil’s text annotation is shown in Figure 5.
Using reflective critique. In order to assess whether critical thinking has taken place, Melissa gets her pupils to articulate self-critique in a given task. She discusses the task with the pupils by asking them, “Why did you design it this way?” The discussion provides opportunities for feedback and for pupils to reflect critically on their own work. Reflective critique provides multiple opportunities for her to go back on a task or get pupils to work on the same task from a different perspective.

Using debates for collaborative learning. Melissa uses debate when doing literature with the pupils to get them to look at issues from the perspectives of different characters. The use of debates fulfils her goal of eliciting discussion from the pupils and generating interest through involvement. By capitalising on competitive debates organised by the English Unit in the Ministry of Education (MOE), she gets the pupils to construct their learning through collaboration during the preparations for the actual debate.

During the debate discussion, it was observed that at certain points, Melissa played the role of an active listener where she let the pupils argue and discuss without intervening. For example, at one point, Melissa asked the pupils if they agreed with the definition of ‘advertisements’ stated by the pupil (S1) in Table 3.
She then left the pupils to discuss among themselves whether educational campaigns addressed during school assemblies and sponsors of items related to assembly talks should be included in their definition of ‘advertisements’. Listening attentively to how they were contributing to the development of the argument, she intervened to sharpen the focus and moved them on to discuss on their own. She then intervened again to elicit examples of bad advertisements to broaden their perspectives as shown in Table 4.

Table 4
Transcript Excerpt Showing Melissa Eliciting Examples from Pupils

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Debate Discussion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asking for examples to broaden pupils’ perspective through comparison</td>
<td>P: Right! Can I ride on S4’s point... you mention there are good and bad advertisements. What are some examples of bad advertisement then ... huh, can you give me concrete examples? S4: Toy..., Nerve guns..., Nerve guns? P: Are all toy advertisements bad? S4: No. But these nerve guns - they design the nerve guns such that their bullets actually cause pain when you hit a person. P: So, when is this advertisement screened? S4: Television P: Ok, it’s on TV, TV commercial. When do you happen to see it?</td>
</tr>
<tr>
<td>Questioning to refine generalization</td>
<td></td>
</tr>
<tr>
<td>Refining generalisation</td>
<td></td>
</tr>
</tbody>
</table>

The observation during the debate discussion revealed debate as a powerful tool for the infusion of critical thinking in pupils as 22 out of the 35 dimensions of critical thought listed by Paul & Elder (2003c, p. 10-11) in the Thinker’s Guide to Analytic Thinking were coded from the hour and half discussion. The alignment of the categories of open codes from the debate discussion with Paul and Elder’s Dimensions of Critical Thought is shown in Table 5.
Table 5
Categorisation of Open Codes Based on the Debate Discussion in Alignment with the Dimensions of Critical Thought

<table>
<thead>
<tr>
<th>Open Codes from Debate Discussion</th>
<th>Dimensions of Critical Thought by Paul &amp; Elder (2003c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questioning to promote independent thinking</td>
<td>Thinking independently</td>
</tr>
<tr>
<td>Exercising fair-mindedness, exercising fair-mindedness by putting themselves in shoes of younger kids, relating situation to younger kids</td>
<td>Exercising fair-mindedness</td>
</tr>
<tr>
<td>Exploring feelings underlying thoughts</td>
<td>Exploring thoughts underlying feelings and feelings underlying thoughts</td>
</tr>
<tr>
<td>Developing intellectual courage</td>
<td>Developing intellectual courage</td>
</tr>
<tr>
<td>Refining generalisations, questioning to refine generalisations, questioning to avoid over-simplification, focusing on another group to avoid over-simplification</td>
<td>Refining generalisations and avoiding oversimplifications</td>
</tr>
<tr>
<td>Comparing similar situations, drawing parallels, exploring similar alternatives</td>
<td>Comparing analogous situations: transferring insights to new contexts</td>
</tr>
<tr>
<td>Stating one's perspective, stating points of view, getting opinions to highlight a point, explaining children's beliefs, highlighting differences in view, expressing opinions, explaining one's perspective, developing one's perspective, developing their own points of view, developing a point of view, clarifying one's perspective, asking for examples to broaden pupils' perspective through comparison</td>
<td>Developing one's perspective: creating or exploring beliefs, arguments, or theories</td>
</tr>
<tr>
<td>Questioning to draw conclusions, making clarifications, explaining reasons for conclusion, analysing ideas and drawing conclusions, summarising conclusion, questioning to clarify issues, analyzing different aspects of issue, giving examples to clarify issues, clarifying issue using negative/positive illustrations, drawing on personal experiences to clarify issues, recounting experience to clarify issue, rephrasing question to clarify issue</td>
<td>Clarifying issues, conclusions, or beliefs</td>
</tr>
<tr>
<td>Questioning to get clarification, clarifying and defining selected words, noticing complexity in term, giving examples to clarify, clarifying differences, clarifying definition, clarifying terms, questioning to clarify and define term, being precise, giving a precise term</td>
<td>Clarifying and analyzing the meanings of words or phrases</td>
</tr>
<tr>
<td>Questioning to probe further, questioning for deep thinking, promoting deeper thinking, raising significant questions, stating contradictory issues to promote deep thinking</td>
<td>Questioning deeply: raising and pursuing root or significant questions</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Analyzing arguments, evaluating arguments illustrating to drive home the point, highlighting point through negative illustration, analyzing interpretations of term</td>
<td>Analyzing or evaluating arguments, interpretations, beliefs, or theories</td>
</tr>
<tr>
<td>Making connections between conclusion drawn and the motion, making conclusions making inferences, generating solutions, drawing inferences through comparisons, drawing conclusions</td>
<td>Generating or assessing solutions</td>
</tr>
<tr>
<td>Evaluating MOE policy on Mother Tongue</td>
<td>Analysing or evaluating actions or policies</td>
</tr>
<tr>
<td>Listening critically</td>
<td>Listening critically</td>
</tr>
<tr>
<td>Questioning beliefs</td>
<td>Practising Socratic discussion: clarifying and questioning beliefs, theories, or perspectives</td>
</tr>
<tr>
<td>Reasoning dialogically: comparing interpretations of terms</td>
<td>Reasoning dialogically: comparing perspectives, interpretations, or theories</td>
</tr>
<tr>
<td>Evaluating perspectives</td>
<td>Reasoning dialectically: evaluating perspectives, interpretations</td>
</tr>
<tr>
<td>Noticing differences between children and adults, noting differences, highlighting differences in view making point using negative/positive illustration, making comparisons, highlighting a point through making comparisons, getting pupils to think about difference, clarifying differences</td>
<td>Noting significant similarities and differences</td>
</tr>
<tr>
<td>Making inferences, making interpretations</td>
<td>Making plausible inferences, predictions, or interpretations</td>
</tr>
<tr>
<td>Stating rationale for conclusion, supporting view with reason, giving the rationale, giving reasons to support perspective, explaining the rationale, asking for reason</td>
<td>Giving reasons and evaluating evidence and alleged facts</td>
</tr>
<tr>
<td>Recognizing contradictions</td>
<td></td>
</tr>
<tr>
<td>Getting pupils to think of implications</td>
<td>Exploring logical implications and consequences</td>
</tr>
</tbody>
</table>

Through the use of the strategies described above, Melissa hopes to see her pupils become active learners who “demonstrate an increased ability to generate sound opinions and use a problem-solving approach to make decisions about their daily activities”. She explains her reasons for wanting these learning outcomes:
I think in this day and age, it’s important. It’s in line with the 21 CC framework of learning. We can’t expect rote learning to be effective anymore so active learners will do much better, I feel, in a very volatile environment. Because being very passive, they’ll always be expecting some kind of formula, expecting to be spoon-fed, expecting people to answer their questions - basically not being anticipating, so to me, in this learning environment now, it’s kind of outdated already.

By being active learners, she is confident that her pupils will progress to being proactive in learning as they move on to higher levels of education.

**Concerns Related to the Infusion of Critical Thinking**

**Being constrained by pupils’ language competency.** To Melissa, the pupil’s level of competency in the English language plays “a major role” in the infusion of critical thinking across the English Language curriculum. The language competency affects the “pupil’s ability to frame questions”. Pupils who are constrained by their command of the English language find it difficult to ask questions. They may even develop a fear of asking questions as they do not “even understand the language”. Even when they do ask questions, the questions are likely to be lower order questions connected to the text such as clarifying questions related to vocabulary. In order to deal with the language competency, Melissa helps the pupils understand the text fully before getting them to express their views. She also seats the weaker pupils with those who are more competent to facilitate meaningful discussions in class during group work. Such heterogeneous grouping enables students from different achievement levels to learn to work together in a mutually beneficial situation (Kellough & Kellough, 2007). While advocates for homogeneous grouping believe that mixed ability groupings may impede the progress of higher ability students, Salend (2008) asserts that heterogeneous grouping should be the goal for cooperative learning activities as they have no negative effects on high ability students and very positive effects on lower and middle ability students.

**Pupils being overly critical.** In the process of learning to think critically, pupils sometimes “get too extreme in their views and they get overly critical” about certain issues. Some are not able to distinguish being critical and thinking critically as they have yet to see the difference between arguing and reasoned argument. Instead of being an effective critical thinker who evaluates fairly in a reasoned manner, some pupils tend to become critical for the sake of being critical. Hence, they end up unfairly picking on some issues instead of offering constructive solutions. Melissa sees the need for pupils to have balanced views and develop an awareness of the “constructive or destructive aspects” of their views.
Yancy

Yancy’s Background

Yancy is a married male in his early forties with a Master of Applied Commerce degree. He has been teaching for 11 years including 5 years as a Head of Department (Humanities) in the GEP, his current designation. Yancy has been teaching English Language (Standard) in the in Gifted Education Programme for the last 10 years in a Government-Aided (Co-ed) school of which 2 years were spent teaching Primary 3-4 and the remaining 8 years teaching Primary 5-6. The Critical Thinking-related courses that he had taken include Foundation Course for Gifted Education, Affective Education and Curriculum Differentiation conducted by the Gifted Education Branch for over three years. These courses were taken part-time as a form of on-the-job (OTJ) training required for certification by MOE as a GEP teacher. His class has 26 High Progress (HP) pupils in the Gifted Education Programme of which 24 are from English speaking homes.

Conceptual Understanding of Critical Thinking

Definition and value of critical thinking. To Yancy, critical reading starts with “understanding the text” and it involves thinking “beyond the text itself, beyond surface reading” to “understanding the implications and consequences” as well as “points of view”. He defines critical thinking as:

- the ability to understand the context and boundaries of a particular situation whilst keeping an open mind to the myriad of possibilities - which leads to a decision making process that guides an eventual line of action.

Yancy believes that one has to be a thinker before one can do critical reading as thinking is needed “to really understand if there is a moral behind it (the text), the teaching behind it, the social message” in the text.

In Yancy’s perspective, it is important for people to be critical thinkers in general and languages (in particular the English language) and humanities are useful platforms for teaching critical thinking. His conviction was developed through experiences of growing up, doing psychology in the university, having conversations with peers/lecturers and being in the GEP when he joined teaching. He seeks to infuse critical thinking on a daily basis. To him, critical thinking is “always about informed decision-making”. He passionately believes that to educate pupils, “we teach them all the different tools and in the end, they must be empowered to make their own decisions”. Hence, pupils “need to develop wisdom and critical thinking allows learners a relatively comprehensive process to begin growing in wisdom.” Besides teaching thinking on its own, he sees the value of teaching pupils to apply thinking “in moral and ethical situations”.

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Focusing on purpose and process instead of product. Yancy is of the view that teachers have to firmly believe in the value of critical thinking and be clear about their purpose for teaching critical thinking before they can teach it effectively:

The first thing you need to do is you’ve got to really believe it because if you don’t believe it, it’s going to be a stressful and tiring job. And when children ask, you’ll not be able to answer with conviction. Besides belief, you’ve got to have a purpose – you need to know why you want to teach critical thinking. When you have that, you’ll find that you’ll be very self-motivated. You’ll be intrinsically driven to go and look for all resources and opportunities to help you teach those things.

Borrowing the concept of purpose from the Understanding by Design (UBD) framework, begin with the end in mind, Yancy teaches his pupils to be purposeful thinkers:

So they must be purposeful in the tasks they do, not just reading but in their homework etc. We do a lot of that. Because of that, I give them a very simplistic way of thinking, of doing things – I do the 3 Ps: Purpose, Process and Product. Everything we do must be purposeful, try to have a process and we develop a product.

Through the English Language lessons, he hopes to see his pupils becoming more conscious about their role as a writer, a reader, a speaker and a listener. He places a strong emphasis on purpose and process when teaching all the four language skills - reading, writing, speaking and listening:

So everything anchors towards purpose and process. Then the product - I believe will come. It may not come in my lifetime but eventually it’ll come if I teach them purposeful things. By teaching them product, they can pass exams but they don’t become better readers or better writers.

Yancy’s emphasis on purpose and process was observed when he was doing guided discussion during his reading lesson as shown in the transcript excerpt in Table 6.
When teaching reading skills, Yancy shows his pupils "how purpose helps them anchor their reading". Likewise, for writing, he tells his pupils that they have to decide what they want their readers to know – "basically the purpose". They begin to write by asking questions first, being more purposeful and more discerning with information received. For speaking and listening, he reveals to pupils the same focus on purpose and that standards such as clarity and precision remain the same:

You're providing your audience with enough information for them to make sense of whatever you're presenting whether in written form or oral. Then when you're reading and listening, it's the same thing. You're assembling the amount of information provided for you, sourcing out for the information that's important and making sense of it as well. So it's essentially the same thing. To me, that's how easy it is. Conceptually, it's very very simple.

Yancy's focus on purpose and process is so pervasive that it is evident in all four of his pupils' journals, which were collected as documents. Below are some quotes from their reflections:

- To enjoy your process, you must remember your purpose. Your purpose spurrs you on, but you only learn from the process.
- I have learnt about the purpose of writing. (We need to) develop good reading processes to write well.
• Purpose is the driving force behind good reading. Reading and writing are not just about the product but the process.
• Process without purpose becomes product.

Focusing on process involves teaching pupils to be purposeful thinkers who think through “why they are doing” what they do as opposed to doing things for the sake of doing them, which to Yancy, is a focus on product.

**Collaborative learning.** Yancy sees collaborative learning as opportunities for pupils to learn from one another. He uses collaborative learning to motivate pupils, in particular those who are not keen on doing comprehension, to learn from their peers:

We do the collaborative so their friends will try to spark that (interest in comprehension). Sometimes they get from their friends better ... Group work helps us re-teach certain things - friends talking to friends probably articulate certain ideas better.

Members in the collaborative groups are not fixed so pupils get to work with different people throughout the year. For discussion of complex comprehension text during Literature, he groups the advanced readers together. However, for oral, he uses “standard, convenience groups’ as it does not require a lot of advanced skills and “most of them are on par”.

During an oral lesson, the pupils were working in groups and taking turns reading out to one another the scripts they had written about a picture. The advantage of working collaboratively was seen as one of the pupils realised that her assumption was incorrect on hearing her friend’s perspective as shown in Table 7.

<table>
<thead>
<tr>
<th>Table 7</th>
<th>Transcript Excerpt Showing Learning from Peers during Group Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Codes</td>
<td>Excerpt of Transcript from Observation 2: Oral Discussion using Collaborative Group Work</td>
</tr>
<tr>
<td>Sharing an opinion</td>
<td>S1: I think we should not consume food in the living room as it’ll make the living room oily and dirty. We should only eat in the kitchen or at the dining table to ensure cleanliness.</td>
</tr>
<tr>
<td>Giving feedback</td>
<td>S2: You said that we should not eat in the living room but the dining table may not be in the kitchen. S1: I thought all dining tables are in the kitchen. S2: Mine is in the living room.</td>
</tr>
<tr>
<td>Gaining a new perspective</td>
<td></td>
</tr>
<tr>
<td>Key: S: Student</td>
<td></td>
</tr>
</tbody>
</table>
Collaborative group work during oral lessons also provides a platform for pupils to exercise critical thinking during listening and speaking as they were given opportunities to provide constructive feedback to their friends as shown in Table 8.

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2: Oral Discussion using Collaborative Group Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting pupils to evaluate</td>
<td>(After S4 had read a segment of his script, the teacher stopped him and asked the others in the group to evaluate him.)</td>
</tr>
<tr>
<td>Evaluating</td>
<td>T: Let’s evaluate. How did he do?</td>
</tr>
<tr>
<td></td>
<td>S1: Good</td>
</tr>
<tr>
<td></td>
<td>S2: Quite Good</td>
</tr>
<tr>
<td>Asking for reason for evaluation</td>
<td>T: Tell me why good? There must be a rubric to assess, tell me one reason why it’s good.</td>
</tr>
<tr>
<td>Explaining reason</td>
<td>S3: Because he said everything that’s happening in the picture very clearly.</td>
</tr>
<tr>
<td>Probing</td>
<td>T: Clarity is one, how is it clear?</td>
</tr>
<tr>
<td>Elaborating</td>
<td>S2: He spoke precisely and accurately.</td>
</tr>
<tr>
<td></td>
<td>S1: He used good vocabulary.</td>
</tr>
<tr>
<td>Questioning for clarification</td>
<td>T: Tell me what is good vocabulary?</td>
</tr>
<tr>
<td></td>
<td>S1: Indulge...indulge in the food, rotund</td>
</tr>
</tbody>
</table>

**Assessing critical thinking.** As part of his training for the GEP curriculum, Yancy has been taught *Elements of Reasoning* and *Intellectual Standards* (Paul & Elder, 1996) and he actively uses these standards to assess his pupils’ critical thinking abilities. Yancy elaborates:

*Paul’s Wheel of Reasoning* and *Intellectual Standards* are comprehensive enough as a tool. At the end of the day, what we (GEP teachers) do is we focus on the standards. The wheel itself is a tool to teach them how to think. It guides them on the kinds of things they can ask in the reading text and we push them to up the level of thinking in this wheel to meet the standards. For example, as we are reading, we want them to explain to us what they understand so they need to clarify – that’s one of the standards - clarity of thought. They need to be able to explain logically so there’s logic. The entire standards are things that we teach.

**Working for transfer of learning.** Transfer of critical thinking skills to other learning areas or to life is something Yancy expects to see in his pupils. By getting pupils to see the close connections between reading, writing, speaking and listening, he tries to help them see the connection between English Language and all the other subjects.
Through conversations with pupils, he is encouraged when some of them were able to articulate how Science is linked back to English Language. He adds:

We all know that we have created an artificial environment for them to learn. They (the pupils) finally realised that English, Mathematics, Science, Social Studies and Mother Tongue are all inter-connected. It’s only for logistics and administration that we have segregated the subjects. By right the children should learn that everything is about educating themselves.

Yancy observed that his students were able to transfer critical thinking skills taught in English lessons to Physical Education (PE):

Most begin to understand when they get frustrated with an activity. They could sit back and think about it or have a discussion and say, “Hey, I couldn’t do this.” They ask questions of someone who’s more adept in that sport. They watch videos and they try to figure how they do it. The girls are interested in tennis and they read up about it. What they haven’t realised is that they are actually using what we have done in English for a topic.

As for evidence of transfer of critical thinking skills to other learning context, Yancy cites the following examples:

... understanding an advertisement about family values and things like that and being able to understand what is useful and meaningful. National Day Parade - while they appreciate it, they can also tell you on the side that it can also be propaganda. These are things that show me that they have reached a different level of understanding.

Yancy hopes that eventually, his pupils will do everything that they do instinctively:

Like “Blink”, it’s about how experts do things intuitively and sub-consciously but they’ve already gone through the practice of doing that. That’ll be the ultimate.

**Strategies to Teach Critical Thinking**

**Modelling thinking.** Yancy believes in the importance of role modelling thinking to pupils. He asserts, “It’s very hard to teach thinking if you yourself are not a thinker in the first place.” Being a role model for Yancy involves practising or applying critical thinking “every single day until it becomes a lifestyle”. He adds:

If we can do that, it makes the teaching (of critical thinking) easier because children no longer feel that it’s an artificial subject. More often, what children find problems with is English, Math, Science - all these are individual subjects taken in silos. If we just introduce something else like thinking, they’re going to think that it’s another subject so it’ll be tough.
**Practising critical thinking school wide.** Yancy believes that the effective promotion of critical thinking requires a school-wide practice of critical thinking. He explains:

I think the first step is to make sure that everybody is a thinker in the first place. It’s very hard to teach thinking if you yourself are not a thinker. When I say that, it doesn’t fall just on the teachers but everyone. It includes your principal, your vice-principals, school management, your board – everybody must understand that that’s what you’re going for in terms of thinking – being critical thinkers but not cynics, not to be always critiquing but being critical thinkers.

**Teaching questioning, visualising & predicting.** Besides using a lot of Socratic questioning with his pupils, Yancy uses Paul’s *Wheel of Reasoning* and *Intellectual Standards* (Paul & Elder, 2008) as a comprehensive tool to teach pupils to think and question. In the Guided Discussion lesson that was observed, it was noted that the categorisation of open codes were aligned to all eight elements in Paul’s *Wheel of Reasoning* as shown in Table 9.
<table>
<thead>
<tr>
<th>Open Codes from Lesson on Guided Discussion</th>
<th>Elements of Thought (Paul &amp; Elder, 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being aware impact of prior knowledge</td>
<td>Assumptions</td>
</tr>
<tr>
<td>Confirming assumptions using contextual clues</td>
<td></td>
</tr>
<tr>
<td>Developing false assumptions</td>
<td></td>
</tr>
<tr>
<td>Evaluating value of prior knowledge (assumptions)</td>
<td></td>
</tr>
<tr>
<td>Jumping to conclusion</td>
<td></td>
</tr>
<tr>
<td>Making assumptions indirectly</td>
<td></td>
</tr>
<tr>
<td>Raising awareness of assumptions</td>
<td></td>
</tr>
<tr>
<td>Revealing assumptions through questions asked</td>
<td></td>
</tr>
<tr>
<td>Analysing meaning of word</td>
<td>Concepts (theories, definitions, principles, models)</td>
</tr>
<tr>
<td>Explaining historical fiction</td>
<td></td>
</tr>
<tr>
<td>Changing visuals with unfolding of new data</td>
<td>Data, Information and Evidence</td>
</tr>
<tr>
<td>Making comparison</td>
<td></td>
</tr>
<tr>
<td>Noting similarities</td>
<td></td>
</tr>
<tr>
<td>Visualising using contextual clues</td>
<td></td>
</tr>
<tr>
<td>Making applications by choice</td>
<td>Implications and Consequences</td>
</tr>
<tr>
<td>Asking for evidence to support inference</td>
<td></td>
</tr>
<tr>
<td>Developing false assumptions</td>
<td>Inferences, Interpretations, Conclusion</td>
</tr>
<tr>
<td>Explaining reason for inference based on evidence</td>
<td></td>
</tr>
<tr>
<td>Inferring about feelings of character</td>
<td></td>
</tr>
<tr>
<td>Inferring based on contextual clues</td>
<td></td>
</tr>
<tr>
<td>Making incorrect inferences based on prior knowledge</td>
<td></td>
</tr>
<tr>
<td>Making modifications to visual with new info</td>
<td></td>
</tr>
<tr>
<td>Questioning for developing inferences and visualisation</td>
<td></td>
</tr>
<tr>
<td>Resulting in biasness</td>
<td></td>
</tr>
<tr>
<td>Tapping on prior knowledge</td>
<td></td>
</tr>
<tr>
<td>Using contextual clues</td>
<td></td>
</tr>
<tr>
<td>Visualising influenced by prior knowledge</td>
<td></td>
</tr>
<tr>
<td>Being open to possibilities</td>
<td>Point of view</td>
</tr>
<tr>
<td>Exploring possibilities</td>
<td></td>
</tr>
<tr>
<td>Having diverse visuals based on the minimal information</td>
<td></td>
</tr>
<tr>
<td>Annotating without purpose</td>
<td></td>
</tr>
<tr>
<td>Being driven by purpose</td>
<td>Purpose</td>
</tr>
<tr>
<td>Deciding on purpose</td>
<td></td>
</tr>
<tr>
<td>Focusing on purpose of task</td>
<td></td>
</tr>
<tr>
<td>Having a purpose for reading</td>
<td></td>
</tr>
<tr>
<td>Having process without purpose becomes product</td>
<td></td>
</tr>
<tr>
<td>Not being purposeful</td>
<td></td>
</tr>
<tr>
<td>Purposeful reading</td>
<td></td>
</tr>
<tr>
<td>Reading without purpose is reading at product level</td>
<td></td>
</tr>
<tr>
<td>Purposeful questioning</td>
<td></td>
</tr>
<tr>
<td>Questioning</td>
<td></td>
</tr>
<tr>
<td>Questioning to clarify issues</td>
<td></td>
</tr>
<tr>
<td>Questioning based on text</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Question at Issue</td>
</tr>
</tbody>
</table>
Yancy focused on the element of ‘assumptions’ in Paul’s Wheel of Reasoning by discussing about prior knowledge and creating awareness in pupils that our prior knowledge can lead to false assumptions as shown in Table 10.

Table 10

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1: Guided Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluating value of prior knowledge (assumptions)</td>
<td>T: You tap on your prior knowledge. Now prior knowledge – is it positive, negative or neutral? Some people say prior knowledge is good. The more prior knowledge you have, the faster you understand things. Ok that’s positive. How about negative? What negative traits does prior knowledge have?</td>
</tr>
<tr>
<td>Aiding in understanding of text</td>
<td>S: Having prior knowledge might lead to biasness.</td>
</tr>
<tr>
<td>Resulting in biasness</td>
<td>T: Good, might lead to bias….lead to assumptions that are false, stereotype, etc.</td>
</tr>
<tr>
<td>Developing false assumptions</td>
<td>S: You may jump to conclusion...</td>
</tr>
<tr>
<td>Jumping to conclusion</td>
<td>T: Helps you jump to conclusions too. Helps you make inferences and conclusions - may or may not be correct. So you have to be aware that prior knowledge can be positive, negative or neutral. So this is what you did, you read the word, straight away you tap on your prior knowledge, then now you visualise. How many of you will visualise Julius as a woman?</td>
</tr>
<tr>
<td>Making inferences based on prior knowledge</td>
<td>CI: Ha! Ha!</td>
</tr>
<tr>
<td>Being aware impact of prior knowledge</td>
<td>T: Why did you laugh so loud?</td>
</tr>
<tr>
<td></td>
<td>S: Prior knowledge...</td>
</tr>
</tbody>
</table>

Yancy typically starts with the title of the book as this “frames or gives the reader a trigger to activate their assumptions and prior knowledge which may or may not cloud their eventual understanding of the passage”. One of the strategies that he uses to get pupils to ask questions is showing a reading text (from Field of Swords by Conn Iggulden) a segment of a sentence at a time. Pupils begin to “form an image of the passage through the words written by the author” as they assimilate each bit of information. As each segment is shown, the pupils “begin by asking questions that they are curious about or that just happen to manifest in their heads as the sentences are presented”. Through asking questions, the pupils develop inferences which will help them visualise and predict as they go along. Table 11 shows some of the questions asked by the pupils as they look at the sentences about Julius Caesar.
Visualisation and prediction help pupils make sense of the text. He explains to them how the visuals in their heads change as they read on:

Whatever you imagine, you paint a picture... it's not right or wrong. As you gather more information, then it (the text) tells you it's a “he” and whoever had a “she” changed; whoever thought it was Asian changed as it turned out to be a sickly old man. You start to change as more and more information comes along.

While getting the pupils to visualise the setting sun in the text about Julius Caesar, Table 12 shows how the visual of the setting sun changes with new information.
It was worth noting that one of Yancy’s pupils wrote about visualisation in his journal in February 2014:

Before last month, I thought reading was only to go through and skim text as fast as I can. I now realise that I can visualise when reading and that is more thorough but it takes way more of my time.

Through visualisation, Yancy drives home the point that comprehension involves “observing and gathering information” and as the visual/theory is being formed in the head, questioning will “confirm or dispel” it. Most pupils have the misconception that comprehension is just answering questions about the text. Yancy addressed this misconception by getting pupils to answer questions based on the gibberish poem, “The Jabberwocky” in *Through the Looking-Glass and What Alice Found There* (Carroll, 1872).

Pupils got the message when they saw that they could get full marks for answering the questions without even understanding the text.

Yancy finds that revealing the text a segment of a sentence at a time useful as pupils are ‘forced’ to respond verbally with questions on the spot as the text is being shown line by line. He adds,
Then it becomes purposeful because the text no longer becomes a text of mine. It becomes a text that they (the pupils) want to find out more about this character whether it's Alice in Wonderland or Tubruk, any character and it all begins with questions.

He uses this same strategy with movies by pausing the movie frequently and doing “the same questioning they would do during reading”. Movies and even music lyrics are used to teach comprehension skills as “another point of entry” for pupils who were not interested in comprehension at the initial stage.

**Annotating text.** Annotation is strategy used by Yancy to get pupils to practise their reading process skills. The purpose of annotation is to understand the story and the characters in the passage better. Pupils are expected to annotate comprehension and cloze passages on their own. Being aware that some pupils ‘fake’ the annotation task by just highlighting different parts of the text, Yancy requires them to write questions on their text and show how they make their inferences by linking them to the appropriate part of the text. He is adamant that the pupils go through the thinking process:

So it helps a lot because when they do this, they are not focusing so much on the right and wrong (answers) but focusing on the good and bad processes. By focusing on the processes, by and large, they’ll eventually get the correct answers.

A sample of the pupil’s annotated text is shown in Figure 6.

![Figure 6. Sample of pupil’s annotated text](image)

Yancy grades the pupils’ annotation tasks with grades A, B or C in the following manner:

Basically, when they underline stuff…very product level, I’ll give a C. If each highlighted bit or underlined bit lends itself to different questions as well as
inferences, I give a higher grade – B. If all the inferences are backed up with evidence that they linked up together, then I give an A.

Pupils are required to have three ‘A’s for their annotation tasks before they are exempted from having to do the annotation process. The emphasis is on purpose and process and pupils who do the annotation purposefully find meaning in it rather than those who annotate for the sake of annotating:

Whether it’s annotation or scribbling is not the main focus - as they are at the product level. What we’re going for is purpose and process. If they’ve got the purpose and the process, I’m fine with the annotation. Some kids will annotate and you’re happy but you get hoodwinked because they’re actually not doing the process. They have to ask those questions and show that they are purposeful.

**Viewing text from different perspectives.** Another strategy used by Yancy is to get pupils to view the same text, “The House”, from different perspectives. The pupils in their groups took on the roles of a real estate agent, a homebuyer, a policeman, a burglar and a housekeeper as they read the text. The task involves reading the text from the perspective of different people and highlighting what is important to them from that perspective:

The role determines what they read and sieve out. Everybody reads the same passage but the information in there relates to different people differently because they have different roles and hence different perspectives. They read it from different perspectives and when asked to highlight what’s important, they’ll annotate very different things.

