Metacognitive Teaching for Developing Student Reading Comprehension Skills in Chinese Language:

A Cross-Case Analysis between Shanghai and Hong Kong

by

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Statement of Originality

I, SHI, Lan hereby declare that I am the sole author of the thesis and the material presented in this thesis is my original work except those indicated in the acknowledgement. I further declare that I have followed the University's policies and regulations on Academic Honesty, Copyright, and Plagiarism in writing the thesis and no material in this thesis has been submitted for a degree in this or other universities.

SHI, Lan

May 30

Abstract

This study aims at identifying effective metacognitive teaching strategies (MTSs) in the Chinese Language that can enhance students' reading comprehension abilities. Learning to learn is the common theme of education reform in Shanghai and Hong Kong since the 21st century. It implies that schools have to train students to become self-regulated learners since the new millennium. However, empirical literature using classroom observation to identify MTSs in a natural environment is scant. Such an approach of study can provide useful results to support student reading abilities within the Chinese-speaking regions. Therefore, this study attempts to fill the research gap. There are three research questions of this study:

Q1 What metacognitive teaching strategies are used by the Shanghai and Hong Kong teachers to develop students' reading comprehension skills in the Chinese Language?

Q2 Are the metacognitive teaching strategies used by the teachers of the two regions suggest any similarities and/or differences?

Q3 What are the factors that may contribute to teachers' use of metacognitive teaching strategies?

A cross-case analysis was employed in this study to identify teachers' strategies and the factors that influence teachers' instruction. The study compared the case studies of Shanghai and Hong Kong teachers' classroom teaching and explored teachers' metacognitive teaching factors. Both qualitative and quantitative methods were used. Two schools from Shanghai and two from Hong Kong took part in the research. In each school, two teachers and about 70 students from two separate classes participated. Data were collected in multiple methods of inquiry, including questionnaires, lesson observation, and open-ended interviews. Classroom observations and interviews were conducted to identify MTSs for teaching the Chinese language. Questionnaires and interviews were used to explore the influencing factors of teachers' use of instructional

strategies. This research adopted NVivo to code the interview and observation data and explored whether metacognitive teaching can impact students' reading comprehension.

First, the findings indicate that MTSs can benefit students' metacognitive learning and their reading comprehension. And the most commonly used MTSs for the teachers in Shanghai and Hong Kong were identified. Second, the differences and similarities of the use of MTSs in the two regions were analysed. In terms of differences, the frequency of applying MTSs in Hong Kong is significantly higher than those in Shanghai. Moreover, in the Shanghai case schools teachers would like to use MTSs in questioning and visualised thinking. In contrast, teachers of Hong Kong case schools would like to use self-directed and participative activities. In terms of similarities, the teachers supported students to extract, improve and apply the learning methods for solving problems. They all focused on facilitating students to think critically, justify their hypotheses, and provide emotional support for learning engagements. Moreover, a metacognitive teaching framework was proposed with four teaching stages: introduction, learning by doing, extended learning, and summary. Third, curriculum standard, teacher beliefs and their knowledge of metacognitive teaching are the influencing factors of the teachers' instruction.

Keywords: metacognitive teaching strategies, reading comprehension skills, Chinese language, a cross-case analysis

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List of Abbreviations

MT	Metacognitive teaching
MTSs	Metacognitive teaching strategies
SRL	Self-regulated learning

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Chapter 1. Introduction

This chapter describes the background in Shanghai and Hong Kong from the three aspects, namely education reforms, social contexts, and teaching cultures. Subsequently, this chapter elaborates the purpose and significance of the study and proposes the research questions expected to be addressed by this study. At last, the structure of this thesis is provided to frame a brief introduction of the following chapters.

1.1 Background

There is an increasing consensus that teaching knowledge alone is not enough to prepare learners to thrive in the current society (Altinyelken, 2011; Teplin, 2009). Promoting student learning abilities to meet the demand of the 21st century is a critical issue for educators around the world. Educators in Shanghai and Hong Kong advocate students' self-regulated learning. Students in Shanghai and Hong Kong have a good academic performance in the OECD Programme for International Student Assessment (PISA) in reading, mathematics, and science(OECD, 2018). However, education in Shanghai and Hong Kong is still facing increasing challenges. New education reforms in the two regions are released to cultivate self-regulated learners (Lau, 2013; Li et al., 2016). The complexity of social context calls for high-quality teaching along with local and global changes. Besides, although they are both Chinese regions, Shanghai and Hong Kong are at different paces in promoting educational changes, which have been observed in the study by Chau and Li (2013). Developing students' metacognition can cultivate learners with self-regulated abilities and higher-order thinking

skills (Houtveen & Grift, 2007). Hence, metacognitive teaching seems to be a possible solution to provide substantial support for students' learning ability and respond to education systems' challenges.

1.1.1 The ongoing education reform

Due to the endless flow of information and harmonisation of education policies, education reforms in different countries today share similar characteristics and values. Globalisation unifies national educational efforts by integrating them with broader global trends. The Global Education Reform focuses on self-reflected learning, creativity, and problem-solving through the modern teaching method (Bonnet et al., 2010). The core idea of global education reform is to improve the quality and effectiveness of education to cultivate student learning abilities required in knowledge economies. Education reform in many countries has shifted from structural reforms to an emphasis on constructivist and student-centred teaching. Teachers need a comprehensive understanding of how students think and learn and better pedagogical skills to design and implement teaching in alternative ways. Students need to develop their mental processes better to study more independently and effectively. Based on the opinion by Sahlberg (2006), China, like many countries, is developing more flexible forms of curriculum and supporting teachers to find instructional approaches to promote students' learning of essential knowledge and skills.

The Curriculum Development Council (CDC) of Hong Kong proposed "Learning to Learn-The Way Forward in Curriculum Development" Education Reform in 2001 to promote students'

whole-person development and self-regulation capabilities, helping them to adapt to the society of the New Millennium(CDC, 2001). After a decade or so, much has been achieved through curriculum implementation in schools (Sum-cho et al., 2007). To mention some achievements, students have greater learning agility and are more proactive; teachers have achieved a pedagogy shift from teacher-centred to student-centred classroom practices (Cheung & Wong, 2012; Zhu et al., 2016). With the implementation of the learning to learn education reform, the society of Hong Kong has been various changes in the economic, social, scientific, and technological domains. To respond closely to the new requirements of social development for talent schooling and deepen the accomplishments achieved, the Hong Kong Education Bureau (EDB) updated the curriculum to "Learning to Learn 2.0", which marked a new phase of curriculum renewal (CDC, 2017). Schools should prepare students for facing the local and global changes and nurture their abilities in learning to learn and lifelong learning.

During the first phase of implementing the curriculum reform in Hong Kong, some obstacles and challenges appeared in schools, according to a survey by Cheung and Wong (2012). The findings suggested that a relatively lower percentage of primary and secondary teachers agreed to adopt teaching strategies appropriately to cater to students' motivation, ability, and needs. In this period, the EDB called for devoting sufficient efforts for schools on curriculum implementation and teachers' professional development to improve instruction for developing students' self-regulated learning (Cheung & Wong, 2012). Schools provided more resources, training, and stressed collaboration between teachers to enhance their professional development in teaching methodologies, such as cultivating self-management skills, critical

thinking, and handling student diversity to align teachers with curriculum goals in that period. In the “Learning to Learn 2.0” curriculum reform, teachers were encouraged to explore ways to increase teaching effectiveness and improve their teaching strategies to support students learning how to learn.

Shanghai has experienced the first and second rounds of education reform. The focus of education reform is to develop students’ innovative spirit and practical ability (Zhang, 2003) . The contents of the courses promoted real-life context, modernization, and humanity (Wang, 2019). However, the current education system faces some challenges, such as examination-oriented study, students’ lack of learning ability and learning attitude. Also, schools need to provide students’ learning experiences related to problem-solving and how to think. Therefore, in 2016, the overall framework of Key Competencies for Chinese students’ development was released (Core Literacy Research Group, 2016), focusing on learners’ self-regulated learning and learning to learn ability. This framework is a continual journey to deepen student-centred curriculum reform in promoting student learning to learn abilities.

For the first time, the new curriculum reform focuses on students’ competencies by promoting independent thinking, learning motivation, and reflection on learning methods. The Shanghai government required schools to integrate core competencies into subject teaching and foster independent learning for learners to support their study and future work. Han (2018) proposed that schools had to overcome the difficulties in implementing curriculum reform. Teachers lacked the teaching experience and abilities to meet the needs of the new curriculum reform.

Moreover, the students from the family of city migrants were weak in learning abilities, restricting the progress of teaching and school development. To achieve the new objective of the reform, schools had to promote pedagogical change to fosters learners' creativity, self-directed and problem-solving skills. Schools also encouraged teachers to conduct educational research, plan and implement the lessons cooperatively.

1.1.2 The complex social contexts

Shanghai and Hong Kong face the challenges of rapid globalization, international competition, and soaring demand for quality education. To respond to several contextual changes in society and worldwide, schools give more attention to sustaining and developing areas deemed essential for enhancing students' independent learning abilities (Cheng & Yip, 2006).

Concerning the differences in social contexts, education in Shanghai aims to promote the balanced development of primary education and improve schools' quality with a weak foundation (Wong & Zhu, 2006). Specifically, as a city of migrants, Shanghai attracts massive migrants and floating people, which results in a complex structure of the student population. Parents with higher economic conditions do everything possible to let their children enter "good schools" (Gong & Zhu, 2020). Some schools located in the community of migrant workers can only recruit students with low learning abilities. Therefore, the development of these schools is relatively slow. The imbalance of educational resources has become a profound social contradiction. Shanghai government put forward *an excellent school project* (強校工程) to help low-performing schools to improve education quality (Xu, 2018). Many schools have

joined this *project* to seek instructional reform and build a school-based curriculum of the Chinese language.

Hong Kong is undertaking social changes in the passing years. Hong Kong is one of the world's leading international financial centres, and its economic structure is undergoing rapid transformation, with a knowledge-based economy becoming the mainstream (Ko, 2018). Hong Kong is a multi-ethnic society having a diverse population structure. Education in Hong Kong should cater to the different cultural backgrounds of students. Schools need to facilitate students developing global views, cultivating a repertoire of skills, and learning how to learn (Education Commission, 2000). In addition, the rapid development of information technology has brought new impacts on people's life. To maintain international competitiveness as a global financial, technology, and cultural centre, it is imperative to equip students with lifelong learning capabilities and multi-perspective skills (Forlin, 2010).

1.1.3 The unique teaching culture

In addition, teaching culture is also strongly linked to classroom teaching in Shanghai and Hong Kong. Teaching culture involves shared beliefs, values, and behaviours that teachers use to interact with their students (Kustra et al., 2015). In Shanghai, the teaching culture is rather traditional. Influenced by Confucianism, teachers' responsibilities have been supposed to "teach, instruct, and explain" (Zhang, 2003). Although there is an instructional change from teaching knowledge to cultivating learning abilities, teachers tend to play a dominant role in tracking the lesson schedule, paying more attention to refine teaching objectives and contents,

and optimizing the teaching process. Teachers always give direct instructions and concern about teaching normalization. Students have to follow their teachers, do not have many opportunities to express their opinions and develop their interests; therefore, their engagement is not high. Second, facing a limited and tense instructional schedule and the pressure of high school entrance examinations and college entrance examinations, teachers tend to select traditional teaching methods, such as lecturing, to help students master knowledge more quickly. Third, teachers realized to improve their teaching to meet the demand of new curriculum reform to cultivate students' learning competencies. Therefore, teachers in Shanghai seek the balance between exam-oriented education and quality-oriented education (Guo, 2019; Xiangming & Anthony, 2009).

In Hong Kong, the teaching culture integrates the characteristics of Eastern and Western cultures and pays more attention to innovation and expression of students' views (Lo, 2012). Schools create a student-centred learning environment and emphasize autonomy, freedom, respect, etc. Teaching mainly focuses on the interaction and dialogue between teachers and students, group work, and students' engagements in classroom activities (Poon & Wong, 2008). Moreover, there is no senior high school entrance examination in Hong Kong, which reduces the teaching pressure to a certain extent. Teachers can foster students with interests, diverse abilities, and aptitudes to unleash their full potential. Teachers try to design the lessons flexibly to cater to various learning needs and cultivate students' self-regulated abilities (Ho et al., 2005). Students are highly involved in discussions or teamwork activities to promote problem-solving ability and enhance their sustainable development.

1.2 Purpose of the study

The issue of education development between Shanghai and Hong Kong is very similar: optimizing the existing teaching to develop students' self-regulated learning and improving instructional quality and effectiveness. In the 2000s, schools and teachers of Hong Kong and Shanghai have begun to implement curriculum reform. The education reform documents did not explicitly provide the possible teaching strategies for cultivating self-regulated learners, and teachers have to design and carry out the lessons independently (Zhang, 2003). Some teachers are more effective to improve students' learning competencies than others. Hall and Harding (2003) pointed out the similar idea that teachers' instructional skills are critical to enabling successful reform in curriculum reform. Wray et al. (2000) argued that effective teaching strategies have the risk of being neglected. Therefore, it would be quite illuminating to explore how effective teachers teach in implementing the curriculum and provide available strategies to cultivate students' self-regulated abilities and increase their performance in a certain subject.

Research literature tends to report applying the metacognitive teaching approach to implement learning to learn in the curriculum (Bialik & Fadel, 2015; Mevarech & Kramarski, 2014). Higher-order thinking skills can help learners regulate their learning process (Brown, 2017). Metacognitive teaching supports learners in monitoring, reflecting, and evaluating their learning process and assists students in selecting appropriate strategies for learning or problem-solving. Metacognitive teaching has a great potential to contribute to the Education Reform in

Shanghai and Hong Kong as it enhances students' self-regulated abilities. Multiple studies proved that metacognitive teaching could orient learners to attain mastery of different cognitive skills and monitor learning performance to be self-regulated learners (Aflah, 2017; Kim & Lim, 2019; Teng, 2016). This study explores teachers' metacognitive teaching in the Chinese language, given that metacognitive teaching strategies effectively support student learning in other subjects.

This study attempts to identify effective metacognitive teaching strategies for developing students' reading comprehension skills in the Chinese language and explore the factors that may influence teachers' metacognitive instruction in Shanghai and Hong Kong. Therefore, the purposes of this study are to:

(1) identify effective metacognitive teaching strategies that can enhance students' reading comprehension in the Chinese language;

(2) compare and contrast the adopted metacognitive teaching strategies between the teachers in Shanghai and Hong Kong;

(3) explore the influencing factors for teachers' metacognitive teaching from the perspectives of curriculum policy, teachers' beliefs, and knowledge of metacognitive teaching.

1.3 Significance of the study

A more discerning and deeper investigation in metacognitive teaching strategies in Shanghai and Kong could be meaningful to have a comprehensive understanding of effective teaching behaviours enhancing student learning in the Chinese language courses.

Students in Shanghai and Hong Kong who participated in the Programme for International Student Assessment (PISA) were among the top performers (OECD, 2018). In PISA 2018, the two cities attained a high average score for reading, mathematics, and science. They can provide a powerful window into the Chinese language education, and it is worth exploring how teachers cultivate students to perform well in their learning. Moreover, Shanghai and Hong Kong are in different education systems. It would be conducive to acquiring plenty of valuable information for this study to respond to the research questions. More importantly, teachers in the two cities advocate for students' independent learning through teaching innovation. The education reforms in Shanghai and Hong Kong were released to nurture self-regulated learners and emphasize promoting students' reflective practice to solve problems (Lau, 2013; Li et al., 2016). It is worthwhile, though, through probing into "what metacognitive teaching strategies are used in Shanghai and Hong Kong" in the background of the ongoing education reforms and comparing their similarities and difference in using metacognitive teaching strategies.

This study serves as a dedicated elaboration on teachers' concrete instruction about metacognitive teaching strategies for developing students' reading comprehension. From a theoretical perspective, metacognitive teaching strategies used in the Chinese language contexts were explored. It should be noticed that Chinese literature has its unique characteristics. (1) According to linguist Wang Li (2015), the form of Chinese is paratactic (a chain of separable links) and can seem like a loose assemblage of small pieces without a coherent shape. The form of English is hypotaxis, which means that articles rely on meaning

(intrinsic logical relationship) to organize language. (2) Focusing on “refining words” (煉字) is another characteristic of Chinese literature. Therefore, reading comprehension in Chinese language depends on combining text information with learners’ life experiences and emotions to achieve understanding (Wang, 2002). Teaching how to read may help students grasp the main idea of a text, make an inference, appreciate the graceful language, and understand the characters’ personalities. An effective teacher is assumed to use metacognitive teaching strategies to develop students’ reading comprehension in the Chinese language. Metacognitive teaching strategies could support students to organize their learning process, diagnose problems, choose strategies, and reflect on the use of strategies (Aminah et al., 2018). This study can contribute to the research on investigating the effective metacognitive teaching methods to develop students’ reading comprehension in the Chinese language.

From a practical perspective, firstly, this study suggests effective metacognitive teaching strategies that can positively impact students’ reading comprehension by encouraging students to control and monitor their reading process. It sets out possible ways to respond to the requirements of the curriculum reform in Shanghai and Hong Kong by nurturing self-regulated learners. This study provides instructional advice on metacognitive teaching to improve the curriculum standard of the new education reform. The local government and Educational Bureau can integrate metacognitive teaching into the curriculum system, which is a possible way to enhance teaching quality and promote the ongoing change of the curriculum reform. This study provides empirical evidence on metacognitive teaching. It can enrich the content of pre-service teachers’ programmes and provide insights into the professional development

training for in-service teachers.

Secondly, the findings could also contribute to the schools in Shanghai and Hong Kong. It is recommended to apply metacognitive teaching strategies for curriculum implementation and instructional improvement. As a school-based practice, teachers can use these strategies to promote effective pedagogy and student learning. In addition, this study investigated the factors that influenced the teachers' metacognitive instruction, including teacher beliefs and knowledge of metacognitive teaching. This experience is worth learning for schools to implement the new curriculum reform by building a vision of metacognitive teaching and supporting innovative teaching methods. This research could also accumulate the experience of curriculum implementors and practitioners working towards improving students' reading achievements. Since incorporating metacognitive teaching is beneficial to learners, this research has a potential role in enhancing teacher quality and thus benefits teaching and learning in schools.

Thirdly, this study could provide exemplary of metacognitive teaching strategies to facilitate self-regulated learning in the Chinese language. This study contributes to understanding how to develop students' reading comprehension and their learning to learn abilities. A series of metacognitive teaching strategies in the Chinese language was examined to guide students' thinking, promote reflective practices, and give effective aids. In addition, this study proposed a metacognitive teaching framework to support students' metacognitive learning in the Chinese language. It provided a feasible teaching process that teachers could follow to help students

plan, control, and evaluate their learning process.

1.4 Research questions

This study investigates effective metacognitive teaching strategies in the Chinese language in a natural environment. It fills the research gap that empirical literature using classroom observation to identify metacognitive teaching strategies in a natural environment is scant. Besides, the factors that may contribute to teachers' metacognitive teaching behaviours are explored. This study may inspire school leaders on how to support teachers in applying metacognitive teaching strategies. The key research questions are:

Q1 What metacognitive teaching strategies are used by the Shanghai and Hong Kong teachers to develop students' reading comprehension skills in the Chinese Language?

Q2 Are the metacognitive teaching strategies used by the teachers of the two regions suggest any similarities and/or differences?

Q3 What are the factors that may contribute to teachers' use of metacognitive teaching strategies?

1.5 Structure of the thesis

This thesis is composed of five chapters. In the beginning, Chapter 1 focuses on building the contextual background of this study that is relevant to current education in the 21st century in Shanghai and Hong Kong. Shanghai and Hong Kong are both experiencing the ongoing education reform for nurturing student learning to learn and self-regulated ability. As an international metropolis, education in the two cities faces the complexity of social contexts of

rapid globalization, international competition, and strong demand for high-quality education. Moreover, the teaching culture in Shanghai is rather traditional. In contrast, the teaching culture in Hong Kong combines Eastern and Western cultures and emphasizes both traditional teaching ethics and modern independent values. This chapter also delineates the purpose of the study, the research questions, and the significance of the study.

Chapter 2 maps out a conceptual foundation of metacognition, metacognitive teaching, and the application of metacognitive teaching strategies (MTSs) in reading comprehension in Shanghai and Hong Kong. This study also proposed the influencing factors of metacognitive teaching, including curriculum standards, teachers' beliefs and knowledge of metacognitive teaching. This chapter also proposes an analytical framework to elaborate the research logic by exploring the effective MTSs and the influencing factors of metacognitive teaching.

Chapter 3 explains the research methodology of the study. It explains the use of multiple-case studies as the major research method and case study as a suitable theoretical approach for the study. This chapter also explains case selection, the procedure of data collection and data analysis. The methods for data collection include lesson observation, in-depth interviews, and questionnaires. Within-case strategy and cross-case strategy were employed to analyse the data. Besides, ethical consideration was also supplemented.

Chapter 4 reports the findings of the research questions. The case studies in Shanghai and Hong Kong suggest that metacognitive teaching strategies can improve students reading

comprehension. For the teachers of Shanghai case school, metacognitive teaching, think aloud, visualised tools, think-pair-share and self or peer assessment are the most commonly used MTSs. For the Hong Kong case school teachers, metacognitive questioning, self-questioning, self or peer assessment, modelling, think-pair-share, and learning guide are the most commonly used MTSs. In addition, an MTSs framework is proposed as an effective teaching procedure to implement the Chinese language course. There are differences between the groups of teachers in the two cities. From a holistic perspective, the frequency of applying MTSs by the teachers of the Shanghai case school was lower than that of the Hong Kong case school. The teachers in Shanghai would like to use MTSs in terms of questioning and visualised thinking, while the teachers in Hong Kong would like to use self-directed and participative activities. By comparing and contrasting the impacting factors to MTSs in Shanghai and Hong Kong, the results present how the curriculum standard, teacher beliefs, and their knowledge impact the implementation of MTSs in the two regions.

Chapter 5 engages in a detailed discussion on the operational mechanism that MTSs effectively promote students' learning. The MTSs framework was also analysed to determine if this instructional framework and teachers' practices could be reproduced elsewhere. It is discussed how curriculum standards, teacher beliefs, and knowledge of metacognitive teaching shape teachers' behaviours on using MTSs. Furthermore, this chapter summarises the empirical framework of MTSs in the Chinese language and the overall process of the study. The implications are articulated to understand the meaning of this study.

1.6 Chapter summary

This chapter illuminated the origin and implementation of the new education reform for self-regulated learners in Shanghai and Hong Kong, the increasingly higher demand from stakeholders in the social context, and the different teaching cultures in Shanghai and Hong Kong. In the background, the classroom instruction enters a new stage that should break the stereotypes and engage students effectively in the self-directed learning process. Because metacognitive teaching can promote students to regulate, monitor, and control their learning, effective metacognitive teaching strategies merit further exploration. Under elaboration described above, this chapter proposes the research questions: investigating effective metacognitive teaching strategies and the factors that may impact the teaching behaviours. Besides, the purpose and structure of the study are stated in this chapter.

The significance of the study was elaborated from the theoretical and practical perspectives. This study analysed teachers' behaviours in Shanghai and Hong Kong, and identified effective MTSs in the Chinese language. It contributes to the instruction practice to cultivate self-regulated learners. This study is also beneficial for schools to respond to the requirements of the education reform and curriculum implementation.

Chapter 2. Literature Review

This chapter firstly reviews the literature on metacognition, metacognitive teaching, and metacognitive teaching strategies. It explicitly explains the roles of metacognition in enhancing students' self-regulated learning for implementing the learning to learn curriculum. Furthermore, this chapter reviews relevant empirical studies that adopted MTSs in Chinese reading in Shanghai and Hong Kong, analyses and compares the MTSs mentioned in the literature. The factors that might influence metacognitive teaching are discussed. Based on overviewing of previous research, the research gap and analytical framework are proposed.

2.1 Metacognition, metacognitive teaching, and metacognitive teaching strategies

This section outlines the definition of metacognition and the models of metacognition, explains why metacognition is important for student learning. It elaborates the study of metacognitive teaching and metacognitive teaching strategies used by teachers to enhance students' self-regulated learning.

2.1.1 Metacognition

This section explains the concept of metacognition, three classic models of metacognition, and its relationship with students' learning.

2.1.1.1 What is Metacognition?

Metacognition is "cognition about cognition", "think of thinking"(Brown, 1987; Flavell, 1979).

Flavell (1976) is the first people proposed metacognition. He claimed that metacognition refers to monitoring, regulation, and orchestration of cognitive processes and products. Subsequent development and use of the term have remained relatively faithful to this original meaning. Jager et al. (2005) defined metacognition as one's awareness of thinking processes and the ability to monitor these processes. Kesici et al. (2011) claimed that metacognition is individuals' knowledge and regulatory skills to control their own cognition. Colombo and Antonietti (2017) described metacognition as a complex concept that refers to cognition about monitoring or regulating first order cognition. Although researchers proposed the definition of metacognition from various perspectives, such as kind of knowledge, skill, awareness, or cognition, these definitions still followed the original definition: a higher thought above the human cognitive system that can monitor one's thinking process.

The ideology of metacognition has a long history in China. Lao Tzu (老子) once put forward the view that "knowing people is wise, knowing oneself is clear" (知人者智，自知者明), which vividly illustrated the significance of self-awareness and self-monitoring in metacognitive activities (Lin, 2005). Furthermore, the earliest educational literature in ancient China, Xueji (《學記》), appeared many metacognitive thoughts. In this book, it was written that "learning and then knowing deficiencies, teaching and then knowing difficulties, knowing deficiencies can make people self-reflection; knowing difficulties can make people self-improvement. Therefore, teaching and learning are mutually beneficial" (學然後知不足，教然後知困，知不足然後能自反也；知困然後能自強也。故曰，教學相長也) (Li, 2007). Metacognition plays a critical role in the teaching and learning process, and teachers should

nurture students' ability to reflect and monitor. Tao Xingzhi（陶行知）said that "a good teacher is to teach students how to learn", and Ye Shengtao (葉聖陶) pointed out that "teaching is for the sake of no needing teaching" (Xiao, 2001). Although the ancient and modern Chinese educational thought contains the concept of metacognition, it does not put forward the definition of metacognition. With the introduction of modern cognitive psychology into China, Chinese scholars and educators have gradually recognised the concept of metacognition.

2.1.1.2 Models of metacognition

Flavell (1979) put forward a cognitive monitoring model to explain four components of metacognition: metacognitive knowledge, metacognitive experience, goals (or tasks), and actions (or strategies) (see Figure 1).

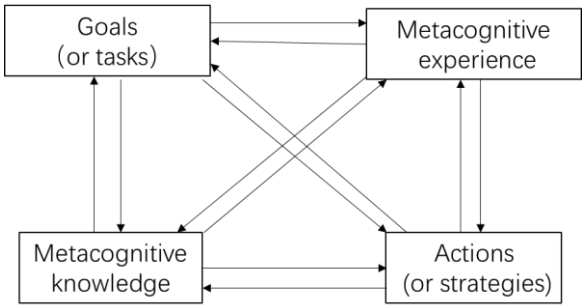


Figure 1. Flavell's cognitive monitoring model (1979)

Based on this model, metacognitive knowledge refers to knowledge fragments stored by individuals, which are related to cognitive subjects and various tasks, goals, activities, and experiences. Metacognitive experience is a conscious cognitive experience or an emotional experience and is subordinate to intellectual activity. Goals are what people need to achieve,

and the actions (or strategies) refer to the behaviours or methods that one takes to finish particular tasks. The four factors are related to each other for supporting effective learning. Learners should set specific goals that influence the knowledge acquiring, learning experience, and actions. Learners apply metacognitive knowledge when learning. They have metacognitive experience when they feel that something is difficult to comprehend, deal with, or remember, or their behaviour is far from the goals. They tend to use appropriate strategies to solve problems and also take actions to achieve cognitive goals.

Later, Brown (1987) developed Flavell's model and emphasized the regulation of metacognition. Brown stated two distinct concepts about metacognition, including knowledge of cognition and regulation of cognition (see Figure 2). Knowledge of cognition is related to stable, often fallible, and late-developing information for the cognitive process. Regulation of cognition involves planning activities, monitoring learning activities, and checking outcomes, and these activities are often not statable.

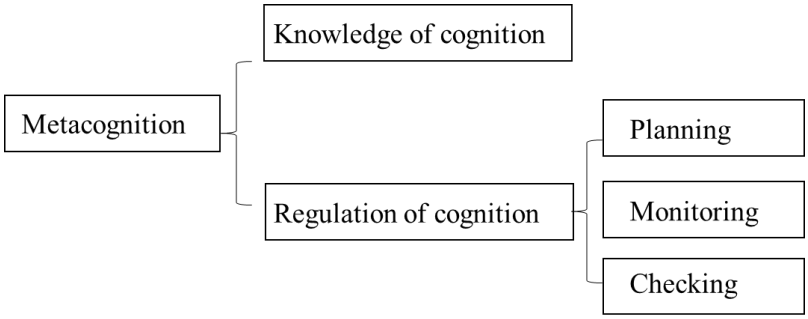


Figure 2. Brown's metacognitive framework (1987)

Based on the previous work, Schraw (1998) developed a metacognitive framework that made a clear distinction between knowledge of cognition and regulation of cognition (see Figure 3).

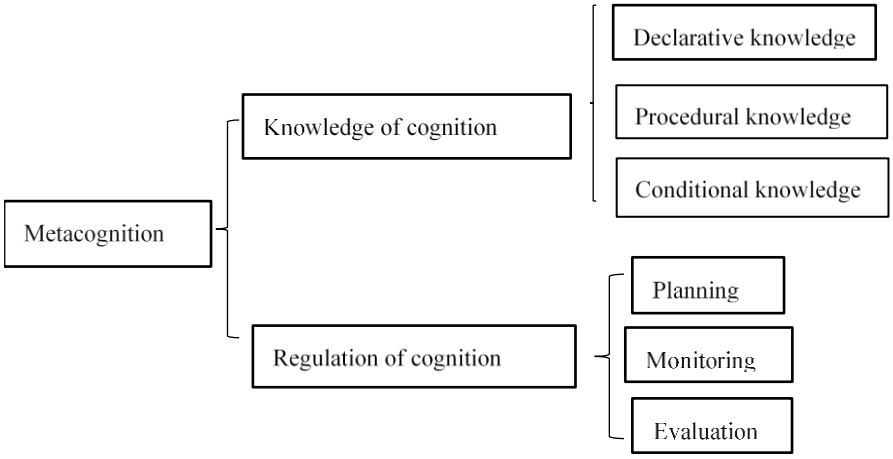


Figure 3. Schraw's metacognitive framework (1998)

Knowledge of cognition is composed of declarative knowledge, procedural knowledge, and conditional knowledge. Declarative knowledge refers to the factual knowledge learned through memorization. Procedural knowledge refers to the knowledge about the methods, steps and sequences to tackle learning tasks. Conditional knowledge refers to the knowledge and awareness of the specific purpose of the learning strategies, how, when, and why they should distribute their resources to implement specific strategies to finish a learning task. Regulation of cognition embraced a series of activities, including planning, monitoring, and evaluation. Schraw made a conceptual analysis and emphasized that teachers can teach metacognition in their classes by utilizing specific instructional strategies. Schraw's classification of metacognition has an extensive influence, and subsequent studies are relatively consistent with this framework (Bozorgian & Fakhri Alamdari, 2018; Muhid et al., 2020; Rahimirad, 2014).

Metacognition is different but closely related to cognition. Cognition is thinking and includes memory, process information, reason, solve problems, and make decisions. As metacognition

can facilitate children to control and regulate these cognitive processes before, during, and after learning, it can help children become thoughtful about their learning (Cheng, 2019). Schraw (1998) pointed out that cognitive skills are essential for performing a task, while metacognition is necessary to understand how the task was performed. Georghaides (2004) strengthened that cognitive behaviour can be done without any judgment or critical thinking on the thinking self; however, metacognitive behaviour involves critically judging and revisiting learning processes through comparing, assessing, and evaluating. The cognitive process helps learners know how to achieve a goal. The metacognitive process can help learners ensure that the goal is achieved successfully and double-check the correct answer. Therefore, cognition involves student learning, and metacognition can support them to learn better.

2.1.1.3 Why is metacognition important?

Metacognition is critical in students' learning and cognitive development, particularly in understanding their learning process and adjust their learning if needed (Dabarera et al., 2014). Self-regulation is generally considered a more global control mechanism that learners use and enable them to reflect and understand the meaning of the learning contents. As Schraw (1998) said, "metacognitive regulation improves performance in many ways, including better use of attentional resources, better use of existing strategies, and greater awareness of comprehension breakdowns." When students plan their learning, they clarify the goals and determine the sub-goals of a learning task (Elfi, 2016), select strategies, estimate study time, and distribute the resource before performing a task (Dunlosky, 2009). When students monitor their learning, they tend to regulate the ongoing cognitive activities towards the learning goals, assess the

effectiveness of the strategies, and refine the strategies if needed to handle problems (Mannion, 2018). They reflect on the understanding of the learning tasks through a process of pause and think (McCormick et al., 2013). When assessing their study, they usually review the effectiveness of their efforts and the level of achievement towards their goals. Self-evaluation can promote students' understanding of the criteria for quality learning, motivate learning behaviours, and influence the planning and monitoring for subsequent learning cycles (Chang et al., 2010; Cornford, 2010).

Metacognition can also affect self-regulated learning, learning efficiency, and problem-solving (Aghaie & Zhang, 2012; Concina, 2019; Terrant & Deborah, 2016). Metacognition is an embedded, high frequency, a necessary element for self-regulated learning processing. Meirav and Bracha (2014) regarded metacognition as a fundamental aspect of self-regulated learning. They justified the effect of metacognition on solving problems in fifth-grade students. Aflah (2017) found that metacognition positively influenced students' reading proficiency and reading comprehension; therefore, it enhanced students' performance in second language reading. Chatzipanteli et al. (2014) reported that if children knew how to learn, they tended to have the ability of self-controlling and self-directing. Studies offered evidence that students with metacognition can realize their learning strategies, construct meaningful learning and achieve their goals (Cornford, 2010; Prins et al., 2006). The research of Colombo and Antonietti (2017) also provided the same outcome that metacognition facilitated students to understand the task, select appropriate strategies to solve learning difficulties, and decide how to structure learning effectively.

2.1.2 Metacognitive teaching and metacognitive teaching strategies

This section introduces the theories and practices of metacognitive teaching, and illustrates the difference between metacognitive teaching and cognitive teaching in promoting students' learning. Metacognitive teaching strategies are discussed, and their effect on promoting reading comprehension is reviewed.

2.1.2.1 What are metacognitive teaching and metacognitive teaching strategies?

Understanding learning through the lens of metacognition provides a way to integrate reflective thinking into learning procedures and pay attention to learners' planning, monitoring and evaluation that was mentioned in Schraw's framework (1998). Students should ask and solve not only "what" questions, but also "how" and "why" questions. Ellis et al. (2014) proposed that the pedagogical possibilities of metacognition suggest "value-added" strategies in the sense that learners might do something more than engaging in learning, they might also self-regulate the learning process and optimize strategies for solving problems. Pintrich (2002) pointed out that, "because metacognition, in general, is positively linked to student learning, explicitly teaching metacognitive knowledge and skills to facilitate its development is needed". It is necessary to expand the term into the instruction area, and teachers could design appropriate pedagogies to foster student metacognitive thinking skills (Jager et al., 2005). Zohar and Barzilai (2013) regarded metacognitive teaching as any instruction to teach specific and explicit metacognitive activities. It involves a system of instructional actions, including teachers, students, teaching materials, a metacognitive environment, and teaching strategies

(Aminah et al., 2018). This study believes that metacognitive teaching refers to the overall teaching behaviours that teachers promote students to track their progress in problem-solving.

Brown (1987) mentioned that learners should be equipped with metacognitive skills to predict, monitor, check, coordinate, and control deliberately for solving problems. Metacognitive teaching strategies refer to the teaching methods that teachers encourage students to reflect on how they solve problems (Nindiasari et al., 2014). Metacognitive teaching strategies can nurture metacognitive learning, promote student to refine their learning strategies. Many empirical studies explored how metacognitive teaching strategies make sense to help students learn better. Lam (2018) investigated four expert teachers and found that one of the core strategies is metacognitive teaching which can promote learners to reflect upon the work and control their learning process efficiently. Kramarski and Mevarech (2003) conducted a study on 122 eighth-grade Israeli students by implementing metacognitive scaffolding to help students plan, set up, conduct, evaluate experiments, and successfully improve students' mathematical reasoning. Kramarski and Zoldan (2008) used a series of metacognitive teaching strategies among 115 students in Grade 9, including diagnosing errors and self-questioning, to enhance students' metacognitive knowledge and ability of error-detecting. Ataman and Özsoy (2009) claimed that reflective questions guided students to focus on the structural features of a task, select appropriate problem-solving strategies, and achieve a deeper understanding. Hence, research has highlighted the value of metacognitive teaching strategies for students' learning in different domains.

2.1.2.2 The differences between metacognitive teaching strategies and cognitive teaching strategies

Because of the plethora of possible strategies, many classification systems of teaching strategies have been adopted to organize various strategies. In these classification systems, three main types of strategies were proposed: cognitive teaching strategies, metacognitive teaching strategies, and classroom management strategies (Mayer, 2003; Parris et al., 2015). The purpose of this study is to examine effective teaching to boost student learning. Therefore, this study focuses on teaching strategies rather than classroom management strategies. The following section articulates the difference between metacognitive teaching strategies and cognitive teaching strategies.

Cognitive teaching strategies aim to enhance students' remembering and understanding of particular information; it enables the reading texts to be more meaningful for students. Cognitive teaching strategies include how teachers guide students to reason, analyse, summarise, and general practice, such as direct interpretation, note-taking, activating prior knowledge, questioning, et al. (Cromley et al., 2010). These strategies may increase the development of coherent mental representations by imposing structure on the information gathered, enabling students to integrate new information with existing knowledge more easily (Mayer, 2003). Metacognitive teaching strategies (MTSs) are approaches that help students regulate cognition. These strategies involve promoting planning, monitoring, and evaluation. MTSs can increase students' self-regulated learning and higher-order skills. These strategies encompass the teaching behaviours used to promote student awareness of tracking their

progress in problem-solving (Nindiasari et al., 2014). Students can be facilitated to pay attention to the learning obstacle, plan for learning tasks, select and adjust strategies, monitor the progress, and detect errors. Based on the described above, the criteria to distinguish MTSs with cognitive teaching strategies incorporate: (a) MTSs involve plan-monitor-evaluate cycles; (b) MTSs can arouse students to review their assumption; (c) MTSs promote students to regulate their learning process.