By showing the pupils that they have highlighted different things that were important to them, Yancy capitalises on that opportunity to show pupils how their perspectives and prior knowledge influence the way they make sense of information. Other than perspective, the reading task also showed pupils how purpose helps them anchor their reading:

It gives them purpose because the burglar will read it differently from the housekeeper; their reactions will be different even if they underline the same words. It elicits different responses e.g. having a huge house with lots of rooms, the burglar may be excited as potentially, there are a lot of things (to steal) but the housekeeper may think it is super tiring because there’re a lot of things to take care of.
Through the use of the strategies listed above, Yancy intends to teach his pupils “to be wise decision makers who are aware of their actions, thoughts and behaviour; who do the right things at the right time and say the right things to the right people”. He elaborates:

I should be able to see that when they start doing things, they should be able to ask questions first - whether they ask me or ask themselves, it’s ok as long as they ask questions. Through their responses and input from answering those questions, they take a course of action. Then at least I know when they are doing something, it’s purposeful. They’ve gone through the thinking - that would be the eventual outcome.

From Yancy’s perspective, whatever he does is geared towards developing opportunities for his pupils to become wise and discretionary decision makers:

So if I teach listening, writing, speaking, reading, everything is to help them build skills to become better decision makers. So, while they are doing things for examinations, for projects, for assignments, they are also subconsciously developing themselves to make decisions next time.

Yancy hopes that his pupils will eventually grow and develop “into independent confident decision makers in all aspects of their lives - which translates into behaviour in and out of classroom”. That includes “developing the sense of moral courage” without lacking “the confidence to make ‘wrong’ decisions and handling the consequences”. In the long run, Yancy’s desire is that his pupils will make decisions based not just on their head (cognitive) but also their heart (affective):

They make the decision and they live with those consequences without extra burden and guilt. That’s my ultimate goal.

He elaborates on his reasons for wanting these outcomes:

To me, that’s (developing wise decision makers is ) the purpose for education. To educate them, we teach them all the different tools and in the end, they must be empowered to make their own decisions. For me, that’s the compass that I have for myself - not to dictate on their behalf.

Concerns Related to the Infusion of Critical Thinking

Teaching thinking as another subject. Yancy’s concern is the possibility of critical thinking being “added as another subject” to be taught in the primary school curriculum in the near future. He opines that it is more effective to infuse critical thinking into every subject rather than teach critical thinking as a module or an elective. His view is that in the ideal situation, all teachers should have been trained to infuse critical thinking within their subject areas. However, the reality is that teachers are not taught to infuse
critical thinking in their subject areas during their pre-service training. Hence, they may not actively infuse critical thinking in their subject areas because they are not expected to do so or they may not know how to do so.

**Mandating the infusion of critical thinking.** Yancy’s other concern is that the infusion of critical thinking might become mandated by the Ministry of Education and end up as “another institutionalised product and tool” or “a teacher’s checklist”. He explains:

If you really want to become a thinker, you must be purposeful and motivated... you yourself must be a learner. It must be a lifestyle choice; you cannot be judgmental. Those are things that if we institutionalise, we make it very product-driven and it’ll go out the window. If it becomes very structured and institutionalised like a checklist to do, people will lose the purpose because it’ll no longer be their purpose but someone else’s. They’ll not be motivated.

His worry is that when the infusion of critical thinking becomes a teacher’s checklist, it may not be treated as something useful and the very “essence of learning thinking” will get lost.

**Unlearning achievement-driven motivations.** Regarding pupils, Yancy’ concern related to the infusion of critical thinking is teaching the children to "unlearn" the "scholastic or achievement driven" motivations and assumptions they bring into the classroom through the various years of previous teaching they have undergone. As a teacher, his objective is never to make pupils "believe" everything he teaches as that runs counter to his intention of “developing independent and confident decision makers and presenting to them an alternative view of what English Language and what education could be about”. He also faces “the challenge of meeting what the school wishes to achieve in terms of results and helping pupils reconcile that with the pressures that they face.”
Betty

Betty’s Background

Betty is a married female in her fifties with a Bachelor of Arts degree. She has been teaching for 15 years including 8 years as a Senior Teacher (English Language), her current designation. Betty has been teaching English Language (Standard) for the last 15 years in a Government-Aided (Co-ed) school of which 4 years were spent teaching Primary 1-4 and the remaining 11 years teaching Primary 5-6. Her class has 36 Middle Progress (MP) pupils of which 26 are from English speaking homes and 2 are pupils with special needs.

Conceptual Understanding of Critical Thinking

Definition and value of critical thinking. To Betty, critical reading involves going beyond “face value” to understanding what the author is trying to say. It involves deciphering the author’s hidden message and questioning if the written text is true. She defines critical thinking as:

- the ability to process information, analyse, question, interpret, reason, reflect on a subject or problem and look at it from various angles or perspectives and being able to form some views about it.

She sees critical reading and critical thinking as “very closely related”:

- You read and form an opinion. Maybe you question the text and then you ponder and think whether it is sound.

Betty believes that critical thinking is important for all subjects and not just English Language:

- For English Language, it involves the expression of opinions. When there’s a topic for discussion, you are not going to just say ‘yes’ or ‘no’. You need to be able to give your viewpoint. You do not accept things as they are. You need to find the reason and logic behind them.

Betty observes that the answers given by people who are inclined towards thinking are more open-minded and their reasoning tends to be ‘sound’ in contrast to the narrow-minded view and ‘shallow’ answers given by those who do not think much:

- Those who have developed the habit of thinking don’t just see one point of view; they actually give you the other side of the coin. I see them sharing from different perspectives. I find that critical thinking is important so that you will not be so one-sided in your view.

Hence, she seeks to foster the disposition of open-mindedness in pupils through questioning and exposing pupils to different perspectives. Betty makes her thinking visible
to her students by thinking aloud to help them process their thinking and justify their responses. She developed the conviction regarding the importance of critical thinking in all subjects through reading and interacting with people (both locally and overseas) as well as observing the way they put forth their arguments.

Betty is opportunistic in her approach to the infusion of critical thinking. In other words, she seeks to infuse critical thinking “as and when the passage lends itself to critical thinking”:

I won’t say that it’s a daily thing that I put into a lesson plan but sometimes the idea comes there and then. I will be mindful and capitalise on the opportunity to ask questions to get pupils to think critically.

It was noted that Betty’s perspective on the need to prepare the questions to be asked during her English lessons changed from the time she was first interviewed at the beginning of the year to the interview conducted at the end of the year. At the first interview when asked the question, “What preparations do you make when planning a lesson that involves the infusion of critical thinking?” her response was as follows:

Frankly speaking, I don’t really consciously make preparations on the questions that I’m going to ask. For comprehension, when there is something important for them to know such as values, I will ask them, “Why do you think this person is doing this? How will you apply this? How will you treat your parents? How will you relate this to your family members? When I come across a passage that has these kinds of questions, at the back of my mind, I will think of asking them during the lesson to get the pupils to think. But it’s not a conscious effort to think of questions. I don’t really phrase the questions beforehand. When I go to the classroom, I will do it on the spot because of the years of teaching experience. The pupils may also say something that leads to further questioning and I’ll ask, “Why do you say that? Why is it not this?”

However, when interviewed again at the end of the year, Betty said:

Now, I would say that if you want more in-depth thinking, you need to prepare the lesson beforehand. You have to deliberately prepare questions that are challenging so that pupils are engaged in critical thinking. If not, ordinarily, let’s say you come across an issue, you tend to just ask for their opinions. For the observation lesson, I consciously picked the passage on The Woodabe Woman and Technology, as it deals with a gadget that the pupils are familiar with - a cell phone - which they may take for granted. Preparation on the types of higher order questions asked was
necessary to get them to do in-depth or higher order thinking. The nature of the questions should enable the pupils to think of both sides of the coin.

**Infusing critical thinking within the context of pupils' experience.** To infuse critical thinking during comprehension lessons, Betty deliberately selects passages in which the content is age-appropriate and within the context of the pupils' experience. She engages her pupils in thinking about issues described in the passages that they can relate to:

For me, I prefer to have lessons that they can relate to because if they cannot relate to the lesson, they'll find the lesson not practical and not engaging. An example that she gave on an issue which relates to pupils is eating shark's fin. Betty conducted a lesson on Shark-Finning in which she showed videos of how people cut off the fins of the shark before leaving it to drown. She sourced for and found a relevant passage about sharks. Then through guided discussion, she got pupils to critically think about values and related issues such as whether it was right to cut off the fins of the shark as shown in the video and whether they should continue eating shark's fin.

During the first observation lesson on Comprehension Cloze, Betty selected a passage on responsible pet ownership, a topic she knew her pupils were interested in. Before the lesson, she got her pupils to do a mind-map to activate their prior knowledge on pets. The pupils added to their mind-map as they discussed the topic in pairs and when she went through the lesson with them. Figure 7 shows a sample of the pupils' mind-map after the comprehension lesson.
Fostering open-mindedness through cooperative learning. Betty uses cooperative learning to expose pupils to multiple perspectives of the same issue. By providing opportunities for pupils to interact with one another, they are exposed to different viewpoints and they learn from their peers:

I think it is good that they see other viewpoints and consider other circumstances rather than being just very narrow in their perception.

To provide the background information for the comprehension cloze on responsible pet ownership, the pupils watched a video on rabbits that were abandoned by their owners after the Lunar New Year. She then got the pupils into their groups to discuss “Why do people act in that manner?” After their group discussion, she got them to share their reasoning. The sharing session provided pupils with the opportunity to hear their friends’ views:

Different groups have different answers so you know they are thinking. If not, they will all be saying the same things. I think it depends on the way they answer you. The way they argue, it also shows their thinking about the issue.
During the second observation on a comprehension lesson, Betty chose a passage about a photographer showing off his high-tech gadgets to some tribal people in the Sahara Desert only to discover eventually that it was a tribal woman, rather than his gadgets, who helped him find his way back to camp when he got lost in the desert. Betty got the pupils to discuss issues related to modern technology in their groups and share their ideas. Table 13 below shows the pupils being exposed to the diverse perspectives shared by their peers after their group discussion.

Table 13
Transcript Excerpt Showing Different Perspectives of Pupils

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Comprehension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stating opinion</td>
<td>T: Question 2. Hand phones are an essential item in present day living. Fact or Opinion? What do you think? S5 – is it an essential item in present day living? S5: It’s an opinion. It’s not very important to have hand phones. Some of the problems cannot be solved by using hand phones. You can get addicted to it (the hand phone). T: Anyone has a different idea?</td>
</tr>
<tr>
<td>Giving reason for opinion</td>
<td></td>
</tr>
<tr>
<td>Giving a different perspective</td>
<td>S6: Let’s say your grandmother has a heart attack and your parents are not at home. It’s very late at night and your neighbours have already locked the door. So you need a hand phone to call the hospital. T: Do you agree with S6 that you need the hand phone for emergency?</td>
</tr>
<tr>
<td>using an illustration</td>
<td></td>
</tr>
<tr>
<td>Asking for class view</td>
<td></td>
</tr>
</tbody>
</table>

Through the class discussion, pupils came to the realisation that while the hand phone may be regarded an essential item in our modern society, tribal people in the Sahara Desert might not find it as essential.

**Working for transfer of learning.** Betty would like to see the transfer of critical thinking skills to other learning areas or life in her pupils. She hopes that they will learn to ask questions about the things they encounter in their daily life and develop questioning as a habit. She noticed that some of her pupils were starting to reason and they were able to relate the thinking skills that she has taught them in English Language to Social Studies:

During a Social Studies lesson the other day, one of my students was asking me questions about the northeast monsoon and the southwest monsoon. I actually told him to look at the arrows and I asked, “Why do you think that it is colder now compared to March or June?” He said, “When you look at the map, the arrows are pointing from the northeast. In the northeast – there’s an open space and the wind
is from the Philippines. In the southwest, we are surrounded by Indonesia so it is not so cold because we are blocked. Hence, the northeast monsoon is colder than the southwest monsoon.”

She also noted that her pupils were making an effort to think before they ask questions. At the beginning of the year, some of her pupils would ask questions in which the answers were quite obvious. They had since made progress and shown some evidence of having thought through the questions asked instead of asking questions with hardly any thinking involved.

**Strategies to Teach Critical Thinking.**

**Guided discussion using newspapers.** Betty makes it a point to read newspaper articles of interest to her pupils. With the newspaper articles that are relevant to her pupils, she uses guided discussion to get them to think about the issues highlighted in the articles. Through a series of questions related to the article, Betty encourages her pupils to share what they think about the article and discuss their views about the issue. She gives an example below:

As I read the papers about the hand phone incident (where the Vietnamese tourist knelt and begged for a refund of the iPhone 6 that he had purchased) at Sim Lim Square, I’ll share the news with the class and ask the class, “Do you think the shopkeeper should do this?” Each day as I come across an interesting article in the news, I just bring it in and talk about it to get them (the pupils) to think.

Sometimes after having provided some scaffolding and information through guided discussion of a particular issue in the newspaper, Betty gets her pupils to write a composition related to the issue discussed. Betty believes that using newspaper articles results in the following benefits:

Such articles are very good – firstly you expose them to reading newspapers; secondly it’s in the context of real life and thirdly, you get them to think about issues.

**Questioning.** Betty promotes critical thinking in pupils by asking thought-provoking questions as they read the comprehension passages. She makes use of questioning to encourage pupils to go beyond surface reading to thinking about the underlying messages in the passages. She also uses questions to probe the pupils’ thinking:

For example, based on this year’s Stellar book entitled ‘Coolie Boys’, I asked the pupils questions like “Why do you think the coolies come to work in Singapore instead of other countries?” and “What are they working for?”
Betty encourages her pupils to do some thinking and analysis before responding to the questions asked. Hence, she expects them to justify their answers instead of just saying ‘yes’ or ‘no’:

If they say ‘yes’ they need to justify why they said ‘yes’. This is to make sure that they know what they are talking about rather than just following the crowd. Or when it is a ‘no’, they need to explain why it’s a ‘no’. It doesn’t matter if it is right or wrong, but at least they have thought about it and are able to justify their answer before they respond with a ‘yes’ or ‘no’.

Betty asks questions such as “Where does it say this?” and “How do you know that it is like that?” to remind pupils to find facts to support their answers. For comprehension passages, pupils are sometimes asked for their opinion of a character in the passage and required to support their answers with reasons.

During the first observation on a Comprehension Cloze lesson, pupils were asked to use contextual clues to help them fill in the blanks. Betty also asked the pupil who answered question 1 to give a reason for his answer as shown in Table 14.

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (Comprehension Cloze)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing an answer</td>
<td>T: (reading out question) Irresponsible pet owners (1) ________________ their animals on the streets when they no longer want them.</td>
</tr>
<tr>
<td>Asking for a reason</td>
<td></td>
</tr>
<tr>
<td>Giving reason for answer</td>
<td>S: Abandon</td>
</tr>
<tr>
<td></td>
<td>T: Why do you say it’s ‘abandon’?</td>
</tr>
<tr>
<td></td>
<td>S: Because they no longer want them and they are irresponsible</td>
</tr>
<tr>
<td>Reminding pupils to annotate</td>
<td>T: Did you draw arrows to link the blank to the clues?</td>
</tr>
</tbody>
</table>

It was observed that when a pupil gave two possible answers for the blank, Betty asked him to choose the more appropriate adjective as shown in Table 15.
After completing the cloze passage, Betty capitalised on the context to get pupils to think more deeply about responsible ownership by asking several thought-provoking questions such as:

- Why do you think people abandon their pets?
- What can we do to prevent people from abandoning pets?
- Would you buy or adopt a pet? Why?
- Many animals are put to sleep every day because there are not enough people adopting, sponsoring or fostering them. Do you agree with euthanasia? Why?
- How can we prevent the abuse of euthanasia?
- What would you do if you witness someone abusing an animal?

Through getting pupils to think of such issues, she also started them thinking about whether they were responsible enough to start adopting a pet or buying one.

In the second observation on a comprehension lesson, getting pupils to discuss whether the following statements were fact or opinion was a thought-provoking exercise which generated a lot of discussion in their groups:

- Technology is useful to anyone anywhere in the world.
- Hand-phones are an essential item in present day living.
- The tribesmen living in Sahara Desert should be pitied for not being able to enjoy the benefits of modern technology.
Through the class discussion following the group discussion, pupils developed a broader perspective of the usefulness of technology as shown in the discussion transcript in Table 16.

Table 16
Transcript Excerpt Showing the Broadening of Pupil Perspective

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Comprehension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eliciting views</td>
<td>T: Some of you may have your own personal opinions and that’s alright. Let me hear your views: How many of you think that technology is useful to anyone anywhere in the world. Who put ‘Yes, I agree. It’s a fact?’ Anybody? No? So you agree that it’s only an opinion.</td>
</tr>
<tr>
<td>Asking for basis of belief</td>
<td>S1: People need technology to get information...Technology is useful.</td>
</tr>
<tr>
<td>Giving reason</td>
<td>T: S1 – Why do you think it’s an opinion?</td>
</tr>
<tr>
<td>Asking clarifying question</td>
<td>S1: People need technology to get information...Technology is useful.</td>
</tr>
<tr>
<td>Modifying answer</td>
<td>T: To anyone anywhere in the world? So it’s useful to the Wodaabe woman?</td>
</tr>
<tr>
<td>Narrowing the focus</td>
<td>S1: Some people need it.</td>
</tr>
<tr>
<td>Making suggestions</td>
<td>T: Who are these people? Who are those who need the phone or the computer?</td>
</tr>
<tr>
<td>Asking about alternative view</td>
<td>S1: Businessmen</td>
</tr>
<tr>
<td>Responding</td>
<td>T: Businessmen – do you agree?</td>
</tr>
<tr>
<td>Asking for more views</td>
<td>S1: Businessmen – do you agree?</td>
</tr>
<tr>
<td>Responding</td>
<td>T: Who else needs the phone? S2: Teachers</td>
</tr>
<tr>
<td>Giving a reason for belief</td>
<td>T: OK. Who may not need the phone? S3: The Wodaabe woman in the desert</td>
</tr>
<tr>
<td>Summarising points made by student</td>
<td>S3: The Wodaabe woman in the desert</td>
</tr>
<tr>
<td></td>
<td>T: Would someone else like to share your view? S4, what do you think? Is technology useful to anyone anywhere in the world?</td>
</tr>
<tr>
<td></td>
<td>S4: No, I don’t think so.</td>
</tr>
<tr>
<td></td>
<td>T1: Why?</td>
</tr>
<tr>
<td></td>
<td>S4: Not everything is based on technology so not everyone needs it.</td>
</tr>
<tr>
<td></td>
<td>T1: Her conclusion is not everyone needs technology. Some people may need it. Any other views? So your opinion is the tribes in the Sahara Desert, like the Wodaabe woman, do not use technology. They do not have access to it. If they do not have a network and cannot access the network from the desert, then they do not need it.</td>
</tr>
</tbody>
</table>

Betty also uses questioning to get pupils to think of the scenario that they are writing about before the actual writing:

Sometimes, when it comes to writing compositions...let’s say it is about an accident or a fire. I will actually take out a newspaper article related to the topic and print it for them. I will get them to highlight and ask them, “What do you think caused the
fire? Why?” and “Why did the police do this?” I try to get them to think before they write the composition.

**Annotating text.** For comprehension passages, Betty believes that through the process of annotating text by highlighting segments of the text, writing notes on vocabulary and using arrows to indicate on the text where the point is substantiated or how different parts of the text are connected, pupils read the text more thoroughly and understand it better:

For example, sometimes when we come across the pronoun “it” in the text, I will ask the pupils, “Who is “it” referring to?” I get the pupils to do cross-referencing and using arrows, they link the pronoun ‘it’ to the earlier segment of the text. It helps them to read the text in detail and develop a deeper understanding of the text so they are able to answer the questions better.

Betty would get her pupils to do their own annotations before the comprehension lesson and add new annotations when they go through the text together in class. During the comprehension lesson, it was observed that the annotation of text involves mainly highlighting key points, writing notes on the meaning of selected words (vocabulary) and using arrows to connect related ideas. An example of Betty’s focus on annotating vocabulary is shown in Table 17.

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Comprehension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading passage</td>
<td>Let’s look at the passage. S4. Can you read the first line loudly:</td>
</tr>
<tr>
<td>Asking for meaning of phrase</td>
<td>S4: (reads) When I was a travel writer and photographer, I found great pleasure in interacting with the various tribes living in the Sahara Desert.</td>
</tr>
<tr>
<td>Explaining meaning</td>
<td>T: Thank you. You can see the desert in this slide. He went to take photographs. Can somebody tell me what is “found great pleasure?”</td>
</tr>
<tr>
<td>Getting pupils to annotate meaning of word in the right tense</td>
<td>S5: Enjoyable</td>
</tr>
<tr>
<td>Asking for meaning</td>
<td>T: He found it enjoyable. Write it down please. “Found great pleasure” is in past tense so when you write it down, you have to write the verb in the past tense...enjoyed. The next word is interacting. Does anybody know what’s interacting?</td>
</tr>
<tr>
<td>Explaining meaning</td>
<td>S6: Communicating</td>
</tr>
<tr>
<td>Acknowledging answer</td>
<td>T: Yes, communicating...</td>
</tr>
<tr>
<td>Giving alternative meaning</td>
<td>S7: Socialising</td>
</tr>
<tr>
<td>Accepting answers</td>
<td>T: Yes, communicating, socialising...interacting is in continuous tense so, socialising is fine.</td>
</tr>
</tbody>
</table>
After showing her pupils how to annotate text, they were required to make their own text annotations and a sample of a pupil’s annotated text is shown in Figure 8.

Figure 8. Segment of pupil’s annotated text

Using the above strategies to infuse critical thinking, Betty would like her pupils to go through the process of thinking about all possibilities to a question before deciding on an answer and support their answers with reasons instead of jumping to conclusion.

For me, it’s like there’s no one correct answer or fixed answer to certain questions. Sometimes, you have to look at it from different perspectives. The fact that they go through this process is good. My objective is to make them think about it – think and re-think: Is that the answer or is there another solution? Are you sure about it? It’s to let them go through the thinking process. Basically I want them to be open-minded and think more deeply.

She looks forward to seeing the following outcomes:

Pupils asking questions, becoming more analytical, reflective and able to rationalise, forming their own opinions, making sound judgements and being self-driven to pursue knowledge...
She explains her reasons for wanting these learning outcomes:

Because in life, you cannot say you agree to everything. There will be certain motions which you disagree with, so you need to state why you disagree. You don’t have to always follow the crowd. It’s like going by your principles, going by your beliefs, going by how you look at it (the situation).

**Concerns Related to the Infusion of Critical Thinking**

**Being constrained by time.** To Betty, time is a constraint when it comes to infusing critical thinking across the English curriculum as there is a need to complete the syllabus:

Sometimes I find that when I ask my pupils to think, they take a long time. I have to wait a long time for them to give an answer. Sometimes, I get impatient as I need to get the lesson going. While they are thinking, I feel like telling them what I am thinking instead of waiting for them to respond. If we have more time, we can really allow them to think and discuss with one another more.

**Being constrained by pupils’ language competency.** The other concern that Betty has regarding the infusion of critical thinking is the profile of the class. Her view is that in a class of academically challenged pupils, the type of questions asked may be limited as they are less likely to ask higher order questions. Likewise, teachers are also constrained by the questions that they can ask these pupils.

**Conclusion**

The three case studies are placed together in this chapter as all three teachers make use of annotating text as one of their strategies to infuse critical thinking across the English Language curriculum. Despite having different definitions of critical thinking, these participants saw sound decision-making as the ultimate purpose of critical thinking. They model thinking and used an array of strategies including debates, Socratic questioning, Paul’s Wheel of Reasoning, reflective critique, mind-mapping, visualising and prediction to infuse critical thinking in the context of real world experiences. In order for teachers to infuse critical thinking effectively, they need to be competent in critical thinking and develop pedagogical competencies for teaching critical thinking.

The following chapter presents the remaining three case studies, grouped together because of some commonalities among them: two of the teachers use Socratic Questioning and Philosophy for Children as some of their key strategies and all three teachers focused on the 5Ws1H questions in one way or another.
CHAPTER 5: CASE STUDIES OF THREE MORE EXPERT TEACHERS

Introduction

This chapter presents three remaining case studies that are put together because of some common strategies among the three teachers. Socratic Questioning and Philosophy for Children are strategies common to two of the three teachers and Focusing on the 5Ws and 1 H (What, Who, When, Why, Where and How) questions is common among all the three teachers. This chapter comprises the second half of the total of six case studies with the first half being presented in Chapter 5.

As in Chapter 5, the participants’ background details are provided followed by a summary of their professional experiences. Following the background information, each case will address the central research questions according to three broad headings namely:

- Conceptual Understanding of Critical Thinking
- Strategies to Teach Critical Thinking
- Concerns Related to the Infusion of Critical Thinking

To ensure that the voices of participants are captured, a considerable amount of direct quotation has been used to develop the cases.

Nancy

Nancy’s Background

Nancy is a married female in her 50s with a Bachelor in Education (Primary). She has been teaching for 30 years including 6 years as a Senior Teacher (Mathematics), her current designation. Nancy taught Pre-Primary for 13 years before teaching Lower Primary (Primary 1 & 2) for the last 17 years in a government aided girls’ school. She was initially exposed to Inquiry Learning while doing her undergraduate studies in the University of Melbourne and subsequently, she attended a 3-month postgraduate course on “Educating for Thinking” in the same university. Her class has 31 Mixed Progress (MP) pupils of which 30 are from English speaking homes and 2 are Special Needs pupils.

Conceptual Understanding of Critical Thinking

Definition and value of critical thinking. Nancy defines critical reading as “understanding the purpose of the text and the language used, so as to be able to enjoy the text, to be able to construct like texts for like purposes”. To her, critical thinking encompasses the following:
To consider what is, what is not and what could be; the spoken and unspoken; to wonder why and why not; to explore what happens before and after; to design, construct and create new ideas.

Her view is that critical reading comes before critical thinking - as one reads, one thinks about what is read resulting in further thinking. The reading material provides the 'input' for thinking. Hence “critical reading results in or reinforces critical thinking”. Nancy states that “developing good thinkers is part of what educators, parents and students see as the purpose of education”. She believes that good thinking is not just having a skill; it is about being a good thinker:

I try to teach students what good thinkers do and say by getting them to do and say these things in class. However, I am aware that my students are not good thinkers until they have internalised thinking and think habitually. I know I cannot make my students practise thinking but I can show them I value it and provide opportunities for them to participate in valuable thinking behaviours. I have adopted this approach to teaching and learning to develop good thinkers. Thinking is a disposition to be cultivated, not a subject or skill to be taught.

Nancy is convinced that everything about a thinking classroom should encourage and promote good thinking:

As a teacher, my attitudes, expectations and values are vital to developing good thinkers. I try to create an environment with practices and structures to allow thinkers to thrive. I also redesign my culture of teaching and learning to encourage and facilitate thinking behaviours and dispositions.

Nancy views knowledge in itself as passive. Hence, critical thinking “is the process by which knowledge becomes useful to learners in expression, application and the motivation to explore further”. To Nancy, “the whole idea of learning is about thinking” and thinking “gives purpose to our reading, listening, speaking and writing”. Her conviction on the value of teaching critical thinking was developed as a result of being exposed to Inquiry Learning in Australia where she did her Bachelor in Education degree. Thus, she injects life into the learning by weaving critical thinking within the curriculum.

As language is the medium for thinking and communication, Nancy believes that all languages, not just the English language, “opens the door for this exchange of thinking, of ideas, of views, of opinions, of perspectives, and imagination” through the processes of reading, listening, speaking and writing. She feels that thinking cannot occur in a vacuum and the use of language makes thinking visible. There must be a ‘purpose’ for thinking and the “more purposeful and closer at heart it is, the better it is”. Besides modelling thinking,
Nancy feels strongly that the teacher needs “to listen to the thinking of the pupils and allow her thinking to be challenged by their perspectives too”.

**Integrating subjects.** At the lower primary level, Nancy integrates Mathematics, Science and Social Studies into the teaching of English Language wherever possible:

I integrated a unit on volume (Math) with collective nouns. For collective nouns, the girls learnt: a jug of milk, a cup of water, a glass of...so we talked about how to quantify liquids using containers. I sort of put the two together. We don’t have to teach in silos. Using this approach, we not only maximise time but enrich the learning experience.

She also integrated the English unit on *Billy Goats Gruff* with 3D-shapes in Math as well as Science. She facilitated pupil research on bridges in the world to study their shapes and structures. Then she got the pupils to work in small groups to collect 3-D shapes and participate in constructing a bridge. She worked with them to incorporate fair testing principles to measure the durability of their design and construction. Nancy also presented each group with feedback on their design and collaborative skills.

**Using authentic real world experiences.** Nancy uses current affairs to promote critical thinking through the incorporation of real-life events such as the Youth Olympic Games (YOG) in 2010 and the Presidential Election in 2011. To celebrate the significance of the YOG in the history of Singapore, she developed a unit of authentic learning on the YOG, “making learning relevant and responsive to current affairs”.

She made use of the events leading to the presidential election to “provide an authentic opportunity for her pupils to consider the roles, qualities and skills of the president as well as the privilege and responsibility of active citizenship”. Nancy explored the meaning of the symbols used by the four presidential candidates and discussed with pupils “the use of symbols in logos to communicate meaning”. Nancy involved the pupils in a discussion on “the privileges and responsibilities of a citizen including voting wisely”. She also got the class to study the candidates and participate in a mock presidential election using democratic practices where each ‘house’ elected a member to count the votes. The pupils then carried out a reflection task where they thought about and wrote down “3 qualities of a president, 2 things they had learnt about the presidential election and 1 thing they would like to share with the president”.

Following their reflections, Nancy “engaged the pupils in functional writing for authentic purpose and a real audience” when she encouraged her pupils to write congratulatory notes to the newly elected president, Dr Tony Tan, and letters of
appreciation to then outgoing President Nathan. The class was thrilled when they received replies from both Presidents.

While looking through her pupils' writing journals, it was noted that she conducted a lesson on British architectural artist Stephen Wiltshire when he was in Singapore in July 2014 to sketch a panorama of the Singapore skyline from memory. Her purpose for learning about Stephen Wiltshire was to inspire her pupils to aspire to be like him, as well as to challenge perceptions regarding people with special needs. Stephen is a renowned artist despite being autistic. Following the lesson, Nancy got the pupils to do a 3-2-1 reflection on Stephen Wiltshire in which she got the pupils to write about 3 things they have learnt from him; 2 things they want to imitate him; 1 question they want to ask him and 1 advice they want to give him as shown in Figure 9.
Figure 9. A sample of the pupil’s 3-2-1 reflection on Stephen Wiltshire

It was an authentic task as Nancy actually scanned all her pupils’ reflections and sent them to Steven in a CD. The pupils felt ‘empowered’ that they could actually give him a piece of advice and they were delighted when he took the time to respond to their writing.
Use of constructivism through the inquiry approach. Nancy uses the Inquiry Approach to facilitate student participation in the “construction of their knowledge, values and skills”. She gave the example of designing a learning experience in which the students were involved in doing research on the achievements and contributions of the past and present presidents of Singapore. They “explored the concept of democracy and considered the importance of electing the best person, regardless of race, language and religion”. The students learned to form questions using the 5Ws and 1 H and they were involved directly in gathering firsthand information:

From the conversations, it was evident that valuable learning had been made about each president including the schools they attended, the work they did before they became president and their contributions to Singapore. Students also considered how each president had been honoured by the nation. It was evident that the best person was chosen to be the president of our country, regardless of race, language and religion.