Wilson and Smetana (2011) concluded that metacognitive teaching pedagogy might help students monitor what and how they had learned due to their experiences, while cognitive teaching strategies might facilitate students to solve problems and engage in learning. Case and Gunstone (2006) pointed out that cognitive teaching strategies encouraged students in solving problems, while MTSs helped students be self-aware of the problem-solving process, such as why the method might solve the problems and what they learned about their efforts to study. It would be challenging to develop learners' metacognitive ability without teachers' guidance and support (Jager et al., 2005). Therefore, it is worth exploring what metacognitive teaching strategies can promote self-regulated learners and how teachers can implement effective metacognitive teaching.

2.1.2.3 Metacognitive teaching strategies in reading comprehension

Reading comprehension involves an active process through which the readers construct meaning based on their experiential background, the purpose for reading, and overall setting (Teplin, 2009). McGregor (2007) elaborated that text plus thinking equals effective reading.

The typical thinking process is about cognition and thinks about thinking as mentioned in the prior section. Paris, Wasik, and Turner (1991) pointed out that self-regulated readers actively devoted themselves to cognitive and metacognitive activities during the whole reading process. This view was expounded by Fogarty (1994), who put forward that reading comprehension needs cognitive elements and metacognitive elements. (1) Cognition in reading comprehension. Comprehension is a complex and multifaceted ability that involves several strategies and skills to construct meaning while thoughtfully and deeply interacting with reading text (McKeown et al., 2009; Van Kraayenoord, 2010). (2) Metacognition in reading comprehension. It refers to metacognitive awareness and regulation of cognition. In terms of metacognitive awareness, if a student is cognizant of the demand for reading effectively, he/she can take steps to respond to the requirements of a reading situation more effectively (Alireza, 2011; Maghsudi & Talebi, 2009). Regarding the regulation of cognition, readers can enhance fluent reading by using metacognitive skills, such as control of planning, previewing, monitoring, adjusting reading rate, repairing, summarizing, and evaluating (Boyet, 2015).

Students should understand the meaning of written information, draw an inference, identify the central thought, and integrate the latter with previous world knowledge. Good readers synthesise as they read, make and revise predictions, and self-correct when meaning is lost. The ability to self-regulate thinking is frequently cited as an essential quality of reading comprehension. Teacher's instruction is needed to help students set the goal for reading, employ strategies to promote understanding and clarify to repair meaning when comprehension breaks down.

MTSs can help students improve their reading comprehension. Moench (1998) applied cognitive teaching and metacognitive teaching strategies in intervention research to eliminate behavioural issues among elementary students who were diagnosed as behaviourally disordered. It was found that metacognitive teaching strategies significantly decreased students' inappropriate behaviours compared with cognitive strategies instruction (Teplin, 2009). MTSs have been identified as essential methods to develop conceptual knowledge and address misconceptions (King & Kitchener, 2004). Othman et al. (2014) conducted an experimental study to improve students' reading skills by using the following MTSs: prediction, examining difficult words, linking the text, self-checking, and finding the main idea. Finally, this study reported that MTSs in all three reading processes (before, during, and after reading) improved students' reading comprehension significantly in reading expository.

More specifically, MTSs develop students' reading comprehension skills in three aspects. Firstly, teachers use metacognitive teaching strategies to make the learners realize reading difficulties. In this situation, students may decide which reading strategies to apply to repair their comprehension. Struggling students particularly lack metacognitive skills. Teachers can use self-questioning or think-aloud to increase students' reflection on what they cannot understand (Dypedahl et al., 2018). The study showed that explicit metacognitive strategy instructs students to consciously regulate their thoughts and realize their failure to understand the textual meaning (Pretorius & Lephalala, 2012). Secondly, teachers can assist readers' reflection on how to use specific reading strategies (Pressley & Harris, 2009). The teachers can

guide students to select alternative strategies to solve problems and recognize effective strategies for a particular learning situation (Bergin et al., 2009). Cohen (2011) proved that metacognitive strategies partially played a critical part in enhancing students' reading process. Instruction with metacognition can support students on how, when, and why they employ these reading strategies to boost their text understanding (Cohen, 2011). Oyetunji (2013) asserted that instructional strategies increased the reading comprehension of second language students through a six-week intervention. Finally, metacognitive teaching strategies were proved to successfully facilitate self-regulated learners in text comprehension (Reeve & Brown, 1985). Students can be supported to set reading goals, choose suitable reading strategies, monitor their learning processes, and evaluate their learning outputs. Teachers can model and explain to students how to self-directing, self-assessing, controlling and adjusting their learning. More chances should be provided for students to reflect on their reading, monitor their thinking effectively, and analyse the process of decision-making (Van Kraayenoord, 2010). Metacognitive prompts and collaborative learning strategies were adopted in an experimental study by Teng and Reynolds (2019). The findings highlighted the effectiveness of metacognitive prompts to support students' vocabulary learning. Pressley (2002) unraveled that metacognitive teaching can cultivate students to be skilled readers with good self-regulated thinking as they can revise, reflect, and monitor their comprehension during reading.

2.1.2.4 Metacognitive teaching and curriculum implementation of self-regulated learning

Nurturing self-regulated learning serves as the education target of curriculum reform. Zimmerman and Schunk (2011) defined self-regulated learning as "the process whereby

learners personally activate and sustain cognitions, affects, and are systematically oriented toward the attainment of personal goals." For effective learning to happen, self-regulated learning is often regarded as a constructive and active process, which involves students setting goals, regulating, monitoring, and controlling their motivation, cognition, and behaviour in the learning environment (Mok et al., 2005; Ziegler, 2014). As described by Zimmerman and Schunk (2011), a proactive self-regular should: (a) make learning plans, (b) implement effective learning strategies, (c) regulate and evaluate the learning process, (d) establish a productive environment, and (e) maintain a sense of self-efficacy for learning.

While the process of metacognition refers to planning-regulation-evaluation, students need to regulate their learning process. It can be concluded that the two concepts of metacognition and self-regulated learning are overlapped. Kaplan (2008) similarly stated that "metacognitive ability is one of the major determinants of independent and self-directed learning". A student with higher metacognitive abilities to regulate their learning process is probably a self-regulated learner. Boyet (2015) also proposed that self-regulated learning is the metacognitive abilities by assessing one's strengths and weaknesses and choosing and adopting effective strategies to optimize learning processes and outcomes independently. Therefore, to implement the curriculum of SRL in schools, teachers should adopt metacognitive teaching to cultivate students' metacognitive ability by managing their learning as part of the efforts toward learners' autonomy.

Metacognition teaching can be used for curriculum implementation of self-regulated learning.

Metacognition teaching may help students control the cognitive process, including planning before learning, self-monitoring during learning, and self-assessment of the learning effect (Burin et al., 2020). Metacognition teaching may contribute to the development of SRL abilities.

Metacognitive teaching strategies can establish students' knowledge, assist them in mastering learning methods, and cultivate their lifelong learning abilities (Lau & Chen, 2013; Li et al., 2016). Mieder and Bugos (2017) provided teaching strategies to promote SRL, such as goal setting, student-driven learning activities, monitoring, adjusting, problem-solving, and self-assessment. Rajabi (2012) emphasized that schools should develop SRL by considering students' interests and encouraging students to take more responsibility for their life-long learning. This literature also suggested MTSs to develop the SRL curriculum, including fostering self-reflection, encouraging self-questioning, and asking metacognitive questioning (Bian, 2016). Mok et al. (2005) have conducted a study in 10 Hong Kong primary schools and found that setting a timetable for revision, seeking help in learning difficulties, revising after tests on weak parts are the effective strategies to enhanced student SRL. Mok et al. (2007) further pointed out that goal setting is an important teaching strategy as the first step of planning. It could represent some kinds of standard in which students modify their actions and judge their learning outcomes. Teachers could analyse the difficulty of the task, identify task relevance, and build more achievable goals. Students can be supported to self-monitoring and self-regulation their learning. MTSs may improve students' metacognition about their thinking, learning preferences, knowledge, and effectiveness of their learning strategies (Bae & Kwon, 2019). In conclusion, metacognitive teaching implements to "create more room for schools,

teachers and students, to offer self-regulated learning opportunities, and to lay the foundation for lifelong learning" (CDC, 2001).

2.2 Comparing and contrasting MTSs in Chinese reading between mainland China and Hong Kong

This section reviews literature themed MTSs in the Chinese language in Shanghai and Hong Kong. This section also compares MTSs between the two regions and elaborates the key MTSs appeared in the literature. Moreover, teaching stages in the Chinese language courses are discussed for supporting the following analysis of metacognitive teaching behaviours in a classroom context.

2.2.1 Metacognitive teaching strategies in the Chinese language in mainland China

In 1989, Dong (1989) introduced the theory of metacognition into mainland China originally. In the early time, the educators and researchers mainly focus on applying metacognitive teaching into the domain of English as a second language (Tang, 2000; Zhang, 2001). In recent years, more studies engaged in Chinese language education. Forty pieces of literature on metacognitive teaching strategies in the Chinese language from 2001 to 2020 in mainland China were sought. There is a noticeable increase in literature on metacognitive teaching strategies since 2015 (see figure 4). Especially, in 2020, 15 studies about the MTSs in the Chinese language were published. Although metacognitive teaching strategies are a hot topic in China, the fact is that there exists an apparent paucity of research on MTSs in the context of the Chinese language (Yuan, 2017).

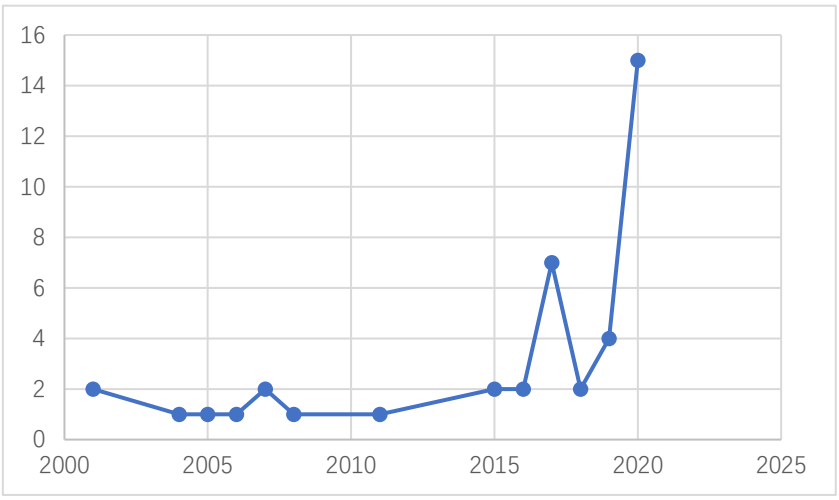


Figure 4. The number of the research on MTSs in the Chinese language in mainland China

Among all of the 40 pieces of literature about MTSs in the Chinese language, six empirical studies examined the effective MTSs to improve students' reading comprehension. Feng and Yang (2017) conducted empirical research on 62 college students by using scaffolding strategies, questioning, and planning-monitoring-evaluation strategies to improve students' professional reading comprehension. The teacher introduced the knowledge of metacognition and the relationship between metacognitive strategies and professional reading, and clearly explained to students why they have to learn in a metacognitive way. The planning-monitoring-evaluation strategy was adopted to help students reflect on their learning gradually as follows.

Planning

- What is the purpose of my reading?
- What does the text write about?
- What information and strategies can I use to reading the text?
- How can I distribute my time and resource?

Monitoring

- How about my progress?
- Can these reading strategies solve the problems?
- Do I need to improve my reading?
- Do I meet the reading goals during reading?

Evaluation

- How well do I accomplish my goals after reading?
- What do I do to make sense to achieve my goals?
- Is there an easier way to do things after I finish a task?
- I summarise what I've learned after I finish?

The results indicated that the improvement of test scores in the experimental group in pre and post-test was more than that in the control group.

Du (2020) implemented a 7-day reading comprehension course for international students learning Chinese and adopted a planning-monitoring-evaluation teaching strategy. The teacher facilitated students to stop and think, take notes, and underline keywords to monitor their reading. The results presented significant improvements in student metacognitive abilities and their reading performance before and after the intervention. The study by Bian (2016) applied MTSs for international students to learn Chinese. The teachers used planning-monitoring-evaluation instruction to teach Chinese vocabulary, grammar, and the transformation of sentence patterns. After 13 weeks of metacognitive strategies training, the average score of the test of the experimental group was significantly higher than that of the control group.

Liu (2009) surveyed about students' reading habits in secondary schools in China. This study found that students with weak reading skills did not have enough strategies to overcome the reading obstacles. When encountering problems, they tended to ask others' answers or ignore these questions. High-skilled students would reread the relevant sentence, self-questioning, and identify details to understand the content. Therefore, it is critical to implement MTSs for developing students' reading comprehension skills in secondary schools. Dai (2004) designed an experimental study to develop a model of MTSs in the Chinese language for junior high school students, which contained (1) stimulating prior knowledge, (2) making a prediction of reading content, (3) modelling and self-questioning, (4) solving problems. They had designed metacognitive teaching strategies that were more suitable for the needs of Chinese students. For example, before facilitating students' self-questioning, the teacher should model to students and facilitate them in groups to ask questions with each other. There is a significant increment of students' reading comprehension scores in the experimental group than in the control group.

A similar finding was revealed in Lu's (2008) study of metacognitive teaching in a junior high school. The intervention in the Chinese language followed four steps: setting goals, modelling, scaffolding for student self-regulated reading, reflection, and peer assessment. Students were guided to adopt many types of reading methods, such as browsing, intensive reading, skimming, skipping in reading to extract information, rereading, and monitoring the usage of the strategies. Results in pre and post-test showed that MTSs effectively improved students' reading comprehension and their metacognitive abilities.

Li (2006) made a checklist of planning-monitoring-evaluation in Chinese reading and examined the effect of MTSs in the experimental class comparing with the learning performance in the control class in a senior secondary school. Both classes were taught basic reading strategies, including previewing, noting, and summarizing the main ideas. Then the teacher of the experimental class implemented multiple MTSs, namely self-questioning, think-aloud, metacognitive questioning, and visualised tools, to assist students in regulating their reading. A significant improvement was found in the experimental class than in the control class.

2.2.2 Metacognitive teaching strategies in the Chinese language in Hong Kong

In Hong Kong, MTSs are regarded as important teaching strategies in Chinese language classrooms for developing self-regulated learners. Six empirical studies were found about the application of MTSs in the Chinese language. Lau (2012) conducted instructional practices of metacognition in Chinese language courses. Metacognitive questioning, introducing metacognitive knowledge, think-pair-share, and modelling were used to enhance students' comprehension. According to the lesson observation, students could analyse the rhetorical skills of the text and identify the main ideas very quickly. Path analyses explored that significant relations between metacognitive reading instruction and students' reading comprehension were found from direct effects. Furthermore, another intervention program was implemented by Lau (2020) in classical Chinese learning in Junior secondary schools. Teachers in the experimental group implemented the instruction based on MTSs and self-regulated

learning in the intervention package. In contrast, teachers in the control group used the traditional teacher-centred method to teach the same reading materials. The first module focused on narrative texts, and the second module focused on argumentative texts in the following semester. The teacher in the experimental group guided students to compare different types of texts and summarise the major features of that text. Various metacognitive instructional strategies, such as scaffolding, modelling, self or peer assessment, etc., were used as the intervention. The teacher also selected interesting supplementary materials, such as YouTube videos, news, and pictures, to increase student motivation. The intervention successfully improved students' reading comprehension in the experimental group.

Ko and Xu (2018) carried out a case study in three primary schools to investigate teaching strategies for supporting students' self-regulated learning. Teachers nurtured students to make a learning plan, learning motivate, peer-questioning, self-checking, and self-assessment. As one of the important MTSs, cooperative learning was adopted in three schools in different styles based on students' situations, including Jigsaw and reciprocal teaching. This research highlighted that school context should be considered in designing the teaching strategies. To enhance students' progress in reading comprehension and improve teacher professional development, Zhu et al. (2016) proposed a comprehensive process model (CPM) to investigate teachers' instruction in the Chinese language in Hong Kong. There were six teaching stages of CPM: awareness, informational, personal, management, consequence, collaboration, and refocusing. The model showed an obvious advantage as an effective instrument to promote students to think critically by mastering the reading process. Similarly, Ku and Ho (2010)

surveyed a university and uncovered that planning-monitoring-evaluation could enhance students' critical thinking in Hong Kong.

Ng (2015) conducted qualitative research to interview six Chinese language teachers about implementing teaching strategies to promote self-regulated learning in Hong Kong. Chinese curriculum multiple strategies were employed, including guided learning plan, think-aloud, visualised tools, self or peer assessment, to develop students' self-management, learning strategies, and time management. One important conclusion was that the teachers should provide students plenty of opportunities to realize their shortcomings, monitor and adjust their learning.

2.2.3 Analyzing, comparing and contrasting MTSs in Shanghai and Hong Kong

Based on the previous analysis, teachers in mainland China and Hong Kong used various MTSs in their classroom teaching to improve students' reading abilities and promote self-regulated learners. Figures 5 and 6 summarise the metacognitive teaching strategies mentioned in the reviewed empirical literature in the Chinese language in mainland China and Hong Kong, respectively.

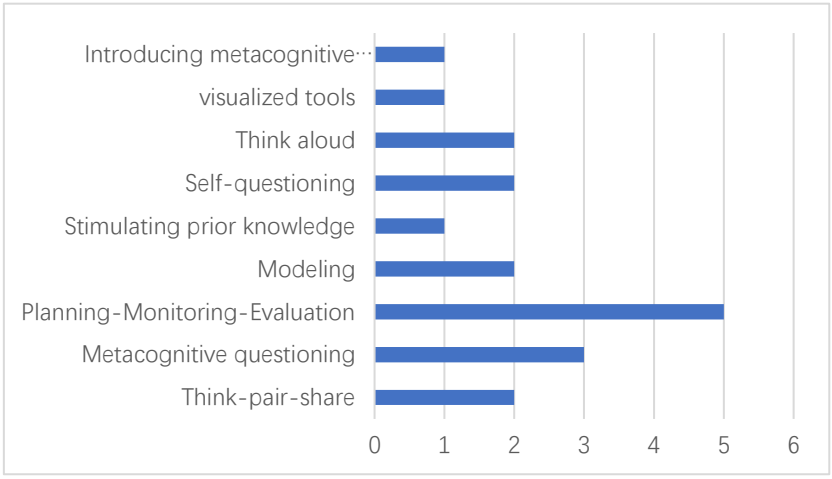


Figure 5. Summary of MTSs in Chinese reading in mainland China

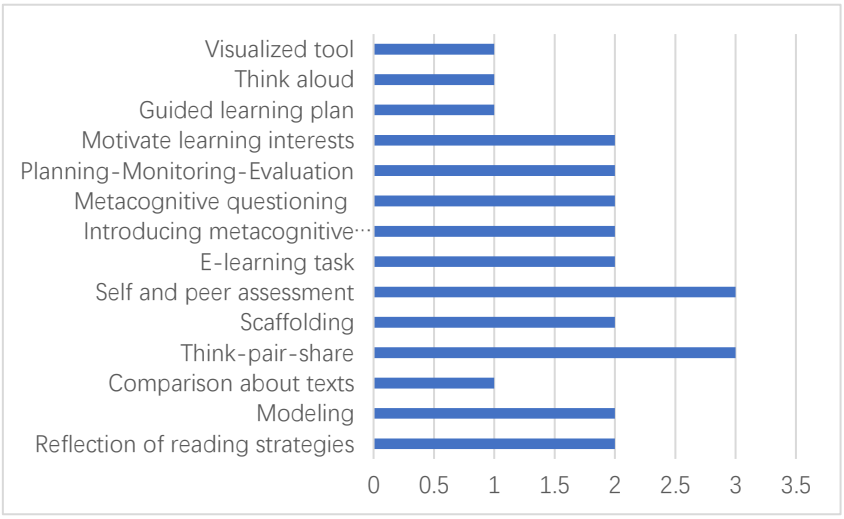


Figure 6. Summary of MTSs in Chinese reading in Hong Kong

It can be noticed that, among the respective six studies in the two regions, teachers in Shanghai used MTSs 19 times, while teachers in Hong Kong used MTSs 26 times. There are more types of MTSs in Hong Kong than in mainland China, 14 types of MTSs in the literature in Hong Kong, whereas nine types of MTSs in the literature in mainland China. Teaching behaviours in the two regions focus on introducing reading strategies and metacognitive knowledge, modelling to students, explaining how to read, and asking metacognitive questions to promote

their self-regulation. In this process, students can learn explicit strategies, reflect on the strategies they are regularly using, and optimize their learning by teacher's questioning. Teachers in the two regions both pay attention to supporting students to summarise, compare, and improve their reading strategies and further apply these approaches in other contexts.

However, there are still some differences that deserve our attention. According to Figures 5 and 6, self or peer assessment and think-pair-share are the most frequently used MTSs by the teachers in Hong Kong, whereas planning-monitoring-evaluation (PME) is the most frequently used strategy for the teachers in mainland China. However, PME lacks a special treatment for helping students overcome learning obstacles and address reading difficulties. In contrast, teachers in Hong Kong used metacognitive teaching strategies more comprehensively and flexibly. In particular, they paid great attention to taking appropriate strategies to cater to student needs and reserve specific space for adjustment in teaching (Lau, 2012, Zhu, Liao, & Deng, 2016). In Hong Kong, teachers leveraged students' reading interests which they thought was an intrinsic and sustained method to keep students engaged in learning. Teachers carefully selected teaching materials based on the theme of the texts, such as news, YouTube videos, and pictures, to enhance student motivation (Lau, 2020). Teachers in Hong Kong agreed that self-regulated learning needs more effort from students. Therefore, it is critical to enhancing their willingness to learn (Ng, 2015). It is also noticed that teachers in both areas paid great attention to think-pair-share. Moreover, teachers in Hong Kong adopted diverse types of cooperation to meet students' needs. In mainland China, metacognitive questioning is usually adopted to promote students' metacognitive awareness and increase their learning progress. We might

regard this phenomenon as a continuation and development of the traditional “question-answer” model in mainland China (Xiao, 2008) .

In this study, we focus on more specific teaching strategies for cultivating student reading comprehension skills. Based on the investigation of the literature concerning metacognitive teaching strategies in Chinese reading in mainland China and Hong Kong, the MTSs, namely think-pair-share, metacognitive questioning, self and peer assessment, modelling, think-aloud, and self-questioning, are included in the research framework because these strategies are commonly used in the two regions as effective instructional approaches according to the literature and can be flexibly embedded in different curriculum contexts.

2.2.4 MTSs of Shanghai and Hong Kong teachers in the existing literature: think-pair-share, metacognitive questioning, self or peer assessment, modelling, think-aloud, and self-questioning

Think-pair-share is a kind of instructional strategy for teachers to organize cooperative groups to solve learning problems together. After the teacher proposes specific reading questions, students think and discuss in pairs or small groups, then share ideas with team members on the solution. The teacher keeps students maximizing participation and provides supports when students encounter obstacles (Cheng, 2019). Think-pair-share is an effective teaching strategy for supporting students’ metacognition. The teacher guides students and provides opportunities for students to articulate and monitor their thinking through metacognitive prompts. Students think and reflect on their thinking through the discussion with their partners. Then they ask

questions to their partners about their thoughts. In this process, students can rethink their solution to the question, evaluate the answers of their partners and themselves, and deepen their understanding of how to evaluate. Think-pair-share can activate students' metacognitive knowledge, help students learn from others, compare various opinions, and enrich their responses (Mevarech & Kramarski, 2014). Li et al. (2019) examined the effect of think-pair-share of junior secondary school students' listening comprehension performance. The results indicated that the treatment group organized by a think-pair-share structure scored substantially higher than the control group.

Metacognitive questioning is one of the most common teaching strategies in classroom teaching (Cheng, 2019). Metacognitive questioning facilitates students to plan, monitor, reflect, and refine their reading process through effective questioning strategies in literacy instruction. Teachers raise these questions to encourage students' metacognitive process, which means teachers focus on "reflect on your thinking" to understand something (Nell K & P. David, 2008). Teachers could pose questions to encourage students to think about how they solve problems and learn better. Ideally, the teacher hopes to encourage students' in-depth thinking to learn rather than superficial thinking (Lewis, 2019). This strategy provides students with opportunities to check their understanding of the textbook and negotiate textual meaning. Metacognitive questions can support students to examine what they have learned, evaluate whether they understand the learning contents, and inspire them to think reflectively about the questions. Teachers should use questioning flexibly, including probing questions, leading questions, rhetorical questions, or scaffolding questions, to stimulate students' thinking aloud

(Wilson & Smetana, 2011).

Self or peer assessment is an indispensable element in the process of teaching and learning. As Bound(2013) said, self-assessment is “the involvement of students in making judgments about the extent to which they have met the learning criteria”, and peer assessment is where “students apply standards to the work of their peers to judge that work”. Teachers should promote the process of self or peer assessment to cultivate autonomous learners. For self-assessment, students are not going to learn how to be good learners unless teachers engage them in activities and reflect on how they performed, what strategies are working or not working for their learning (Chatzipanteli et al., 2014; Yeung, 2015). Utilizing self-assessment, students can realize learning weaknesses and advantages, review their learning errors, and check the effectiveness of the learning strategies. For peer assessment, teachers should encourage students to critically judge others’ performance and activate peers to arrive at an effective reflection. Students analyse and evaluate others’ learning outcomes by comparing the learning goals. Ultimately, they may learn how to be responsible for their learning and develop learning to learn skills. Pantiwati and Husamah (2017) conducted training through lecturing self or peer assessment and integrating this strategy into active learning. Eventually, they found an influencing effect of self or peer assessment on students’ metacognitive awareness and learning. Tavakoli (2014) discussed the relationship between self-assessment and peer assessment. He proposed that peer assessment can be adopted to help self-assessment. Teachers could facilitate students to develop an understanding of the assessment criteria and the intended learning outcomes. Students were supposed to be easier to identify how they were learning and

strengthen their metacognitive awareness.

Modelling is related to “demonstration” or “imitation” in practice (Cheng, 2019). The teacher uses modelling to demonstrate a skilled reader’s method for arriving at meaning in different text types. Students imitate the demonstrated thinking process by the teacher in understanding the text (Brenda et al., 1990; Coogle et al., 2020). Taylor and Pearson (2002) believed that an effective metacognitive teaching strategy models the use of strategies, verbalizing the thinking process, and providing visual examples by performing a skill accurately to students. A detailed explanation and guidance to students are needed. (Methe & Hintze, 2003). Fisher et al. (2008) believed that expert teachers usually perform modelling in reading instruction to teach students how to think aloud to monitor their thinking. Parsons et al. (2020) study justified the most robust effect of “modelling plus dialogic reading” on children’s vocabulary learnings than that of “dialogic reading” because modelling can supports students to imitate teachers’ thinking to handle the learning problems independently.

Self-questioning is a strategy that teachers encourage students to ask themselves questions before, during, and after the reading (Johnson et al., 2012). Joseph and Ross (2018) proposed several phases to implement self-questioning. First, the teacher explained the strategy of self-questioning and provided examples to students. Second, the teacher demonstrated to students how to ask themselves questions during learning. Third, students practised how to ask questions with teachers’ support. Fourth, students could promote their learning by answering their questions. Self-questioning is an effective method to check students’ understanding of the

content and promote their problem-solving ability. When students read a text, they may not realize what they don't understand. By self-questioning, students can assess their understanding, use data integration, organization, memory, analysis, and evaluation skills to achieve understanding (Shang & Chang-Chien, 2010). This method helps students enhance the self-controlling of thinking, promote the application and transformation of knowledge and skills, and improve learning motivation, attitude, and performance (Hartman, 2001).

Think-aloud was defined by Oster (2001) as a strategy in which people can verbalize their thoughts. Fountas (2006) proposed that modelling through think-aloud was the best way for teachers to instruct all comprehension strategies. Teachers make their thinking processes explicit by explaining the "think-aloud" activity. Then students practice by themselves or cooperate with their peers to follow this strategy (Oster, 2001). Students can be probed by implementing think-aloud to recognize the difference between reading the text and comprehending it by speaking out what they think (Syamsul et al., 2018). Through this strategy, students can predict what might happen next and draw inferences, monitor and review their cognitive processes to construct meaning. Therefore, it is an effective metacognitive teaching method of supporting students to know how well they understand the text through verbalization. Then they can adjust their reading strategies or focus on the content that they don't understand.

In sum, metacognitive teaching strategies are involved in the instructional process and make students become increasingly empowered, metacognitive, engaged, and self-regulated in their learning. The main steps of each strategy are outlined in Table 1.

Table 1. The components of metacognitive teaching strategies

Metacognitive teaching strategies	The components/features
Think-pair-share	The teacher poses a question or presents a problem Give students 1 to 5 minutes to think carefully about the question Ask students to compare their answers in small groups Ask students to share their work with the class
Metacognitive questioning	The teacher asks students questions to monitor their learning process The teacher asks students to check the reading strategies The teacher asks students to reflect on their answer
Self or peer assessment	Identify standards and/ or criteria to apply to their task Learn performance Use the criteria and apply the standards to the task by themselves or with their peers Judge about the learning behaviours if they have met these standards
Modelling	Tell students what to do about monitoring their learning process Demonstrate to students how to monitor their learning process Students imitate what the teacher does
Self-questioning	The teacher poses reading content or a reading task Facilitate students to generate questions Facilitate students to answer the questions
Think-aloud	One student talks out loud while the partner records what they are saying Advise students about how to articulate their thinking Students switch roles and do the same for each other Give feedback to students

Furthermore, Yang (2020) proposed that metacognitive teaching promotes students to realize the control of their learning, which is also a process of continuous social interaction and construction between teachers and students and among students. As Maiko (2013) stated, besides the common patterns identified in conducting metacognitive teaching strategies, teachers also combine different types of thinking (e.g. individual thinking, pair thinking, small-

group thinking, and collaborative class thinking) into metacognitive teaching.

Table 2. Metacognitive teaching strategies with thinking scaffolding

	Individual thinking	**Pair thinking**	**Small-group thinking**	**Collaborative class thinking**
Think -pair-share	Think individually about a topic	Discuss and share with a partner	Or discuss and share with small-group	Expand the "share" into the whole-class discussion
Metacognitive questioning	Ask questions to an individual student to promote thinking	Ask questions to promote thinking	Ask questions to promote thinking	Ask questions to the whole class to promote thinking
Self or peer assessment	Self-assessment for one's learning	Peer assessment	Peer assessment in small group	Peer assessment in whole class
Modelling	Teacher models and students imitate			
Self-questioning	Students perform by themselves			
Think aloud	Students perform by themselves	Students speak out their understanding in pairs	Students speak out their understanding with group members	

These thinking methods are viewed as external reinforcement, which changes students' thinking habits to be more self-regulated and incorporate the new learning method into students' reading techniques with the supports of pairs, small-groups, and whole class sharing while reading the passage.

2.2.5 Teaching stages in the Chinese language courses

In this study, metacognitive teaching strategies were also discussed in different teaching stages. Teaching stages provide a logical progression of instruction and refer to what the teacher

intends to teach the students. Gilmore (2019) provided a structure of teaching stages containing Introduction, Development, Consolidation, and Conclusion. Teachers introduced the new lesson to students, developed their knowledge and cognition, consolidated if students achieved specific learning results, and concluded the lesson. Hedlund (2020) offered an Engage, Build, and Consolidate (EBC) framework of teaching stages in science learning to attain positive student learning achievements. Engage, the first step, was to e/ngage students, raise their attention, and encourage them to connect with the relevant experience. Build, the second step, referred to building novel knowledge and skills by the teacher's scaffolding, analogies, and demonstration. Consolidate, the last step, referred to rehearsal the new information, apply the knowledge, or assign homework. In the above literature, the teaching stages contain an introduction, learning to develop their knowledge and skills, and reviewing student learning and consolidation. This framework can also shed light on the Chinese language instruction by increasing students' engagement, developing their reading skills, and helping students internalize the skills to reinforce what they learned.

In terms of teaching stages about metacognition, the reflective process was strengthened. Three phases have been hypothesized in the self-regulated learning literature by Brown (1987), who proposed a planning-monitoring-evaluation (PME) model. This classic PME model was introduced in section 2.1.1.2. In addition, Roberts et al. (2019) designed a teaching sequence in alphabet learning. (1) Warn-up. The instructor guided students to revise the previous lesson, checked homework and provided activities to engage students in the class, (2) Introduction. The teacher introduced and lectured the new contents. (3) Play and learn. The teacher organized

students to play games by using the new letter. (4) Cumulative review. The teacher asked students to “think again” and facilitated students to regulate and reflect on their learning inclination. Ko and Xu (2018) introduced a four-step teaching framework: preparing for learning, learning from doing, summary, and extended learning. This procedure was proposed for supporting self-regulated learning in the Chinese classroom context by emphasizing the teacher’s demonstration, students’ practice, and reflection. In the stage of introduction, the teacher presented the learning objectives, warm up the class. In the stage of learning from doing, the teacher coherently presented the topic, provided students opportunities to participate in the teacher’s demonstration, let students practice what they learned, and independent practice. In the summary stage, the teacher gave a summary and asked students questions to evaluate the achievement of learning objectives. In the stage of extended learning, review of the learning and knowledge application were encouraged.

In the literature about the Chinese language courses, Shan (2015) proposed a teaching procedure, including introducing the new lesson, the overall perception of the text, deep reading, extended learning, and conclusion. This study adopted the teaching procedure integrated the opinion by Ko and Xu (2018) and Shan (2015) to form the teaching stages in the Chinese language courses. There are four stages: introduction, learning by doing, extended learning, and summary. Introduction means that the teachers arouse students’ prior knowledge to introduce the lesson. Learning by doing means that the teacher guided students to solve reading problems or finish various activities. Extended learning means knowledge application or reflection on learning. Summary means that students summarised their understandings of

the whole learning contents in this lesson.

What should be paid attention to is that the framework of teaching stages was not a fixed recipe. It is more probably a tool or helpful list of guidelines to support teachers to reflect on and improve their practice to promote effective learning. Because teaching and learning construct a complex system with different variables, teachers need to design the lesson by personalizing activities and the classroom situation. Teachers can follow these stages to prescribe what to learn, then provide instruction about regulating, controlling students' learning, and providing them with a range of strategies that support learning.

2.3 Factors influencing teachers' usage of MTSs

In Shanghai and Hong Kong, many schools may not effectively develop students' SRL and enhance their academic performance. The reasons may refer to a low utilization rate of school resources, the seldom time for teachers to promote their professional development, lack the understandings for curriculum reform, and so forth (Hall & Harding, 2003; Pintrich & Zusho, 2002). Whereas some instructional strategies are more effective which involve using a wide repertoire of metacognitive approaches. They are characterized by student self-regulation, student engagement, and promoting learning outcomes. This situation raises the research interest in exploring the possible factors influencing the implementation of curriculum effectively and sheds light on how to nurture students' self-regulated learning in the context of new curriculum reform.

Cheung and Wong (2011) proposed some relevant factors that may affect curriculum implementation from curriculum standard, teacher knowledge, their attitude, student and parent factors. This study focuses on the influencing factors on effective teaching behaviours; therefore, the difference between students' original ability level and their parents' attitude is not be discussed in this study. The following paragraphs discuss curriculum and teacher factors that may probably influence teachers' application of MTSs.

2.3.1. Curriculum policy

Lingard et al.'s (2013) pointed out that curriculum was understood by educational researchers "as systemic policy implemented or enacted in schools and classrooms through pedagogy and framed by systemic evaluation, assessment, and testing policies". Curriculum policy puts forward specified concepts, knowledge content, objectives, and structures, and conveys a character of value-neutrality and objectivity, meanwhile hiding inevitable value-laden impressions (Hayes, 2009). That means curriculum policy has its value and attitude about what kinds of learners should be cultivated to meet the pragmatic needs of the society through legitimating and designating official school objectives, knowledge, abilities, and assessment criteria. Wong and Zhu (2006) compared the curriculum policy in Shanghai and Hong Kong. They noted that although there were differences in many aspects, such as curriculum decision, design, structure, aims and assessment, the curriculum policy in the two regions persisted a value that was nurturing students' key competencies and launching a competency-based policy.

According to Latin derivative, "currere", means "a course to be run" (Cherryholmes, 2002).

Curriculum policy also refers to pedagogical practices in schools and classrooms, the organization of school time and space, and the meaning-making by teachers and students (Todd, 2001). It constructs a powerful comprehensive system over teaching and learning experiences. Todd (2001) described how the curriculum is the "raw material" of education and proposed that teachers needed to explain, localize or create the curriculum. In this sense, curriculum plays a vital role in influencing teachers' behaviours subjectivity. Education is a process by which teachers facilitate and shape students to become a self in the whole curriculum mechanism. The pedagogy that teachers adopt implies their understanding of the curriculum. They believe that the role of curriculum implementation is to release a student from the binds of indoctrination and inculcation to develop their potential for independent learning (Winter, 2017).

Policy mechanisms may enhance teachers' educational performance and resolve assumed educational problems, such as declining teaching quality, the attainment gap between advantaged and disadvantaged students and providing professional guidance to teachers (Singh et al., 2013). Curriculum policy forms a totalizing programmatic discourse governing the constitution, implementation and evaluation of instruction. Lau and Chen (2013) discussed the curriculum policies from mainland China and Hong Kong to elaborate its influence on Chinese language instruction. It should be noticed that Chinese language teachers in different areas may have different teaching performances because of the possible impact of their curriculum policies. Although operating in the same cultural background, teaching methods of the Chinese language courses may vary under different educational systems.

2.3.2 Teachers' beliefs of metacognitive teaching

Teachers' beliefs refer to one's constructs that can provide understandings, judgments, and evaluations of instructional practices (Yang & Pun, 2008). Teacher beliefs influence their decision and perspective, which in turn affect their teaching practice in the classroom (Chan, 2016). In the research by Lombaerts et al. (2009), it is found that teachers' educational beliefs are often strongly related to their teaching behaviours of self-regulatory instruction. Wangeleja (2010) conducted a study on the implementation of competence-based teaching approaches and found that if the teacher believed students' learning outcome can be changed by the competence-based teaching approaches, they had the great potential to conduct that pedagogy.

Teachers' beliefs about metacognitive teaching affect the adoption of teaching strategies in the classroom (Avalos, 2011; Borko, 2016; Opfer et al., 2011). It consists of a concept, view, or philosophy about what should be taught and how to teach. Teachers will not conduct metacognitive teaching if it conflicts with their teaching conceptions and preexisting beliefs (Gregoire, 2003). Teachers who believe that metacognitive instruction can improve students' interpretation of the texts would tend to use metacognitive methods (Perry et al., 2006). Only when teachers believe that this instructional method can improve learning, they would like to change the teaching practice by promoting learners to self-monitor their reading process (Lau, 2013). Christodoulou et al. (2009) proposed that teachers' beliefs drive their practices and lead them to review the subject inquiry. When they become aware that their teaching influenced student academic performance, they re-evaluate and adjust their teaching in a positive way that

is more inclusive and equitable. Nsengimana et al. (2020) said that teachers don't cling to regular instructional practice. They would like to change the classroom climate when they believe they can change students by employing creative teaching methods.