On the day Dr Toh Chin Chye passed on, Nancy asked her pupils, “Why is the flag at half-mast today?” Some pupils did not even notice that it was at half-mast though a few knew about it. Together with her students, Nancy linked the history of Singapore to the reason the flag was at half-mast. Then she invited the pupils to write down all the questions they wanted to know about the late Dr Toh clearly and neatly using interrogative pronouns.

Nancy relates the value of the authentic task:

There was an authentic reason for them to write neatly and express themselves clearly. Mostly, when students work with question marks, they were really doing it for the teacher as a pen and paper exercise. For once, they were writing real questions. I just felt at that moment, they were using punctuation and interrogative pronouns for the first time meaningfully and authentically.

Nancy also cites the advantages of getting pupils to write down their questions:

I think writing down is best for two reasons: it gets as much thinking out of them faster. Secondly, as a Language teacher, I want to integrate thinking, speaking, reading and writing altogether.

After the pupils had written down their questions, Nancy got them in small groups and gave each group some newspaper articles about the late Dr Toh to read and find the answers to their own questions:

The collaborative inquiry aroused the curiosity of the pupils and some went ahead with self-directed learning in the form of reading and talking with their family to find out more about Dr Toh.
Nancy tries to rouse pupils not to accept things as they are and to consider other possibilities by posing questions such as: “How many wheels does a bus have? What happens when we remove one wheel or add another wheel to it? Does a bus travel faster with more wheels? How many blades does a fan have? Is a fan with fewer blades less windy?” With flexible thinking, she hopes her pupils will look at issues and think: “Maybe there’s another reason. Let’s try another way.” In doing so, they would be more adventurous in thinking. Nancy believes that the experience of having to change one’s mind after being proven wrong by others helps one to be more open about seeking other possibilities.

Working for transfer of learning. Nancy’s conceptualisation of developing critical thinking includes the transference of what pupils learn in class to their daily lives. She illustrates how while teaching a topic on shapes, she got her pupils to talk about the significance of the characteristics of different shapes. Through the discussion, the pupils discovered that a flat surface allows a shape to ‘sit’ and not roll over. As a class, the pupils then listed several real life examples to explain why cartons and containers with flat surfaces were preferred to those with curved surfaces. Pupils also discussed the significance of curved surfaces in shapes. They related curved surfaces to rolling and cited real life uses including balls, trolleys, skates, office chairs, tyres, roller shoes, rolling pins and roller trucks.

Over time, pupils began to relate shapes with their characteristics and purposes. Pupils were also provided with opportunities to classify shapes. They explored a range of classifications including colour, size, material, where the material come from (e.g., from plants, animals, or the earth), and their environmental-friendliness. Through collaborative thinking, students also discovered the relationship between shapes and safety. When a student actually tripped and fell in class and hit her cheek against the corner of a desk, Nancy involved her pupils in thinking by asking, “Against what part of the desk did she hit her cheek? Had her cheek landed on the edge of the desk, would it have made any difference?” In doing so, Nancy helped her pupils to make the connection between what they had learnt about shapes with the accident that occurred.

In another example on connecting shapes to real life, Nancy asked her pupils, “If you are designing a cake box for a cake shop, what shape will you choose and what material will you use? Why?” Through getting pupils to think about such questions, they developed an awareness of the characteristics of shapes and the function for which it is intended.
Strategies to Teach Critical Thinking

Modelling thinking. Nancy views modelling thinking as an important strategy to teach critical thinking:

Thinking is not visible – it’s in your head and a child can’t see it. So I feel that as a teacher, you should model it by thinking aloud. You take the trouble to list “What are the causes and effects?” or “What are the pros and cons?” You deliberately say it out loud to make the thinking and the thought process visible to the kids. It’s like modelling for the child how you come to the conclusion.

Using Socratic questioning. Nancy uses both spontaneous and exploratory Socratic questioning (Paul & Elder, 2003b, p. 48-49) to determine what students know or think and probe student thinking on different issues raised in class. With regards to issues, she makes it a point to select topics that are interesting and relevant to the pupils. The topics are also related to the subject matter to be covered in the level. She described a lesson in which she was having a Socratic discussion on ‘Things in the Garden’ with her class and the discussion led to pupils classifying living and non-living things:

I asked them, “What are living things?” I wanted pupils to articulate their understanding. Then I asked for examples of living things and examples of non-living things, “What do living things need? What can living things do?” The kids were telling me lots of things and I was asking them spontaneous questions like “What do you mean? Why do you say that?” That day, we learnt classification.

Instead of saying table and chair, I said, “What’s a better word?” We learnt to classify them as furniture and then we began to refer to the grass, bushes, flowers and trees as plants; the bees, butterflies and ants as insects; the stones, rocks and soil as non-living things... It wasn’t planned but it served us very well.

Through Socratic questioning, the pupils’ thinking was stimulated and she let the pupils move the discussion along the direction of their questions:

When the pupils were presenting their definitions of living things, they came to the conclusion that there were two categories of living things: animals and plants. When they were discussing what living things need and what living things can do, they found that some concepts do not apply to all living things. For example, some pupils concurred that living things can talk, but do animals talk? “Animals do make some noise,” agreed most pupils, but do plants make noise? So there was this conflict of ideas and understanding that forced us to reconsider our understanding of what living things can do. Someone suggested that, “Living things can move.” ‘But plants don’t move,” argued many pupils. Then one of the girls said, “Yah, the
mimosa moves its leaves." The discussion went back and forth as pupils substantiated their arguments about how plants move as they grow towards the light and creepers climb up the fence and twirl round trees.

As the discussion went along, Nancy found herself amazed by the thinking of her young charges:

Then we came to some awesome thinking – that living things die. “You mean non-living things don’t die?” they started asking. I thought for a P2 class of 8 year olds, it was very sombre to talk about death because some kids might be frightened by it. For a moment, pupils seemed to think that non-living things are better off because they don’t die. We had an interesting discussion as we considered, “Is it better to be a living thing or a non-living thing? Do non-living things live forever?”

In another example of a focused Socratic discussion on liquids, Nancy asked her pupils how they would group the liquids. As they started discussing ways of classifying the liquids, Nancy was able to introduce pupils to some new concepts:

That sets them thinking (about liquids) so the pupils started talking about colours. Some talked about taste. So I said, “How would you classify taste?” Some said spicy. I said, “Possible, what are other ways of classifying taste?” Some said nice/not nice. That was when I suggested the words pleasant/unpleasant by saying, “Do you mean pleasant/unpleasant?” Some said poisonous and not poisonous so I introduced them to the term non-poisonous. Some said can eat and cannot eat so that was when I introduced the words edible and inedible. As pupils were suggesting various classifications, they were thinking. They were stimulating one another to explore different ideas. Someone suggested hot and cold. Another added not hot not cold - lukewarm and that was when the term ‘room temperature’ was introduced to them. Some even talked about usage - it’s for cleaning, washing and cooking.

As the Socratic discussion progressed, Nancy was fascinated by the unpredictable new direction that the discussion took on:

I don’t know how but suddenly we started talking about body liquids. The girls were telling me things like tears, urine, saliva, blood and perspiration. It was just amazing! I never knew that they could list so many types of body fluids. They were able to name body fluids as one classification of liquids…that’s amazing!
In the midst of the discussion, the pupils remembered a comprehension passage about a boy whose bag of ice melted into water. They were able to link the discussion on liquids to the passage and the class moved on to talk about the states of water:

What causes ice to change to water? Some were able to say that it was the sun. Then we talked about heat and discussed temperature changes - rise in temperature. I asked them, “So if the temperature were to drop to freezing cold, what would become of the bag of water?” They said, “A bag of ice.” So they were able to link the discussion to the passage read earlier.

**Active learning.** Nancy promotes critical thinking through active learning which encompasses providing pupils with opportunities to wonder, to explain, to speak, to reason, to justify their reasoning, to provide examples and non-examples, to construct and design. Such opportunities were provided using Socratic discussions as well as Philosophy for Children which involves philosophical discussions related to children’s literature.

Nancy believes that teachers can facilitate thinking by giving students opportunities to wonder. She uses the ‘See, Think, Wonder’ strategy which involves asking students to identify what they see or read, relating that to what they already know, and asking questions that arouse their curiosity (Fontichiaro 2010). Before reading an article on deserts, she lets the pupils wonder by writing down questions associated with deserts that they were inquisitive about. Some of the pupils wrote:

- Why is there so much sand in the desert?
- Where did the sand come from?
- Why do people want to stay in the desert?
- Why is the desert so hot?
- Are there living things in the desert?
- Can deserts be cold?

Nancy marveled at the questions written by the pupils. They revealed a few misconceptions but indicated a lot of thinking.

Giving pupils the opportunity to offer explanations requires them to think and reflect on their understanding. During the Socratic discussion on Family in the first observation, Nancy asked the pupils to explain their decision on who should be included in a family. Student 3 explained that her helper (maid) originates from another country and hence is not part of her family. However, Student 7 gives a different perspective by illustrating that her uncle comes from a different country but is still family. Table 18 shows the two different perspectives shared by the pupils:
At the end of the lesson, the children had a much deeper understanding of the concept of family and the different types of people associated with the term ‘family’.

In the second observation, a P4C discussion on change, Nancy’s original intention was to get pupils to observe that changes could be made for the better or the worse. She was pleasantly surprised by the new insight brought up by one of the pupils who observed that changes made could be normal i.e. neither for the better nor the worse as shown in Table 19.

Table 18
Segment of Transcript Focusing on Pupils’ Different Perspectives

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (Socratic Discussion on Family)</th>
</tr>
</thead>
</table>
| Explaining basis of decision using country of origin | T: Ok let’s hear her. How do you decide whether it is family or not family? How do you decide?  
S3: The helper comes from a different country to live with another family? |
| Asking for clarifications | T: Say that again? So you are referring to the helper?  
S3: She comes from a different country to live with another family. |
| Clarifying | T: So the other family is you?  
S3: Yes. |
| Clarifying | T: So are you saying that if someone comes from another country to live with you, she’s not family?  
S7: No, sometimes, people can go to another country but is still family. |
| Rephrasing | T: What do you mean? Can you give an example?  
S3: Like my uncle and auntie can go to another country and they can just come back. |
| Giving a differing view of family using country of origin | T: So if your auntie and uncle live in America, are they still your family? They can live there and still be a family. He comes back he’s still your family. Can you see these two girls have different thinking?  
C1: Yes. |
| Asking for example | T: S3 is saying that the helper comes from another country, is staying in her home but is not family. S7 is saying that her uncle, although he is not living in her home, he is in another country but he is family. |

At the end of the lesson, the children had a much deeper understanding of the concept of family and the different types of people associated with the term ‘family’.

In the second observation, a P4C discussion on change, Nancy’s original intention was to get pupils to observe that changes could be made for the better or the worse. She was pleasantly surprised by the new insight brought up by one of the pupils who observed that changes made could be normal i.e. neither for the better nor the worse as shown in Table 19.
Table 19
Segment of Transcript Showing New Insight by Pupil

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C Discussion on Change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarising</td>
<td>T: S2 said they are opposites just like S1 and one is positive and the other is negative.</td>
</tr>
<tr>
<td>Sharing new insight</td>
<td>S3: Long and short are opposites but they are not positive or negative.</td>
</tr>
<tr>
<td>Asking consensus and clarifications</td>
<td>T: Who agrees with her? Who said up and down? It’s true – some opposites are not positive and negative. If they are not positive or negative, what are they?</td>
</tr>
<tr>
<td>Stating change</td>
<td>S3: They are just normal.</td>
</tr>
<tr>
<td>Introducing new term</td>
<td>T: Shall we say they are neutral? Today, who is the main character in our story? S: Lazy Duck</td>
</tr>
</tbody>
</table>

Nancy stresses that providing pupils the opportunity to give reasons with a question such as “What makes you think so?” or getting them to justify their reasoning by asking, “Why do you say that? What is your reason?” also require thinking. She adds that giving pupils the opportunity to provide examples and non-examples helps them clarify their thinking. Figure 10 shows a sample of a pupil’s list of examples and non-examples on determination.
During the second observation, Nancy asked for an example related to Lazy Duck, the main character in the book which they have read. The illustrations given by the pupils in Table 20 show that they were able to relate real-life applications to the book:
In the same observation, when Nancy asked the pupils if changes were permanent, Student 2 gave an example to show that changes need not be permanent. It is interesting to note that Student 8 was able to relate Student 2’s illustration to her personal life by describing how she was negatively influenced by watching cartoons as shown in Table 21 below:

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C Discussion on Change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relating story to real life</td>
<td>T: Do you know that people can change? We know that the character, Lazy Duck changed from lazy to busy.</td>
</tr>
<tr>
<td>Asking for real-life example</td>
<td>T: Do you know anybody who also changed like Lazy Duck?</td>
</tr>
<tr>
<td>Illustrating positive change</td>
<td>S9: S10 is not rolling on the floor and she’s sitting down now. T: S10 is not rolling on the floor and she’s sitting. That’s a good change. How did the farmer in the story change? He changed his_____? CI: mind</td>
</tr>
<tr>
<td>Illustrating change in book</td>
<td>T: He wanted to cook Lazy Duck for dinner and then he changed his mind. He said that Lazy Duck was more useful alive than dead. Let’s talk about you. Lazy Duck can change...what about you?</td>
</tr>
<tr>
<td>Asking for personal applications</td>
<td>S11: My cousin who could not drive at first. She passed her driving test after failing four times.</td>
</tr>
<tr>
<td>Giving illustrations of positive change</td>
<td>T: She has a driving license now. She failed four times but she did not give up. Cannot drive, can drive – that’s change.</td>
</tr>
</tbody>
</table>

Table 20
Segment of Transcript Showing Personal Application from the Examples
As the discussion went on, Nancy asked Student 8 how she could change her behaviour from bad to good. It was noted that she was able to articulate how to solve her own problem by explaining that she could remove the negative influence of the cartoons and replace that with the positive influence of good programmes as shown in Table 22.

Table 21

**Segment of Transcript Showing Application to Personal Life**

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C Discussion on Change)</th>
</tr>
</thead>
</table>
| Explaining and illustrating meaning of word | T: What is the meaning of the word ‘permanent’?  
**S2:** Permanent means it goes on forever and does not stop like God’s love for us is permanent.  
T: Yes. So **S2,** are changes permanent? |
| Illustrating that change is not permanent | **S2:** No. This girl played with somebody bad and she learnt the bad habits and became a bad girl. Then she decided to go to a new group. She played with the good girls and became good.  
T: We are talking about change and **S2** is trying to explain to us that changes are not permanent. So is the change permanent – good means forever good and bad means forever bad? Is it like that or is it changing all the time? Who says your change is always changing? Let’s hear from **S8.**  
**S8:** At first I was good. Then I learnt some bad stuff from the cartoons and I became bad. |

| Giving an example of change through negative influence |

As the discussion went on, Nancy asked Student 8 how she could change her behaviour from bad to good. It was noted that she was able to articulate how to solve her own problem by explaining that she could remove the negative influence of the cartoons and replace that with the positive influence of good programmes as shown in Table 22.

Table 22

**Segment of Transcript Showing Personal Problem-Solving**

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C Discussion on Change)</th>
</tr>
</thead>
</table>
| Noting that this change can be reverted by removing negative influence | **T:** Is your change permanent? Is it possible for your behaviour to become good? How do you change from bad to good?  
**S8:** Stop watching the bad cartoons.  
**T:** **S8** was good. Then she learnt something mischievous from the cartoon and she was for a little while mischievous. How can **S8** change her behaviour from bad to good? She said stop watching the bad cartoons.  
**S3:** But then, she always watches it.  
**S8:** Our parents let us. That’s why.  
**T:** How can you change for the better?  
**S8:** Stop watching it and watch something else.  
**T:** What’s something else that you could watch?  
**S8:** Watch something good. |

| Posing problem |

| Noting the need for positive influence |

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In the ensuing discussion, it was noted that the eight-year olds were able to solve the problems posed by Nancy through using positive and negative consequences as well as being a positive role model as shown in Table 23.

Table 23  
Segment of Transcript Showing the Exploration of Positive and Negative Consequences

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C Discussion on Change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posing problem</td>
<td>T: We are always changing. How can we discourage people from changing from good to bad and encourage them to change from bad to good?</td>
</tr>
<tr>
<td>Providing solution to question through exploring positive and negative consequences</td>
<td>S15: We can discourage people from changing from good to bad and encourage them to change from bad to good by telling them they are going to jail. We can encourage them to change from bad to good by telling them their parents will be proud of them.</td>
</tr>
<tr>
<td>Summarising what was said</td>
<td>T: She will discourage them by telling them that they are going to jail or the Girls’ Home. So that’s the consequence. If you continue being bad, you have to face the consequences by going to jail or the Girls’ Home. She’s going to encourage them to change from bad to good by telling them their parents will be proud of them. That is the consequence. Both your choices have consequences.</td>
</tr>
<tr>
<td>Introducing the term ‘consequences’</td>
<td>S2: You can also discourage them by playing with them and teaching them the right things. Then, if they like you, they’ll come back and play with you and slowly, they’ll turn from bad to good.</td>
</tr>
<tr>
<td>Being a role model</td>
<td>T: Very Good. You heard that? She’s talking about being a good role model. If you’re a good role model and you get her to play with you, she’ll learn all your good habits and she become like you.</td>
</tr>
<tr>
<td>Paraphrasing</td>
<td></td>
</tr>
</tbody>
</table>

Through the Socratic and P4C discussions, Nancy got the pupils to verbalise their thoughts on problem solving by articulating their views. The rest of the class were able to listen to the thoughts and the varied perspectives of their peers.

After reading the book, *A World of Tools*, Nancy found it appropriate to give pupils the opportunity to design and construct a desk organiser with their hands:

They took the 3D shapes and cardboard boxes and started making a pencil holder. They were beautiful. This is where I see creativity as well. In making the desk organiser, the criterion is that pencils should not fall through any gaps. Many of them used toilet rolls but how are they going to create a base for the pencil holder? The kids explored and some of them were very smart….they took a piece of paper and wrapped it over one end and secured it with a rubber band. Then they folded
the paper outwards to form part of the design. Some wrapped the toilet roll in coloured paper. They added patterns to make it look beautiful. They were very engrossed and they were very proud of their products.

**Doing parallel writing.** To help the lower primary pupils write better, Nancy uses parallel writing where she gets them to model after a book that is read in class. For example, after reading *Telling time with Mama Cat*, a book to teach time, Nancy got her pupils to write a parallel story using their own names with an adjective that begins with the same letter as their name, such as Caring Cheryl. Inside, they imitated the book and wrote about their day. Some of the girls included humour as there was humour in the book. By using the book as a model, the girls were able to imitate and create their own book. Nancy views that by writing parallel stories, pupils are also thinking and applying:

When the kids make use of the story they have read to write their own story, there’s this sense of achievement...it’s theirs. The thinking and construction come from them. For the child, it’s very powerful. Although they start by mimicking the story, their imagination directs them to include other ideas. This creativity is valuable and empowering.

A scan of her pupils’ writing journals revealed Nancy’s frequent use of parallel writing in her class. Figure 11 shows a sample template used by Nancy to scaffold her pupils’ writing through brainstorming for ideas before writing a story parallel to the nursery rhyme, *Mary had a Little Lamb* and Figure 12 shows a sample of a pupil’s parallel writing.

![Figure 11. Sample template used for brainstorming ideas prior to parallel writing](image)
Through the use of the strategies described above, Nancy hopes to see the following outcomes:

Students who dare to ask why and why not; students who dare to wonder, dare to dream, dare to fantasize – it doesn’t matter if it seems silly, ridiculous or nonsensical; students who are keen to explore, keen to create and design; students who are flexible in thinking yet logical, able to give reasons and open to reasoning; able to weigh the pros and cons (not just one-sided), consider the cause and effect and link ideas.
She explains her reasons for wanting these learning outcomes:

My basic belief is that everyone is special. Each child has a unique contribution that only he or she can offer. It’s important for us (teachers) to develop every child so that they can make that distinct contribution to planet Earth. In language arts, math, science, sports, music or design, my role is to encourage the kids to explore.

Nancy would like her pupils to be open minded. For example if she is an artist, Nancy hopes that she would be open to other artists. She wants them to know that what each person knows is limited to a single perspective. She wants them to be excited and hungry for other ideas, dreams and fantasies. Nancy believes that open-mindedness is key to learning and growing.

**Concerns Related to the Infusion of Critical Thinking**

**Being constrained by time.** Time is Nancy’s main concern when it comes to infusing critical thinking across the curriculum as teaching pupils to think requires more time than just teaching facts. Nancy tends to let the pupils’ thinking take the discussion to where it leads and do more of the higher order thinking. Hence, she takes longer than the prescribed time to complete the syllabus. However, being convinced about the value of thinking, she is not content to just teach for knowledge gain:

In teaching, I always ask myself what is the purpose and significance of this learning? For example, in the study of shapes, I ask myself what is the relevance and value for my students in learning about the characteristics of different types of shapes?

Nancy believes that the purpose of learning is to inform one’s decision making so that one can make better choices based on knowledge and understanding. Hence she is committed to taking the time to help her pupils make meaning of whatever they have learnt by relating it to their lives.

**Being constrained by large class size.** The other concern that she has is the large class size coupled with the short attention span of 8 year-olds. Young children are impulsive and they all want to speak more than listen. She observes that it is hard for them to wait patiently as they want to be heard immediately. Thus, Nancy finds it challenging to get students to listen to one another. Also, when inspired, students are eager to share their enlightenment so she finds that their excitement is stifled when they have to wait for a long time for their turn to speak.
Sam

Sam's Background
Sam is a married male in his late 40s with a Bachelor of Counselling degree. He has been teaching for 25 years including 16 years as a Head of Department. He is currently HOD (Character and Citizenship Education). Sam has been teaching Upper Primary (Primary 5 & 6) pupils English Language for the last 15 years (8 years in Standard English and 7 years in Foundation English) in a neighbourhood government coeducational school. He has attended a 3-month course on Critical Thinking conducted by the National Institute of Singapore. His class has 13 Low Progress (LP) pupils of which 7 are from English speaking homes, 10 are from disadvantaged homes and 7 are Special Needs pupils with dyslexia, autism or Attention Deficit Hyperactivity Disorder (ADHD). Four of these students are highly dyslexic and are either unable to read proficiently or able to pronounce the words phonetically without understanding the meaning of these words.

Conceptual Understanding of Critical Thinking

Definition and value of critical thinking. Sam defines critical reading in this manner:

As you are reading, you are deciphering what are the main points. You are actually looking for key ideas that are coming out from the passage. It is not just mere reading and understanding the whole story...It is also interpreting the passage and coming to conclusions.

Looking at critical reading from the perspective of foundation pupils, the weaker learners, Sam relates that when they read, they are reading the whole passage in totality and they are not able to critically look “at what each paragraph is talking about and what the key ideas are”. Hence, he sees the need to bridge (customise) critical reading for the weaker learners to help them understand and interpret the text, summarise the text and come to a conclusion.

To Sam, critical thinking involves allowing “students to think through and solve problems posed by critically appraising the facts that are presented to them and constantly reviewing the solutions”. He emphasises that critical thinking focuses on “different possibilities” as opposed to thinking about solutions in a linear manner.

Sam sees critical reading as a process and critical thinking as a skill. However, he adds that the line between critical reading and critical thinking is very fine because:

Without critical reading, you cannot arrive at critical thinking. But you can do critical reading and not be critically thinking. That means I can decipher what is happening. I can read the text but I do not have enough experiences, prior
knowledge or the experience of reading different texts and being exposed to life experiences or different sets of ideas that I am able to formulate the thinking critically.

To Sam, teaching English Language is more than just teaching communication skills encompassing the ability to speak, write, listen and comprehend well. He believes that “language (not just English but also Mother Tongue) transcends all other subjects”. It is the vehicle to teach critical thinking; to empower pupils to decipher information and make well-informed decisions in a globalised world with people of different cultures and social backgrounds. He adds:

So the challenge is not producing academic people. It is producing thinking people; people who are able to critically decipher what is happening on the ground, not be deceived but make critical decisions. That is what language is about...We’re honest - there’s no bribery. People are talking to you at face level (in Singapore) but it is not like that everywhere (in the world). If you do not teach critical thinking in your language lessons, you are going to prepare your pupils to fail. These youngsters that go out to the world which is globalised already; the boundaries are very thin. They are going to face challenges which they are not going to be prepared for.

Sam gave the following illustrations to drive home the importance of teaching pupils to think critically:

The assumption is that a man is drowning. You walk by. Do you save the man or do you walk away? By saving him, you are putting your life at risk. There are a lot of nations suffering. People are without food, water and all that. So do I give away my own belongings and my wealth because I want to help the rest of the countries? Or do I keep it to myself because I’ve earned it? It is how you put forward the argument. But if you do not teach the pupils how to critically think and come to that arrival of decision by themselves, then you have failed.

Sam shared that in one of his lessons, he made use of a text that examines an argument presented by the author on the right of the person to help a starving person versus his right to keep what belongs to him. He got the pupils to discuss the issue and come up with the best solution that could then be applied to their Values-in-Action (VIA) project in which they created an advertisement to entice others to contribute and yet remain empathetic when someone does not. To Sam, critical thinking is applied as a way of life in the daily decisions made in real life. Sam states:
Critical thinking is not about reading and interpreting a text. It is bringing all the skills that you have learnt into that (a) particular situation and making a decision at that moment.

Sam passionately believes in the importance of infusing critical thinking and he seeks to infuse critical thinking into every lesson.

**Seizing the opportunities to infuse critical thinking.** He believes that a teacher who is competent and passionate about infusing critical thinking would take every opportunity to infuse critical thinking across the curriculum. He illustrates how he capitalises on suitable texts in Listening Comprehension to infuse critical thinking:

During Listening Comprehension - there are 7 texts altogether. How do you go by that opportunity without putting in critical thinking? If every text is a gem, then you ask your children, "What do you think about this?" I remember this passage in a PSLE Listening Comprehension that really irked me. It was about a speaker who was invited to talk about how she had lost weight through the Trim and Fit (TAF) Club. She was telling a story about how in school, people used to disturb her and they called her “Fatty Fatty Bom Bom”. During that “Fatty Fatty Bom Bom”, segment, the kids burst out laughing because they related to it. They didn’t even realise that it was bullying. They didn’t realise the harm being done to the other person (being made fun of). They were not empathizing. That was a gem. So I got them to critically evaluate that particular conversation and then talk about how they felt. But if I had just gone through the answers (the usual way), it doesn't make sense (is a wasted opportunity). This is the issue. Can you write down all these in your scheme of work that every teacher must follow? You can't. It is a belief system and it comes down to the competency and passion of the teacher.

**Infusing critical thinking holistically across school programmes.** Sam believes that “critical thinking is an important skill that allows pupils to apply across all dimensions of learning encompassing both Instructional Programmes and non-Instructional Programmes”. Hence, critical thinking should be infused holistically into all school programmes including non-instructional programmes such as Physical Education (PE) and Aesthetics. He gives the following illustration on the integration of the topic of racial harmony with PE:

You want to talk to people about racial problems. Get them to play with different races. Throw a ball at them and ask them to go and select their own team. Once they have picked their team, we assemble and ask them why they picked that team. There are certain key players. These are the good players. Do you pick them
on skills? Do you pick them because of race? Do you pick them because you want to win? So the decision process is thought through. When the children articulate how they came to that decision, that is when we correct and say it is not about winning and we are talking about teamwork. That's a simple process in a PE lesson itself. You are talking about process changing. So your PE teacher don't go in there and think that my only job is to teach you how to kick and play the game because all these games have a bigger meaning in life. The bigger meaning is to teach pupils sportsmanship, the values of being a gentlemen, the values of how to lose or win graciously and how to control your emotions when you are playing the game.

To effectively implement critical thinking, Sam sees the need for a school system which moves everybody in the same direction so that teachers are applying critical thinking skills in all school programmes. He emphasises that critical thinking should not be taught “in silos” in particular subjects as it “cuts across” all subjects. He also illustrates the infusion of critical thinking in Aesthetics:

Even in Aesthetics, the art lessons infuse critical thinking into it. The skill set involves critically appreciating the art; that means that particular piece, the drawing and the colours. If you have children with that talent, they need to know that kind of skills. But beyond that, what is the artist trying to say? Why has he said that? What has influenced him? Those are (involve) critical thinking. Because if you don’t do that, what you are going to have is people are going to look and say “What a wonderful painting!” But there are a lot of messages there.

Sam also illustrates infusing critical thinking in Character and Citizenship Education (CCE):

In the domain of character development, we use three things that must run across all subject areas: critical thinking, reflections as a process and your own thought processes. And storytelling is a mechanism we are using. That one is tied up with 21st century competencies; which is a lot about children being able to communicate.

The storytelling mechanism mentioned above involves an integration of the reading passage with life skills during English Language lessons. The teacher helps pupils to critically evaluate what is happening in the passage before getting them to develop their own ideas and communicate them. Children write the stories related to the passage from their experiences, tell the stories and reflect on the stories after receiving comments on
their stories from their peers. Nevertheless, Sam acknowledges that it is a challenge to infuse critical thinking across all programmes.

**Working for transfer of learning.** Regarding working for transfer of learning, Sam illustrates a case involving a pupil who refused to come to school for two years. Volunteers were sent to teach him at his home and at the Family Service Centre while waiting for him to sort out his emotional issues and return to school. During that period, Sam deliberately “selected reading passages and media about resilience and moving ahead; inspiring passages about people who have overcome obstacles”. The volunteers were briefed on how the lessons should be carried out and the messages behind the lessons. Language was used powerfully to build the pupil’s motivation as the school worked in partnership with the counsellor. The pupil eventually topped the whole cohort for the Foundation stream when he came back to school. Sam believes that “the use of language and media given to him had changed his life because it had been instilled in his thought process”.

In order to work at transfer of learning, Sam sees the need for teachers to go beyond classroom lessons to getting pupils to critically evaluate their daily interactions in line with the lesson:

In the classroom, we talked about conflict resolution in an article – a simple example like racial harmony in the context of rioting. Do we stop there? If you stop there, the learning is about something very abstract which none of our children will relate to because they have never seen riots. But how do you bring it back to the classroom, critically evaluate their daily interactions, when they make choices like: Where to sit? Who to sit with? What language to use (when someone of a different race joins the homogeneous group that was communicating in their Mother Tongue)? Unless I talk to them through the reading of passages and real life experiences and show them the real life consequences, they will never come to that thinking (about code-switching out of consideration for the person of a different race who had just joined their homogeneous group).

**Strategies to Teach Critical Thinking**

**Modelling thinking.** Besides role-modelling critical thinking to children, Sam believes in being a role model for teachers in his department and he seeks to change the thinking process and belief system of teachers by having conversations with them:

My job is to coach them (the Subject Heads) and coach the teachers in their belief system and their thinking processes. I spend a lot of energy on this at this particular juncture... at least for the past 2 years, I have been spending a lot of time
talking to teachers because that is the way you alter the thinking process of our teachers and that is how you develop the next generation of teachers.