2.3.3 Teachers' knowledge of metacognitive teaching

Teachers' professional knowledge is significant for successfully implementing metacognitive teaching (Perry et al., 2006). Knowledge of metacognition refers to the knowledge of metacognition and metacognitive teaching about how, when, and which strategy to adopt to equip students with self-regulated learning abilities (Zohar & Barzilai, 2013). Balcikanli (2011) created Teacher Metacognition Inventory (TMI) by conceptualizing the construct of teachers' knowledge about metacognitive teaching into three aspects: declarative knowledge, procedural knowledge, and conditional knowledge. This design echoed the component of knowledge of cognition proposed by Brown (1987) and Schraw (1998) that was mentioned in section 2.2.1. (1) Declarative knowledge refers to what teachers know about themselves, metacognition, and metacognitive teaching. Teachers with this kind of knowledge can describe the definition of metacognition and explain different types of metacognitive teaching strategies (Tishman et al., 1995). (2) Procedural knowledge refers to know how to use the metacognitive teaching strategies (Patricia et al., 1998). Teachers with this kind of knowledge can use these strategies step by step proficiently to achieve the education aim or instructional purpose. (3) Conditional knowledge refers to knowing why and when to deliver metacognitive teaching strategies (Zohar & Barzilai, 2013). Teachers with conditional knowledge are clear about when to apply metacognitive teaching based on the lesson context and which situation is suitable for

implementing these methods.

In short, this knowledge can support the sustainability of metacognitive instruction. It should be equipped with teachers in the context of teaching metacognition. Teachers should be familiar with different MTSs that can help students' reading. It includes modelling the use of a metacognitive strategy in reading contexts, providing explicit instruction of metacognitive thinking, encouraging students to explain, or reflecting on their thinking (Case & Gunstone, 2006). Besides, teachers should be capable of deciding where, when, and how to use MTSs based on different students and teaching contexts. These kinds of understanding make metacognitive instruction achievable (Gudmundsdottir & Shulman, 1987).

2.4 The research gap and an analytical framework of the study

According to the previous literature review, there is a research gap that few empirical studies explore metacognitive teaching strategies in a natural classroom setting, especially in the Chinese language. Most of the existing literature investigated the effects of metacognitive teaching by training teachers and comparing the experimental group with the control group. For example, Sahin and Kendir (2013) taught the experimental group to identify the effect of applying MTSs for solving problems, metacognitive skills, and attitude. Lau (2013) conducted a teacher collaborative programme to train teachers to implement SRL-based instruction among 31 Chinese language teachers in Hong Kong. Houtveen and Van (2007) trained Dutch teachers on metacognitive strategy instruction and tested students' metacognitive abilities. This study bridges the knowledge gap by detecting and comparing MTSs in a natural instructional

environment in Shanghai and Hong Kong and explore the factors contributing to the behaviours of metacognitive teaching (research questions 1, 2, and 3).

Figure 7 illustrates the analytical framework of this study. This study aims to investigate effective metacognitive teaching strategies that enhance students' understanding of the texts in a natural classroom setting. Think-pair-share, metacognitive questioning, self and peer assessment, modelling, self-questioning, and think-aloud served as anticipated MTSs to implement metacognitive instruction. Furthermore, it is discussed what factors contribute to teachers' behaviours of MTSs.

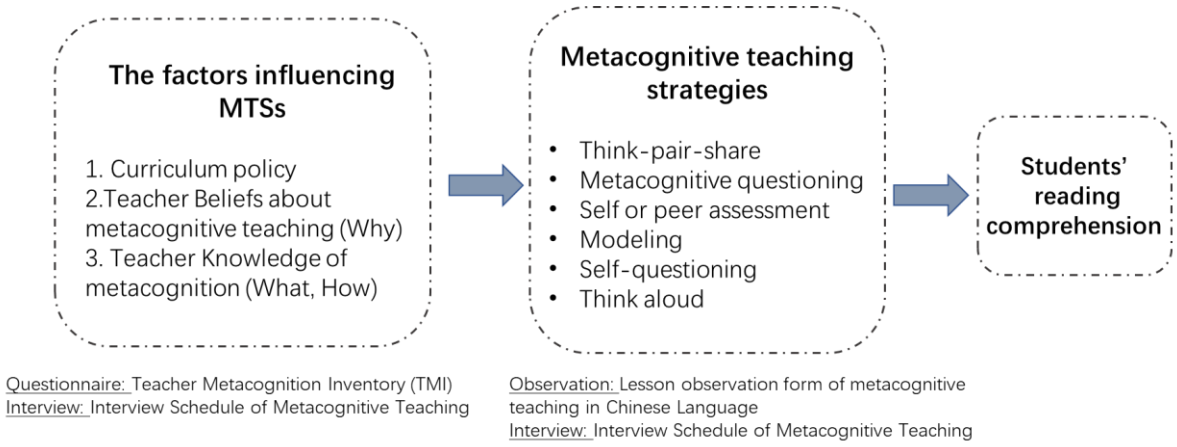


Figure 7. An analytical framework of this study

2.5 Summary

Metacognition is regarded as "cognition about cognition", "think of thinking" (Brown, 1987; Flavell, 1979), and it is a higher thought above one's cognitive system and can monitor the thinking process. Previous research proposed metacognition models, and a common view is achieved that metacognition is composed of knowledge of cognition and regulation of

cognition. Learners apply their cognitive knowledge, plan, monitor, and evaluate their learning process to solve problems. It plays a significant role in promoting student learning through reflection, regulation, and refinement of their learning process and strategies. In the context of implementing the curriculum of SRL, metacognition can support students to monitor, adjust, and self-assess their learning behaviours, and promote themselves to be self-directed learners.

Developing metacognition in the classroom setting is a popular topic for researchers and educators seeking methods to improve instruction quality. Metacognitive teaching is different from general teaching. General teaching promotes students to solve problems, while metacognitive teaching supports students' reflection, evaluation, and adjustment of their problem-solving process. Metacognitive teaching strategies (MTSs) can support curriculum implementation of SRL by promoting students to reflect on how they solve problems. MTSs can enhance students' reading comprehension skills by utilising appropriate reading strategies, and boosting their understanding of a text. This chapter also reviewed the empirical studies of MTSs in the Chinese language in Mainland China and Hong Kong. It summarised and introduced six strategies (think-pair-share, metacognitive questioning, self and peer assessment, modelling, think-aloud, and self-questioning) as effective MTSs in the Chinese language.

This chapter also illustrated the factors that may influence teachers' metacognitive teaching. Based on the literature, curriculum policy, teachers' beliefs, and knowledge of metacognitive pedagogy can impact their metacognitive instruction. The review of existing literature suggests a research gap that few empirical studies have been done on MTSs in a natural classroom

setting, especially in the Chinese language. The analytical framework of this study was proposed. Metacognitive teaching strategies adopted in the natural classroom context were investigated to improve students' reading comprehension. The factors influencing teachers' metacognitive instruction are explored from curriculum policy and teachers' aspects.

Chapter 3. Research Design and the Methods to be Used

This study adopts a case study to investigate effective MTSs applied by Chinese language teachers and the factors that impact teachers' behaviours of metacognitive teaching. This study uses multiple data collection methods, namely lesson observation, in-depth interview, and questionnaire. Eight Chinese language teachers are selected from Shanghai and Hong Kong schools. Within-case and cross-case analysis was adopted to analyse qualitative and quantitative data. At last, this chapter discusses ethical issues in this research.

3.1 Research methodology

A case study is an effective method for in-depth and holistic investigation (Tellis, 1997). It is a research methodology that can investigate a contemporary phenomenon as a subject of study (the case) within its related contextual conditions (Mills et al., 2009). This study adopts a case study to understand the cases and the circumstances surrounding them (Yin & Davis, 2007). Multiple methods could be applied in case study to collect data for assessing the occurrence in natural settings (Vázquez, 2014).

A case study research can be multiple-case studies and then draws a single set of "cross-case" conclusions (Yin, 2014). Multiple cases follow the same logic and are involved in a common framework. The researcher should select each case carefully to achieve similar and/or different results (Yin, 2014). This study adopted a case study as a research method to identify MTSs in Shanghai and Hong Kong and explored the influencing factors that lead to the metacognitive

teaching behaviours of the Chinese language teachers in the two regions.

3.2 Case selection

The reason for selecting Shanghai and Hong Kong as the research locations is that the curriculum standards in the two regions both focus on promoting students' independent learning skills and their performance in Chinese language courses. Moreover, the students in Shanghai and Hong Kong have a high performance in reading worldwide according to PISA results. It is worth exploring teachers' effective instruction to cultivate students' learning skills in Shanghai and Hong Kong.

This study targets grade seven in junior secondary schools. According to the Chinese Language Education Curriculum Guide issued by the Curriculum Development Council of Hong Kong (CDC, 2017), the teaching aim of Secondary 1 to Secondary 3 is mainly training students' abilities of reading, writing, listening, speaking and their ability of the comprehensive application. Schools should develop students' high-level thinking skills according to the curriculum standards. Students in junior secondary schools should be equipped with basic language abilities, such as literacy, language expression, and writing. They are developing their comprehension of complex texts and self-regulated learning abilities (CDC, 2017). As the starting grade of junior secondary school, students in grade seven have no pressure for preparing for the examination of entrancing high schools. Therefore, the teachers responsible for the instruction in 7th-grade may have more time to join in the research.

Eight teachers who taught in 7th-grade with different classes were selected to compare the various strategies and to unveil the metacognitive teaching performance in Shanghai and Hong Kong. Among them, four teachers were selected from two schools in Shanghai, and the other four were selected from two schools in Hong Kong. This study aims to explore MTSs implemented by the teachers to nurture students' reading comprehension. The study involved lesson observations of their MTSs, reviewed the design of teaching materials, and the adopted teaching strategies. Three lesson observations were carried out for each selected teacher to understand their behaviours of MTSs. 24 lessons were observed for all eight participated teachers in four months. The texts used in the observed lesson were modern Chinese literature except for poems and ancient Chinese prose.

The cases were selected through the following procedures. For the Shanghai teachers,

(1) three teachers from school A who taught the classes with high-achievers and the other three teachers from school B who taught the classes with lower-achievers were selected. The criterion for case selection was based on the school ranking of the Joint Entrance Examination in their communities (see Figure 8).

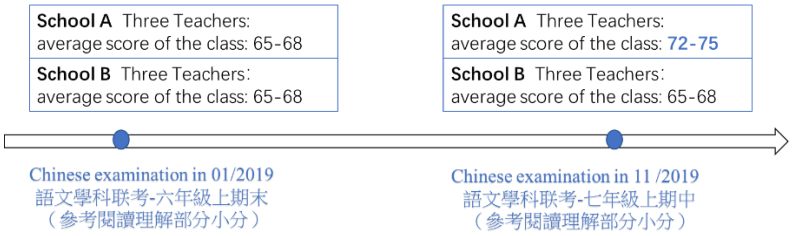


Figure 8. Case selection in Shanghai according to the reading examinations

All of the targeted students took part in the Chinese examination in 2019, and the

comprehension scores of all the students were obtained. In this study, the score of the final-term examination (Grade 6) in 01/2019 and the mid-term examination (Grade 7) in 11/2019 were extracted. The targeted students who were taught by the six teachers are in the same level of average scores (the average score is between 65 and 68) in 01/2019. In Nov. 2019, the students in school A had a noticeable improvement (average score is 72-76) in the Chinese reading examination; however, no significant change was found in the students in school B.

(2) A checklist for assessing metacognitive awareness for teachers (see Appendix 1) was sent to the six Chinese language teachers in Shanghai, respectively. The checklist comprises three aspects: teacher metacognitive experiences, metacognitive knowledge about the self, and teacher metacognitive planning/monitoring/reflection. Each aspect contains five questions, and totally there are 15 items in all with a five-point Likert scale (1 for "strongly disagree" to 5 for "strongly agree"). The Cronbach's alphas reliability coefficient is 0.729 (see Table 3).

Table 3. The reliability of the checklist for assessing metacognitive awareness

Cronbach's alphas coefficient	N of Items	Mean	Variance	SD
0.729	16	65.000	19.429	4.407

The answer on each item was counted, and the average score of these 15 items was calculated to indicate the final result of each teacher's metacognitive awareness. The higher the score is, the stronger their metacognitive awareness will be. In school A, the average scores of checklists of the three teachers were 4.40, 4, and 3.60. Then the researcher selected two teachers (labelled with teacher A-1 and A-2) with higher scores on the

metacognitive awareness checklist than the other one. In school B, two teachers (labelled with teacher B-1 and B-2) were identified with lower metacognitive awareness (their average scores on the checklist were 3.22 and 3.5) than the other one (the average score was 4.01). Besides, what must be confirmed is that the metacognitive awareness of teachers A-1 and A-2 is higher than teachers B-1 and B-2.

In Hong Kong, another six teachers (three teachers are from school C, the other three are from school D) are selected from Band 3.

(1) A reading comprehension test (see Appendix 2) was distributed to the six teachers' classes. There are two reading comprehension articles in the test, including "An indispensable urban landscape: zebra crossing" and "Sour orange". The full score of each article was 20, and the total score of the reading comprehension test was 40. The scores of the classes in school C were 23.73, 22, and 24.81, and the scores in school D were 15.39, 16.93, and 17.66. The classes in school C had better test results (exceeding 15% of the score) than those in school D.

(2) These six teachers also completed the checklist of assessing metacognitive awareness. In school C, the researcher selected two teachers (labelled with teacher C-1 and C-2) with higher metacognitive awareness (their average scores of the checklist were 4.5 and 4.1) than the other one (the score was 3). In school B, two teachers (labelled with teacher D-1 and D-2) were identified with lower metacognitive awareness (their average scores of the checklist were 3.07 and 3.73) than the other one (the average scores was 4). And the metacognitive awareness of teachers C-1 and C-2 is higher than teachers D-1 and D-2.

The whole picture of the results of case selection in Shanghai and Hong Kong can be seen in Table 4.

Table 4. The results of case selection in Shanghai and Hong Kong

Shanghai		**Hong Kong**	
School A	School B	School C	School D
Teacher A-1:Class1-High	Teacher B-1:Class3-Low	Teacher C-1:Class5-High	Teacher D-1:Class7-Low
Teacher A-2:Class2- High	Teacher B-2:Class4-Low	Teacher C-2:Class6- High	Teacher D-2:Class8-Low

To exclude other factors that may influence students' learning outcomes, the number of students taking tutorials after school didn't exceed 10% of the whole student number in all classes. It is considered that this number is not significant enough to influence the overall reading achievements of the class.

3.3 Data collection

Classroom observations and interviews were conducted to identify MTSs for teaching Chinese. Questionnaires and interviews were used to investigate teachers' beliefs and knowledge of metacognitive teaching. The research period lasted for four months. Each lesson was around 40 minutes. Each teacher was being observed for three lessons, and 24 lessons were observed totally in this study.

3.3.1 Lesson observation

Observation has been a central method throughout the history of qualitative inquiry classrooms, and it involves observations of meetings, classrooms, sidewalk activities, and factory work

(Yin, 2014). The enactment of the phenomenon studied generally takes place within a natural context. The focus of the observations in this study was the teaching behaviours of MTSs in natural instruction environment, with no intervention.

Teachers' instructional strategies were analysed through lesson observations of the reading comprehension lessons. The researcher videotaped the classes, observed the lessons, and filled in the observation form (Table 5). The contents of the observation form contained teaching strategies (Item 3), the regulation of cognition: planning, monitoring, and evaluation (Item 1, 4, 6), metacognitive awareness (Item 2), and class interaction and management (Item 5). In terms of the rating in the lesson observation form, a Spearman correlation coefficient was used to evaluate the rater reliability in SPSS. The researcher rated the lessons twice. The first time was in the class when the lessons were conducting. The second time is during the data analysis, about four months later than the first time. The correlation between the first and second ratings is 0.855, and the correlation is significant. The data of lesson observation was acquired to explore what MTSs and methods were used by the teachers in the lessons. The data collected from the lesson observation can respond to RQ1 and RQ2 of the study.

Table 5. Lesson observation record form

Lesson Observation Record Form (Metacognitive Teaching)

Topic:_____

School:	Grade:	Class:
Date:	Duration: _____minutes:	
Teacher：	(Observer) Assessor:	
Teaching Objective:		

Teaching Performance and Progress	Score (5 is the highest score)	Record relevant evidence
1.Lesson plan is concise, clear, fit for Ss	1 2 3 4 5	
2.Arouse Students' Metacognitive Awareness	1 2 3 4 5	
3.Metacognitive Teaching Strategies		
Modelling	1 2 3 4 5	
Metacognitive questioning	1 2 3 4 5	
Think-pair-share	1 2 3 4 5	
Think-aloud	1 2 3 4 5	
Visualised tools	1 2 3 4 5	
_____	1 2 3 4 5	
4.Metacognitive Monitoring		
Make students' rethinking, reflection	1 2 3 4 5	
5.Class Interaction and Management		
Opportunities for student participation	1 2 3 4 5	
Learning atmosphere	1 2 3 4 5	
Organized	1 2 3 4 5	
6.Lesson Evaluation		
Feedback to learning	1 2 3 4 5	
Summary	1 2 3 4 5	
Knowledge application	1 2 3 4 5	
7.Chalkboard for visualised thinking	1 2 3 4 5	

Please identify key strengths and/or areas for improvement in Teaching:

_____

_____

_____

_____

(Efklides, 2011; Han, 2018)

3.3.2 In-depth interview

The interview provides the main sources of evidence for a case study (Yin, 2014). An in-depth interview is a powerful approach for generating a description and understanding of the social world. Rubin and Rubin (2012) emphasized the advantage of the in-depth qualitative interview to illuminate research topics. Through interviews, the researcher can inquiry the teachers about their motives, knowledge, and experiences about metacognitive teaching in detail. Yin (2014) suggested that researchers have to follow the line of inquiry by their case study protocol and ask practical questions in an impartial manner throughout the interview. This study involves in-depth interviews with eight teachers. The purpose of the interviews is to answer the third research question by obtaining the teachers' viewpoints about what factors influence their metacognitive teaching behaviours.

The interview aims to collect information and data on metacognitive teaching. After the teachers conducted the three lessons, the researcher interviewed them. Two sub-themes (teachers' beliefs and knowledge of metacognitive teaching) were mentioned in the interviews. The outline of the interviews are as follows:

(1) Knowledge of metacognitive teaching (what) (how)

Declarative knowledge

- Could you please explain what metacognition is?
- What MTSs do you know? Can you explain some of them?
- How do you achieve the knowledge of metacognitive teaching, such as the concept or strategies?

Procedural knowledge

- Could you explain how to use this metacognitive teaching strategy?
- How do you design the lessons to support students to master the learning methods step by step?

Conditional knowledge

- According to the lesson observation, you used _____(teaching strategies) in this lesson. May I know the reasons why you used these strategies?
- When do you use these metacognitive teaching strategies? Why?
- Do you think students perform well by using these strategies? Please explain a little more.

(2) Teacher beliefs about metacognitive teaching (why)

- Do you agree that metacognition can improve students' learning? In what aspects? Why?
- What are the advantages of metacognitive teaching compared with other methods?
- What is your expectation of the lesson_____?
- Do you believe using MTSs can help you achieve the goals? Could you explain more about that?

To ensure a smooth conversation between the researcher and the interviewees, probing questions were prepared. Before the interview, the researcher explained the purpose of the interview and the issues of research ethics. To ensure a proper transcription of each interview, an audio recording was taken with the consent of the interviewees. The researcher interviewed the teachers in conference rooms of their schools from Sep. to Dec. 2020. Each interview lasted

from 40 minutes to one hour. Interview and questionnaire were used to answer RQ3 by understanding teachers' beliefs and knowledge of metacognitive teaching. Moreover, the interview was also adopted to answer RQ1 and RQ 2 through understanding teachers' perceptions of metacognitive teaching behaviours.

3.3.3 Questionnaire

A questionnaire of Teacher Metacognition Inventory (TMI) (Balcikanli, 2011) was used to investigate teachers' beliefs and knowledge of metacognitive teaching (see Appendix 3), which can answer RQ3. The questionnaire with a five-point Likert scale on a continuum from "strongly disagree" to "strongly agree" was sent to each participated teacher after the lesson observations. TMI includes two dimensions: teachers' beliefs in metacognitive teaching and knowledge of metacognitive teaching. The sub-dimensions of knowledge of metacognitive teaching are declarative knowledge, procedural knowledge, and conditional knowledge, which were explained in section 2.4.3. The Cronbach's alphas reliability coefficient of TMI is 0.845 (see Table 6).

Table 6. The reliability of Teacher Metacognition Inventory

Cronbach's alphas coefficient	N of Items	Mean	Variance	SD
0.845	16	66.750	30.786	5.548

The data of TMI were triangulated with the results of interviews to provide rich data to explore teachers' knowledge and beliefs related to their practices of metacognitive teaching.

3.4 Data analysis

The multiple methods of data collection used in this study would reduce the risks of accidental

associations and systematic biases of a single method (Maxwell, 2013). It is subject to a process of triangulation which can gather a more valid picture to answer the different aspects of the research phenomena.

3.4.1 Within-case strategy analysis

In this study, a data analysis spiral method (Creswell, 2009) was employed. The process was represented in a spiral image, a data analysis spiral. As shown in Figure 9, the researcher engaged in moving in analytic circles rather than using a fixed linear approach to analyse the data.

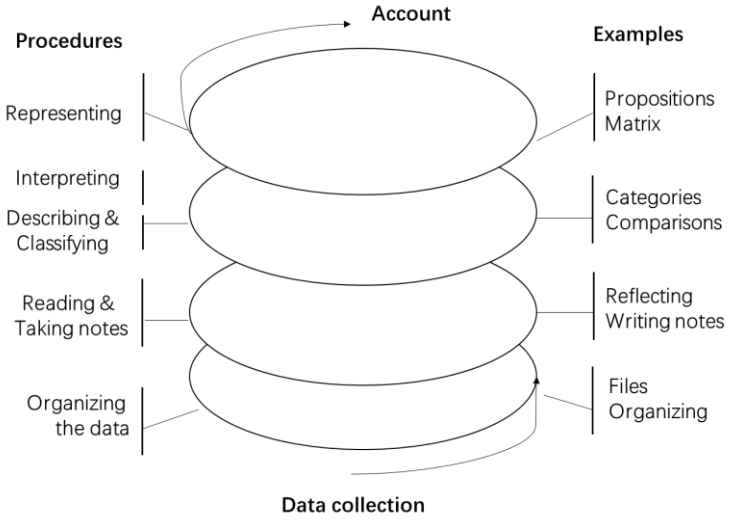


Figure 9. The data analysis spiral

The researcher analysed the data collected from the eight cases respectively. Five steps for each case were conducted, including organizing the data, reading and taking notes, describing and classifying the data, interpreting the data, and representing the data. In each step, the researcher analysed two sets of data: the data collected from lesson observation, and the data collected from interviews and questionnaires. Through analyzing the data collected from lesson

observation, the researcher identified MTSs adopted by each teacher. Through analyzing the data collected from the interview and questionnaire, the factors that may contribute to each teacher's behaviours of metacognitive teaching were investigated. The five steps were conducted as follows.

Firstly, organizing the data. (1) For the observation data: A folder of each case teacher was created on a computer. It contained the teacher's personal information, including schools, age, educational background, and professional title. The video of lesson observation was taped and transferred to the transcript for detailed analysis. The video footage could be further examined by the researcher to explore different MTSs. The lesson observation form (see Table 5) served as a complement to highlight the teacher's strategies. It also provided an opportunity for the researcher to revisit the teaching process relating to the use of MTSs. The researcher labelled the following information in each observation period: the site, date, length of observation, the teacher conducting the lesson, and keywords about the instructional events (Ritchie, 2014). (2) For the interview and questionnaire data: After the lesson, the researcher interviewed the participating teachers. The audio recording was transcripted to interview scripts. The researcher wrote down the interview headings, the dates, the places, and settings, and the questions asked and answered. The data collected from the teacher questionnaire was recorded (see Appendix 3: Teacher Metacognition Inventory). The questionnaire was composed of 16 questions with a five-point Likert scale (1 for "strongly disagree" to 5 for "strongly agree"). The outcome of each question was recorded as numbers.

Secondly, reading and taking notes (Creswell, 2009). Following organizing the data, the researcher continued reading the entire transcripts several times to get an overall meaning. The lesson plan, the transcript of lesson observation, teaching texts, and students' learning outputs were put together and scanned to generate major organizing ideas. The researcher took reflective notes in the margins of transcripts, photographs or teaching materials to facilitate exploring the database (Cope, 2010). These notes were ideas, short phrases, or key concepts that occur to the researcher. Such as the researcher took notes of "the same question as above", "the strategy cannot help achieve the teaching goals", or "student engagement increased" in the margins of transcripts. Moreover, four teaching stages, including introduction, learning by doing, extended learning, and summary, were marked in the transcripts according to the researcher's analysis of the data of lesson observation.

Thirdly, describing and classifying the data. In this step, the researcher reduced the data into themes by coding and condensing the codes. (1) For the data collected from observation, as the lesson observations were recorded and the video was transcribed, labelling observations and organizing the data were needed. The code of the participated teachers and their lessons in Shanghai, and Hong Kong can be seen in Table 7. It's worth noting that Teacher A-1 and A-2 belong to group A, Teacher B-1 and B-2 belong to group B, Teacher C-1 and C-2 belong to group C, Teacher D-1 and D-2 belong to group D.

Table 7. Code of the participated teachers and their lessons

Teachers	**Group**	**The topic of the lessons**	**Coding numbers**

Teacher A-1 (Shanghai)	Group A	Chinese stone arch bridge	A-1-01
		Uncle Lai- 1	A-1-02
		Uncle Lai- 2	A-1-03
Teacher A-2 (Shanghai)	Group A	In Berlin	A-2-01
		Growth in Summer	A-2-02
		In the Wind	A-2-03
Teacher B-1 (Shanghai)	Group B	The Shepherd Who Planted Trees-1	B-1-01
		The Shepherd Who Planted Trees-2	B-1-02
		In Berlin	B-1-03
Teacher B-2 (Shanghai)	Group B	Cats-1	B-2-01
		Cats-2	B-2-02
		First Voyage	B-2-03
Teacher C-1 (Hong Kong)	Group C	Sun Yat-sen	C-1-01
		In the Wind	C-1-02
		The Sight of Father's Back	C-1-03
Teacher C-2 (Hong Kong)	Group C	Shells	C-2-01
		Uncle Lai- 1	C-2-02
		Uncle Lai- 2	C-2-03
Teacher D-1 (Hong Kong)	Group D	Uncle Lai- 1	D-1-01
		Uncle Lai- 2	D-1-02
		In the Wind	D-1-03
Teacher D-2 (Hong Kong)	Group D	Life Trees	D-2-01
		Chest of Drawers- 1	D-2-02
		Chest of Drawers- 2	D-2-03

NVivo was used to code the content of lesson observation. The coding system can be seen in Table 8. The coding process is clear, detailed and organizes in a way that MTSs can be accessible throughout the three lessons of each case (Munn & Drever, 2004).

Table 8. Coding system about the data of lesson observations

Code Category		Examples of MTSs	Students' behaviours
Metacognitive teaching strategies:			
Modelling	Modelling	"Let me demonstrate to you how to think aloud to learn the concept of *Ecosystem*….."	Students watched and learned the teacher's thought process and how to connect with different actions. Then they tried to imitate it.
Think-aloud	Think-aloud	"Please think aloud to figure out how much does it cost to travel to Beijing for 7 days. How can we do that?"	"We need to buy air tickets, when arriving in Beijing, we should calculate the cost of visiting classic sights, transportation, meals and accommodation…"
Strategy reflection	Strategy awareness	"Students, please pay attention to what strategy we just use. Think about the process how we analyse the characteristics of Zhaozhou Bridge?"	"First, as a kind of Chinese stone bridge, Zhaozhou Bridge has the common characteristics of Chinese stone bridge; second, we found out the unique characteristics of Zhaozhou Bridge."
	Strategy practice	"We will use this strategy to analyse the characteristics of Lugou Bridge."	Students used the method just learned to analyse the characteristics of Lugou Bridge.
Self-questioning	Self-questioning	"You've read the text. What content in this text you don't understand?"	"I don't understand why the people of Lilliput treat Gulliver well?"
Self and peer assessment	Self- assessment	"What do you think of your reading just now?"	"I think I read very smoothly, but my voice is not loud enough."
	Peer assessment	"Check with your groupmates about their answers."	"I think his computational process is right, …"
Visualised tools	Mind map	"Please create a mind map to present the beginning, climax, and resolution of this story."	Students made mind maps to identify the beginning, climax, and resolution of the story.
Think-pair-share	Think-pair-share	"Please group discussion: what contents imply that Robinson is a novice? "	Group members exchanged their views and made comments to each other.
Metacognitive	Metacognitive	"Recalling the problem-solving procedures I taught,	The student reflected on his problem-solving process

Questioning	Questioning	then re-thinking about your answer. Is it right?"	and found he missed some steps.
Cognitive teaching strategies:			
Note-taking	Note-taking	"Please write down these… in your notebook. Pay attention to the neat handwriting."	Students wrote down the notes.
Questioning	Questioning	"Who is the main character of this novel?"	"The main character is uncle Lai."
Emotional motivation	Emotional motivation	"Your answer is very good. I believe you can do it."	The student was more confident in answering questions.
Content interpretation	Content interpretation	"How does this text express the author's sadness? Let me explain to you."	The students listened to the teacher and wrote what the teacher said.
Recalling prior knowledge	Recalling prior knowledge	"We learned how to describe a person. What kind of character description do you know?"	Students answered. They made a connection between what they have learned to what they are going to learn.

(2) For the data collected from the interview and questionnaire, the qualitative data were analysed by NVivo. The researcher analysed the text, assigned a code/label according to the meaning of the passages or sentences in the transcripts (see Table 9). In terms of the data collected from the questionnaire, the researcher calculated the average score of the two clusters of teachers (group A and C, group B and D) in each item. These data were described in a word file.

Table 9. Coding system about the data of the interviews

Code Categories		**Examples**
Teacher beliefs		"I believe that metacognition is important for student learning." "I always used metacognitive methods because I think it is critical to cultivating self-regulated learners."
Teacher knowledge	Declarative knowledge	"I can describe what is metacognitive teaching……"
	Procedural knowledge	"By promoting students to self-questioning, firstly, I asked them to re-read and check their understanding of the text; secondly, I encouraged them to ask questions, then let them write down the questions."
	Conditional knowledge	"I asked students to create a mind map when the structure of the text is complicated..."

Fourthly, interpreting the data. In this stage, the researcher triangulated the data collected from different sources to explore the MTSs adopted by the teachers and the factors influencing their teaching behaviours (see Figure 10).

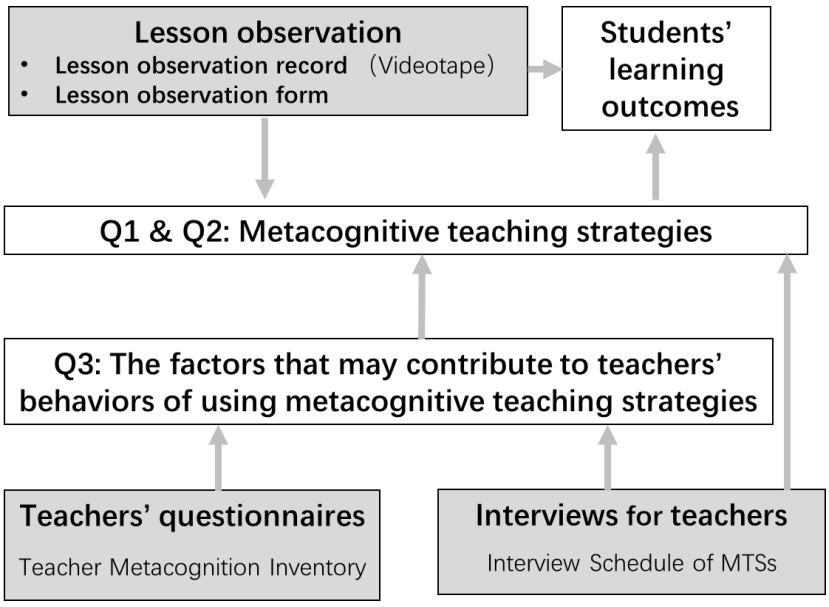


Figure 10. Interpreting and triangulating multiple sources of data

(1) For the data collected from lesson observation: The researcher analysed the data from the transcript of the lesson video and the observation form to identify MTSs. As teaching strategies have been labelled from the transcript, the data from the lesson observation form took into account as supplementary material to examine if some strategies or methods were omitted. Moreover, the data on student reading comprehension was based on (a) the researcher's observations and fieldnotes during the lesson observations and (b) students' outputs in the lessons, such as mindmaps, drawings, or short creative writings.

(2) For the data collected from interviews and questionnaires: The data of interviews can provide complementary evidence to identify MTSs by teachers' explanation of what MTSs they used and why they used them. The factors that affect teachers' metacognitive teaching were investigated through the interviews and questionnaires to

the teachers. Interviewing is often adopted as an efficient and valid way of understanding teachers' perspectives, while questionnaires can detect more rational reasons that would not be influenced by people's emotions and subjective judgments. With the purpose of complementarity and expansion, the data collected from questionnaires were analysed to see if the teachers really have beliefs and knowledge of metacognitive teaching. By considering the data from interviews and questionnaires, the researcher found the influencing factors of MTSs and looked for correspondence between the two sources of data.

Finally, presenting the data. The researcher presented the data by creating a visual figure of the findings.

3.4.2 Cross-case strategy analysis

Yin (2009) advances a cross-case synthesis as an analytic technique when the researcher studies two or more cases. This method implies that the researcher can look for similarities and differences among the cases. The researcher developed naturalistic generalizations from analyzing the data and learn from the case for applying to a population of cases.

To answer RQ1, the researcher compared the four cases in Shanghai and Hong Kong, respectively. First, the data from group A and group B teachers in Shanghai was analysed.

(1) Based on the labels describing the MTSs by using NVivo, the researcher calculated how many MTSs were used by group A and group B teachers in the observed lessons using Microsoft Excel. Then the total number and types of MTSs used by group A and group B teachers were presented through a table and a strip chart. The independent t-test using SPSS 19.0 was conducted to examine if there is a significant difference in the frequency of MTSs and the usage of specific MTS between group A and B teachers.

(2) The researcher analysed what MTSs group A and group B teachers used in the four teaching stages, which were mentioned in section 2.2.5 (introduction, learning by doing, extended learning, and summary). Specific examples of metacognitive teaching were provided to elaborate how group A teachers adopted MTSs to improve student reading comprehension effectively.

(3) The usage of cognitive teaching strategies by group A and group B teachers was also compared. (a) The researcher labelled the cognitive teaching strategies applied in the observed lessons by NVivo and added up the counts of cognitive teaching strategies used by the two teachers in each group. The total number of cognitive teaching strategies applied by group A and group B teachers was achieved. (b) A table and a strip chart were used to present the total number of cognitive teaching strategies applied by group A and group B teachers. (c) This study created a treemap to display group A teachers' teaching strategies (MTSs and cognitive teaching strategies) in four teaching

stages. Treemap was generated using the *Insert* tab in Microsoft Excel Version 2019. The researcher went to the *Insert* tab, then *Hierarchy Chart*, at last selected *Treemap.* Each branch of the tree (a rectangle in the same colour) represented one teaching stage, and sub-branches (smaller rectangles) were created in each branch represented different teaching strategies. The area of each rectangle represented the number of cognitive teaching strategies applied by group A teachers. Moreover, the other treemap was constructed for group B teachers.

Second, the data from group C and group D teachers in Hong Kong was analysed similarly to Shanghai.

To answer RQ2, this study compared the cases between Shanghai and Hong Kong.

(1) The differences in the use of MTSs in group A and group C teachers were investigated from the following three perspectives. (a) From a holistic perspective, this study compared what types of MTSs were used by group A and group C teachers and how many times group A and group C teachers used MTSs. The data was displayed by making tables. This study also conducted a one-way analysis of variance (ANOVA) by using SPSS 19.0 to analyse the statistical differences in using MTSs between group A and C teachers. The results were displayed in tables. (b) From the perspective of specific strategies, MTSs used by group A and group C teachers were illustrated through teaching episodes. (c) In the four teaching stages, the MTSs applied in each teaching stage were displayed through a histogram and explained through teaching episodes.

(2) The researcher also compared and found the similarities of MTSs between group A in Shanghai and group C teachers in Hong Kong. The lesson observation data was adopted, and classroom dialogue, worksheet, and teaching steps referring to MTSs were reported to reveal the similar behaviours of the two groups of teachers.

Considering that the use of MTSs in the Chinese language courses could be various, and no two teachers employ the same instruction and class management practices, it is difficult to obtain insights into how different teachers perform through a completely uninformed and predetermined type a survey normally designated for. Through adopting the qualitative research method, this study follows the step to achieve an inductive framework of an exploratory and continuous metacognitive teaching behaviour.

To answer RQ3, the factors that may contribute to the teachers' behaviours have been laid out based on the former analysis according to the following procedures (see Figure 11):

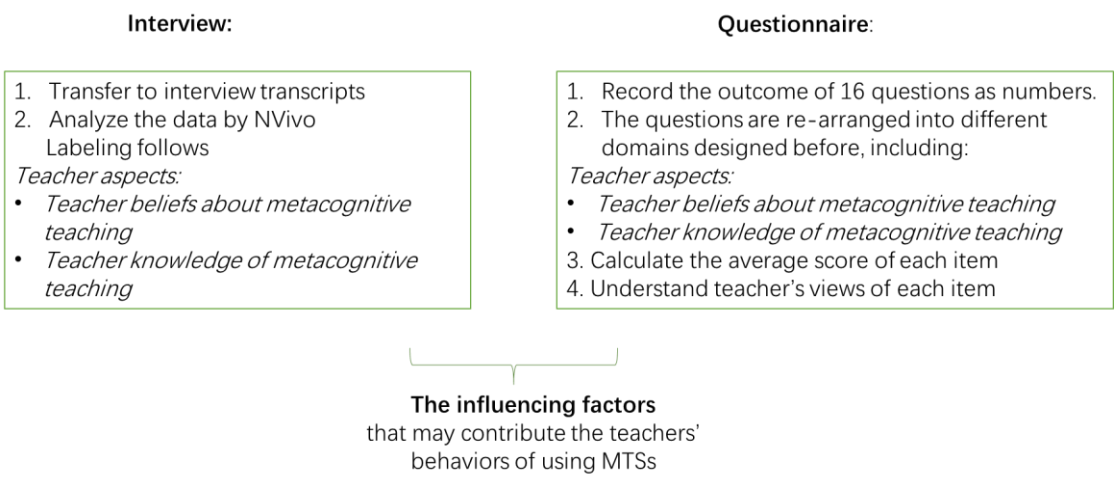


Figure 11. Analyzing the data from interview and questionnaire

The researcher compared the factors between the two clusters of teachers (group A and C, group B and D). To detect the factors influencing teachers' behaviours of MTSs, the researcher compared code labels and analysed them.