**Systematically Focusing on the 5Ws1H Questions.** As the pupils in Sam’s class were weak in comprehending text, Sam systematically focused on the 5Ws1H questions. He did this by preparing passages with comprehension questions all starting with ‘Where’ at various levels of difficulty. For several lessons, there was a concerted focus on just the ‘Where’ questions by getting pupils to look for the place that the question was asking for. Then he repeated the process with a concerted focus on each of the following ‘When’ (time), ‘Why’ (reason), ‘Who’ (people), ‘What’ (something) and ‘How’ (method). A sample of the pupil’s worksheet focusing on ‘Where’ questions is shown in Figure 13.

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**Figure 13.** Sample of pupil’s worksheet with concerted focus on ‘where’ questions
Questioning Concept Thinking (QCT). Questioning Concept Thinking (QCT) is a strategy devised by Sam. It involves questioning, “What is the concept behind it?” and “What are your thoughts?” He explains it as follows:

So for each paragraph after they have read it, I ask them to write the questions that they have which they do not understand. What is the concept that this person is trying to deliver? What are your thoughts about this? So in this way, each paragraph is linked. So it is sort of teaching summary writing...QCT requires you to look at what exactly is happening in the passage. That can be made applicable to composition writing by asking, “What are you trying to deliver in that paragraph? What is the key concept? Where do you want your reader to go to?

During the Comprehension lesson in Observation 1, Sam uses QCT to help pupils to understand the concept of 'illiterate' as shown in Table 24.

### Table 24
**Segment of Transcript Showing the Use of Questioning Concept Thinking**

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (Comprehension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focusing on where Responding</td>
<td>T: This paragraph you all interpreted-stayed in close contact with the families – letter. And the letter go to where?</td>
</tr>
<tr>
<td>Being more specific Focusing on who Responding</td>
<td>CI: China</td>
</tr>
<tr>
<td>Summarising</td>
<td>S5: Families in China</td>
</tr>
<tr>
<td>Guessing meaning of word Responding</td>
<td>T: Gp 2 - the letter is written by who?</td>
</tr>
<tr>
<td>Asking for meaning Rephrasing</td>
<td>S4: Letter writers</td>
</tr>
<tr>
<td>Making connections</td>
<td>T: Professional, right. Maybe, we should add the word 'professional'. Professional – take money from them, write letter. Gp 3 says that the money goes to China.</td>
</tr>
<tr>
<td>Summarising concept</td>
<td>T: Unable to write, so illiterate means what?</td>
</tr>
<tr>
<td></td>
<td>S1: Don’t know how to write</td>
</tr>
<tr>
<td></td>
<td>T: If you don’t know how to write means you also don’t know how to what? If you know how to write, you must be able to?</td>
</tr>
<tr>
<td></td>
<td>S4: Read</td>
</tr>
<tr>
<td></td>
<td>T: So illiterate means unable to read and write. It seems an important word, so we can’t just throw it away</td>
</tr>
</tbody>
</table>

It was observed that through asking questions about the context, the pupils developed an understanding of the concept of illiteracy.

**Using words in context, take away words strategy and drawing pictorially.** In addition to QCT, Sam uses a variety of strategies such as Using Words in Context, Throwing Away Words and Drawing Pictorially in the same comprehension lesson to scaffold and help pupils comprehend the text. In the first observation, Sam was going
through a passage which they had difficulty comprehending and had done badly in a written comprehension exercise. Despite having asked the 5Ws and 1 H questions about the passage earlier on, they were not able to comprehend the text. Sam gave an example to show pupils how they could guess the meaning of a word they do not understand by using other words in the context. Then he got them to use that strategy for the introductory paragraph. Table 25 shows the pupils making use of words in context to aid their understanding of text:

Table 25
Segment of Transcript Showing the Use of Words in Context to Comprehend Text

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (Comprehension)</th>
</tr>
</thead>
</table>
| Selecting words which aid understanding | T: Anyone, go up there and circle the words you think are clues and tell me why you think they are clues to helping you understand where this is happening. What does that tell us, S1?  
S1: Teacher, I want to try. They said living in Chinatown, crowded shophouses – it means they share one house – shop house so that’s why they say crowded shop house.  
T: Where is the place?  
S1: They live in Chinatown.  
T: Anyone, tell me, Chinatown means what?  
S2: A place  
T: Who lives in Chinatown, where is it?  
What picture comes into your head? S4? S3?  
S3: Living in Chinatown, they have a lot of small houses  
T: Small houses, you’re right. |
| Relating meaning                      |                                                                                                                                                                                                                                                    |
| Asking where                          |                                                                                                                                                                                                                                                    |
| Asking who/Visualising                |                                                                                                                                                                                                                                                    |
| Sharing visual in the head            |                                                                                                                                                                                                                                                    |

When Sam noticed that the pupils still had difficulty understanding the text as they were hindered by the vocabulary, he taught them a new strategy which involved taking away words (Table 26) which they did not understand to see if it would help them comprehend the text. He adds:

If reading the passage and trying to make a guess doesn’t work for them, then throw away all these words which they do not understand, it’ll still make sense to them. It aids them in making a guess as to what’s happening.
On reflecting after the lesson, Sam felt that the Taking Away Words strategy helped the pupils in understanding the text. However, he also recognised the limitations of the strategy:

That Taking Away Words strategy has a flaw because when you take away words, as a child, if you do not understand which words to take away, you may take away critical words and the critical points. So when you put the rest of the words back together, you may get the wrong message. Here what we are trying to do is to take away verbs and they pay attention to the reading. They are (currently) reading the words – each word by itself so when they put the words together, it becomes very difficult for them as the sentence is too long. So the whole idea is to take away...
verbs and adjectives. The few words left – what message does it deliver?

Hopefully, they get the meaning of the passage.

During the same lesson, Sam also encouraged pupils to visualise and use the strategy of Drawing Pictorially. In the first two lines of the transcript in Table 26, Sam demonstrated the strategy by drawing a picture of a Samsui woman working very hard and perspiring. The first segment of Table 27 shows Sam giving instructions for the pupils to work in groups to visualise and draw a picture of the sentence that’s assigned to them. In the second segment of Table 27, Group 3 has drawn a picture of money with wings to show money being sent to their families in China,

Table 27
Segment of Transcript Showing the Strategy of Drawing Pictorially

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (Comprehension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giving instructions</td>
<td>T: Next paragraph, 5 minutes, you break it down for me in this manner. I'll call your group. Each group will come up here and add on in pictorial form what this means. Look at the second paragraph and see how you'll break it down in pictures. Do I need to know who these Samsui women are? S3: It's a girl. T: You know it's a girl, it's a Chinese woman ... you've got to make sense of it. Break it down in pictures, later you have to explain it to the class.</td>
</tr>
<tr>
<td>Getting them to work in groups to draw pictorially</td>
<td>Text assigned to Group 3 “Most Samsui women were illiterate and unable to write their own letters. What they earned, they faithfully sent back to their families in China.”</td>
</tr>
<tr>
<td>Questioning</td>
<td>T: Group 3 – you can refer to what you drew on your paper. You're not cancelling any word, just highlighting? Interpretation? What does that diagram mean? How do you interpret? Anyone?</td>
</tr>
<tr>
<td>Responding</td>
<td>T: Most Samsui women were illiterate and unable to write their own letters. 'If you throw away 'illiterate', it will read 'Most Samsui women were unable to write their own letters.'</td>
</tr>
<tr>
<td>Commenting on what group has done</td>
<td></td>
</tr>
<tr>
<td>Asking group to explain the diagram drawn</td>
<td></td>
</tr>
</tbody>
</table>
A scan of the pupils’ comprehension worksheets revealed that Sam’s pupils attempted to draw pictures to help them visualise the text as shown in Figure 14.

![Image of a worksheet with a drawing and text](image.png)

**Figure 14.** A sample of pupil’s attempt at drawing pictures to visualise text

As half of the class are pupils with special needs, Sam groups pupils who are more skilful in reading comprehension with those who are weaker to ensure meaningful discussion. He adds that the “pairing is done in such a way that there will be one person who is able to help the other person within the particular group”.

**Tapping on a variety of media.** To cater to the learning needs of lower ability learners, Sam taps on a variety of media such as shared experiences, stories, visual aids, songs and videos along with articles to infuse critical thinking. In addition to the comprehension passage, Sam uses videos related to the theme of the passage to enhance their understanding by getting them to come up with questions related to the topic.
In the second observation on Guided Discussion, Sam made use of a video on Colonel Sanders when he did a lesson on life skills as an extension of an English lesson. Sam’s instructions to the pupils before viewing the video were as follows:

When watching the video, these are the things you need to pick up – values. What are the values that made him a success? Tell me how many professions he has gone through and why do you think he succeeded. Values, number of jobs and what made him succeed? Table 28 shows a segment of the discussion that followed the viewing.

Table 28
Segment of Transcript Showing Discussion on Values after Viewing Video

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Guided Discussion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing the background</td>
<td>T: I wanted to show you what type of country Colonel Sanders came from as most of you are not familiar with the US. You saw the pictures over there. This is the 1960s. We also heard about certain values over there...certain things that he had within him - the values, certain things which made him succeed. Did you get that in the video? Unfortunately, you did not track the number of careers that he went through. From the video, what are the values? S7?</td>
</tr>
<tr>
<td>Asking for values</td>
<td></td>
</tr>
<tr>
<td>Stating values</td>
<td>S7: Never give up</td>
</tr>
<tr>
<td></td>
<td>T: Some more</td>
</tr>
<tr>
<td></td>
<td>S8: Be patient</td>
</tr>
<tr>
<td></td>
<td>T: Be patient, some more?</td>
</tr>
<tr>
<td></td>
<td>S9: Hard work</td>
</tr>
<tr>
<td></td>
<td>T: Hard work, some more?</td>
</tr>
<tr>
<td></td>
<td>S10: Faith</td>
</tr>
<tr>
<td></td>
<td>CI: Hope, courage, respect, confidence, resilience, success, determination...</td>
</tr>
<tr>
<td></td>
<td>T: I ask you for values: Let’s look at these words - respect is a value?</td>
</tr>
<tr>
<td>Deciding if suggested values are values</td>
<td>CI: Yes</td>
</tr>
<tr>
<td></td>
<td>T: Success is a value?</td>
</tr>
<tr>
<td></td>
<td>CI: No</td>
</tr>
<tr>
<td></td>
<td>T: It’s not a value. It’s something I get at the end of a journey – I succeed or I fail. It’s not a value which comes from me. Never give up...can I get a better word for that?</td>
</tr>
<tr>
<td></td>
<td>S6: Never quit.</td>
</tr>
<tr>
<td>Asking for a synonym</td>
<td>T: Never quit. One word...what value?</td>
</tr>
<tr>
<td></td>
<td>CI: resilience</td>
</tr>
<tr>
<td>Changing adjective to noun</td>
<td>T: Is determination a value? Determination and confidence are values. Be patient. What’s the value?</td>
</tr>
<tr>
<td></td>
<td>CI: Patience</td>
</tr>
</tbody>
</table>
As a result of the video discussion, it was concluded that courage, hard work, confidence, resilience, patience, determination and respect were the main values observed in Colonel Sanders' life. Following the video, the pupils were given an article on Colonel Sanders to read and discuss in their small groups. Their task was to support the value they observed in the video with the information given in the text. Table 29 shows a segment of the class discussion after their small group discussion.

Table 29
Segment of Transcript Showing Class Discussion on Values after Group Discussion

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (Guided Discussion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarising</td>
<td>T: He carried on working many jobs... found himself broke at 65. Supposed to be succeeding but not succeeding... then we know the rest of the story. He succeeded later on by franchising the chicken. Which part of the story shows which value? This group – what's the value? Where? Determination – where did you find it? Anyone can tell me. S7, Where does determination come from? Which part of the story?</td>
</tr>
<tr>
<td>Asking for value and basis of stated value</td>
<td>S7: Although he was turned down 1009 times, he did not give up.</td>
</tr>
<tr>
<td>Stating basis</td>
<td>T: He was turned down 1009 times but he went around. He was rejected 1009 times yet he continued trying. How many of you would try 1009 times?</td>
</tr>
<tr>
<td>Getting pupils to reflect</td>
<td>...</td>
</tr>
<tr>
<td>Stating view</td>
<td>T: What other values come from here?</td>
</tr>
<tr>
<td>Giving reason for view</td>
<td>S1: Patience</td>
</tr>
<tr>
<td>Summarising</td>
<td>T: Why do you say patience? Where do you get patience?</td>
</tr>
<tr>
<td>Stating view</td>
<td>S1: He was patient because he worked many jobs but he never gave up.</td>
</tr>
<tr>
<td>Elaborating</td>
<td>S8: Courage</td>
</tr>
<tr>
<td>Wrapping it up</td>
<td>T: Courage to continue</td>
</tr>
<tr>
<td></td>
<td>S9: Confidence</td>
</tr>
<tr>
<td></td>
<td>T: Confidence to persevere... the story teaches you... he had a very strong personality... he had the determination but with the determination alone, success is not guaranteed. He needed patience because he tried over and over again... patience to wait for the success... Being patient alone and determined is not going to help you. He had the courage – that every time he failed, he had the courage to try again.</td>
</tr>
</tbody>
</table>

Through the class discussion on values, Sam helped the pupils to discover what the author was trying to communicate in the article. He adds:
They (pupils) need to understand in this day and age, you need to have a plethora of values to succeed not just one critical value although that critical value will pull you through because it brings along all the other values.

Although the pupils in his Foundation Class were extremely weak in comprehension skills, Sam persevered at teaching them to read beyond the text in order to decipher what the author is trying to communicate. Through the use of the strategies described above, Sam hopes that his pupils will be able to critically evaluate any situation, think through the process and outcomes, come to a conclusion and make the correct decision.

Sam notes that with social media, as the public space increases, the private space seems to be very much restricted to the home. He observes that pupils are very free on the public domain, revealing themselves and uploading photos of themselves on Instagram, Facebook and Twitter. Hence, he is convinced of the need to teach pupils to think critically about how they should operate in the public space and the private space. He adds that before making the decision to post a comment or upload a photo, pupils need to critically evaluate and ask themselves the following questions:

Am I making the critical decision that this is the right thing to do? Or am I stirring up something that may be wrong? Do I go on the private space and tell this person directly that this is wrong? Or do I go on a public space?

Sam shared the following anecdote to illustrate how he critically evaluated an incident he encountered:

I was 200m away and this lady and her husband were having an argument. There was a small baby in the pram and the lady used the pram to hit her husband. You can see the baby move. And then they argued and she used the pram to hit him again. At the moment, a lot of thoughts are running through. Do I run and interrupt? Do I make the decision to go and confront them? Do I wait and watch? Do I take out my phone and take a video? Youngsters must know that at that particular juncture, they need to evaluate the situation…if I had interfered at any moment, the man was just waiting to blow up. He just needed another man to go and confront him. You can’t move in that situation that fast. So that is critical thinking. It is not about reading and interpreting a text. It is bringing all that skills that you have learnt into that particular situation and making a decision at that moment. But I moved close enough in case the child was in danger. And then another lady came in and interfered. Now, a lady interfering is a different thing. The man will not throw a punch at the lady.
Sam believes that if pupils are able to critically evaluate their actions and decisions by thinking about what is right and what is wrong and by comparing the practice which they have been taught, with what is being said, they will not be easily radicalised by what is presented on websites. To Sam, the ultimate purpose of teaching critical thinking is to help pupils “make correct decisions”. He states that unless pupils are taught to critically evaluate situations in class and ask questions about what is right and what is wrong, there is little likelihood that they would critically evaluate issues they are confronted with on social media, which they are constantly exposed to.

**Concerns Related to the Infusion of Critical Thinking**

**Being constrained by language competency of pupils.** One of Sam’s concerns about the infusion of critical thinking was the profile of the class, in particular the class that was observed in 2014, in which half the class were pupils with special needs who had difficulty comprehending what they read. He shared that the level of infusion of critical thinking and the way questioning had to done in this particular class was “very different” from what he had experienced in the past few years when he was teaching the weaker pupils in the Foundation classes:

Half the learners are actually struggling with language and how do you then teach them that they are supposed to question this way and these are the questions they have to ask when they are looking at the text? That’s the bigger challenge when they do not understand the text itself. Going through videos is very simple...we can critically look at the video and play back and look at it and question ourselves – that can be an option for these particular kids for post examination but when you’re struggling with the syllabus and you’re supposed to teach comprehension and that’s when the main delivery of daily lesson is. You can’t take critical thinking and say, “Today we are going to do critical thinking and therefore, we’re going to do this particular lesson and we’ll do it once a month.” It doesn’t happen that way. How do you infuse it into your daily comprehension - that was the struggle which I faced this year as compared to previous years.

**Being constrained by time.** Another concern that Sam has is that of time. He is of the view that it takes a lot of preparation time to customize the lesson and find the relevant media. Teachers need to think through what they want to achieve in terms of critical thinking and values as well as how the resources are going to help them achieve these objectives. He elaborates:
So how do you prioritize what you want to do and how do you do it? It is very easy to deliver in silos; comprehension we do comprehension, composition, we do composition. How do you bridge all that so children do listening comprehension, composition and grammar, linked in such a manner that you arrive at the end of the week or in a fortnight that this is the skill you want to teach the pupils. What is the critical thinking skill or value that you want to arrive at? You must be clear about that. If not, it is going to become like silos all over the place.

**Lack of whole-school approach to developing teachers in critical thinking skills.** Sam’s third concern is that different schools are interpreting critical thinking and what it means in different ways. Hence, what is delivered to pupils depends on the individual teacher’s interpretation of what critical thinking is. In other words, “schools are relying on the individual capacity of teachers rather than a process” as few teachers have gone for training on critical thinking and few are experts in this area. He adds:

As long as it is not a process oriented decision or move, it will always remain at a very low level, dependent on the teacher’s ability to deliver. But if it becomes a process, meaning the whole school is adopting this method, the department heads, the teachers all speak the same language, you would have hit the nail on the head.

He thinks that it is not feasible to get all primary school teachers to go for a course on critical thinking. Hence, he suggests that MOE train several teachers from each school in Critical Thinking and get these teachers who are ‘experts’ in teaching critical thinking to “translate” what critical thinking means to their colleagues instead of leaving it open to teachers’ interpretations.
Kathy

Kathy’s Background

Kathy is a married female in her late 40s with a Master of Education (Primary) degree. She has been teaching for 27 years including 7 years as a Senior Teacher (English), her current designation. Kathy has been teaching Upper Primary (Primary 5 & 6) pupils English Language (Standard) for the last 27 years in a neighbourhood government coeducational school. She has attended 24 hours of workshops related to Philosophy for Children organised by the Singapore Teachers’ Union. Her class has 42 High Progress (HP) pupils of which 75% are from English speaking homes.

Conceptual Understanding of Critical Thinking

Definition and value of critical thinking. Kathy views critical reading as reading beyond the surface level. She defines critical reading as “in-depth reading, understanding the text and understanding the message the author is trying to put across”. In-depth reading includes “evaluating the characters, the language that is being used, and the scenes” as well as making comparisons from the text to themselves or people around them. Kathy sees critical thinking as “a purposeful organised mental process that we use to understand the world and make informed decisions. It involves asking questions to come up with potential solutions to different problems”.

To Kathy, critical reading and critical thinking are intricately related as the reader needs to “engage in thinking in order to do critical reading”. She states that “thinking is inevitable” when reading in-depth because one has to think about “what is the message that is being relayed, why are the characters as such, why are the scenes painted as such, why is the language as such and why are the figures of speech being used as such”.

Kathy believes that it is important for pupils to think critically and this conviction was developed as a result of time spent doing research and reading journals on critical thinking. She infuses critically thinking about twice a week during English Language lessons especially during comprehension and composition lessons. She observes that pupils who do not think critically encounter difficulty with inferential questions in comprehension:

Students nowadays take everything at face value and do not question the facts or questions posed to them. They do this because they lack logical reasoning. At exam levels, pupils are often confronted with inferential questions and if they do not read the given questions or texts critically, answering these inferential questions would be a challenge to them.
The comment Kathy made that students take everything at face value and do not question the facts posed to them reflects her personal opinion based on her interaction with her students. This may not be representative of all students in the primary schools in Singapore.

By reading text critically, pupils are able to evaluate the composition pieces written by their peers:

This is what I do with my class - I give them a composition piece that was written very well and given high marks. Because they read it critically, my pupils are able to tell what’s missing and how it can be improved. In that way they are also improving in their writing.

In addition, Kathy adds that critical thinking is invaluable during group work,

By thinking critically and applying this thinking in group work, pupils would be able to see both sides of an issue, be open to new evidence that disconfirms their ideas, reason out their perspectives and understand that their perception is not always the accepted one.

Practising critical thinking school wide. To Kathy, “a culture of thinking” in the school is only possible if school leaders and all teachers in the school are thinking critically, as a way of life, not just during teaching and learning:

As a whole body – students, teachers, leaders – we all have to think, think not only of what we are going to be teaching, what we are going to be learning or how you’re going to be running the school, but more in-depth thinking about every issue, even when you go to the supermarket, what you are buying, what’s the content, it’s all in-depth thinking.

Being a reflective thinker. Kathy believes that “what we are is what we teach in the class”. Hence, if one is a reflective learner and a critical thinker, that would be eventually imparted to the pupils. She views reflecting deeply as the process which results in her growth as a critical thinker. She shares how she reflects as a trainee teacher:

When I was told to reflect on my lesson way back as a student-teacher, I did it in a very shallow manner. It was just focusing on what happened from time-to time, what the lesson was about, the process of the lesson, and then what the reactions of the children were. But I did not evaluate what the responses of the children towards my lesson were...Did they evaluate how I was teaching?

She has since made much progress in reflective thinking,

So now as I mature as a teacher, I have become a very reflective thinker. I reflect not just on the process: I reflect on … did my children understand what I have
taught; their questions and their answers. I actually reflected on the questions and the answers that they gave me. The questions that they asked me… What did it tell me about my lessons? Their answers may not be what I wanted but what did it tell me about my lesson, of how I was delivering it? You’ve got to really be at that level where you can actually evaluate and go in-depth into what your lesson is about.

Kathy maintains that Lesson Study supports teacher reflection as the teachers observing the lesson are able to see how the students are responding to the teacher’s lessons. These teachers provide useful feedback to the teacher when they share their observations. In line with this, it was noted that the two lessons that I observed were in the context of Lesson Study carried out by Kathy in her school.

**Working for transfer of learning.** Kathy’s conceptualisation of developing critical thinking includes creating a mindset in children that learning could be transferred or applied to other subject areas and in life. Pupils need to learn to evaluate what people tell them instead of just accepting that as truth:

Like for instance, the scenario of a friend asking you for money to buy cigarettes (in Observation Lesson 1). It teaches them that you cannot just give him the money, you have to evaluate... By giving money, what are you promoting? How would you help your friend by giving money or not giving money?

She observed that her pupils were able to transfer what they had learnt about critical thinking in the classroom to their Community Involvement Programme (CIP). The pupils’ reflections at the end of the CIP showed that they understood why they were collecting newspapers and they did not question why they should do it. They were able to explain that the purpose of collecting the newspapers was to save the environment and raise funds for the elderly.

In the second P4C observation, Kathy used an optical illusion graphic as a trigger activity and the class noticed that what some students saw in the picture was different from the others. The discussion led to the idea that people see things from different perspectives. When Kathy asked the pupils how they could relate the idea of seeing things from different perspectives to their classroom learning, they were able to connect the idea with comprehension, composition and oral picture discussion as seen in Table 30.
<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asking for purpose Seeing beyond the surface</td>
<td>T: What do you think the purpose of the exercise was? S5: Not see things at surface level... T: Not see things at a surface level. Ok, like many of you have said. So you all understand that you cannot see things at the same level. You have to see things from a different perspective. Bring that to your learning, how would you do that? You understand that you have to see things from a different perspective, you all see things differently. Some of you saw things which I didn’t see and you made me see that. How would you take this exercise to the classroom? In your own for learning?</td>
</tr>
<tr>
<td>Making Connections to classroom</td>
<td>S6: Comprehension. T: How?</td>
</tr>
<tr>
<td>Making Connections to comprehension</td>
<td>S6: Read... we have to understand the passage, by reading it between the lines T: Ok, S6 had said that for comprehension, when we do comprehension we cannot just read on the surface we have to read between the lines and understand the author's or the writer's intentions. Yes, S7.</td>
</tr>
<tr>
<td>Reading between the lines</td>
<td></td>
</tr>
<tr>
<td>Reading beyond the surface/ Understanding author’s intentions</td>
<td>S7: For composition T: How would it be for composition? S7, louder please. S7: Because, uh, like... I don’t know how to explain lah. T: Just try. S7: Because for example you are given a situation to write, uh continuous writing, then many people have... like different thinking of how to continue the story. So it can help us to see many ways are there to write the continuous story.</td>
</tr>
<tr>
<td>Having different ways to write a story</td>
<td></td>
</tr>
<tr>
<td>Having different interpretations</td>
<td>T: Ok, so you understand what S7 is trying to say. When you are given a situation, the interpretation differs. You cannot say that we all have the same interpretation. Any other? Anyone else?</td>
</tr>
<tr>
<td>Making Connections to oral picture discussion Using critical thinking to interpret picture</td>
<td>S8: Picture discussion. T: Picture discussion, very good. How? S8: You can use your critical thinking to elaborate what you see about the picture.</td>
</tr>
</tbody>
</table>
As the class discussion went on, it was noted in Table 31 that the pupils were able to make connections from the idea of seeing things from different perspectives to Mathematics and Science as well.

Table 31

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 2 (P4C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Making Connections to mathematics</strong></td>
<td></td>
</tr>
<tr>
<td>Using different methods for Math</td>
<td>T: All clear, any others? I saw hands, yes?</td>
</tr>
<tr>
<td>Seeing problem sum from different perspectives</td>
<td>S9: Um like in math, look at the problem...like use a different method.</td>
</tr>
<tr>
<td><strong>Making Connections to Science</strong></td>
<td></td>
</tr>
<tr>
<td>Using different concepts in Science</td>
<td>T: You heard S9? Using a different method. Seeing the problem sum from a different perspective and using a different method to work at it. Fantastic, S10.</td>
</tr>
<tr>
<td>Thinking beyond the surface</td>
<td>S10: Science also.</td>
</tr>
<tr>
<td>Thinking deeper</td>
<td>T: Science, how?</td>
</tr>
<tr>
<td></td>
<td>S10: You first try the concept and it does not work for the question, then you think of another concept to use.</td>
</tr>
<tr>
<td></td>
<td>T: Right, fantastic. So you cannot run away from critical thinking, can you? You cannot. But it's very easy to look at things on the surface, isn't it? It's very easy to look at things on the surface. But to go deep in you need to open up your mind.</td>
</tr>
</tbody>
</table>

Although she has yet to see how the pupils are making transfers in the application to real life, the discussions shown above revealed that Kathy’s pupils have developed an awareness that critical thinking skills are applicable not just in English Language but also in Mathematics and Science.

**Strategies to Teach Critical Thinking**

**Infusing critical thinking through literature.** Kathy uses literature to promote critical thinking. She started by introducing short stories to her pupils in Primary 5:

The short stories they have been doing are related to understanding the value of friendship, respecting others, accepting differences...They don't just read the story on the surface and just say the friend is like that and the friend is such but they are able to realise that the friend is being accepted because everyone is special. We all have our differences and they understand that.

When these pupils moved on to Primary 6, she got them to read the literature book, *Sing to the Dawn* written by Minfong Ho. The pupils had to evaluate the text to decipher the
message put forward by the author and make comparisons of issues from the book to their current lifestyle.

**Socratic questioning.** Kathy believes that Socratic questioning promotes thinking as the questions asked often lead to other questions depending on the responses of the children. Through Socratic questioning, Kathy involves the pupils in metacognition where they think further about their own thinking including how they think and why they think in such a manner. By questioning the questions raised by pupils, Kathy observes that they begin to question their own thinking:

I have actually kind of influenced the kids to start questioning their friend’s questions as well. Also, when they get the comprehension text with the ten questions, they question those questions. They ask, “Why is this question asked like this? What is the question asking?”

A scan of her pupils’ comprehension worksheets revealed that text annotation was mainly highlighting text and the occasional writing of alternative meanings for selected vocabulary in the text. However, the comprehension questions were frequently annotated using the 5Ws1H by indicating if the question is asking for a reason (Why); asking for something (What); asking for a place (Where); asking for time (When); asking for a person (Who); asking for a method/way (How). The paragraph from which the answer may be found is also indicated on the left hand margin next to the question. The tense and the type of question such as reference questions are also annotated as shown in Figure 15.
Involving children in P4C Community of Inquiry (COI). During P4C lessons, Kathy gets her pupils to work in groups, with each group forming a community of inquiry. Kathy defines a community of inquiry as “a group of people used to thinking together”. As explained by Kathy, COI is used as a platform to develop skills of collaboration, critical and creative thinking skills as well as the values of care and respect:
When they work together in groups, they are able to tap on one another’s ideas with a view to increase their understanding and appreciation of the world around them and each other. I may not see what a friend sees, so I tap on that knowledge and build new knowledge. By working together, you actually develop one another and the knowledge grows. That’s the value of working in a team.

Kathy adds that by working in groups, pupils learn to articulate their views and listen to the perspectives of their peers:

When they (pupils) speak, they have to first think about what they’re going to say. They cannot just say whatever they want to say. They have to really think about their thought processes first before they articulate it. They also have to listen to what their friends have to say and not be judgmental about it. They have to think about what their friend is trying to say.

During the two observations when P4C lessons were carried out by Kathy, a demonstration of a COI by pupils was crafted into the lesson to ensure that all the pupils know how to carry out their group discussions. Table 32 shows a segment of the discussion during the COI demonstration.
Following the demonstration, Kathy states the following ground rules for COI:

- Only one person speaks at a time
- Pay attention to the person who’s speaking
- Give your friends a chance to speak
- Wait for your turn
- Respect your friends’ ideas - politely say you disagree or beg to differ; don’t judge or put down your friends
The pupils were given some time to read an excerpt of the text from the book *Weslandia* by Paul Fleischman before getting into their discussion groups to discuss the questions assigned to their groups. As there were five sets of questions and ten groups, each set of questions were assigned to two groups. Table 33 shows a segment of the discussion transcript of one of the groups.