(1) Coding the data of the interviews. Read the transcripts and label the relevant contents of teachers' perception of metacognitive teaching and their knowledge of metacognition and metacognitive teaching. There are two categories of coding (see Table 9), namely "Teacher beliefs" and "Teacher knowledge". "Teacher knowledge" includes declarative knowledge, procedural knowledge, and conditional knowledge.

(2) Analysis of the questionnaire. After collecting the finished questionnaires from the teachers, the researcher used descriptive statistical analysis by SPSS to calculate the average score of each cluster of teachers (group A and C, group B and D) in each item. As introducing in section 3.3.3, the questionnaire of TMI contained two dimensions: "Teacher beliefs of metacognitive teaching" (4 items) and "Teacher knowledge of metacognitive teaching" (12 items). "Teacher knowledge of metacognitive teaching"

included declarative knowledge (4 items), procedural knowledge (4 items), and conditional knowledge (4 items). Therefore, the average score of group A and C teachers, and group B and D teachers in the 16 items could be achieved.

(3) Display the data. The factors of teacher beliefs and their knowledge of metacognitive teaching were interpreted separately by connecting data from interviews and questionnaires. Based on the average score from descriptive statistical analysis by SPSS, histograms were created by Microsoft Excel. The histograms presented the opinions of group A and C teachers and group B and D teachers in the relevant items. Moreover, the interview data was described based on the categories of interview content to support the comprehension of teachers' thinking about the metacognitive teaching method. This study explained the influencing factors of teachers' metacognitive teaching behaviours by the interview and questionnaire data between group A and C teachers and group B and D teachers.

3.5 Ethical considerations

The study was approved by the principals, and the teachers were selected as the subject of this study. The researcher obtained permission to implement research from the relevant schools in Shanghai and Hong Kong. The purpose of the study was introduced to the school leaders and the teachers in Shanghai and Hong Kong. This study identified effective MTSs in the Chinese language and explored the reasons for teachers' behaviours of using these strategies. To avoid unnecessary pressure on teachers and schools, the researcher did not elaborate on the details of the research design.

Furthermore, as the aim of this study is to examine effective metacognitive teaching behaviours among teachers and what are the factors that may influence teachers' metacognitive instruction, the results as shown in this report would indicate the differences in terms of the use of MTSs among the teachers with no intention of categorising and labelling teachers. To mitigate the sensitivity of presenting teachers as groups that may create labelling effect, this study adopted the same data collection procedure for each teacher, such as observing the lessons objectively and interviewing them with the same questions and duration. Teachers were called according to different case schools they belonged to. According to the literature, it is supposed that teachers with MTSs could support students to learn better. This study mainly discussed teachers' metacognitive teaching behaviours in the observed lessons and their interaction with students to examine if their teaching can develop students' reading comprehension.

As working in Shanghai for nine years, the researcher contacted some school principals in the same community and acquired students' Chinese comprehension scores of the Joint Entrance Examination. This information was used for the sample selection of this study and would not be disclosed to the public. In Hong Kong, a Chinese reading test was conducted for the relevant classes. The test results were only used for sampling in this study.

Once teachers were selected, consent forms were sent to the participated teachers and

the students in the related classes to seek permission from the students' parents. To ensure the privacy of all participants, pseudonyms were used for teachers and school names. To protect the identities of participated teachers, the researcher labelled each teacher for lesson observation and interview.

The eight teachers took part in this study voluntarily. The researcher introduced the procedures of the study to the teachers before the study began. The data was collected only for research purposes. Although interviews, videos, and questionnaires were conducted, the privacy of the teachers and students is respected. Teachers' instructional behaviours, opinions, and attitudes were only used as research data. All the research data were processed in a specialized computer and properly preserved.

3.6 Summary

This chapter described research methodology, case selection, data collection, and analysis. A cross-case study from Shanghai and Hong Kong was adopted. This study selected eight Chinese language teachers with high and low teaching results on student reading comprehension from Shanghai and Hong Kong. Their levels of metacognition were compared with their teaching performance. The data were collected through a checklist which assess their metacognitive awareness. Such that the researcher can check if the teacher with the higher teaching performance were associated with a higher level of metacognition.

This study used multiple methods for data collection to examine effective MTSs in the Chinese language courses and acquire an understanding of what factors may influence their metacognitive teaching behaviours. Classroom observations and interviews were used to investigate teachers' MTSs in the Chinese language lessons. The lesson observation form for MTSs was designed. Moreover, this study used questionnaires and interviews to identify the influencing factors of metacognitive teaching. The research period lasted four months. Three Chinese language lessons were observed for each participated teacher.

Within-case strategy and cross-case strategy were employed for analyzing the data. Firstly, this study analysed the eight cases, respectively, with the following steps: organizing the data, reading and taking notes, describing and classifying the data, interpreting the data, and representing the data. Secondly, this study compared the MTSs used by group A and group B teachers in Shanghai, and group C and group D teachers in Hong Kong, to identify effective MTSs in the two regions. Then, the MTSs used by group A teachers in Shanghai and group C teachers in Hong Kong were compared and contrasted. Lastly, different factors that might contribute to teachers' MTSs performance were discussed and interpreted.

Chapter 4. Findings

This chapter presents the findings regarding the research questions: what MTSs are adopted by the teachers in Shanghai and Hong Kong for developing students' reading comprehension skills, what are the similarities and/or differences in the teachers' metacognitive instruction between the two regions, and what factors contribute to the teachers' behaviours of using MTSs. For research question 1, the most commonly used MTSs for group A teachers in Shanghai are metacognitive questioning, think-aloud, visualised tools, think-pair-share, and self or peer assessment. The most commonly used MTSs for group C teachers in Hong Kong are metacognitive questioning, self-questioning, self or peer assessment, modelling, think-pair-share, and learning guide. In terms of research question 2, the differences in the use of MTSs in the two regions are: the frequency for applying MTSs by the teachers of the case school in Hong Kong was significantly higher than those applied by the teachers of Shanghai case school; the teachers of Shanghai case school would like to use MTSs referring to questioning and visualised thinking, while the teachers of Hong Kong case school would like to use self-directed and participative activities. The similarities are: the teachers of the Shanghai and Hong Kong case schools would like to use metacognitive questioning, think-pair-share, and self or peer assessment. They provided emotional support to students' engagements in metacognitive learning. Regarding research question 3, the influencing factors of teachers' instruction included curriculum standards, teacher beliefs and their knowledge of metacognitive teaching.

4.1 Effective MTSs used in Shanghai and Hong Kong

In this section, effective MTSs were identified from the Shanghai and Hong Kong cases, respectively. From the lesson observation, the teachers used MTSs to help students plan, regulate, and evaluate their learning process to improve reading comprehension and self-directed learning.

4.1.1 Effective metacognitive teaching strategies in Shanghai

Based on the data analysis for the lesson observation, MTSs adopted by group A teachers included metacognitive questioning (N=18), visualised tools (N=5), think-aloud (N=5), think-pare-share (N=5), self or peer assessment (N=5), learning guide (導學案) (N=2), self-questioning (N=2), planning (N=2), and abstracting strategy (N=2). Refining learning methods and modelling were only used once (see Table 10).

Concerning group B teachers, the most used MTS is metacognitive questioning. The number is 8, however still less than that of group A teachers. Think-aloud, think-pair-share, modelling and self or peer assessment were adopted twice by group B teachers. Other MTSs, such as learning guides, planning, and refining learning methods, were not used.

Table 10. The total number of MTSs applied by the participated teachers in Shanghai

Metacognitive teaching strategies	**The total number of MTSs (N)**	
	Group A teachers	**Group B teachers**
Metacognitive questioning	18	8
Visualised tool	5	1

Think-aloud	5	2
Self or peer assessment	5	2
Think-pair-share	5	2
Learning guide	2	0
Self-questioning	2	2
Planning	2	0
Abstracting strategy	2	1
Modelling	0	2
Refining learning methods	1	0
In total	**47**	**20**

According to the strip chart below, MTSs were employed 47 times by group A teachers, while MTSs were employed 20 times by group B teachers. It can be derived that the frequency for applying MTSs by group A teachers is higher than those of group B teachers (see Figure 12).

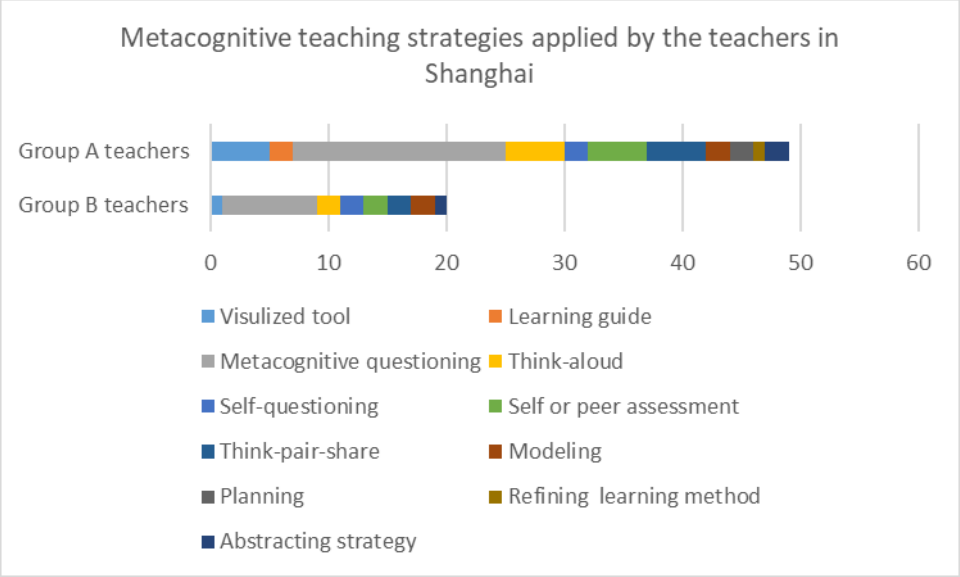


Figure 12. The strip chart of MTSs applied by the teachers of the two groups in Shanghai

This study also conducted the independent t-test for the frequency of MTSs between group A and B teachers. The finding showed a statistically significant difference

(sig=0.007) in the frequency of MTSs used by group A and B teachers (see Table 11). There is no significant difference between group A and B teachers in the usage of each MTS.

Table 11. The independent t-test for the frequency of MTSs used by group A and group B teachers in Shanghai

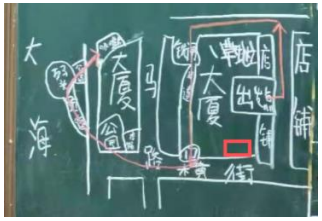
Group	N	Mean	SD	T-test for equality of means		95% Confidence interval of the Difference	
				df	Sig	Lower	Upper
Group A	2	23.50	0.707	2	0.007	8.689	18.310
Group B	2	10.00	1.414				

The researcher rated teacher instruction (three lessons for each teacher) in the lesson observation form and analysed the average rating in each group (see Table 12). The lesson observation form incorporates lesson plan, MTSs, promoting student metacognitive monitoring, lesson evaluation, and chalkboard. The finding indicated that group A teachers have a higher metacognitive teaching practice than group B teachers. Table 13 presented the examples of MTSs applied by group A teachers.

Table 12. The rating for the lesson observation form for group A and B teachers

Group A teachers		Group B teachers	
Lessons	**Rating**	**Lessons**	**Rating**
A-1-01	3.67	B-1-01	3.27
A-1-02	3.80	B-1-02	2.80
A-1-03	4.07	B-1-03	2.87
A-2-01	4.27	B-2-01	3.27
A-2-02	4.13	B-2-02	2.80
A-2-03	3.87	B-2-03	2.87
Average rating	**3.97**	**Average rating**	**2.98**

Table 13. Examples of MTSs for group A teachers in Shanghai

MTSs	The application of MTSs	Students improved their reading
Metacognitive questioning	T: What do you want to know about the text? How do you solve the question? What did you learn in today's class?	S: When reading independently, I want to know what the main purpose of the article is. By analyzing the paragraphs and the keywords, I have learned that the purpose of writing "life" in this article is to show the author's awe for life, while the purpose of writing fishermen is to show the author's concern for the people living at the bottom of the society.
Self-questioning	T: Do you have any questions about this passage? Think and speak out your questions.	S1: It is said that all the people are silent in the carriage. What are they thinking about? S2: Those old people have been sent to the battlefield. Who will be sent to the battlefield next?
Self or peer assessment	T: Please compare the two sentences written by students A and B. Please give comments: which sentence can better express the vitality of spring?	S: I think sentence A is better. Because this sentence used the words "vigour" "bright colors" to express the growth of flowers: from buds to flowers, and then become fruits.
Learning guide	Before the lesson *In the wind*, the teacher sent a learning guide to students: "Please draw the author's travelling route on the street after the typhoon."	Student's work 

Think-aloud & Think-pair-share	Student cooperation: can we delete the sentences in terms of the broken bricks and glass in paragraph 6? Discussing with your group members and sharing your ideas about how you arrived at your answer.	A student in a group: We think it cannot be deleted. Because bricks and glass become broken after the typhoon, which shows that the wind is huge. First of all, it proves the author's point of view that typhoon is destructive; second, it makes the language of the article more convincing.
Visualised tools	T: Please use different circles to show the relationship among stone arch bridges, Chinese stone arch bridge, Zhaozhou bridge and Lugou bridge.	The teacher invited one student to draw the graph on the blackboard. (see Figure 15)
Planning	T: The two points are what we plan to learn in this lesson. 1. His prose is about human feelings in life. 2. The contents are scattered but the theme is focused.	The students understand the learning plan of this lesson.
Refining learning methods	T: Now we read aloud with no hand movement or body action. Can you improve the reading method to read aloud?	S: I think reading aloud with hands clapping is a better method. I can feel the vitality of spring. Then the student read aloud like this way.
Abstracting strategy	T: Rethink about the analyzing method we used just now, can you conclude it?	S: We first understand the surface meaning of "chests of drawers", and then connect the author's emotion to understand the deep meaning of the "chests of drawers".

To have a deep understanding of the usage of MTSs by the teachers of Shanghai case schools, the researcher analysed MTSs according to the four teaching stages in the Chinese language course (see section 2.2.5), including introduction, learning by doing, extended learning, and summary. According to Figure 13, group A teachers used more MTSs in each teaching stage than group B teachers. In the stage of *Learning by doing*, the most used MTSs by group A teachers was metacognitive questioning. They also adopted visualised tools, think-pair-share, abstracting strategies to promote students reading comprehension. For *Extended learning* and *Summary,* group A teachers adopted seven types of MTSs to extend students' thinking and summarise their learning. Group B teachers used two types of MTSs in these two stages.

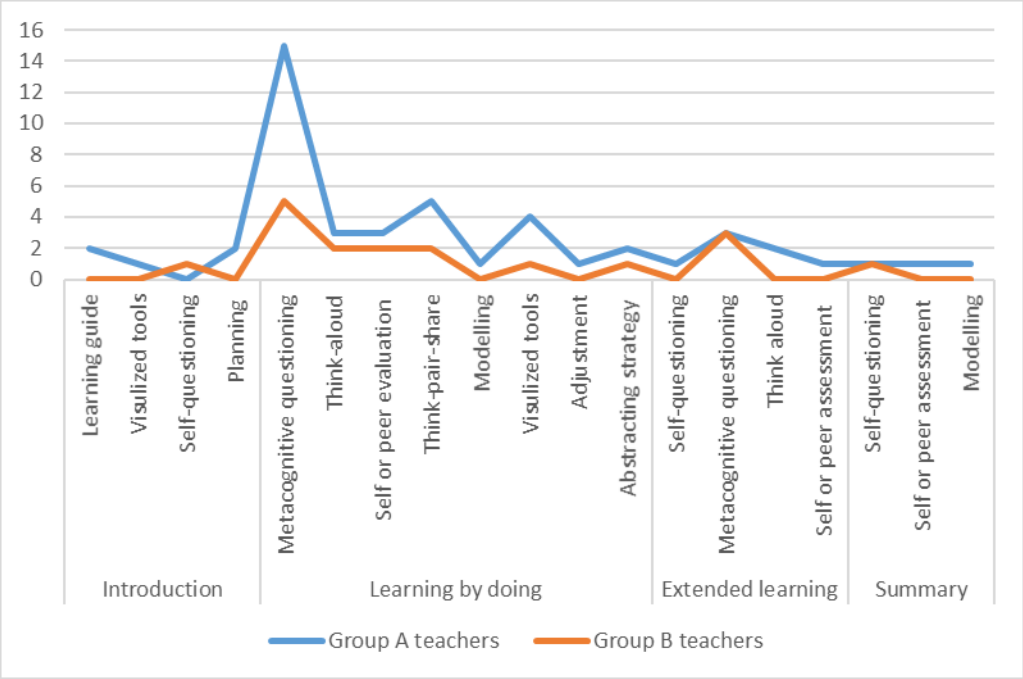


Figure 13. The comparison of the usage of MTSs applied by the group A and B teachers in Shanghai

In terms of the *Introduction section*, Teacher A-1 asked students to plan what they should learn in an expository text, and then connected the learning objectives with the new text to help students clarify the learning objectives in a new lesson.

T: Before learning the text, please think about what we need to learn in expository texts?

S: First, I think we should make clear about the object of description (說明對象), then make clear about the order of description (說明順序), and understand the writing methods of expository text (說明方法).

T: What writing methods do you know?

S: Such as providing examples, making comparisons, and making inferences, etc.

T: Thanks for your answer. Exactly. In this lesson, we are going to study these aspects. (A-1-01)

Teacher A-1 said in the interview that she designed these questions to check if students still remember the knowledge they have learned and connect the prior knowledge with the current learning content. Comparing with teacher A-1, teacher B-1 also aroused students' memory to introduce the new lesson.

T: We have learned *Green mountains never turn old*. What is the story about?

S: An older man insisted on planting trees in the Northwest of China.

T: Yes. The story is about an older man and her companion who insisted on planting trees in the desert and changed the desert into an oasis. Today we are going to learn the

other text *The Shepherd Who Planted Trees*, which is also about the topic of planting trees. (B-1-01)

It is worth noting that teacher B-1 only connected the topic of the learned text with the new text, making students know the general content of the new text. While teacher A-1 activated students' prior knowledge of what they should know in expository texts, which guided students to think about how to read the text of the same type. Because of the guidance of the teacher, students set goals about what to learn in this lesson.

In the stage of introducing new lessons, the teachers in Group B adopted self-questioning. For example, teacher B-1 asked, "do you have any questions in your reading?" Students posed a lot of questions, such as "why is the shepherd willing to plant trees on bare land?" "Why doesn't he plant trees together with more people?" However, in the later teaching, the teacher didn't respond to students' questions. Her instruction still followed the teaching design prepared before. Therefore, teacher B-1 didn't utilize MTSs to improve students' understanding.

In terms of *Learning by doing*, metacognitive questioning was adopted many times by the teachers of group A. For example, metacognitive questioning helped students deepen their understanding of the contents. In Lesson *Chinese stone arch bridge*, it was found that the teachers' questions promoted the students to reflect on the difference between the concepts "stone arch bridge" with "Chinese stone arch bridge" and

improved their reading comprehension.

T: .... Let's take a look at the sentence in the second paragraph. Do you notice that the subject of this sentence has changed, not "Chinese stone arch bridge"? What's the subject of the second paragraph?

S: It is "Stone arch bridge".

T: Yes. Let's think, does "stone arch bridge" have the same meaning as "Chinese stone arch bridge"?