Table 33

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (P4C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asking for views</td>
<td>GL: Why do people torment others?</td>
</tr>
<tr>
<td>Stating a view</td>
<td>S1: I think people torment others because they think the victims (they torment) are smaller than them and are easy prey.</td>
</tr>
<tr>
<td>Sharing different perspective</td>
<td>S2: I think they like to torment others because it makes them happy.</td>
</tr>
<tr>
<td>Building on perspective</td>
<td>S3: I think they torment others because they are jealous of their victims doing better than them and they want to see the victims being afraid of them so they feel better.</td>
</tr>
<tr>
<td>Agreeing with view</td>
<td>S4: I agree with both of them because some tormentors are outcasts and making others outcasts makes them feel better.</td>
</tr>
<tr>
<td>Sharing a different perspective</td>
<td>S1: I think they torment others because they themselves have been tormented and they want to take the anger out on others.</td>
</tr>
<tr>
<td>Stating questions</td>
<td>GL: Anything else? Do you think it's right to torment others because they are different? Why?</td>
</tr>
<tr>
<td>Sharing opinion and giving reason for view</td>
<td>S1: I don't think it's right to torment others because everyone in this world is different. They have different personalities. Sometimes they may be weaker in some things like Math but they are stronger in sports.</td>
</tr>
<tr>
<td>Building on idea shared</td>
<td>S2: I think it's not right because everybody is special. Everybody has things they're good at and things they're weak in. They should not torment others just because they are different.</td>
</tr>
<tr>
<td>Agreeing with view</td>
<td>S3: I agree with both of them as... because like playing a card game, our cards are definitely going to be different. Each of them is unique. So each of us is like one of the cards-unique and different.</td>
</tr>
<tr>
<td>Supporting view with illustration</td>
<td>S4: I think it's not right to torment others- as... because... like if you're weak in this subject and the other guy is strong in it, you may need his help. If you torment him, he won't help you</td>
</tr>
</tbody>
</table>

GL: Group Leader

The pupils were observed to be fully engaged in the group discussions. Within their groups, the pupils listened to one another without interrupting and heard the different perspectives of their friends. They worked well together and respected their friends' views. They actively took turns to share their views and whether they agreed or disagreed with their friend's view. Kathy felt that the pupils were able to share their views freely as a non-
judgmental class culture had already been established over time. The pupils were able to abide by the ground rules and the leader made sure that every single one contributed their ideas. Evidence of critical thinking was seen as pupils verbalised their thoughts and supported their views with reasons.

After the small group discussion, the pupils in the class were seated in a big circle and Kathy invited each group to read out their discussion questions and share their collated group responses. Table 34 shows an excerpt of the transcript of the sharing by the two groups which were assigned the same set of questions:
<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Excerpt of Transcript from Observation 1 (P4C)</th>
</tr>
</thead>
</table>
| Stating question                      | **T:** Question 4: Must you be the same as your friend in terms of interest, personality, character etc? Why?  
**S5:** Our answer is yes because if we do not change, we'll be left out e.g., John likes to play soccer and another boy likes to play soccer, he would play with this boy instead of someone with a different hobby. |
| Sharing perspective supported by reason | **S1:** Our answer is no because everyone is special. We do not need to be the same as others.  
**T:** What about the rest?  
**S2:** I agree with S1 because we have our unique characteristics and in the future, there will be someone with similar characteristics as us so we'll not be left out.  
**S3:** I agree with S2 because we have our own likes and dislikes and we should just be ourselves because if we are all the same, our lives will be very boring.  
**S4:** I agree with all 3 of them because if we change our interest, characteristics etc, we may feel uncomfortable. We won't feel like ourselves and will face even more problems. |
| Sharing a different view               | **S5:** If Boy A.....  
Class laughter  
**T:** Why are you laughing? Let him speak.  
**C1:** Sorry S5 |
| Agreeing and building on idea          | **S5:** Boy A likes to play chess but all the others like to play basketball. When we have group discussion, no one will play with him because everyone thinks he's different.  
**T:** What will you do? |
| Sharing different facets of the same perspective | **S5:** I'll have no choice but change because no one will play with me.  
**T:** If you're the boy who plays chess, do you think you have to change for their sake? |
| Attempting to clarify view             | **S5:** Ya. Because if I don't change, life will be more boring because no one plays with me.  
**T:** What about the rest? Do you have anything to say? |
| Developing intellectual courage by speaking up for what he believes by illustrating view | **S6:** S5 is actually right but he's a little wrong at the same time. Maybe he could adapt and see if he enjoys basketball but if he doesn't, he should not force himself to do so. |
| Sticking by view                       | **S6:** Maybe he could introduce chess to them and see if they like it. They might like it but if they don't, maybe he can go outside and find other friends. |
| Sticking by his opinion                |                                                                                                                                                                                                                                |
| Being more open-minded                 |                                                                                                                                                                                                                                |
| Making a compromise on the view shared |                                                                                                                                                                                                                                |
The two groups assigned Question 4 (stated in Table 34) had opposing views. It is interesting to note that Student 5 demonstrated intellectual courage by standing up for his view after three of his classmates disagreed with his view. He attempted to clarify his view and was not deterred by the class laughter. He supported his view with an illustration which pupils could relate to and he stuck by his opinion. Towards the end of the transcript in Table 34, it was observed that Student 6 responded to the opposing views by coming up with a compromise of both views and he even provided a suggestion of an alternative solution.

When the pupils read the text, they developed their individual perspective of the text. However when they got involved in group discussions related to the text during a COI, they had the opportunity to listen to the views of all their friends and they began to see the text from different perspectives. The two class observations of the P4C lessons showed that Kathy’s pupils were able to give meaningful responses and substantiate their views with reasons and illustrations. Their deep and thoughtful responses given during the discussions showed that her pupils were thinking beyond the surface level.

After the P4C lesson, Kathy’s pupils were given the task of writing their personal reflections on what they learnt through participating in a community of inquiry (COI). A sample of the reflections showing a pupil’s awareness of the value of collaborative group work is shown in Figure 16.
Through the use of the strategies described above, Kathy hopes to see the following outcomes:

With critical thinking, the children will read the text in-depth as they have been taught to do annotation and in-depth thinking. Then they will reason/ investigate/interrogate issues given to them. They will consciously think about their thinking process and question their own thinking. They will be able to understand the importance of logical reasoning, be receptive to others’ perspectives, not be judgmental, and provide reasons for their own perspective i.e. Why is it that they have given such an answer? Or why do they say that the other person is being judgmental? They would not take anything at its face value because when they do that, they tend to give shallow answers.

Concerns Related to the Infusion of Critical Thinking

**Being constrained by time.** To Kathy, time is a major factor related to the infusion of critical thinking. She opines that with four examinations a year, the bulk of the curriculum time is spent preparing pupils for examinations. Hence, she is of the view that
more time could be spent developing pupils as critical thinkers if the education system was less exam-oriented:

If I were to take the time to teach critical thinking because critical thinking can’t be done in a one-off lesson. One comprehension text can take me two days and that would mean I have lesser time to do other things. If I devote all my English periods to just visiting the text and then evaluating it ... getting the pupils to understand, that would take up time and that would mean that I cannot complete all the worksheets that I’m supposed to do. And probably it is not to be questioned why is it that I’m not able to complete all my worksheets but rather to understand that my children have produced quality work because the critical thinking has actually helped them evaluate every text that they read.

Besides the curriculum time needed to teach critical thinking, time is also needed for teaching preparations including, sourcing for suitable text and planning the questions to be asked after having found the right text:

Not every text will lead you to do critical thinking. I’ve had some slight problems with expository text. I mean expository texts are a bit difficult because it’s factual but when they do endangered species, they can talk about how they can actually help to save certain animals and what they can do.

**Lacking feedback on teaching of critical thinking.** The lack of feedback on how critical thinking is taught is another area of concern for Kathy:

Knowing if I’m doing it the right way (is a concern) because there’s nobody to evaluate me... So whatever I teach the students, they accept it as they can’t evaluate me either.

Kathy would like to have teachers who are skilled in teaching critical thinking audit her lessons and provide feedback on the way she infuses critical thinking across the English Language curriculum.

**Conclusion**

This chapter presents the other three remaining case studies that were put together because of some common strategies among the three teachers. Focusing on the 5Ws and 1 H (What, Who, When, Why, Where and How) questions is common among all the three teachers while Socratic Questioning and Philosophy for Children are strategies common to two of the three teachers. As in Chapter 4, the three participants define critical thinking differently but saw sound decision-making as the eventual purpose of critical thinking. In addition to an assortment of strategies to infuse critical thinking in the context of real world experiences, they also made use of diverse tools such as current affairs,
videos, stories, literature, scenarios, visual aids and See-Think-Wonder to stimulate thinking. Their passion for and commitment to teaching critical thinking is demonstrated through their pursuit of professional development related to critical thinking and the way they apply critical thinking in the daily decisions they make. Teachers can only develop a passion for and a commitment to teaching critical thinking when they truly believe in the value of critical thinking.

The next chapter presents the synthesis and discussion of the research findings across all six cases.
CHAPTER 6: CROSS CASE SYNTHESIS

Introduction

This chapter presents the synthesis and discussion of research findings across the six cases. The findings of the first three cases were detailed in Chapter 4 and the findings of the other three cases were presented in Chapter 5. The central research questions in these two chapters were addressed according to the participants’ conceptual understanding of critical thinking, their strategies to teach critical thinking and their concerns related to the infusion of critical thinking. These findings are consolidated in Chapter 6.

In this chapter, the participants’ definitions of critical reading and critical thinking as well as the relationship between them were consolidated. Next, using the constant comparative method of analysis (Strauss, 1987), the themes common to all cases were identified in the cross-case analysis. Seven common themes associated with the conceptual understanding of the participants and their strategies to infuse critical thinking across the English Language curriculum were identified. These themes which remained salient across teacher practices in the classrooms were derived from inductive analyses of the interviews, data obtained from documents and observational data across all cases. Four themes depicting perspectives pertinent to half the participants with regards to the infusion of critical thinking across the English Language curriculum were then described followed by a consolidation of the teachers’ concerns regarding the infusion of critical thinking.

Participants’ Conceptual Understanding of Critical Thinking

A summary of the participants’ conceptual understanding of critical thinking shown in Table 35 is used in the discussion that follows.
<table>
<thead>
<tr>
<th>Table 35</th>
<th>Analysis of Participants’ Conceptual Understanding of Critical Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition of Critical Reading</strong></td>
<td>Melissa</td>
</tr>
<tr>
<td>Reading with deep understanding of author's intended purpose and the evaluation of the author's message.</td>
<td>Thinking beyond the text to understanding implications and consequences as well as points of view</td>
</tr>
<tr>
<td><strong>Definition of Critical Thinking</strong></td>
<td>Ability to think clearly with depth</td>
</tr>
<tr>
<td><strong>Developing Thinking Dispositions</strong></td>
<td>Being open-minded</td>
</tr>
<tr>
<td>Exposure to from multiple perspectives of an issue</td>
<td>Viewing text from different perspectives</td>
</tr>
<tr>
<td>Developing intellectual courage through debates</td>
<td>Developing moral courage through becoming independent, confident decision-makers</td>
</tr>
<tr>
<td><strong>Purpose of thinking</strong></td>
<td>Generate sound opinions and use problem-solving approach to make decisions</td>
</tr>
</tbody>
</table>
Relationship between Critical Reading and Critical Thinking

In line with the definition of critical reading in the literature review (see p. 34-36) and the intended curriculum in the MOE English Language Syllabus (p.3), all six participants unanimously agreed that critical reading goes beyond surface reading to reading with deep understanding in order to decipher the author’s intended purpose and message. To this definition, Yancy tags understanding implications, consequences and perspectives while Sam adds making conclusions about the text read. Melissa and Kathy include evaluating the message, characters, language and scenes. Betty focuses on questioning whether the written text is true or verifiable with data while Nancy includes the ability to construct similar texts for similar purposes as a consequence of understanding the author’s intended purpose.

With reference to the literature review in Chapter 2, four of the participants included aspects which are commonly accepted by most researchers as comprising critical thinking (p.34) namely decision-making, problem-solving and cognitive skills of analysis and interpretation in their definition of critical thinking. The other two participants focused on thinking clearly with depth and the creation of new ideas in their definition of critical thinking.

All participants see critical reading and critical thinking as intricately related. Betty, Nancy and Sam believe that critical reading comes before critical thinking. Nancy adds that critical reading results in or reinforces critical thinking as the input for thinking comes from the reading material. Sam argues that one cannot think critically without critical reading but one can be reading critically without thinking critically.

Yancy and Kathy, on the other hand, believe that one has to engage in thinking before one can do critical reading as thinking is needed to understand the author’s intended message. Only Melissa sees both critical reading and critical thinking as synonymous (as suggested on p. 34-36) as both involve challenging assumptions instead of taking things at face value, striving for deep understanding and making evaluations.

It is noted that the participants do not see critical thinking as just a class-based or text-based activity related to critical reading. Rather, all participants unanimously view critical thinking as being demonstrated most strongly when students are asked to consider the applications or implications of critical thinking to real life problem-solving and decision-making. This is in tandem with their ultimate purpose of teaching critical thinking: to empower students to decipher information and make well-informed decisions in a globalised world with people of different cultures and social backgrounds.
Common Themes Related to the Infusion of Critical Thinking

The following seven common themes emerged from the perspectives of the six participants on the infusion of critical thinking across the English Language curriculum:

**Theme 1: Being Committed to Teaching Critical Thinking** (see Appendix F)

The participants’ positive and stable teacher identity is closely related to their commitment to teaching critical thinking (Day & Gu, 2007) which is demonstrated through their beliefs, convictions and desired outcomes for pupils:

**Teacher beliefs.** All six participants are passionate about infusing critical thinking across the English curriculum as they believe in the value of critical thinking. Teacher identity and agency are essential in their motivation and commitment to teaching critical thinking (see p. 23). To Nancy, Sam and Yancy, teaching English Language is more than just teaching communication skills encompassing the ability to speak, write, listen and comprehend well. They believe that languages (not just English but also Mother Tongue) are vehicles to teach critical thinking. To Nancy, language is the medium for thinking. She elaborates:

I think all languages, whether we are conducting reading, listening, speaking, writing or viewing, opens the door for this exchange of thinking, of ideas, of views, of opinions, of perspectives, of imagination, creating design and construction.

Sam believes that language “transcends all the other subjects” as it lends itself to the teaching of critical thinking. The reason for this is that language lessons encompass teaching pupils to decipher information and critically appraise the facts presented to them. Yancy adds that languages and humanities are useful as they provide the media for teaching pupils to make applications “in moral and ethical situations”.

Yancy manages the curriculum to promote his personal commitment which is geared towards developing opportunities for his pupils to become wise and discretionary decision makers. To Nancy, learning is thinking and thinking gives purpose to reading, listening, speaking and writing. As having a strong belief in the value of thinking is part of her professional identity (see p. 21), Nancy is not content to just teach for knowledge gain. Hence, she takes the time to help pupils make connections of whatever they are learning to their decision making.

Sam integrates his personal belief about the value of critical thinking into the curriculum. He believes that a teacher who is competent and passionate about infusing critical thinking would take every opportunity to infuse critical thinking across the

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3 Singapore adopted the bilingual policy in 1966. Bilingualism is an integral part of the education system. While English is the medium of instruction in schools, students also learn their Mother Tongues comprising Mandarin, Malay, Tamil or Non-Tamil Indian Languages.
curriculum. His view is that pupils who are able to critically evaluate their actions and decisions will not be easily radicalised by what is presented on websites. He reminds pupils to evaluate situations critically in class by asking questions about what is right and what is wrong. With his belief in the transfer of learning from school to real life, he hopes students would critically evaluate issues they are confronted with on the social media.

All participants use a variety of strategies to infuse critical thinking despite the constraints faced. However, they vary in the degree and frequency in which they infuse critical thinking. Yancy and Sam seek to infuse critical thinking on a daily basis. Kathy infuses critical thinking about twice a week during English Language lessons especially during comprehension and composition lessons. By thinking critically, she believes that pupils will be able to answer inferential questions in comprehension as well as evaluate composition pieces written by their peers. Nancy infuses critical thinking on a fortnightly basis. Melissa and Betty are opportunistic in their approach to the infusion of critical thinking. They seek to infuse critical thinking whenever the opportunity arises and whenever the passage lends itself to critical thinking. They see a positive correlation between critical thinking and reading comprehension. In addition, Melissa views critical thinking as essential in the expression of opinions during writing. By applying critical thinking within the intended curriculum, the six participants conform to the demands of their professional identity (see p. 18).

**Development of convictions on the value of critical thinking.** As shown in Figure 17, the development of the participants’ conviction on the value of teaching critical thinking, which contributes to their professional identity, was influenced by three main factors: personal experiences, interactions with people and continual learning through reading, research and courses related to critical thinking.
It was noted from the figure above that Yancy was influenced by all three factors; Betty and Sam were both influenced by continual learning and interaction with people. The rest were influenced by one of the factors namely personal experiences for Melissa and continual learning for both Kathy and Nancy.

Teacher professional development enhances the knowledge base and professional identity (see p.25) of the participants and promotes their commitment and self-efficacy (Day & Gu, 2007) in the infusion of critical thinking. Five of the six participants developed their professional commitment to the teaching of critical thinking as a result of continual learning. For Betty and Kathy, the conviction on the value of critical thinking developed through a personal drive for further learning by reading literature and researching on critical thinking. Nancy developed her conviction through formal learning as she was exposed to Inquiry Learning in the University of Melbourne, Australia, where she did her Bachelor in Education. This was followed by a personal pursuit of continual learning through Professional Development Learning (PDL) involving a 3-month postgraduate course on “Educating for Thinking”. Yancy’s conviction resulted from doing psychology in
the university, and professional development on thinking skills for three years (on the job) in the Gifted Education Programme.

Three of the participants developed their conviction on the value of critical thinking through interacting with people. Yancy was influenced by the conversations he had with peers and lecturers; Betty, in her interactions with people both locally and overseas, observed that people who think critically were able to develop their arguments reasonably as opposed to those who were narrow in their thinking; Sam, on the other hand, noted through his interactions with many younger teachers aged 30-40, that their linear thinking hindered them from thinking on their feet. Both Melissa and Yancy’s convictions on the value of critical thinking were influenced by their personal experiences as students and their professional work experiences.

**Desired outcomes for pupils.** Through the use of different strategies to infuse critical thinking across the English curriculum, all six participants would like their pupils to look at issues from different perspectives and to think about all possibilities before making a decision that is supported by reasons. They would also like to see their pupils develop open-mindedness and be receptive to others’ perspectives instead of being judgmental.

To Yancy, developing wise decision makers is the purpose for education. It includes pupils being aware of their actions, thoughts and behaviour. He explains:

> I want to teach my students to be wise decision makers who do the right things at the right time and say the right things to the right people. Basically, it’s about context, it’s about circumstances – to be able to make good and wise decisions as far as you can. It requires thinking but it doesn’t have to be so in-depth that it actually causes paralysis but empowering enough for the people to enact some change either in others or in themselves.

Sam concurs with Yancy and sees making the right decision as the outcome of teaching critical thinking. He elaborates:

> Critical thinking for the sake of it and producing people who are able to critically evaluate the situation, come to a conclusion, and do the wrong thing will be an issue for us, as teachers. I think critical thinking is about evaluating a situation, thinking through the processes and thinking through the outcomes. But the most important thing is making the correct decision.

Yancy hopes that his pupils will eventually become independent confident decision makers in all aspects of their lives whether in or out of the classroom. It also encompasses the development of moral courage to handle the consequences when wrong decisions are made. Yancy hopes that eventually, pupils will make decisions instinctively based not just
on their head but also their heart. Yancy brings his professional identity goals to the curriculum:

...at the end-point, they (the pupils) will do it so well that their decision making include not just the cognitive but also the affective. They make the decision and they live with those consequences without extra burden and guilt. That’s my ultimate goal.

When asked if his intention to develop decision makers with values entails starting with the cognitive and then the values, Yancy responded as follows:

If I have to pick 51-49, the 51% will be the values...When they start to delve deeper into issues as we start to discuss, they realise that you can never be devoid of any affective decisions, the implications and consequences because it’s not possible...There are limits because we are not created to be just logical and rational. What makes us human is the irrational part – the affective, the emotion that makes us more complete...So we show them these are skills but in terms of priority, between skills and your heart, the heart comes first...I also tell them about the heart, the head and the hands. Eventually, they’ll learn all 3 sets and they’ll find their own balance.

Participants’ approaches and strategies. A summary of the participants’ approaches and strategies for promoting critical thinking is shown in Table 36. When these approaches and strategies were benchmarked against an approach which focuses on the process of explicit teaching and assessing of critical thinking skills (see p. 42-44), it was noted that only Yancy explicitly taught his students the Elements of Thought and how they could use the Intellectual Standards to assess their thinking. Of the six participants, Yancy was the only one who actively assessed the thinking of his students to determine how well they were reasoning critically, using the Intellectual Standards (Paul & Elder, 2008).
Table 36
Summary of Participants’ Approaches and Strategies for Promoting Critical Thinking

<table>
<thead>
<tr>
<th>Approach / Strategy</th>
<th>Melissa</th>
<th>Yancy</th>
<th>Betty</th>
<th>Nancy</th>
<th>Sam</th>
<th>Kathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelling Thinking</td>
<td>Model thinking and decision making in real life</td>
<td>Role model or walk the talk by thinking critically as a lifestyle</td>
<td>Thinking aloud to help students process their thinking and justify their responses</td>
<td>Thinking aloud, listening to pupils’ thinking and allowing her thinking to be challenged by their views</td>
<td>Role modelling thinking to students and teachers, applying critical thinking as a way of life</td>
<td>Role modelling being a reflective and a critical thinker</td>
</tr>
<tr>
<td>Using tools to stimulate thinking</td>
<td>Text, Newspaper, Shared experiences</td>
<td>Text, Media—songs, videos</td>
<td>Text, Newspaper, Media-videos</td>
<td>Text, Current affairs, See-Think-Wonder</td>
<td>Text, Media-videos, Stories</td>
<td>Literature, Newspaper, Scenarios, Visual Aids</td>
</tr>
<tr>
<td>Using Collaborative Learning</td>
<td>Debates / Group discussions</td>
<td>Debates / Cooperative group work</td>
<td>Cooperative Learning</td>
<td>Collaborative inquiry / P4C discussions</td>
<td>Group discussions using media/ text</td>
<td>P4C Community of Inquiry</td>
</tr>
<tr>
<td>Infusing CT through real-world experiences</td>
<td>Thinking critically about controversial issues in real life</td>
<td>Applying critical thinking to making presentations for real audiences</td>
<td>Infusing critical thinking about issues within context of pupils’ experiences</td>
<td>Using current affairs and events in real life to promote thinking</td>
<td>Seizing opportunities to infuse critical thinking and relating it to real life</td>
<td>Infusing critical thinking using scenarios related to real life</td>
</tr>
<tr>
<td>Questioning &amp; other reading strategies</td>
<td>Socratic questioning and cognitive dissonance</td>
<td>Socratic questioning, Elements of thought and Intellectual Standards</td>
<td>Thought-provoking questions</td>
<td>Socratic questioning</td>
<td>Questioning Concept Thinking</td>
<td>Socratic questioning</td>
</tr>
<tr>
<td>Annotating questions and text</td>
<td>Annotating Text from different perspectives</td>
<td>Annotating Text</td>
<td>Getting pupils to ask 5Ws1H questions</td>
<td>Annotating questions with 5Ws1H</td>
<td>Annotating questions with 5Ws1H</td>
<td>Annotating questions with 5Ws1H</td>
</tr>
<tr>
<td>Using reflective critique</td>
<td>Using 3-2-1 questions for reflections</td>
<td>Using 3-2-1 questions for reflections</td>
<td>Getting students to reflect</td>
<td>Getting students to reflect</td>
<td>Getting students to reflect</td>
<td>Getting students to reflect</td>
</tr>
<tr>
<td>Illustrating text using Visualising</td>
<td>Visualising and Prediction</td>
<td>Mind-mapping</td>
<td>Parallel writing</td>
<td>Using words in context, take away words and drawing pictorially</td>
<td>Using words in context, take away words and drawing pictorially</td>
<td>Using words in context, take away words and drawing pictorially</td>
</tr>
<tr>
<td>Promoting transfer of learning</td>
<td>To other subjects and real life situations</td>
<td>To other subjects and real life situations</td>
<td>To other subjects and daily life</td>
<td>To other subjects and daily life</td>
<td>To all subjects, programmes and daily interactions</td>
<td>To other subjects and daily life</td>
</tr>
</tbody>
</table>

Table 36 is used in the discussion of the rest of the common themes related to the infusion of critical thinking in the pages which follow.
Theme 2: Making Thinking Visible

Modelling. All six participants echo Epstein (2008) in the belief that teachers themselves need to model critical thinking in order for children to become critical thinkers. Kathy demonstrates the integration of the personal and professional selves (see p. 19-20) when she states that, “What you are is what you teach in the class.” She adds that if one is a reflective learner and a critical thinker, one would eventually impart these qualities to one’s students.

Yancy stresses the difficulty of teaching thinking if one is not a thinker in the first place (see Appendix F). These teachers recognise that critical thinking occurs in the head and hence, to make thinking visible to their pupils, they need to think aloud with their pupils and share personal real-life examples of how they evaluate the pros and cons before making decisions, when confronted with issues. Like Sam, Yancy and Kathy believe that for thinking to be pervasive in the classroom, teachers need to think as way of life, not just when teaching in the classroom but in all aspects of their daily life. Besides modelling critical thinking to children, Yancy, Sam and Kathy also explicitly state that they take the effort to model critical thinking for teachers (in their departments) in their capacities as Heads of Department and Senior Teacher.

Using tools to stimulate thinking. All six participants make use of a variety of tools to engage pupils in authentic learning involving real life situations and promote critical thinking across the English language curriculum. These tools include current affairs and newspaper articles of interest to pupils, shared experiences, stories, visual aids, songs, videos, scenarios, selected texts and thinking routines like ‘See-Think-Wonder’. Ritchhart and Perkins (2008, p.1) use the term “thinking routines” to refer to these tools as they reveal pupils’ thinking by helping them “share what they think of a topic, identify questions they puzzle about, and target directions to explore”. Epstein (2008) adds that ‘wondering together’ with children is an effective strategy for promoting thinking in the classroom.

See-Think-Wonder activities are used mainly by Nancy (see Appendix F) to facilitate the thinking of her young charges as they are suitable for Primary 1 & 2 pupils. Nancy also encouraged her students to wonder by asking questions like “Why is this so? Why would this be so?” rather than just providing explanations. Very young children have the propensity to wonder if they are encouraged to do so. Teachers can encourage their young charges to wonder by paying attention to the questions children ask, even questions about the mundane.
Theme 3: Developing Thinking as a Social Endeavour

Organizing pupils in cooperative learning groups has a significant influence on pupil learning (Marzano, Pickering & Pollock, 2001). Ritchhart and Perkins (2008, p.23) state that individuals can “elicit thinking” through collaborative efforts that outweigh individual effort. In the cross-case analysis, it was observed that all six participants made use of cooperative or collaborative group work in the process of infusing critical thinking across the English Language curriculum, with some using it more extensively than others: Yancy uses cooperative group work with his class almost daily; Kathy uses it 2 to 3 times a week and the rest use cooperative group work about 2 to 3 times a month.

Participants in this study provided opportunities for pupils to work with different peers throughout the year and most groups observed were heterogeneous. Cooperative group discussions were carried out informally with the exception of the community of inquiry (COI) observed during Kathy’s P4C lessons. Kathy stated the five ground rules very explicitly each time before pupils started their group inquiry and she was the only teacher who organised the pupils in the class in a big circle for a big group discussion following the small group discussions.

Cooperative group work was used for comprehension lessons, project work, oral picture discussions, debates, collaborative inquiry using newspaper articles and even in incorporating fair testing principles to measure the durability of pupil design and construction.

The pupils were observed to be fully engaged in the group discussions. Within their groups, the pupils listened to one another without interrupting and heard the different perspectives of their peers. They worked well together and respected their friends’ views. They actively took turns to share their views and built on what was shared by their friends. Evidence of critical thinking was seen as pupils verbalised their thoughts and supported their views with reasons.

Co-operative learning fosters open-mindedness as it exposes students to multiple perspectives presented by their peers on the same issue (see p.40). Developing thoughtful responses to open-ended questions and contemplating the diverse responses of their peers enable students to integrate their classmates’ ideas with their own thoughts (Lampert, 2006). Cooperative group work provided a platform for pupils to exercise critical thinking during listening and speaking as they were given opportunities to articulate their views, listen to the perspectives of their peers and provide them with constructive feedback. By providing opportunities for pupils to interact with one another, the participants exposed pupils to multiple perspectives of the same issue and some had their
wrong assumptions corrected in the process. Some pupils also demonstrated intellectual courage by standing up for their views amidst opposing views raised by their peers. It was noteworthy that the collaborative discussion revealed debate as a powerful tool for the infusion of critical thinking as 22 out of the 35 dimensions of critical thought listed by Paul and Elder (2003c, p. 10-11) were coded from the hour and half discussion. The usefulness of debates in developing critical thinking is also endorsed by Yeh (1998) who states that it enables students to “identify an issue, consider different views, form and defend a viewpoint, and consider and respond to counterarguments” (p. 49).

**Theme 4: Focusing on Real World Issues**

Focusing on real issues makes it possible for pupils and teachers to experience the relevance and richness of studying reality (Brady, 2008). All six participants infuse critical thinking by focusing on real world issues (see p. 40) in their own unique ways. Yancy encouraged his pupils to think about how they could provide enough information to enable their real audience to make sense of the presentations they make, whether verbally or in written form. Betty deliberately selected comprehension passages with controversial issues within the context of the pupils’ experience such as shark-finning and responsible pet ownership so they could think critically about issues they could relate to. Melissa engaged pupils to think critically about controversial issues related to real life through the use of debates. Shim and Walczak (2012) noted an improvement in students’ critical thinking abilities when challenging questions were posed in class. Hence they argue that thought-provoking questions challenge students to look at issues from different perspectives. However, they add that the development of critical thinking requires teachers to “balance cognitive challenge with intellectual support” (p.24) through the explanation of abstract concepts.

Nancy used current affairs to promote critical thinking through authentic learning related to current national events and engaged pupils in authentic writing to real people. She also took the effort to constantly link what was taught in class to real life situations through questioning. Sam engaged pupils in critical evaluations of real life situations to help them make decisions in their daily life. He also made use of the story of Colonel Sanders to get pupils to think critically of values required for success in life. Kathy used real life scenarios to engage pupils in thinking about what they would do and to explain the reasons for their actions. Most of the participants capitalised on the use of controversial issues to get pupils to evaluate the pros and cons of each perspective before making a decision on their personal stance. David (2008, p.80) adds that real-world problems
captivate student interest and “provoke serious thinking as the students acquire and apply new knowledge in a problem-solving context”.

**Theme 5: Questioning and other Reading Strategies**

**Questioning.** The use of questioning to infuse critical thinking (see p.50) across the English curriculum was widely observed in all participants. Yancy, Melissa, Nancy and Kathy used Socratic questioning to determine what students know or think and provoked student thinking on different issues raised in class. Melissa, Nancy and Kathy developed the art of Socratic questioning through pursuing the individual approach to professional development, being driven by their personal motivation (Edge, 2002). Yancy, on the other hand, had on-the-job training in Socratic questioning as a GEP teacher. Through the use of Socratic questioning during class discussions, pupils began to look at issues from multiple perspectives. Socratic questioning promotes thinking as the questions asked often lead to other questions depending on the responses of the children. Through Socratic questioning, Kathy observed that pupils begin to question their own thinking as they start questioning the questions raised by their peers. Nancy demonstrated that Socratic discussions can be effectively conducted even with very young children in Primary One, who are predominantly from English-speaking homes.

Besides Socratic questioning, Yancy also taught his pupils to think and question using the *Elements of Thought* and he assessed their thinking using the *Intellectual Standards* (Paul & Elder, 2008) explained on p. 42. Betty promoted critical thinking in pupils by asking thought-provoking questions related to newspaper articles and comprehension passages that enabled them to think of both sides of the coin. This is in line with the suggestion by Costa (2008, p. 22) that “posing challenging content-embedded questions and problems that tax the imagination and stimulate inquiry” aids learning. Betty made use of questioning to encourage pupils to go beyond surface reading to thinking about the underlying messages in the text. She also expected pupils to justify their answers with reasons based on the text. In doing so, Ritchhart and Perkins (2008, p. 60) concur that over time, pupils would take on this “expectation for reasoned thinking”.

Melissa, Yancy and Betty modelled and demonstrated detailed annotations of comprehension passages. They clarified and analysed the meaning of selected words or phrases with the class and wrote down questions that came to their minds as they read the text. By getting pupils to focus on annotating text, they sought to develop pupils as critical readers through a critical appraisal of text.

Through the process of annotation, pupils deepen in their understanding of the story and the characters in the passage. The examination of pupils’ work from Melissa and
Yancy’s classes revealed the focus on questioning as the pupils wrote down questions that came to their mind as they interacted with the text. For Kathy and Betty’s class, however, a scan of the pupils’ comprehension worksheets revealed that the focus of the annotation revolved mainly around the meaning of vocabulary and the use of arrows to connect related ideas.

Besides text annotation, Melissa required pupils to annotate comprehension questions before they read the passage. In doing so, the pupils developed an overview of the text and they became aware of what to look out for in the passage. Thus, these questions were used as an advanced organiser to pre-condition pupils to think about how the questions directed them.

However, for Sam and Kathy’s class, it was observed that the comprehension questions were frequently annotated using the 5Ws1H, indicating whether the question asked for a reason (Why); for something (What); for a place (Where); for time (When); for a person (Who); or for a method/way (How). Sam used Questioning Concept Thinking (QCT) to get pupils to write down the questions they had regarding the text read. They then used these to think about the concepts the author was trying to get across and their thoughts about it. In doing so, the pupils focused on the key ideas that the author was trying to communicate in the text.

Other reading strategies. Three of the participants also involved students in reflections. Other reading strategies used by the participants included visualising, predicting, mind-mapping, parallel writing, using words in context, taking away words and drawing pictorially.

**Theme 6: Fostering Thinking Dispositions**

Regarding dispositions, the ones commonly cited by researchers as stated by Lai (2011), include open-mindedness, fair-mindedness, a propensity to seek reason, inquisitiveness, a desire to be well-informed, flexibility and a respect for and willingness to entertain diverse viewpoints (p. 32-34). Of these, all participants sought to foster the disposition of open-mindedness (Ritchhart & Perkins, 2008) and a respect for and willingness to entertain diverse viewpoints through exposure to multiple perspectives. They encouraged these dispositions and provided opportunities for pupils to practise thinking behaviours through activities involving cooperative group work. During group work, pupils articulated their views and listened to the thoughts and the varied perspectives of their peers. Exposure to the diverse perspectives of their peers enabled pupils to consider alternatives and they became more open-minded.
Betty believes that by seeing things from different perspectives, pupils will be able to develop sound reasoning. Kathy, Sam and Nancy add that pupils need to realise that their individual perspective is narrow and not always the accepted one and they need to be open to new evidence that challenge their ideas. Nancy also cultivates in pupils a mindset of different possibilities by habitually posing questions to get them to think out of the box. With such a mindset, pupils are more likely to consider alternative pathways instead of being dogmatic. Nancy believes that the experience of having to change one’s mindset after being proven wrong helps one to be more open about seeking possibilities. Besides cooperative group work, Melissa and Yancy helped pupils to develop multiple perspectives through the use of debates. In addition, Yancy also exposed pupils to multiple perspectives of the same text. Fostering dispositions such as open-mindedness, being sensitive to the ideas of others, being cooperative and the willingness to take risks support the critical thinking process (McBride, 2004).

Nancy fosters inquisitiveness in her pupils by encouraging them to wonder while Kathy inculcates the propensity to seek reason by getting pupils to share evidence from text to support their reasoning. Yancy hopes to see the growth of moral courage over time as students become independent and confident decision-makers. Opportunities to develop intellectual courage were also observed during Melissa’s debate discussions and Kathy’s P4C discussions.

**Theme 7: Working for Transfer of Learning**

All six participants expected to see transfer of critical thinking skills to other learning areas or to life (see p.41). However, most of them recognised that transfer of learning was a long term goal which might not be realised while their pupils were still in primary school.

Melissa deliberately built in opportunities for learning transfers during class projects by asking pupils to predict problems and foreseeable issues so that they could make sound decisions. By getting pupils to see the close connections between reading, writing, speaking and listening, Yancy and Kathy helped them make connections between English and all the other subjects. Noddings (2008, p. 11) endorses this strategy when he points out that it is vital to help pupils “connect one subject area to other subject areas in the curriculum, and to everyday life”.

Betty modelled questioning about the things she encountered in her daily life with the hope that her pupils would develop questioning as a habit. Through helping lower primary pupils to connect learning about curved and flat surfaces to their purpose and use,
Nancy observed that they made transfers from the classroom to their daily lives. Sam encouraged pupils to critically evaluate their daily interactions in line with the lessons.

A. Themes Pertinent to Some Participants

Table 37 which shows the themes pertinent to some of the participants is used in the discussion that follows.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Melissa</th>
<th>Yancy</th>
<th>Nancy</th>
<th>Sam</th>
<th>Kathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>School-wide practice of critical thinking</td>
<td>Teachers, School Leaders, School Management Committee, School Board</td>
<td>CT should be infused into all subjects</td>
<td>Infusing CT in all subjects</td>
<td>Infusing CT holistically across all school (IP &amp; Non-IP) programmes</td>
<td>Teachers, School Leaders, Middle Management</td>
</tr>
<tr>
<td>Infusing critical thinking holistically</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching in silos</td>
<td>Seen as artificial</td>
<td>Using subject integration to overcome limitations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Approaches</td>
<td>Constructivism</td>
<td>Constructivism</td>
<td>Constructivism through inquiry Approach</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Theme 1: Having a School Wide Practice of Critical Thinking

Three of the six participants strongly felt that creating a critical thinking culture required a school-wide system moving everyone in the same direction. To Yancy, besides teachers, ‘everyone’ included principals, vice-principals, school management committees and members of the school board (Appendix F). He believed that everyone should have a shared vision pertaining to the purpose of infusing critical thinking in the school and the means of accomplishing this purpose before being equipped with the mindset and skills. Effective educational leaders promote the development of a shared vision, which is developed with a clear purpose and achievable goals, together with their staff (Fullan, 2010). Like Yancy, Kathy and Sam concurred that developing a thinking culture in school is only possible if school leaders, middle management and all teachers in the school think critically, as a way of life, not just during teaching and learning. This is consistent with Carrington and Robinson’s (2004) emphasis that the change process requires school
leaders to create a climate of collaborative effort and ownership of the change process and effective change is only possible when school leaders and teachers are actively involved in the change process together.

**Theme 2: Infusing Critical Thinking Holistically in All School Programmes**

All participants generally feel that critical thinking should be infused into other subjects besides English Language. Yancy, Sam and Nancy state that Mother Tongue languages and Humanities are also useful platforms for the infusion of critical thinking. Sam believes that critical thinking should be infused holistically in all school programmes including non-instructional programmes such as Physical Education (PE), Aesthetics and Citizenship Development (CCE). In line with this, Yancy added:

As a nation, as a ministry or as a school, these are the things we need to do because there are many ways to infuse; there are many ways to teach critical thinking. There’s no right or wrong. But we have to decide if our end goal is to make our people more critical thinkers but at the same time compassionate, understand implications and be tolerant – all of these at once, it cannot be infused in just the subjects that we are doing so that takes a bit of time.

Noddings (2008. p.9) supports this idea when he states:

Any subject – be it physics, art, or auto-repair can promote critical thinking as long as teachers teach in intellectually challenging ways.

**Theme 3: Recognising the Limitations of Teaching in Silos**

Pupils in primary schools tend to associate English Language, Mathematics, Science and Mother Tongue as individual subjects taken in silos. Three of the participants recognised the limitations of infusing critical thinking when teaching in silos. Like Yancy, Sam and Nancy emphasised that critical thinking should not be taught in silos as a subject. Interdisciplinary instruction engages students, deepens learning and makes learning connections more explicit (Vars, 1993). Sam adds that critical thinking should not be infused just in particular subjects as it cuts across all subjects. As Nancy taught the younger pupils in Primary 1 & 2, she was able to overcome some of the problems of teaching in silos by integrating the teaching of Mathematics and Social Studies with English Language whenever possible.

However, she thought the integration of subjects was less feasible at the Upper Primary Level in view of the depth of content and subject specialisation by teachers in some schools. The term ‘integration’ is defined as “making various elements interact in order to create a high quality and harmonious whole, to unite parts so that the outcome surpasses the sum of these parts” (Legendre, 2005, p. 784). However, as Ross and
Hogaboam-Gray (1998) pointed out, teachers need a good knowledge of the sciences and mathematics to achieve integration. Interdisciplinary work enables teachers to utilise content as a means to promote critical thinking rather than see content as an end in itself (Erickson, 2008).

**Theme 4: Using Constructivism**

Nancy, Yancy and Melissa facilitated student participation in constructing their knowledge (see p.40). Pupils were involved in gathering firsthand information through research on their own using the Internet and/or print resources including newspaper articles and they shared their findings in class. Nancy used the Inquiry Approach while Melissa and Yancy helped their pupils to construct their own understanding through the use of Socratic questioning and cognitive dissonance. The benefits of constructivism are elaborated by Wilhelm and Friedemann (1998):

> Classrooms that encourage the active construction of meaning focus on big understandings and powerful ideas rather than facts, and they encourage students to ask their own questions, follow their own interests, make their own connections, reformulate ideas, and reach unique conclusions” (p. 30).

**Concerns Related to the Infusion of Critical Thinking**

Although all participants actively infused critical thinking within their classes in different ways, they had their concerns about the infusion of critical thinking across the English Language curriculum. A summary of the teachers’ concerns is shown in Table 38.

<table>
<thead>
<tr>
<th>Teachers’ Concerns</th>
<th>Melissa</th>
<th>Betty</th>
<th>Nancy</th>
<th>Sam</th>
<th>Kathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constrained by students’ language competency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students being overly critical</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible inclusion of critical thinking as another subject to be taught</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Possible mandating of infusing critical thinking resulting in it being treated as a checklist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Unlearning achievement-driven motivations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Constrained by time</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Constrained by class size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Lack of whole-school approach to developing teachers’ critical thinking skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Lack of feedback on critical thinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Table 38 revealed that most of these concerns were issues related to the classroom while few issues were concerns about future ministry directions that might impact the teaching fraternity.

**Classroom Issues**

**Time constraint.** Time constraint was the main concern when it came to infusing critical thinking across the English Language curriculum for four out of the six participants. Time was needed to customize lessons and find relevant resources. Teachers needed time to think through what they wanted to achieve in terms of critical thinking as well as how these resources would help them to achieve the objectives. Letting pupils’ responses direct the flow of discussion through the use of Socratic questioning and focusing on authentic real-life experiences required more time than just teaching a lesson didactically. In line with the view of the other three participants, Kathy highlighted that more time could be spent developing pupils as critical thinkers if the education system was less examination-oriented. In their study on the Singaporean secondary teachers’ perspectives of critical thinking in Social Studies, Baildon and Sim (2009) found that one of the three critical tensions that came up was teaching critical thinking in an examination culture. As in this study, the lack of time was a persistent theme which emerged as these secondary teachers moved towards teaching Social Studies more critically and creatively.

Related to the issue of time constraint is the tension that occurs between the teachers’ personal identity in terms of their values and convictions and their professional identity in terms of institutional expectations of students' work and academic results (see p. 19-20). Nancy sometimes wondered if she had distracted her students by spending time engaging in critical thinking activities and “not doing more practices of the exam type”. Kathy did not relish the thought of being questioned about having not completed all the allocated worksheets due to time spent teaching critical thinking.

**Class profile.** Class profile or the pupil’s level of competency in the English Language was another area of concern highlighted by half of the participants. Pupils who were constrained by inadequate language competency found it difficult to ask questions. Even when they did ask questions, the questions were likely to be lower order questions connected to the text. As Melissa said, they may even develop a fear of asking questions as they do not even understand the language. In the same vein, teachers were also constrained by the questions that they could ask these pupils. Sam faced much difficulty in his attempts to infuse critical thinking into comprehension lessons with his 2014 class of academically challenged Foundation English pupils. It was an uphill task as half of the class were pupils with special needs who had difficulty reading and comprehending what
they read. Roberts and Billings (2008, p.33) affirm this concern when they state that reading, writing, speaking and listening are “the key to teaching thinking” adding that the “more fluent students become as readers, writers, speakers, and listeners, the clearer, more coherent, and more flexible their thinking will become”.

Yancy faced the challenge of helping gifted pupils deal with the pressures that they faced from meeting the perceived school expectations in terms of results. This is due to the high expectations often communicated by teachers to GEP pupils in view of the fact that they were formally identified as the top 1% of the national cohort.

**Other concerns.** The rest of the concerns related to classroom issues were raised by individual participants. Nancy’s concern pertains to an issue of pedagogical management related to the large class size coupled with the short attention span of 8 year-olds. When excited, her young charges were often more eager to share their ideas than to listen to their peers. Hence, the long wait for their turn to speak, especially with so many pupils wanting to share at the same time, could be stifling for them. Melissa’s concern was that pupils sometimes argued for the sake of arguing instead of evaluating fairly and reasonably. Kathy’s concern was the lack of feedback on how she taught critical thinking and her desire for some feedback from teachers competent in teaching critical thinking. Yancy’s concern was teaching pupils to “unlearn” the achievement driven motivations and assumptions that they brought into the classroom as a result of their earlier years in school.

**Concerns about Future Ministry Directions**

Sam’s concern was the unevenness with which critical thinking was taught in the primary schools in Singapore as a result of schools having different interpretations of critical thinking and what it entails. This lack of consensus and shared understanding regarding critical thinking make the implementation of critical thinking as a whole school approach difficult. Yancy adds that most primary school teachers may not infuse critical thinking because they do not know how to do so as they were not taught to infuse critical thinking in their subject areas during their pre-service training.

Currently, the manner that pupils were taught critical thinking depended on the individual teacher’s interpretation of critical thinking. Due to the lack of a structured process on the teaching of critical thinking, primary schools are dependent on the individual capacity of teachers. Hence, Sam saw the need for MOE to develop a process of training several teachers from every school in Singapore as leaders of curriculum change. These teachers could then translate what critical thinking entails and how it can
be infused across the curriculum to the rest of the teachers in their schools. This process would result in a whole-school approach in the teaching of critical thinking.

Yancy was concerned about the infusion of critical thinking being mandated by MOE in the future and ending up as “another institutionalised product and tool” or “a teacher’s checklist”. His perspective was that when critical thinking becomes institutionalised and product-driven, teachers who are passionate about teaching critical thinking may lose their motivation and their purpose of teaching critical thinking. He fears that when it becomes a teacher’s checklist, the essential qualities of learning thinking may become lost. Bodman et al. (2012) contend that decision-making at the policy level instead of the classroom level will result in the lack of autonomy and teachers feeling less responsible for outcomes. If the infusion of critical thinking becomes mandated, teachers will do it because they have to and not because they believe in it and the impact and effectiveness would be lost.

Yancy’s other concern was the possibility of critical thinking being included as an additional subject to be taught in the primary school curriculum in the near future. He believes that infusing critical thinking into every subject would be more effective than teaching critical thinking as an elective.

**Developing Key Categories from Themes**

As common themes derived from the focused codes emerged from the cross-case analysis, the data were analysed to refine and confirm some of these as key categories. As a result of the inductive analysis of the conceptual categories, five key categories emerged from the data as shown in Figure 18.
Figure 18. Developing Key Categories from Themes Derived from Focus Codes
With reference to Figure 18, the common themes derived from all the six cases were subsumed under 2 key categories ‘being competent in critical thinking’ and ‘being pedagogically competent in teaching critical thinking’. The theme ‘being committed to teaching critical thinking’ was raised as a key category due to its frequent occurrence among all the six participants (Appendix F). The last two themes ‘having a school-wide practice of critical thinking’ and ‘infusing critical thinking holistically in all school programmes’ were themes found among half of the participants. However, they were raised inductively as key categories due to their significance based on a review of literature on school enculturation.

Conclusion

Based on the inductive analysis of the themes derived from cross case analysis, five key categories emerged from the data. They include: being committed to teaching critical thinking, being competent in critical thinking, being pedagogically competent, having a school-wide practice of critical thinking and infusing critical thinking holistically in all school programmes. Through the process of constant comparison, these key categories seemed to fall into two main groups. Being committed to teaching critical thinking, being competent in critical thinking and being pedagogically competent are all characteristics of teachers who are effective at teaching critical thinking while having a school-wide practice of critical thinking and infusing critical thinking holistically in all school programmes are connected to a school culture in which critical thinking is practised. Two theoretical propositions developed from the five key categories are presented in the next chapter.
CHAPTER 7: THEORETICAL PROPOSITIONS

Introduction

The key categories which emerged from the themes common to all participants and those pertinent to some (Figure 18) formed the groundwork for theoretical propositions which were developed using both inductive and deductive analytical processes. These themes were derived from focused codes as explained in Chapter 3 in the section on Data Analysis. The five key categories identified include: being committed to teaching critical thinking, being competent in critical thinking, being pedagogically competent, having a school-wide practice of critical thinking and infusing critical thinking holistically in all school programmes. These five categories led to two key propositions which were then used to develop an explanatory theory about the creation of a critical thinking culture.

The cross-case analysis in Chapter 6 addressed the two main research questions in this study:

1. What are the perspectives of expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical reading on the infusion of critical thinking across the English Language curriculum?

2. What are the concerns of expert primary school in-service teachers of English Language in Singapore who firmly believe in the importance of critical reading on the infusion of critical thinking across the English Language curriculum?

Although the guiding questions for Research Question 1 regarding the primary school English Language expert teachers’ perspectives on aims, strategies, significances, and outcomes related to the infusion of critical thinking within the discipline of English Language, the propositions made in this chapter go beyond English Language and across other disciplines. This is due to the fact that the data emerging from three of the themes pertinent to half of the participants, namely, having a school wide practice of critical thinking, infusing critical thinking holistically in all school programmes and recognising the limitations of teaching in silos, dealt with application of critical thinking as a way of life and the application of critical thinking across all disciplines and programmes.

Development of Proposition 1

Proposition 1 was developed from three sub-propositions which in turn were developed from the following three categories:

1. Being Committed to Teaching Critical Thinking
2. Being Competent in Critical Thinking
3. Being Pedagogically Competent in Teaching Critical Thinking

**Category 1: Being Committed to Teaching Critical Thinking**

**Sub-Proposition 1.** The degree to which teachers infuse critical thinking depends on their passion and commitment to teaching critical thinking as demonstrated through their beliefs, convictions and desired outcomes for students.

**Discussion.** Day (2012) states that being passionate about the learning and achievement of students is essential for effective teaching as it generates energy and “fuels determination, conviction and commitment” (p. 17). Commitment is a predictor of the performance of teachers and is closely connected to the health of the school as an organisation (Tsui & Cheng, 1999). Sammons et al. (2007, p. 696) emphasised that teachers who are committed believe without wavering that they can make a difference to the learning and achievements of students “through who they are (their identity), what they know (knowledge, strategies, skills) and how they teach (their beliefs, attitudes, personal and professional values embedded in and expressed through their behaviour in practice settings).

Passion and commitment for teaching critical thinking is a major driving force that enables the participants to teach critical thinking in the classroom despite time constraints. Teachers who are passionate and committed to teaching critical thinking are undeterred by constraints of having to cover the syllabus. They are not satisfied with just covering the syllabus. They see value in teaching critical thinking and are motivated to infuse critical thinking within the confines of the syllabus. In doing so, they exercise agency which strengthens their teacher identity (see p. 23-24).

Most of these expert teachers also experience tension between their personal identity and the institutional demands placed on their professional identity (see p.19-20) as they struggle between engaging pupils in critical thinking and spending more time on drill and practice of exam-oriented questions to achieve better results. Nevertheless, all six participants chose to make time to infuse critical thinking across the English Language curriculum. However, it was observed that the six participants infuse critical thinking across the curriculum with varying degrees of depth and frequency.

**Category 2: Being Competent in Critical Thinking**

**Sub-Proposition 2.** Developing teacher competency in critical thinking to the extent that critical thinking is applied in daily life will result in a more pervasive infusion of critical thinking in the classroom.
**Discussion.** Case (2002, p.11) asserts that critical thinking is not a “discrete dimension of the curriculum” but a “way of life”. For most of the participants, thinking critically is a habit and a lifestyle. They apply critical thinking in the daily decisions they make in their personal lives, as well as in their professional roles.

The participants’ competency in critical thinking was observed to be on a continuum according to their background training in critical thinking, their pursuit of ongoing professional development in critical thinking and the extent to which they apply critical thinking as a way of life. Their positive professional identity was determined by their strong orientations to professional development and knowledge (Opfer et al., 2011). Being intrinsically motivated to teach pupils to think critically was a common quality among the participants as they firmly believe in the importance of critical thinking (see p.53). In addition, they were also motivated to learn more about critical thinking (see p. 27). Kathy did her own literature research on critical thinking before taking the initiative to attend courses on P4C while Nancy spent three months doing a postgraduate course on critical thinking at the University of Melbourne for her Professional Development Leave (Table 1).

Because of their competency in critical thinking, participants were able to make thinking visible to their students by modelling. Paul and Elder (2010, p. 38) attest to the necessity of modelling when they stress that teachers are able to promote critical thinking “only to the extent that they themselves think critically”. In addition, some participants were able to recognise the limitations of teaching in silos (Table 37) and they see the value of infusing critical thinking into all subjects as well as daily life.

**Category 3: Pedagogical Competencies for Teaching Critical Thinking**

**Sub- Proposition 3.** Having pedagogical competencies for teaching critical thinking facilitates the effective infusion of critical thinking in the classroom.

**Discussion.** All six participants were award-winning teachers with teaching experience ranging from eleven to thirty years and they all had very strong pedagogical skills. Besides being skilled in pedagogy, they were also competent in teaching critical thinking using a wide repertoire of instructional strategies including cooperative learning, a host of questioning techniques including Socratic questioning and they made use of an assortment of tools to make students’ thinking visible. They also fostered thinking dispositions, focused on real world issues and used learner-centred approaches such as constructivism (Tables 36 & 37). All these instructional strategies facilitated their effective infusion of critical thinking across the English Language curriculum.
From the three sub-propositions stated above, Proposition 1 is developed as follows:

*Proposition 1.* The effective infusion of critical thinking across the curriculum is driven by teachers’ commitment to teaching critical thinking, their competency in critical thinking and their pedagogical competencies in teaching critical thinking.

**Development of Proposition 2**

Proposition 2 is developed from three sub-propositions which in turn are developed from the following:

1. Proposition 1 as stated above: The effective infusion of critical thinking across the curriculum is driven by the teachers’ commitment to teaching critical thinking, their competency in critical thinking and their pedagogical competencies in teaching critical thinking.
2. Category 4: Having a school-wide practice of critical thinking (Table 37)
3. Category 5: Infusing critical thinking holistically in all school programmes (Table 37)

**Sub-Proposition based on Proposition 1**

Competent teachers who are committed to teaching critical thinking form the basic building block required in the creation of a critical thinking culture.

With reference to Proposition 1, the term “competent teachers” refers to teachers who are competent in critical thinking and are pedagogically competent in teaching critical thinking. Drawing from Proposition 1, this becomes the first sub-proposition of Proposition 2. As Sub-Proposition 1 has already been discussed under Proposition 1 above, it will not be discussed here.

**Category 4: Having a school-wide practice of critical thinking**

**Sub-Proposition 4:** Having a school-wide practice of critical thinking will be achieved when the vision for developing a thinking culture in the school is shared by the whole school community, including board members, school leaders, middle management, teachers, parents and students.

**Discussion.** For the effective infusion of critical thinking, being competent in critical thinking and having pedagogical competencies in teaching critical thinking as well as the commitment to teach critical thinking are required at the individual teacher level. A critical mass of individual teachers who are competent in critical thinking, pedagogically competent in teaching critical thinking and committed to teaching critical thinking will contribute to the development of a school-wide practice of critical thinking. Paul and Elder (2010, p.38) emphasized that “large groups of students can be expected to achieve these
(critical thinking) competencies only when most faculty within a particular institution are fostering critical thinking standards in their subject(s)."

In order for the teaching of critical thinking to be effectively implemented, a school-wide practice and philosophy of critical thinking must be embedded in the school’s vision. This could result in the creation of a “school-wide atmosphere that encourages reflection and critical thought” (Kassem, 2000, p.27). Voutas (1999, p.16) emphasises that without a shared vision, a school has little or no direction. With a shared vision, resources would be directed towards or allocated for the purpose of achieving the vision. Chang (2001) asserts that cultivating a thinking culture in school requires every member of the school to play an important part in the formation and sustainment of the thinking environment.

While implementing a school-wide approach to critical thinking, Kassem (2000) described how the school leaders at Rabun High School created a non-threatening environment by supporting teachers in a school-wide focus on critical thinking without using the results to assess teachers in a punitive way. Kassem (2000) also elaborated (p.28) on how the school leaders established the right climate in the school by:

- Adopting a confident, positive attitude toward the impending changes; modelling how such changes could occur; offering resources, support, and encouragement to colleagues; and developing a reasonable, incremental plan. The plan involved small, manageable suggestions such as the following: rearrange classroom furniture to encourage more discourse; use more higher order questions and longer wait time to encourage deeper discussions; and expect all students, not just those identified as gifted, to function at the highest levels of Bloom’s (1956) Taxonomy.

**Category 5: Infusing critical thinking holistically in all school programmes**

**Sub-Proposition 5.** The holistic infusion of critical thinking in all school programmes (core and non-core) is necessary for the creation of a critical thinking culture.

**Discussion.** Paul and Elder (2010) assert that students could develop critical thinking skills within one or more content areas and yet not develop critical thinking skills in general. They argue that the best teaching approach promotes both so that students are able to reason across subjects and domains. Halpern (2003) adds that the deliberate application of critical thinking skills in a wide variety of contexts is necessary for the transfer of learning. In order for that to happen, it is essential for the holistic infusion of critical thinking in all school programmes including both core and non-core programmes. The infusion of critical thinking within English Language, a core programme, has already been discussed in Chapters 4-6.
Critical thinking and citizenship education are both essential to Social Studies education in Singapore (Baildon & Sim, 2009). The infusion of critical thinking within Social Studies is not discussed here as the strategies used would be similar to those used in English Language. However, as much of Social Studies cover history, there could be an explicit focus on thinking historically (Wineburg, 2001) which encompasses “interpreting and analysing historical artefacts and primary sources and constructing and critiquing narratives about the past” (Waring & Robinson, 2010). As the Mother Tongue subject involves languages other than English Language, the strategies used described in Chapters 4 to 6 could be adapted for use in the Mother Tongue languages.

The infusion of critical thinking within Science, Mathematics, non-core programmes comprising art, music, physical education, and character and citizenship education is discussed in the paragraphs below to give a gist of what it means to infuse critical thinking holistically in the various programmes.

**Science.** Expert science educators propose that scientific reasoning be taught in the context of rich subject content knowledge as they were of the view that developing proficiency in Science requires students to engage in inquiry experiences as well as content knowledge (Willingham, 2007). Willingham explains that this conclusion is drawn from evidence that engaging in scientific thinking requires background knowledge. Using the generation of multiple hypotheses for a given situation as an illustration, he asserts that one’s judgment regarding the plausibility of a factor being significant (for hypothesis generation) is dependent on one’s knowledge of the domain. He adds that prior knowledge and beliefs not only influence the hypothesis one prefers to test but also how one interprets the experimental data. A meta analysis of 40 experiments investigating approaches of teaching problem solving in science revealed that successful approaches concentrated on building integrated knowledge bases as part of problem solving while unproductive approaches centred on strategies needed for problem solving to the exclusion of the knowledge required for the solution (Willingham, 2007).

**Mathematics.** In mathematics, the particular kind of critical thinking that is the focus is problem solving. Willingham (2007) highlights that students sometimes fail to recognise similar word problems requiring the same mathematical knowledge because they focused on the scenario of the word problem (its surface structure) rather than the mathematics needed to solve it (its deep structure). He adds that students find it difficult to apply familiar solutions to problems that seem new to them as they are distracted by the surface structure of the problem. Using an example of two problems involving the use of the least common multiple with the scenario of a band in the first one and the scenario of
vegetables in the second one, Willingham relates that few students noticed that the two problems were similar. He explains that students interpret the problems based on their prior knowledge of the surface structure (row of band marchers, vegetables in a garden) instead of the deep structure (using the least common multiple). Hence, he advocates the need for teachers to help students become familiar with a problem’s deep structure in order for transfer of learning to occur.

Art. Research with undergraduates and K-12 students have shown that inquiry-based activities such as aesthetic, critical and creative inquiry can be used in art to foster critical thinking skills and dispositions in art students (Lampert, 2006). Lampert explains that aesthetic inquiry explores “broad questions about the value, nature, meaning and definition of art” whereas critical inquiry involves the “exploration and investigation of a specific piece or body of artwork” and creative inquiry “entails exploration of expression with visual language” (p.46). Her findings showed that art students in the sample were more disposed to using thinking and reasoning when solving all problems (not only those that are art-related) than non-art students.

Burton, Horowitz and Abeles (2000) assert that students who are frequently exposed to the arts demonstrate clear evidence of an understanding of multiple perspectives. Through critical inquiry questions related to artworks such as “What is going on here...? What do you see that makes you say that...?” Housen (2001. p.2) persuades students to state supporting evidence in their evaluation of artwork. Geahigan (1997) adds that when students learn to support their personal interpretations with reasons, they develop skills in the construction of evidence-based arguments. Housen (2001) uses aesthetic and critical inquiry in a group setting to develop critical thinking as the ambiguity of art makes it possible for students to support their diverse viewpoints in their interpretation of the same artwork. Housen’s research showed that as students are exposed to multiple perspectives and observations, they construct their own understanding of the artwork by reconciling the different perspectives resulting in the development of higher order thinking patterns.

Lampert (2006) states that after listening to the perspectives of their peers, students who continue to reflect on the artwork in their journals develop higher order reflective thinking as their critical and aesthetic understanding deepens. She adds that by modelling respect for divergent thinking and creating an atmosphere of trust, open-mindedness and honesty in the classroom, students will be free to share their personal opinions instead of conforming to the opinion of the teacher or the majority of their classmates. Geahigan (1997) stresses that comparing and contrasting selected pieces of
art can challenge students’ prior assumptions about the nature of art, genres and artistic intentions. Thus, it is evident that inquiry-based art appreciation enhances students’ ability to think critically.

Music. Teachers can foster critical thinking in music programmes using inquiry and analysis (Bamberger, 1991). Constructivism which stresses the reflective understanding of the students’ musical experiences is an effective pedagogical approach to music as it enables students to make meaning of their own musical experiences (Wiggins, 2001). In a study to determine the effect of critical thinking instruction on music listening skills, fifth grade students were motivated to think about alternate solutions to the teacher’s questions (encompassing higher order cognitive questions), reflect on the listening experience, and improvise instrumentally and kinaesthetically in their response to music listening examples (Johnson, 2011). The critical thinking instruction focused on doing musical activities and thinking about the music. Findings showed that the critical thinking instruction had a significant and positive effect on the participants’ responses to music listening. Hence, Johnson (2011) emphasised that music teachers should make use of open-ended questions and improvisation in conjunction with vocabulary and response activities in their design of music listening instruction. Johnson (2011) concludes that critical thinking instruction in music listening is a “promising avenue for promoting thoughtful music curricula and developing students’ musical independence”.

PE. In Physical Education programmes, as McBride (2004) puts it, teachers are neither encouraged nor expected to teach critical thinking. However, he asserts that the physical education environment is extremely suitable for fostering critical thinking dispositions and research on the use of critical thinking in physical education has shown encouraging results. Bonnette and McBride (1996) found that after participating in activities which required group cooperation and critical thinking, there was a significant increase in the critical thinking scores of some at-risk boys. They described an activity in which a group of ten to twelve boys were required to balance on a small platform for a specified amount of time. The boys persisted in trying different strategies despite being unsuccessful. Thus Bonnette and McBride (1996) suggest that under suitable conditions, students in physical education settings may show many of the critical thinking dispositions identified in literature. They emphasize that teachers need to structure the physical education environment in order to foster the development of critical thinking dispositions in students. Structuring the environment encompasses the role of teachers in modelling, demonstrating and promoting thinking dispositions; getting students to find solutions to critical thinking tasks through cooperative group learning; and debriefing students after the
group learning experience (McBride, 2004). McBride explains that the purpose of debriefing is to get pupils to make sense of the group experience by reflecting on the things that worked well as a group, those that did not and what they might do differently next time.

CCE. For Character and Citizenship Education, Sim and Low (2012) assert that the purpose and the enactment of citizenship education is to “promote action and thought for a democratic and pluralistic society” (p. 13). Being able to form one’s opinions about matters related to justice and public interest is an essential aspect of citizenship as citizens in a democratic society need to be accountable for their own moral decisions (Schuitema, Van Boxtel, Veugelers, and Ten Dam, 2011). Veugelers and Vedder (2003) state that citizenship education should strengthen the students’ capacity to develop and justify their own viewpoints on value-related issues. Banks (2004) adds that in the process of developing their personal view, students should reflect on and take into consideration the multiple perspectives on the moral and social issue(s).

Solomon, Watson and Battistich (2001) suggest that an effective strategy to encourage students to reflect on moral values and consider the multiple perspectives of others is to stimulate dialogue in the classroom. Schuitema et al. (2011) add that many studies related to instruction in citizenship support instructional designs in which students engage in dialogue with one another in small groups and co-construct ideas related to moral issues. They assert that “elaboration on the contributions of others, equal participation, checking behaviour and explication of moral values” are crucial characteristics of student dialogue with regards to citizenship education. As Schuitema et al. (2011) put it, students develop their own opinions as they think about the perspectives of their peers. Co-construction of meanings and ideas take place when they reflect and build on the opinions of their group members (Van Boxtel, 2004).

In a study on the effects of an instructional strategy for dialogic citizenship education on students’ ability to take moral values and multiple perspectives into account when justifying their viewpoints, Schuitema et al. (2009) designed a curriculum unit for history education in which dialogic citizenship education was integrated. A comparison on the learning outcomes of the students who participated in the curriculum unit with students in a control group who followed the same history course without an explicit focus on moral values and dialogue was made. The effects of the curriculum unit on the ability to reflect on moral values and various different perspectives were examined in the students’ written essays. Analyses of the essays showed that students who participated in the curriculum
for dialogic citizenship education were more inclined to take multiple perspectives into account (Schuitema et al. 2009).

Jeong and VanSickle (2003) argue that the most effective way to promote students’ formation of rational systems of value is to strengthen their critical thinking in the moral sense through practical applications in the context of daily decision making. They contend that the “failure to establish a methodology for integrating value-related decision making with disciplinary and inter-disciplinary scholarship damage the quality of moral education” (p. 236). They illustrate that dealing with issues such as “poverty, the homeless, the destruction of the ozone layer, and the imbalance of wealth among nations of the world requires the perspectives of several disciplines” (p. 236). Hence, it is crucial for teachers to integrate critical thinking related to values in the context of the various subject disciplines to promote critical thinking across subjects and domains. Jalil, Chua and Sim (2012) add that the use of a dialogic pedagogy would also enable students to examine ways to solve global problems.

From Proposition 1 and the two sub-propositions described above, Proposition 2 is developed as follows:

Proposition 2: Driven by competent teachers committed to teaching critical thinking, a vision for developing a thinking culture, shared by the whole school community will facilitate the holistic infusion of critical thinking across all school programmes and a school-wide practice of critical thinking.

**Theory of a Critical Thinking Culture**

Proposition 1 states that “The effective infusion of critical thinking across the curriculum is driven by teachers’ commitment to teaching critical thinking, their competency in critical thinking and their pedagogical competencies in teaching critical thinking.” A model of the characteristics of practitioners required for the effective infusion of critical thinking can be represented using the Venn diagram in Figure 19.
In view of the fact that Proposition 1 is a subset of Proposition 2, the overarching theoretical proposition developed in this study is about the creation of a thinking culture as stated in Proposition 2: Driven by competent teachers committed to teaching critical thinking, a vision for developing a thinking culture, shared by the whole school community will facilitate the holistic infusion of critical thinking across all school programmes and a school-wide practice of critical thinking. A model of the factors necessary for the creation of a critical thinking culture is presented in Figure 20.
Conclusion

The propositions and sub-propositions developed in this chapter attest to the importance of developing the competency of all primary school teachers in pedagogy and critical thinking by encouraging them to apply critical thinking as a way of life. There is also a need to provide teachers with systematic, ongoing professional development on critical thinking so that teachers can infuse critical thinking effectively in whatever they teach. Besides competent teachers who are committed to teaching critical thinking, the other two building blocks, namely, a school-wide practice of critical thinking; and the holistic infusion of critical thinking in all programmes are required in order to create a critical thinking culture in school.

The value of co-construction of ideas in cooperative groups stands out as a common element in the infusion of critical thinking in the non-core programmes, comprising art, music, physical education and character and citizenship education. Infusing critical thinking in core and non-core programmes facilitates student reasoning across subjects and domains as they observe how critical thinking is applied in different
contexts. Hence with some guidance from teachers, students will be able to see how key dispositions and critical thinking can transfer to other subject areas and to their daily lives.

Two theoretical propositions are developed in this chapter with Proposition 2 being the overarching one as Proposition 1 is a subset of it. They are stated as follows:

Proposition 1: The effective infusion of critical thinking across the curriculum is driven by teachers’ commitment to teaching critical thinking, their competency in critical thinking and their pedagogical competencies in teaching critical thinking.

Proposition 2: Driven by competent teachers committed to teaching critical thinking, a vision for developing a thinking culture, shared by the whole school community will facilitate the holistic infusion of critical thinking across all school programmes and a school-wide practice of critical thinking.

The two theoretical propositions developed in this chapter have clear implications for professional practice, organisational policy and practice, and future research. These implications will be discussed in the Chapter 8.
CHAPTER 8: IMPLICATIONS AND CONCLUSIONS

Introduction

Although research on critical thinking is diverse and abundant, there is very little empirical research in connection with the perspectives of teachers or the self-reporting of teachers regarding the infusion of critical thinking and how this has impacted classroom practice, particularly in primary schools. This study attempted to redress the oversight as it contributes to the body of educational research through an in-depth investigation into the perspectives of six primary school in-service expert teachers of English Language in Singapore. This study is also significant as it opens a window, albeit a small one, for educators to take a peek at how the TSLN vision, of a nation of thinking and committed citizens capable of meeting the challenges of the future, launched in 1997, has since been enacted in the English Language curriculum by some expert teachers in the primary schools in Singapore.

The aim of this multiple-case study was to generate explanatory theory regarding the infusion of critical thinking by investigating the perspectives of six primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical thinking. This was achieved by interviewing the participants, observing their classroom practice over a period of ten months and examining the work of their students. An interpretivist approach was taken to examine the practices of the participants from their perspectives. The data collected from the initial survey, interviews, observations and documents were used to construct individual case studies of the participants. A cross-case analysis was then made which generated insights into the two key research questions:

1. What are the perspectives of expert primary school in-service teachers of English Language in Singapore, who firmly believe in the importance of critical reading on the infusion of critical thinking across the English Language curriculum?

2. What are the concerns of expert primary school in-service teachers of English Language in Singapore who firmly believe in the importance of critical reading on the infusion of critical thinking across the English Language curriculum?

This chapter provides a summary of the research by revisiting the explanatory theory, the two propositions that build the theory, the five sub-propositions and the implications for professional practice. This is followed by the implications for organisational policy and the contributions of this study. The limitations of this study and the directions for further research are then explained and the chapter ends with the conclusion.
Implications for Professional Practice

The theory proposed in the preceding chapter is that the infusion of critical thinking across the school curriculum will be promoted by the creation of a critical thinking culture in schools. The theory has two propositions and five sub-propositions. Proposition 1 focuses on the qualities required of teachers for the effective infusion of critical thinking across the curriculum, namely:

- commitment to teaching critical thinking
- competency in critical thinking
- pedagogical competencies for teaching critical thinking

The three sub-propositions which form Proposition 1 have clear implications for the professional practice of both pre-service and in-service teachers.

Sub-Proposition 1

*The degree to which teachers infuse critical thinking depends on their passion and commitment to teaching critical thinking as demonstrated through their beliefs, convictions and desired outcomes for students.*

Almost all teachers would agree that critical thinking is important but not all teachers value critical thinking enough to implement it in the classroom. Some teachers would like to infuse more critical thinking within the curriculum but they do not know how to do so. Case and Wright (1997) support the view that critical thinking is much valued but not adequately addressed in classrooms with extensive data from interviews and surveys of teachers. Despite contradictory results, some research studies have shown that the belief systems held by individual teachers have the greatest influence on his/her classroom practice (Deemer, 2004). Before teachers can be committed to teaching critical thinking, there is a need to build personal beliefs and convictions on the value of critical thinking as well as develop teacher competency in critical thinking skills. Guskey (2002) suggests three principles for professional development in relation to change in teachers’ practices.

Firstly, there is a need to recognise that change is a gradual and challenging process as developing competency in something new involves time and effort. Secondly, it is essential to provide teachers with periodic feedback on the progress of their students. Thirdly, it is necessary to provide sustained follow-up and support.

In their study of constructivist-oriented reforms implemented by elementary school teachers, Elmore, Peterson and McCarthey (1996) state that
...in all instances, their practices were unlikely to change without some exposure to what teaching actually looks like when it's being done differently and exposure to someone who could help them understand the difference between what they were doing and what they aspire to do (p. 241).

In line with the findings of Elmore et al. (1996), the following are some suggested ways of building teacher competency in critical thinking through professional development:

a. Encouraging teachers to observe other teachers who are competent in infusing critical thinking within the curriculum through peer observations or Lesson Study. These observations should show teachers how critical thinking can be implemented in the different language skills such as reading, writing, speaking and listening.

b. Providing resources such as critical thinking research articles and sample lessons to show teachers what critical thinking in the classroom looks like at the lower and upper primary levels.

c. Using Professional Learning Communities (PLC) as a platform to encourage teachers to develop and share their own critical thinking practices. Teachers could then engage in professional conversations with other teachers who are competent in infusing critical thinking across the curriculum.

d. In addition, it is essential for MOE to conduct in-service critical thinking courses such as Socratic Questioning, Critical Thinking Strategies and Fostering Thinking Dispositions for primary school teachers to strengthen their competencies in teaching critical thinking. In particular, a course on the Paul-Elder Critical Teaching Framework is necessary as the study revealed assessing critical thinking as an area for improvement for teachers (see p.170).

Sub-Proposition 2

*Developing teacher competency in critical thinking to the extent that critical thinking is applied in daily life will result in a more pervasive infusion of critical thinking in the classroom.*

Teaching critical thinking is not an end in itself, but should lead to applications in real life. Teachers accustomed to engaging in authentic learning involving real-world situations as part of learning have a stronger possibility of carrying critical thinking skills into everyday life and thus improving the quality of daily life for the community. As part of the twenty-first century skills, connections between school curricula and authentic learning in the real world have the potential to improve the quality and ethical practices of daily life for all. Jeong and VanSickle (2003) argue that students develop a deeper form of conceptual understanding when they are engaged in learning experiences in which
concepts are applied to real-life situations as these concepts become more worthwhile when seen as relevant to real life.

Teachers need to develop competency in critical thinking and actively apply critical thinking in their daily lives in order to model it for their students. Teachers can create a culture of inquiry within the classroom by sharing and modelling their own curiosity and the questions they have with their students (Fontichiaro 2010). In order to promote higher order challenges successfully, teachers should model thoughtfulness by displaying interest in students’ ideas and demonstrate how they thought through a problem instead of offering a final answer in problematic issues (Jeong & VanSickle, 2003).

Sub- Proposition 3

Having pedagogical competencies for teaching critical thinking facilitates the effective infusion of critical thinking in the classroom.

This study has identified some effective strategies used by the participants (Table 36) which could be adopted for the infusion of critical thinking across the curriculum by all teachers. Teachers need to develop pedagogical competencies in order to use these strategies. The following segment provides a summary of strategies that are part of the repertoire that teachers could make use of in their classroom to effectively infuse critical thinking across the curriculum:

Co-operative learning. Carini, Kuh, and Klein (2006) revealed that the interaction of language learners through cooperative learning enhanced their critical thinking level. Cooperative learning results in “process gain (i.e., more higher-level reasoning, more frequent generation of new ideas and solutions), greater transfer of what is learned within one situation to another (i.e., group to individual transfer)” than competitive or individualistic learning (Johnson & Johnson, 1999, p. 72). Case and Wright (1997, p. 9) concur that if teachers “solicit and value student opinions, and provide a healthy forum for student dialogue”, then students will tend to develop a healthy respect for the opinions of others.

Focusing on real world issues. Wiggins (1998) asserts that authentic assessment enables students to see the relevance and benefits of learning which enhances their motivation and interest. Williams (2005, p. 177) states that “connecting course content to issues of personal relevance to students” is the challenge of day-to-day teaching. Critical thinking occurs only in the context of problematic situations as it is not required in matters of preference or opinion where all answers are acceptable (Case & Wright, 1997). Case and Wright stress that by crafting subject matter in the form of critical challenges whereby students are required to assess the reasonableness of plausible
options or alternative conclusions, students are engaged in critical thinking. These challenges could be related to real life situations or create dissonance with students’ prior beliefs. As shown in Chapters 4 to 6 of this study, some of the most effective strategies to get students to think critically include discussing controversial issues related to real life through debate or the use of scenarios to set the stage for critical thinking. Noddings (2004) asserts that it is the teachers’ job “to confront students with the strongest (not the most extreme) arguments on all sides of an issue and to help them to arrive at and defend a view they can commit themselves to” (p.492).

**Using Socratic questioning.** All teachers make use of questioning in one way or other in the classroom. However, Socratic questioning is not widely practised in the primary school classroom in Singapore as most teachers are not exposed to it during their teacher training at the National Institute of Education. Four out of the six participants who actively use Socratic questioning in the classroom had picked up the skill through in-service professional development courses. Paul and Elder (2003b) assert that thinking is driven by questions rather than answers and hence to promote student thinking through content, it is essential to stimulate their thinking by asking questions which result in further questions. They add that besides probing student thinking, the modelling of Socratic questioning by teachers would result in students developing a questioning mind.

**Annotating text to deepen comprehension.** Fisher and Frey (2013) explain that annotating text enables readers to read critically as they develop an active relationship with what they are reading by talking back to the text. It is a physical note of a possibility or a prediction. It is a process of training the mind to think by using thinking strategies and it serves as an aide-memoir of possibilities – possible ways of thinking about text which might subsequently be corrected as the student reads on. It helps the student keep open possibilities, eliminate wrong possibilities and move towards making conclusions. Taking the students through annotating the text is a useful strategy to help students understand the text in-depth.

**Fostering thinking dispositions.** Teaching critical thinking and problem-solving skills is not sufficient. Teachers need to help students develop the disposition or inclination to use “productive habits of mind, including persisting, managing impulsivity, thinking flexibly, striving for accuracy, and remaining open to continuous learning – on their own” (Costa, 2008, p. 22). Developing critical thinking dispositions in students improves their ability to reflect on possible solutions and perspectives when confronted with complex, open-ended problems, before deciding on the resolution (Lampert, 2006).
**Teaching for transfer.** Rather than assuming that transfer will occur naturally, Perkins (1986) and Halpern (1998) emphasise teaching for transfer as critical thinking learnt in a particular situation will not be intuitively applied in other situations. Students need to practice the art of transferring the skills from one situation to another (Van Gelder, 2005). Williams (2005) suggests incorporating a broad diversity of examples in teaching thinking and applying thinking in different ways under varied circumstances to promote transferability. McBride (2004) adds that to help students transfer critical thinking dispositions from one discipline to other subject areas and to their daily lives, teachers in one discipline, such as `physical education, need to help them look out for similarities between critical thinking tasks in physical education classes and those in other subject disciplines.

Proposition 2 focuses on the factors necessary for the creation of a critical thinking culture namely:

- a shared vision for developing a thinking culture
- competent teachers committed to teaching critical thinking,
- holistic infusion of critical thinking across all school programmes
- a school-wide practice of critical thinking

The two sub-propositions which form Proposition 2 have clear implications for professional practice.

**Sub-Proposition 4:**

*Having a school-wide practice of critical thinking will be achieved when the vision for developing a thinking culture in the school is shared by the whole school community, including board members, school leaders, middle management, teachers, parents and students.*

Leithwood, Harris, and Hopkins (2008, p. 29) argue that “almost all successful leaders draw on the same repertoire of basic leadership practices”. They noted that among these practices, “building a shared vision” is one of the key themes which surfaces constantly from the literature in connection with developing an understanding of the work of effective educational leaders in times of significant change. Hence, it is necessary for school leaders to promote the development of a shared vision, established with a clear moral purpose and attainable goals together with their staff (Leithwood et al., 2008). Carrington and Robinson (2004) add that school leaders need to create an atmosphere of collaborative effort and ownership during the change process.

Kassem (2000) proposes the creation of the right climate which encompasses “a school-wide atmosphere that encourages reflection and critical thought” (p.27). In the
process of creating the right climate, she stresses the need to obtain group consensus in the school community pertaining to the goal of improving critical thinking skills. Carrington and Robinson (2004) concur with Kassem on the necessity of engagement with the school community even as the school leaders and teachers participate in the change process together:

An inclusive school culture engages the school community in collaborative forms of learning and is underpinned by democratic planning processes (p.142).

Sub-Proposition 5:
*The holistic infusion of critical thinking in all school programmes (core and non-core) is necessary for the creation of a critical thinking culture.*

Lipman (1991) and Perkins (1992) advocate a systems approach to the instruction of critical thinking in which the thinking is infused into all subjects and all grade levels. In the implementation of a school-wide approach to critical thinking instruction in Rabun County High School in Georgia, the school principal appointed a Critical Thinking Team comprising a representative from each discipline, the school counsellor and even the library/media specialist (Kassem, 2000). The Critical Thinking Team devoted time and resources to improving critical thinking skills including the provision of workshops on critical thinking for all staff. In addition, time was set aside during department meetings throughout the academic year to discuss lessons on critical thinking. On top of that, each department was held accountable by having to present how they implemented critical thinking at regular school-wide staff meetings. Findings showed that teachers in Rabun High School realised that it was feasible to include objectives for higher order thinking in all disciplines including Physical Education and that it was essential to provide all students (not just the gifted) the opportunity to show their critical thinking skills.

In order to support the implementation of Propositions 1 & 2 at the school level, there is a need for a professional development structure to be put in place to develop the pedagogical competencies required for teaching critical thinking in both pre-service and in-service teachers. There is also a need for policy revision pertaining to proposed changes in the PSLE. All these are detailed in the next segment.

**Implications for Organisational Policy**

In this study, 28 out of a shortlisted pool of about 50 award-winning teachers took part in the initial online survey to determine their perception of critical thinking before the six participants were eventually selected. In the survey, all 28 participants agreed or strongly agreed that critical thinking is important and that it is essential to teach primary school students to read critically. As expected, when asked to define 'critical thinking', it
was noted that the definitions of the participants were extremely diverse with some listing higher order skills from Bloom’s taxonomy namely, analysis, synthesis and evaluation and others emphasising reasoning or supporting one’s stand with reasons. About one quarter of the participants focused on the eventual purpose of making decisions/judgements or coming to conclusions while the definitions of yet another quarter were vague and hazy. Kuhn and Shaughnessy (2004) argue that educators need clarity on what it means to develop students’ thinking skills.

Hatcher (2006) emphasizes that institutions committed to achieving the goal of teaching critical thinking need to look conscientiously at two key questions: What do they mean by the phrase ‘critical thinking’? How are critical thinking skills best taught? This suggests a need for MOE to work with educators to arrive at a common understanding of ‘critical thinking’ for the teaching fraternity in Singapore as the interpretation of ‘critical thinking’ will lead to the type of resources used to develop students' critical thinking skills and determine how these skills are most effectively taught (Hatcher, 2006). For example, contrary to the lengthy and comprehensive definitions explained in the literature review in Chapter 2, Yeh (2001 p.12) defines critical thinking simply as careful argumentation for the following reasons:

Conceptualising critical thinking in terms of argumentation provides a simple, useful way to focus instruction and assessment according to the type of critical thinking that appears to be valued in the workplace.

If MOE could come up with a simple and useful way of defining critical thinking as Yeh had done, it would provide teachers, in particular, primary school teachers with simple and clear directions on the focus of critical thinking instruction and assessment in the primary schools (see p.32 on proposal to adopt Case and Wright’s definition of critical thinking for primary schools).

To enhance the possibility of whole school curriculum development to infuse critical thinking practices across the curriculum, there is a need for a systematic and staged process of professional development in critical thinking for all primary school teachers. Hence, a two-pronged professional development strategy simultaneously involving both pre-service teachers and in-service teachers is required in line with Torff’s (2005) recommendation.

**Pre-service Primary School Teachers**

All pre-service primary school teachers need to be explicitly taught to think within their subject disciplines. They should also be equipped with thinking strategies to infuse critical thinking within their subject disciplines in order for critical thinking to be infused
across the entire curriculum. Williams (2005) argues that future teachers are unlikely to promote critical thinking unless they themselves become skilled critical thinkers. He adds that it is also just as unlikely for trainee teachers to become skilled critical thinkers if critical thinking practices are not stressed in their teacher education programmes.

A study on the effects of integrating critical thinking skills into a teacher preparation course showed that emphasis on critical thinking, even in one course content area resulted in positive effects on pre-service mathematics teachers’ attitudes and their perception of their role in teaching Mathematics (Sezer, 2008).

In another study, the implementation of an inquiry-based biology laboratory improved pre-service elementary teachers’ opinions about science and how it is best taught. These pre-service elementary teachers valued the flexible and self-directed structure of the inquiry-based format and looked forward to using exercises from the inquiry-based laboratory in their future classrooms. These results indicate that the use of inquiry-based laboratories in teacher education programmes encouraged pre-service elementary teachers to use inquiry in their future classrooms (Tessler, 2010).

Currently, there is a lack of explicit teaching on critical thinking and the infusion of critical thinking within most subjects of specialisation in the DipEd and PGDE programmes for primary school teachers in training. Hence, designing and integrating critical thinking into the subjects specialised by pre-service teachers will prepare them to be practitioners who are able to effectively infuse critical thinking within their subjects. MOE could work in collaboration with NIE to include the explicit teaching of critical thinking and the infusion of critical thinking in all subject areas (core & non-core) in the pre-service teacher training for primary school teachers during their PGDE and DipEd programmes. In this way, all pre-service teachers can be systematically instructed on how they could infuse critical thinking in their subject areas of specialisation.

**In-service Teachers**

Despite all six participants being experienced award-winning teachers who believe in the importance of critical thinking, the study reveals that the degree and frequency with which they infuse critical thinking across the curriculum lie along a continuum. It could be inferred that the continuum would lengthen markedly when the critical thinking practices of all primary school English teachers in Singapore are examined. Nonetheless, this continuum of practice offers the possibility of developing a staged PD to develop in-service teacher competencies in teaching critical thinking, beginning with simple strategies to infuse critical thinking within the curriculum and progressing to the explicit teaching of critical thinking and how to assess the quality of reasoning. In view of the great
unevenness in the critical thinking practices of teachers in Singapore, there is a need to understand and shape teacher beliefs regarding the value of critical thinking (Williams, 2005) in order to make the infusion of critical thinking more pervasive in the primary school classroom.

Saphier, Haley-Speca and Gower (2008) argue that teacher beliefs which “drive behaviour, are often unexamined and are certainly resistant to change” (p. 11). However, Alsup (2006) asserts that these beliefs can be changed if they are repeatedly challenged through cognitive dissonance. Cognitive dissonance can be created through professional conversations and classroom observations involving teachers who are passionate and committed to infusing critical thinking. Kempe and Reed (2014) contend that ongoing professional conversations are beneficial in maintaining innovative identities and practices. It is also essential for these teachers to interact with other like-minded teachers in groups during the training sessions. They explain that implementing new teaching approaches introduced during professional development sessions is not a simple task as teachers may face resistance from colleagues. Hence, teachers who seek to “initiate and implement changes in established classroom practices are likely to require support from like-minded professionals” (p.57). Kempe and Reed (2014) also advocate ongoing professional conversations after group members have completed the course for the sustenance of the confident teacher identities developed while the group was undergoing the training sessions (see p. 26).

Professional development programmes are often designed to bring about changes in the attitudes, beliefs and perceptions of teachers with the assumption that this would lead to changes in classroom behaviours and practices (Park & Sung, 2013). However, Guskey (2002) argues that it is the experience of successful implementation that results in changes in teachers’ attitudes and beliefs. He developed a model to depict the “temporal sequence of events from professional development experiences to enduring change in teachers’ attitudes and perceptions” (Guskey, 2002, p. 381). In the model, the sequence of events is: teachers’ participation in professional development programmes; change in teachers’ classroom practice; change in student learning outcomes; and change in teachers’ beliefs and attitudes. Guskey elaborates:

According to the model, significant change in teachers’ attitudes and beliefs occurs primarily after they gain evidence of improvements in student learning. These improvements typically result from changes teachers have made in their classroom practices, a new instructional approach, the use of new materials or curricula, or
simply a modification in teaching procedures or classroom format. (Guskey, 2002, p. 383)

Other studies which support Guskey’s ideas showed that teachers commit to a curricular innovation only after they had experienced success with it in the classroom (Cohen & Hill, 2000, Hubermam, 1992). In view of this, the professional development sessions on critical thinking for in-service teachers should incorporate opportunities for classroom practice of strategies taught. Following the classroom practice, there should be follow-up sessions to allow teachers to reflect and share their implementation experiences. Hence, the teacher development sessions should be systematic, ongoing and developmental instead of a one-off session (Park & Sung, 2013). Effective professional learning designs should “promote professional identity and agency: theory; building and applying theory; close observation of practice; discussion grounded in teachers’ work with learners, and sustained and ongoing learning” (Bodman et al., 2012, p.20).

Fullan (2007) cautions that the implementation of a new curriculum requires a continual process of adapting and revising as teachers seek a balance between the new curriculum goals as well as their own understanding and context. In their study of curriculum reform involving Korean primary school teachers, Park and Sung (2013) found that teachers expressed a lack of peer support for solving problems and resolving difficulties they encountered during the process of implementation as being critical to their lack of commitment to implementation. Hence, it is necessary to promote peer support and collaboration during the implementation phase of a reconstructed curriculum (Seo, 2009). Fullan (2007) states that a collaborative work culture raises staff morale and the enthusiasm of teachers as the continual communication and collaborative work provide the impetus that teachers need to get the implementation of curricular ideas going. Park and Sung (2013) contend that peer support plays a critical role in “facilitating implementation and seriously affects teachers’ decisions to innovate in the classroom” (p. 30). Hence, they reiterate the need for policymakers and administrators to foster a collaborative school culture where teachers work together to experiment with new curricular ideas and solve problems arising during the implementation. In addition, they highlight the need for policymakers to address the heavy workload constraints faced by teachers during the period of curriculum innovation.

In schools with the Gifted Education Programme, GEP teachers, who are already trained in critical thinking, could conduct sharing sessions on teaching critical thinking and invite mainstream teachers to observe how they infuse critical thinking within the curriculum. Mainstream teachers could then consider how they could adapt these
strategies to infuse critical thinking in their classes. Diamond (2007) reports that teachers often go to other teachers for direction when making pedagogical decisions and hence collegial interactions are important in influencing the instruction of teachers.

**PSLE English Language Assessment**

Just teaching critical thinking skills is not enough. Marzano (1988, p.5) asserts that teachers need to assess student competence in these skills as assessment is “inexorably linked with instruction because we tend to learn best that on which we are assessed”. Kuhn and Crowell (2011) also argue that much as the 21st century skills are valued, “these can have weight only to the extent that they can be rigorously defined and measured”. Williams (2005, p. 181) concurs that “accountability tests should give primary emphasis to critical thinking rather than to simple mastery of content” if critical thinking is considered an important academic outcome in the various subjects. Hence, the value of critical thinking should be recognised by using appropriate ways to assess it.

Furthermore, teaching instruction is heavily influenced by high stakes testing policies (Diamond, 2007). Although research regarding the benefits of high stakes assessment as an instrument for reforming educational practice has been controversial, there is some evidence that whatever is tested is likely to be taught (Vogler, 2002). In his study, Vogler (2002) found that the use of high stakes state-mandated student performance assessments contributed to changes in the instructional practices of teachers encompassing the use of open-response questions, creative/critical thinking questions and problem-solving activities. Yeh (2001, p.12) contends that:

> If one accepts the premise that tests drive curriculum and instruction, perhaps the easiest way to reform instruction and improve educational quality is to construct better tests.

Currently, primary school teachers see it as their responsibility to prepare students for PSLE, a high stakes examination. Hence, if given a choice between spending time on critical thinking activities and conducting lessons which prepare students for PSLE, it is likely that most would choose the latter. Findings of a study on the knowledge, beliefs and syllabus implementation of more than 2600 primary and secondary school English teachers from 150 schools in Singapore by Goh, Zhang, Ng and Koh (2005) revealed that “teachers’ priorities and practices have been (and will most likely continue to be) heavily influenced by examination syllabuses” (p.146). They added that teachers’ consideration for examinations seemed to be the key driving force in their teaching. In view of this, if changes to certain components of the PSLE English Language paper are made which
require students to think critically, there is a great likelihood that teachers will spend time
guiding students to think critically.

The current change in the assessment format of the PSLE comprehension with
effect from 2015 includes several questions which require students to reason logically and
support their view with reasons based on the text. This is a step in the right direction as far
as promoting critical thinking school-wide is concerned. Teachers in all schools when
doing comprehension practice would guide students to think of the basis for their opinions
based on information from the text in view of the new assessment format. In so doing, they
are consciously or unconsciously promoting some form of critical thinking among students.

In view of this, more changes could be made on the format of the PSLE English
Language papers to include critical thinking in the oral and writing components. Yeh
(2001) advocates changing the tests to reflect greater priority in critical thinking. He adds
that such tests would encourage teacher behaviour which promote the learning of
desirable critical thinking skills. Currently, the oral conversation component requires
students to share their opinions about a topic related to the picture stimulus. By
deliberately selecting pictures related to controversial issues or providing scenarios
involving decision-making and tweaking the conversation prompts, students could be
asked to make their stand on an issue and support their opinions with reasons. The
controversial issues selected should be within the context of the students’ experience in
primary school (including their exposure to Science topics and CCE) such as eating
sharks’ fins, responsible pet ownership, recycling, killing of wildlife for their skin or horns,
telling white lies and keeping secrets.

For continuous writing, the new examination format with effect from 2015 provides
students with the flexibility of writing in different text types instead of just narrative text as
in the past. Currently, there is only one question with three pictures and students have to
write about the given topic using at least one of the pictures. A second question could be
given as an option for continuous writing as in the previous examination format prior to
2015. However, the suggested second question should be an argumentative prompt
requiring students to adopt their position on a given issue and write a persuasive argument
in favour of their position using relevant information based on the STELLAR curriculum,
their personal experience or their own reading. Some examples of topics related to the
primary school students’ experience include: Does the Internet do more harm or good? Is
learning Mother Tongue in school important? Should students be allowed to use cell
phones in school? Are school rules necessary? These issues require students to think
critically and weigh the pros and cons before stating their conclusion or adopting their position based on their assumptions and the evidence they are aware of.

Williams (2005, p. 167) explains that researchers frequently assess critical thinking by requiring students to evaluate whether the “stated conclusions logically follow from the evidence and assumptions provided. Hence, he concludes that critical thinking ability is “reflected in how well students analyse evidence and determine what conclusions would legitimately follow from that evidence”. Dickson (2004, p.35) asserts that being able to “form and hold beliefs, make judgements, and consider opposing views is vital to the significant decisions that people make in their lives”.

As the argumentative prompt is an additional option, students who are not ready to do argumentative writing could still choose the option of narrative writing based on the pictures. Hence, not only is the risk involved in providing the argumentative prompt as an option low, it also provides a platform for students who are competent in argumentative writing to display their critical thinking. However, before the implementation of the argumentative prompt, Singapore Examinations and Assessment Board (SEAB) together with MOE, would need to develop a new rubric for grading the argumentative essay. Currently, it is noted that the same grading rubric is used regardless of the text type written by the students, whether narrative or expository.

However, the provision of an argumentative prompt as an option for continuous writing in PSLE may be counterproductive when teachers prepare students for the test by predicting the possible controversial issues that might be tested for the continuous writing component of the English Language PSLE and teach to the test through rote memorisation. If student competencies for critical thinking are to be formally assessed, both the conversation and argumentative prompts need to be authentic, involving real world situations without relying on specific curricular content and yet not be so predictable that they are open to teachers’ drilling for performance.

Diamond (2007) reports that teachers in every school tend to prepare students for high stakes tests by covering tested content and coaching them on test-taking skills. Unlike previous research which showed the impact of testing on content, studies by Diamond showed that while there is a strong impact on content, the impact on pedagogy is limited. That would imply that if teachers are pedagogically trained in teaching argumentative writing by teaching students to examine critically both sides of the issue before adopting their stand, it is likely that they will continue to use the same pedagogy to prepare their students for the argumentative prompt instead of teaching to the test. Hence, the assessment using controversial issues for the conversation component and the
argumentative prompt as an option for continuous writing is an instrumental way to get curriculum outcomes that are desirable.

**Contributions of this Study**

Although this study is relatively small scale with only six participants comprising six distinct case studies, the in-depth qualitative study made a significant contribution in addressing the lack of research on critical thinking from the perspective of teacher practitioners, particularly in the primary schools. Hence, this study contributes towards developing an empirical base in the context of Singapore with regard to how teachers view critical thinking and how they operationalise it. By looking at the beliefs of the participants and how they infuse critical thinking across the English Language curriculum over a period of ten months, this study has identified the effective strategies and approaches used to infuse critical thinking across the English language curriculum by expert in-service primary school teachers in Singapore.

Through the themes and theoretical propositions based on a thick description of the six expert teachers, an explanatory theory regarding the creation of a critical thinking culture in the school environment was generated with implications for professional practice, organisational policy and practice, and further research. An understanding of this theory would provide school leaders with concrete ideas on how they could create a critical thinking culture in their schools.

This study also provides useful information for policy makers within the Ministry of Education with regards to pre-service teacher education and in-service teacher professional development as well as proposals for changes to be made in the assessment of English in the Primary School Leaving Examination.

**Limitations of this Study**

As mentioned earlier, of the 50 award-winning teachers who were invited to do the initial survey, only 28 participated in the survey. This may suggest that even among award-winning teachers, only about half are sufficiently committed to teaching critical thinking to engage with the survey. Nine teachers out of the 28 were deemed suitable as potential participants; of whom six eventually participated in the study due to their willingness. Hence, this study is limited to the perspectives of only six award-winning primary school English Language teachers. A larger research study would be required to define the scope of the challenge in re-culturing primary schools in Singapore for critical thinking.

It must be acknowledged that social desirability concerns might have influenced some of the interview responses given by the teachers. The strength of the influence is
dependent on whether these teachers felt a need to show that they were worthy of the awards that they had received.

**Directions for Further Research**

To investigate the state of infusion of critical thinking across or within the curriculum among primary school teachers in general, more action-based research could be carried out in primary schools. These site-based action researches could focus on the practice of infusing critical thinking in the different core subjects such as English Language, Mathematics, Mother Tongue, Science and Social Studies as well as non-core subjects such as Physical Education, Music, Art and CCE. As the four core areas of CCE are aligned strongly to critical thinking, studies on how critical thinking is enacted in the CCE curriculum might be productive. The action researches could also be a combination of the infusion of critical thinking and teacher professional development or practical research on what works in the primary school context regarding the infusion of critical thinking.

Future research could also systematically investigate how training within one domain might transfer to other domains. In addition, it would be useful to determine if there are approaches to critical thinking that promotes high performance on standardised tests in view of teachers’ concerns about taking time away from standardised test preparation when curriculum time is spent promoting critical thinking in students.

Examining the characteristics of students would also be a significant direction for future research. The rationale for this is that children’s prior educational experiences and their family beliefs about the value of critical thinking could play a role in the effectiveness of critical thinking education. It would also be beneficial to examine teachers’ comments on teaching critical thinking ideas that are implemented by other teachers through focus group discussions. This could result in teachers building on one another’s ideas in interesting ways.

In view of the suggestion of using controversial issues for the conversation component and including the option of an argumentative prompt for continuous writing for PSLE, it is recommended that the Research and Development Division within the Singapore Examinations and Assessment Board (SEAB) consider researching the related assessment procedures to see whether these suggestions are feasible. The conversation and argument prompts should not be predictable and should not encourage teaching to the test by getting students to prepare and memorise possible answers. What are the appropriate ways of assessing critical thinking without it being so predictable that teachers can prepare students for it? This may pose a challenge for test constructors. Hence,
developing assessment procedures that avoid these issues could be the direction of future research as the assessment process should not become counter-productive to the outcomes to be achieved and should not have an adverse impact on learning.

**Conclusion**

Central to the Thinking School Learning Nation vision is that of equipping students for the unpredictable future, by ensuring that young people can think for themselves and find their own solutions to new challenges faced in the future (Goh, 1997). In tandem with the TSLN vision, being a confident person who is able to think independently and critically is one of the Desired Outcomes of Education.

Following the thinking programmes came the eventual moving away from teaching critical thinking as a stand-alone approach to the infusion of critical thinking across curricular domains. Infusing critical thinking by integrating thinking and disciplinary content to develop disciplinary understanding is educationally sound and a step in the right direction. Nevertheless, without clear guidelines and directions from the ministry, particularly in the primary schools, with the exception of the Gifted Education Programme, the teaching of critical thinking across the English Language curriculum has been treated as an optional extra or as an add-on, where it competes for time with the intended curriculum, and has little recognition in PSLE, a high stakes examination. This research has indicated that even when some teachers are committed to infusing critical thinking across the curriculum, they (with the exception of GEP teachers) may lack some of the necessary substantive background knowledge and the pedagogical skills to assess how well their students are thinking critically. This research, grounded in the professional experiences of expert teachers committed to the infusion of critical thinking has proposed ways in which the policy ambitions of TSLN might be re-booted to more comprehensively achieve its goals.

Fullan (2011) argues that the solution to successful educational reform is to tap on the energy of educators and students as the driving force. He advocates that this energy arises from “doing something well that is important to you” and “which makes a contribution to others as well as society as a whole” (p. 3). Critical thinking is something teachers have to be passionate about and it should be infused purposefully across the total curriculum. The key to making critical thinking more pervasive in primary schools is to tap on the energy of teachers who are passionate about infusing critical thinking and getting them to influence other teachers through capacity building and collaborative group work (Fullan, 2011). Only by equipping all pre-service and in-service teachers to infuse critical thinking across the curriculum through systematic, ongoing professional
development can all primary school teachers in Singapore be empowered to respond as Schwartz did:

    If I waited until I had time in my already overloaded curriculum to teach critical thinking, I would never get to it. If, however, I model it and make assignments and activities critical-thinking ones, then I can cover the prescribed curriculum while infusing critical thinking into the course (Schwartz as cited in Case and Wright 1997, p.15).
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Appendix A
Letter to Inform Principals and Seek Consent for Teacher Participation in Study

Marnie O’Neill
Senior Honorary Research Fellow
Graduate School of Education
The University of Western Australia
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T: +61 8 9488 0000
F: +61 8 9488 0000
M: 0419 988 848
E: Marnie.O’Neill@uwa.edu.au
www.gse.uwa.edu.au
CRICOS Provider Code: 00126G

10 September 2013

Dear Name,

Project Title: Infusion of Critical Thinking Skills across the English Language Curriculum: A Multiple Case Study of Primary School In-Service Expert Teachers in Singapore

Chief Investigator: Professor Marnie O’Neill (email: marnie.onell@uwa.edu.au) 
Researcher: Mdm Kow Hui Meng (email: kow_hui_meng@moed.edu.sg)

I am writing to seek your permission to include a teacher from your school as a case study in the research identified above. The purpose of this study is to generate explanatory theory regarding the perspectives of primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking skills across the English Language curriculum. The term ‘expert teacher’ refers to a teacher who has received some form of recognition for his/her teaching expertise, such as the President’s Award for Teachers or the Inspiring Teacher of English Awards. (Name of teacher) has been identified as a possible participant.

Through this study, we hope to address the deficit in empirical research regarding the perspectives of teachers on the infusion of critical thinking skills and how this has impacted classroom practice, particularly in primary schools. The empirically-based research findings and recommendations will benefit policy makers and English Language curriculum developers in the Curriculum Planning & Development Division (CPDD). Primary school teachers of English Language will gain insights into the development of more effective strategies and models of instruction for teaching critical reading which they could use to promote critical thinking in pupils.

The sample of award-winning teachers will be surveyed to determine their beliefs regarding critical reading and the infusion of critical thinking across the English Language curriculum. From the survey, six teachers who firmly believe in the importance of critical reading and expressed willingness to participate in the study will be selected for the case study. Data will be collected using semi-structured interviews as well as unstructured classroom observations. Oral interviews should take approximately 60 minutes per session for up to a total of about three hours. Observations will take 60 minutes per session for up to a total of three hours. Interviews will be audio-recorded and the teacher (but not the students) will be video-taped during the observations. The audio-taped interviews and selected segments of the observations will be transcribed. Once transcribed, the transcript will be given back to the participants to check and any misinterpretations will be rectified. No identifying information pertaining to the school or the participant will be included in any publications that emerge from this research.

Participation is voluntary (please refer to attached Participant Consent Form), and the teacher may revoke his/her consent to participate, without prejudice at any time prior to the appearance of the work in published form. There is minimal risk and minor inconvenience associated with participation in this study. All data will be collected confidentially and coded to prevent identification of the individual participant. All data will be stored in encrypted format. The investigators (Hui Meng and Dr Marnie) are available to answer any further questions that you may have in relation to this research project.
Approval to conduct this research has been provided by the University of Western Australia, in accordance with its ethics review and approval procedures. Any person considering participation in this research project, or agreeing to participate, may raise any questions or issues with the researchers at any time.

In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Research Ethics Office at the University of Western Australia on (08) 6488 3703 or by emailing to hreo-research@uwa.edu.au

All research participants are entitled to retain a copy of any Participant Information Form and/or Participant Consent Form relating to this research project.

Marnie O’Neill
Senior Honorary Research Fellow
Graduate School of Education
The University of Western Australia
10 September 2013

Name & Address

Dear (Name of Teacher)

Research Participant Information Form

Project Title: Infusion of Critical Thinking Skills across the English Language Curriculum: A Multiple Case Study of Primary School In-Service Expert Teachers in Singapore.

This doctoral research will be conducted by Ms Kow Hui Meng under the supervision of Dr Marnie O’Neill (email: marnie.onell@uwa.edu.au).

You have been invited to participate in this study because you are a finalist / an awardee of the President’s Award for Teachers / Inspiring Teacher of English Award.

The purpose of this study is to generate explanatory theory regarding the perspectives of primary school in-service expert teachers of English Language in Singapore, who firmly believe in the importance of critical reading, on the infusion of critical thinking skills across the English Language curriculum. This study will help to address the deficit in empirical research located in the perspectives of teachers on the infusion of critical thinking skills and how this has impacted classroom practice, particularly in primary schools.

Data will be collected using semi-structured interviews as well as unstructured classroom observations. You will be invited to participate in the interviews and observations. Oral interviews should take approximately 60 minutes per session for up to a total of about three hours. Observation studies will involve you being observed for 60 minutes per session, at your convenience, in your learning environment for up to a total of three hours.

Interviews will be audio-recorded and you (but not your students) will be video-taped during the observations. The audio-taped interviews and selected segments of the observations will be transcribed. Once transcribed, the transcript will be returned to you to check and any misinterpretations will be rectified. No identifying information pertaining to you or your school will be included in any publications that emerge from this research.

Participation is voluntary (please refer to attached Participant Consent Form), and you may revoke your consent to participate, without prejudice at any time prior to the appearance of the work in published form. There is minimal risk and minor inconvenience associated with participation in this study. All data will be collected confidentially and coded to prevent identification of the individual participant or school. All data will be stored in encrypted format.

The investigators (Hui Meng and Dr Marnie) are available to answer any further questions that you may have in relation to this research project.

Approval to conduct this research has been provided by the University of Western Australia, in accordance with its ethics review and approval procedures. Any person considering participation in this research project, or agreeing to participate, may raise any questions or issues with the researchers at any time.
In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Research Ethics Office at the University of Western Australia on (08) 6488 3703 or by emailing to hreo-research@uwa.edu.au. All research participants are entitled to retain a copy of any Participant Information Form and/or Participant Consent Form relating to this research project.

Marnie O'Neill
Senior Honorary Research Fellow
Graduate School of Education
Appendix C
Research Participant Consent Form

Participant Consent Form

Project Title: Infusion of Critical Thinking Skills across the English Language Curriculum: A Multiple Case Study of Primary School In-Service Expert Teachers in Singapore

Chief Investigator: Dr Marnie O'Neill (email: marnie.onneil@uwa.edu.au)
Researcher: Kow Hui Meng

I (the participant) have read the information provided and any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I may withdraw at any time without reason and without prejudice.

I understand that all identifiable (attributable) information that I provide is treated as strictly confidential and will not be released by the investigator in any form that may identify me. The only exception to this principle of confidentiality is if documents are required by law.

I have been advised as to what data is being collected, the purpose for collecting the data, and what will be done with the data upon completion of the research.

I agree that research data gathered for the study may be published provided that neither my name nor any other identifying information is used.

______________________   ______________________
Participant                     Date

Approval to conduct this research has been provided by the University of Western Australia, in accordance with its ethics review and approval procedures. Any person considering participation in this research project, or agreeing to participate, may raise any questions or issues with the researchers at any time.

In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Research Ethics Office at the University of Western Australia on (08) 6488 3703 or by emailing to hreo-research@uwa.edu.au

All research participants are entitled to retain a copy of any Participant Information Form and/or Participant Consent Form relating to this research project.
Name of Teacher __________________________

<table>
<thead>
<tr>
<th>Please tick the appropriate column</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Critical thinking is important.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. It is essential to teach primary school students to read critically.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I am committed to teaching my students to read critically.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Critical reading and critical thinking are closely related.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I infuse critical thinking activities during English lessons on:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Speaking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Listening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
SA – Strongly Agree; A – Agree; N – Neutral; D – Disagree; SD – Strongly Disagree

6. Which of the following teaching strategies have you used during your English Language lessons?
   Please write 1, 2 or 3 in the box to indicate your THREE most frequently used strategies:

<table>
<thead>
<tr>
<th>Socratic questioning</th>
<th>Case studies</th>
<th>Cooperative learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debate</td>
<td>Role-playing</td>
<td>Group project work</td>
</tr>
<tr>
<td>Inquiry-based learning</td>
<td>Guided discussions</td>
<td>Group performances</td>
</tr>
</tbody>
</table>

7. Please fill in the 3 most frequently used strategies and place a √ in the box to indicate how often you use each of the strategies during your English lessons?

<table>
<thead>
<tr>
<th>Strategy 1</th>
<th>Strategy 2</th>
<th>Strategy 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3x a week</td>
<td>2-3x a week</td>
<td>2-3x a week</td>
</tr>
<tr>
<td>2-3x a month</td>
<td>2-3x a month</td>
<td>2-3x a month</td>
</tr>
<tr>
<td>2-3x a term</td>
<td>2-3x a term</td>
<td>2-3x a term</td>
</tr>
</tbody>
</table>
Open-ended questions

1. My definition of critical thinking is ________________________________
   ______________________________________________________________
   ______________________________________________________________

2. I think it’s important to teach students to read critically because
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

3. The following are some examples of critical thinking activities which I have
   infused in my English lessons:
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

4. I hope to see the following outcomes in students as a result of infusing
   critical thinking skills into my English lessons:
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

5. I face the following constraints in the process of infusing critical thinking in
   the English Language curriculum:
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

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Appendix E
Initial Interview Questions

Building Rapport
Please tell me something about yourself. When and why did you become a teacher?

Interview

1. What do you think of when you hear the vision statement, “Thinking School, Learning Nation”?

2. How can teachers play their part in making their school a thinking school?

3. In your opinion, what is critical reading?

4. How do you see the connection between critical reading and critical thinking? (F/U question: How do they use critical reading practices to promote critical thinking?)

5. Why do you think critical thinking is important in the teaching and learning of English Language? How did you develop this conviction?

6. How would you infuse critical thinking across the English Language curriculum? Please give a specific example that you have carried out this term.

7. How often do you infuse critical thinking into your English lessons? Why?

8. What preparations do you make when planning a lesson that involves the infusion of critical thinking?

9. What are some strategies/activities you have used to infuse critical thinking into the English curriculum? Why do you use these strategies?

10. What outcomes do you hope to see in students as a result of infusing critical thinking into the classroom?

11. Do you expect to see the transfer of critical reading practices to other learning areas or life in general? Have you seen any evidence of a transfer of critical thinking skills taught in English lessons to other learning contexts, and to the pupil’s life? Could you think of a specific example?

12. What are some constraints you faced in the process of infusing critical thinking across the English curriculum?

13. What tips would you share with teachers to help them infuse critical thinking into the English Language curriculum?

14. What are your concerns regarding the infusion of critical thinking in the English curriculum?
## Appendix F

### Grounded Theory Coding Example: Open Codes to Focused Codes

<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Interview Transcript</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Being committed to teaching critical thinking</strong></td>
<td>How can teachers play their part in making their school a thinking school? In the first place I think teachers need to be convicted that thinking is a critical skill. So they must buy the vision statement. And then the next thing is that they should model the thinking part and they themselves must always be professionally upgrading so that they are always updated and they can somehow pre-empt the learning needs and gaps that need to be filled and bridge it.</td>
</tr>
<tr>
<td><strong>Modelling thinking</strong>&lt;br&gt;Upgrading professionally&lt;br&gt;Being updated, anticipating learning needs and bridging gaps</td>
<td>Why do you think critical thinking is important in the teaching and learning of English Language? English literacy is about reading. You use the language to express opinions so if you don’t teach them how to think critically, it’s probably going to affect the quality of their writing. Eventually, because they are tied, you will see that deficiency surfacing when they go for papers like General Paper. When you compare the poorer writers with the better, more competent writers, you see that it is not a matter of language skills. It is no longer just giving a passage or an essay with no grammatical mistakes, very good structure. There must be some substance when you are trying to express the ideas behind what you write.</td>
</tr>
<tr>
<td><strong>Valuing critical thinking</strong>&lt;br&gt;Relating quality writing with critical thinking</td>
<td>I feel that it is important to teach students to read critically as students with poor thinking skills have poor reading comprehension.</td>
</tr>
<tr>
<td><strong>Connecting poor writing with lack of critical thinking</strong></td>
<td>Reading comprehension is a way to evaluate their depth of analysis.</td>
</tr>
<tr>
<td><strong>Seeing writing as more than language skills, grammar, structure</strong>&lt;br&gt;Perceiving critical thinking as essential in writing</td>
<td></td>
</tr>
<tr>
<td><strong>Being committed to teaching critical thinking</strong>&lt;br&gt;Evaluating depth of analysis</td>
<td></td>
</tr>
</tbody>
</table>

Key: Open codes selected as focused codes are in bold.
<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Interview Transcript</th>
</tr>
</thead>
</table>
| **Being committed to teaching critical thinking school wide/Modelling thinking/School-wide practice of CT**<br>Being critical thinkers not cynics<br>Understanding thinking levels and perspectives | How can teachers play their part in making their school a thinking school?  
I think the first step is to make sure that everybody is a thinker in the first place. It's very hard to teach thinking if you yourself are not a thinker in the first place. When I say that, it doesn't fall just on the teachers but everyone. It includes your principals, your VPs, school management, your board — everybody must understand that that's what you're going for in terms of thinking — being critical thinkers but not cynics, not to be always critiquing but being critical thinkers where you understand different levels of thinking, the perspectives and things like that...things that we are going to do.  
It involves everyone.  
Then we equip everyone with the mindset and skills. Skills can come in second after we ironed out the purpose. Once we can do that then we role-model. We do it every single day until it becomes a lifestyle. If we can do that, it makes the teaching easier because children no longer feel that it's an artificial subject.  
More often, what children find problems with is English, Math, Science—all these are individual subjects taken in silos. If we just introduce something else like thinking, they're going to think that it's another subject so it'll be tough. |
| **School-wide practice of CT**<br>Equipping all with mindset and skills/ Having a clear purpose first/Modelling thinking daily/Thinking as a lifestyle | **Recognising limitation of teaching in silos**<br>Viewing thinking as a subject |
| **Valuing critical thinking**<br>Valuing critical thinking<br>**Being committed to teaching critical thinking**<br>Developing good decision-makers | **Why do you think critical thinking is important in the teaching and learning of English Language?**  
I think it's important generally. I just happen to use English as the medium to teach. I think generally, it's important for people to be critical thinkers. For me, it's always about informed decision-making. I always want to teach my children to be wise decision makers, to be wise decision makers who do the right things at the right time and say the right things to the right people.  
Basically, it's about context, it's about circumstances — to be able to make good and wise decisions as far as you can. It requires thinking but it doesn't have to be so in-depth that it actually causes paralysis but empowering enough for the people to enact some change either to others or to themselves. Both ways can be a positive change to others or a negative change. Thinking on its own is one but we definitely have to teach them to apply that in moral and ethical situations so for me that's the basis to start. English is useful or languages. Basically humanities is useful. |
<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Interview Transcript</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justifying their views</td>
<td>How can teachers play their part in making their school a thinking school? For lessons, when we ask a question, we do not expect the pupils to say just ‘yes’ or ‘no’. If they say ‘yes’ they need to justify why they said ‘yes’. This is to make sure that they know what they are talking about rather than just following the crowd. Or when it is a ‘no’, they need to explain why it’s a ‘no’. It doesn’t matter if it is right or wrong, but at least they have thought about it and are able to justify their answer before they respond with a ‘yes’ or ‘no’. We need to get their brains thinking, get them to do some thought processing and analysis before they say something.</td>
</tr>
<tr>
<td>Not having a crowd mentality</td>
<td></td>
</tr>
<tr>
<td>Developing thinkers who think before answering and are able to justify view</td>
<td></td>
</tr>
<tr>
<td>Being committed to teaching critical thinking</td>
<td></td>
</tr>
<tr>
<td>Seeing value of CT for all subjects/ Focusing on communication</td>
<td>Why do you think critical thinking is important in the teaching and learning of English Language? I would think that actually it is important for all subjects and not only English. For English Language, it involves communication with others.</td>
</tr>
<tr>
<td>Justifying view</td>
<td></td>
</tr>
<tr>
<td>Expressing your viewpoint</td>
<td></td>
</tr>
<tr>
<td>Seeing value of CT for all subjects</td>
<td></td>
</tr>
<tr>
<td>Being committed to teaching critical thinking</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Open Codes</th>
<th>Interview Transcript</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Being committed to teaching critical thinking by modelling thinking aloud</strong></td>
<td>How can teachers play their part in making their school a thinking school? Thinking is not visible – it’s in your head and a child can’t see it. So I felt that as a teacher, you should model it by thinking aloud. You take the trouble to list “How did you come to this?” or “What are the pros and cons?”  You deliberately say it out loud to make the thinking of the thought process visible to the kids. It’s like modelling for the child how you come to the cause and effect (cause and consequence). So I think that we can do this and maybe we can facilitate thinking by giving kids opportunities to wonder just very safe... just wonder... ask them what they wonder and you’ll be surprised the things that they wonder about. They ask me, “Why is there so much sand in the desert? Where did the sand come from?” I thought that was great.</td>
</tr>
<tr>
<td><strong>Using language as a medium for thinking</strong></td>
<td>Why do you think critical thinking is important in the teaching and learning of English Language?</td>
</tr>
<tr>
<td><strong>Using all languages/components as media for thinking</strong></td>
<td>Language is the medium for thinking. Language is the medium for communication, whether it’s oral, written, it’s still the medium. The components in the teaching and learning of language, I don’t think it’s just the English language, I think all languages, whether it’s reading, listening, speaking, writing or viewing, opens the door for this exchange of thinking, of ideas, of views, of opinions, of perspectives, of imagination, creating design and construction. I feel that you cannot think from nowhere. There must be a purpose, a reason and the more purposeful, the closer at heart to it, the better it is. It’s not just you yourself thinking, you need to listen to the thinking of the pupils and challenge their thinking. To make it visible, you have to use the language tools.</td>
</tr>
<tr>
<td>Open Codes</td>
<td>Interview Transcript</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Teaching language per se</td>
<td>Why do you think critical thinking is important in the teaching and learning of English Language?</td>
</tr>
<tr>
<td>Going beyond teaching language to teaching values</td>
<td>...language in itself, becoming a good language person doesn’t make you a good student or a good person. It is the vehicle that drives the rest. If you are just teaching language and making a person efficient and proficient at the language, then you are just teaching a language.</td>
</tr>
<tr>
<td>Being committed to teaching critical thinking</td>
<td>If you are here to teach critical thinking because that particular skill is about how to decipher information...when you make a particular decision, affecting life, affecting the way people think - that transcends all your other subjects.</td>
</tr>
<tr>
<td>including decision-making skills which transcends subjects</td>
<td>Of course your basic reading and writing will help you in your science and mathematics and the rest of the understanding. Someone can put forth an argument. The assumption is that the man is drowning. You walk by. Do you save the man? When I’m putting my hand across, do I save him? (because I am putting my life at risk) Or do I not. Do I walk away? Classic story. There are a lot of nations suffering. People are without food, water and all that. So do I give away my own belongings, my wealth because I want to help the rest of the countries? Or do I keep it to myself because I’ve earned it. It is how you forward the argument.</td>
</tr>
<tr>
<td>Having basic skills</td>
<td>But if you do not teach the pupils how to critically think and come to that arrival of decision by themselves, then you have failed. And that is what critical thinking is about... deciphering that knowledge because you are talking about 21st century skills.</td>
</tr>
<tr>
<td>Illustrating decision making scenarios</td>
<td>You are talking about people communicating with you through the net. You are talking about preparing our young children to be in a society where they are going to meet people of different cultures, of different social backgrounds.</td>
</tr>
<tr>
<td>Understanding the value of being committed to teaching pupils critical thinking and decision making</td>
<td>At the same time, you must have empathy for your own country, be rooted but looking forward and dealing with all these people and these multiple kinds of information and things coming out. It is not that safe background that Singaporeans are used to. We’re honest, there’s no bribery, people are talking to you at face level, it is not like that everywhere.</td>
</tr>
<tr>
<td>Communicating online</td>
<td>If you do not teach them critical thinking in your language lessons (I’m not going at a very low level and I’m going at a higher level), you are going to prepare your pupils to fail.</td>
</tr>
<tr>
<td>Preparing children to meet people of diverse backgrounds</td>
<td>These youngsters that go out to the world which is globalised already; the boundaries are very thin. They are going to face challenges which they are not going to be prepared for.</td>
</tr>
<tr>
<td>Being aware of new technology and diverse backgrounds</td>
<td>...So the challenge is not producing academic people. It is thinking people; people who are able to critically decipher what is happening on the ground, not be deceived but make critical decisions. That is what language is about.</td>
</tr>
<tr>
<td>Understanding the value of being committed to teaching pupils critical thinking and decision making</td>
<td></td>
</tr>
<tr>
<td>Open Codes</td>
<td>Interview Transcript</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **Being committed to teaching critical thinking/ Researching** | How can teachers play their part in making their school a thinking school?  
Basically you have to first start off – for me for instance before I started teaching my pupils critical thinking, I researched on it.  
I actually went for courses on it and I found that one platform was the P4C, philosophy for children. That’s one way of getting the children to become critical thinkers. And I also learnt in the process of it, it is important for you to be a reflective thinker and learner |
| **Being reflective thinkers**                  |                                                                                                                                                       |
| **Doing poorly in comprehension**              | Why do you think critical thinking is important in the teaching and learning of English Language?  
For English language, the area that the pupils do not do very well is reading comprehension and the kinds of questions coming out nowadays are a lot of inferential questions.  
And so the kids who do not read critically or do not do an in-depth reading of the text will not be able to answer that kind of questions. So it’s very important that’s one area.  
And by critically reading text or for instance model compositions pupils can actually evaluate a composition piece. This is what I do with my class - I give them a composition piece that was written very well and given high marks. Because they read it critically, my pupils are able to tell what’s missing and how it can be improved. In that way they are also improving in their writing. So as a matter of fact in reading comprehension as well as in composition writing, it helps.  
It’s important for them to be able to think critically. |
| **Valuing critical reading**                   |                                                                                                                                                       |
| **Evaluating writing through critical reading**|                                                                                                                                                       |
| **Thinking about making improvements through critical reading** |                                                                                                                                                       |
| **Aiding comprehension and composition**       |                                                                                                                                                       |
| **Being committed to teaching critical thinking** |                                                                                                                                                       |