S: I don't think so.

T: Who can explain why "stone arch bridge" is different from "Chinese stone arch bridge" depend on the contents? Looking back at the previous content.

S: I found this sentence: "stone arch bridge appeared earlier in the bridge history in the world", which means that stone arch bridge also exists in other countries. (A-1-01)

In this example, the teacher used reflective questioning to help students find relevant details to answer the question. Besides, group A teachers also applied metacognitive questioning to promote students to make inferences.

T: What are the three characteristics of a stone arch bridge?

S: It has a long history, beautiful form, and strong structure.

T: Very good. And because the Chinese stone arch bridge belongs to a stone arch bridge, what are the characteristics of the Chinese stone arch bridge?

S: I think the Chinese stone arch bridge also has a long history, beautiful form, and strong structure. (A-1-01)

In the interview, teacher A-1 said, "I asked students metacognitive questions and support students to discover the answer through association, comparison, and bridging inference. It may spend more time, but we can see their development of comprehension."

Contrasting with group A teachers, group B teachers asked more closed-ended questions answered by "yes" or "no", or "what" questions. The teachers constantly repeated students' answers, which did not significantly promote students' understanding. For example,

T: What is this forest look like?

S1: It is a big forest with leafy and spreading trees.

T: Oh, yes, leafy… and spreading. (The teacher repeated the student's answer.)

S2: These trees are tall and straight, like teenagers. This sentence shows the tenacity and straightness of the birch.

T: What rhetoric technique is used here? (This question is meaningless because the students have analysed that these trees liked teenagers.)

S: Metaphor.

T: Here, we can see that the tree is tough and straight. (The teacher still repeated the student's answer.) (B-1-01)

The visualised tool was used four times by group A teachers. Usually, this strategy was accompanied by think-pair-share. In Lesson *In Berlin,* Teacher A-2 asked students to draw a picture to present the text's contents with their team members. She explained the intention of using this strategy in the interview.

"This article is a mini-novel. Students like reading novels. They are easily attracted by wonderful plots. I just want to promote their self-regulated learning. Visualization strategy can let students extract the content, grasp the key information, examine students' understanding of the text, and exercise their expression. It can achieve many things at one stroke." The lesson episode can be seen below.

T: Suppose you are the author, sitting on this train leaving Berlin. You can draw a scene for an exhibition in the museum. Which scene and characters would you choose from the story? Please draw a picture with your group members and report it in the sharing session.

Besides, the teacher also kindly reminded students: Don't worry about your painting skills. A simple picture is enough. You can elaborate the drawing by words when sharing with the classmates. (A-2-03)

The students began to create excitedly. They carefully read the sentences in the text and drew pictures according to the details of the text. Figure 14 presented students' outputs.

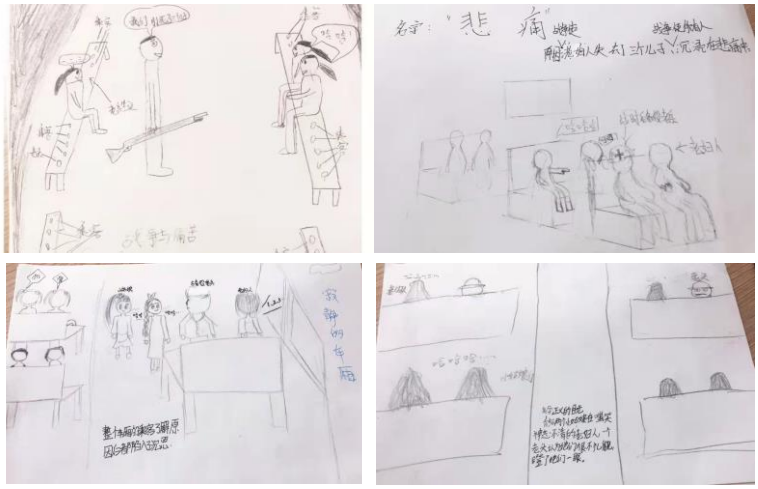
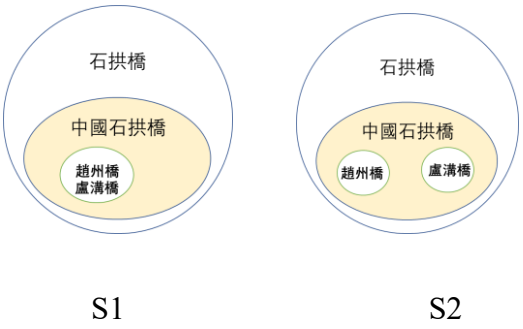


Figure 14. Students' outputs in Lesson *In Berlin*

Then teacher A-2 asked one group: why your group chose this scene and what is your understanding of the text? A student replied that this picture was about an old lady who counted "1, 2, 3" with dull eyes. "1,2,3" represented her three sons, who all died in the war. The old lady suffered excessive distress, and her mind was in a trance. This activity stimulated students' interest in learning, encouraged them to read the text, generate their understanding, and present the scene described in the text. In another lesson, teacher A-1 used visualised tool to facilitate students to present the relationship between different concepts accurately. She described why she adopted this strategy. "One weakness of my students is that they don't understand the logical order of the articles. I used drawing graphics to show the logical relationship of the *Bridges* that cannot be clearly expressed in words. Students can visualize their understanding and reflect." (see Figure 15)

T: Please draw different circles to represent the relationships among stone arch bridge, Chinese stone arch bridge, Zhaozhou Bridge, and Lugou bridge.



S1 S2

Figure 15. Students' learning outputs in Lesson *Chinese stone arch bridge*

Student 1 drew Zhaozhou Bridge and Lugou Bridge in the same circle, and student 2 drew two smaller circles to represent the two bridges. Interestingly, without the teacher's comments, student 1 realized the problem of his drawing by contrasting the picture of student 2. The relationship between the two bridges is juxtaposed, so they should be created separately. In the above examples, visualised tool promotes students' reflection on their thinking.

Concerning *Extended learning*, group B teachers were more likely to use questioning and seldom designed activities to extend students' learning. Therefore, students' thinking is limited in analyzing the content and the characters of the article. Students rarely have the opportunity to apply the knowledge to other contexts and revise their learning. Group A teachers tended to use think-aloud, self-questioning, and metacognitive questioning to expand students' learning. For instance, in Lesson *In the wind*, teacher A-2 asked students to rewrite the text, transforming this prose into a piece of news. In Lesson *Chinese stone arch bridge*, teacher A-1 asked students to verify whether their previous anticipation is correct. In *Growth in Summer*, students were

supported to grasp the main idea of the text by tracking the keywords. Then she asked students to apply this method into a new text *Feeling of summer* by think-aloud.

In the *Summary* stage, group A teachers adopted modelling, self or peer assessment, and self-questioning to help students think about what they learn during the lesson. The teachers of group B didn't have enough time for students' summary because the analysis of the contents was too detailed, or they arranged too many activities that were irrelevant to the learning objectives. Group B teachers tended to end the lesson when the main content of the lesson had been completed. The teachers in group A facilitated the learners to reflect on the entire learning process and facilitated students' consolidation of the knowledge learned in the lesson. Teacher A-2 said that "metacognitive strategies can be used to evaluate if their reading goals are achieved and summarised what they learned during the whole class." For example, Teacher A-2 supported the students to name and evaluate their painting created as a conclusion of the lesson.

T: I give you a demonstration of how to name it. I drew two girls laughing at the old lady who was counting "1,2,3". A passenger condemned the two girls for their rudeness. Therefore, my topic is "the eyes of justice".

S1: Our topic is "war and pain". Although the story does not describe the cruel battle, the old couple lost their three beloved sons, the old lady has gone crazy, and the old man had to go to the battlefield. The reader can feel the pain of war.

S2: Our topic is “Instant silence”……

S3: Our topic is “Quiet carriage”……(A-2-01)

Then the students evaluated the name created by the other groups. The teacher summed up the lesson with the demonstration method, and the students have a high engagement.

To have a comprehensive view of the usage of teaching strategies by the two groups of teachers in Shanghai, this study also compared teachers’ usage of cognitive strategies. From Table 14 and Figure 16 below, it can be seen that both group A and B teachers adopted a large number of questioning strategies. Especially, group B teachers used it 58 times. The strategy text content interpretation was adopted 19 times by group B teachers, whereas group A teachers used it ten times. In using other cognitive teaching strategies, the difference between the two groups of teachers is not obvious.

Table 14. The total number of cognitive teaching strategies applied by the participated teachers in Shanghai

Cognitive teaching strategies	**The total number of cognitive teaching strategies (N)**	
	Group A teachers	**Group B teachers**
Questioning	45	58
Emotional motivation	3	4
Content interpretation by teachers	10	24
Teacher evaluation	5	5
Teacher summary	2	2
Activating prior knowledge	1	2

Note-taking	5	5

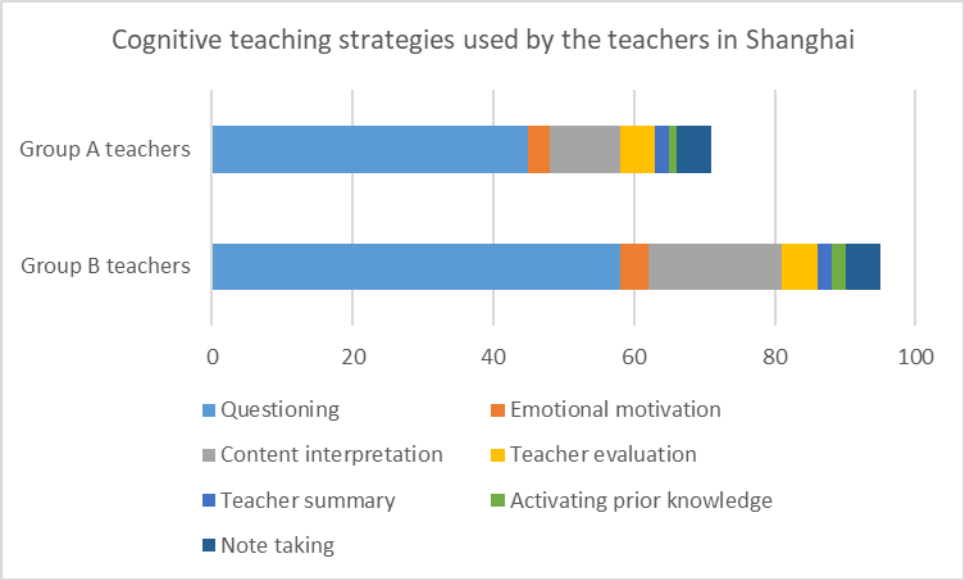


Figure 16. Cognitive teaching strategies used by group A and group B teachers in Shanghai

This study further presented the differences in teaching strategies between the two groups in the four teaching stages. The researcher found from Figures 17 and 18 that group A teachers utilized abundant and diversified teaching strategies in each teaching stage. They also used more MTSs than those of group B teachers. However, the teaching strategies used by group B teachers are more monotonous, mainly focusing on questioning and content interpretation.

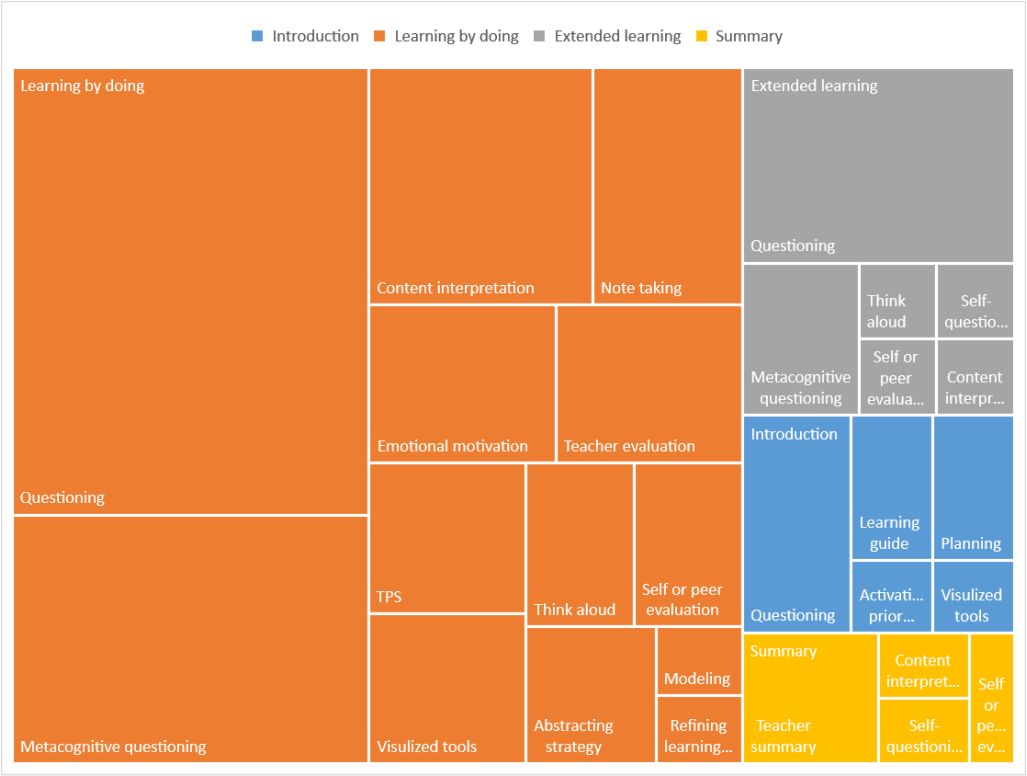


Figure 17. The treemap of teaching strategies by group A teachers in Shanghai

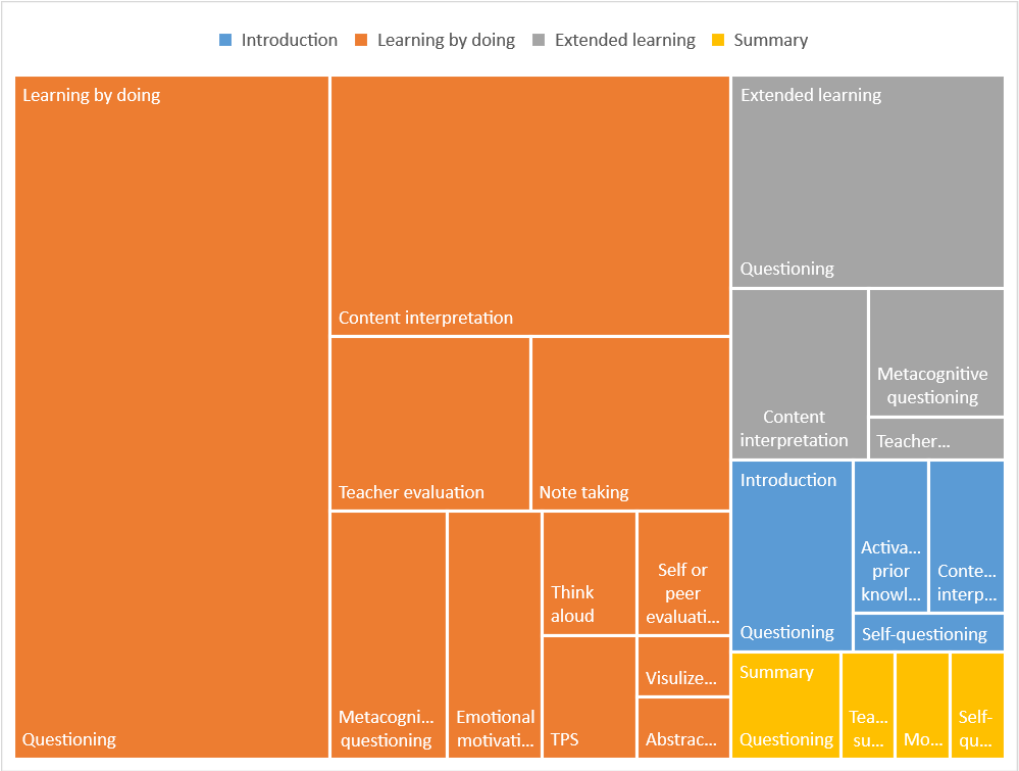


Figure 18. The treemap of teaching strategies by group B teachers in Shanghai

4.1.2 Effective metacognitive teaching strategies in Hong Kong

The findings indicated that MTSs adopted by group C teachers included metacognitive questioning (N=14), self-questioning (N=9), modelling (N=8), self or peer assessment (N=8), learning guide (N=6), think-pair-share (N=6), think-aloud (N=3), and visualised tools (N=3) (see Table 15). Group D teachers also used metacognitive questioning most often (N=6). Learning guide, think-pair-share, and self-questioning were adopted more than or equal to twice for group D teachers.

Table 15. The total number of MTSs applied by the participated teachers in Hong Kong

Metacognitive teaching strategies	**The total number of MTSs (N)**	
	Group C teachers	**Group D teachers**
Metacognitive questioning	14	6
Self-questioning	9	2
Self or peer assessment	8	3
Modelling	8	1
Think-pair-share	6	2
Learning guide	6	4
Think-aloud	3	1
Visualised tools	3	0
Role play	2	0
Stop and reflection	2	2
Planning	1	1
Abstracting strategies	1	0
In total	**60**	**22**

According to the following strip chart, MTSs were employed 60 times by group C teachers, while MTSs were employed 22 times by group D teachers. It can be derived that the frequency for applying MTSs by group C teachers is higher than those applied by group D teachers (see Figure 16).

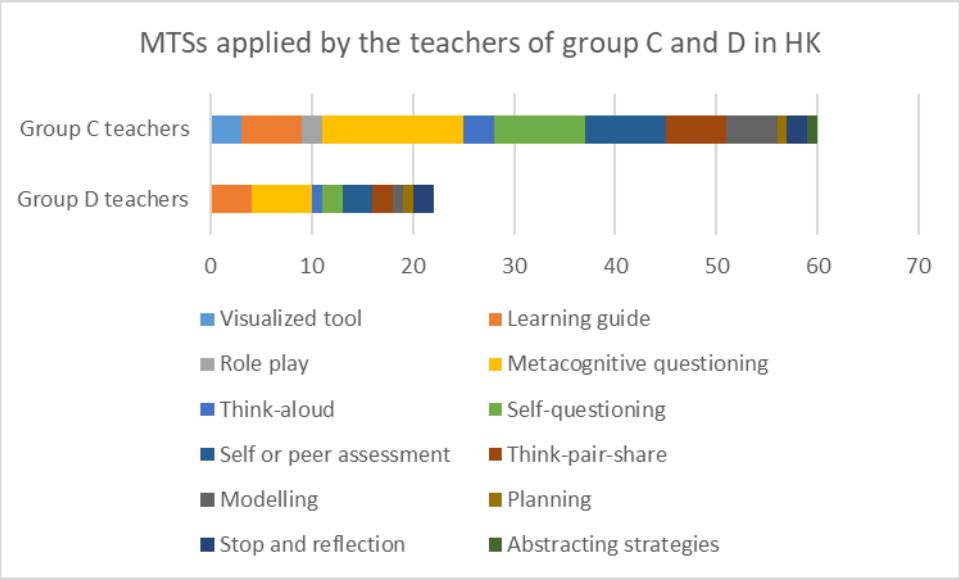


Figure 19. Strip chart of the usage of MTSs applied by the teachers in HK

The result of the independent t-test indicated that there is a significant difference (sig=0.05) in the frequency of metacognitive teaching strategies used by group C and D teachers (see Table 16). In terms of using each MTS, there is a significant difference between group C and D teachers in using self-questioning and self or peer assessment.

Table 16. T-test for MTSs used by group C and group D teachers in Hong Kong

Item	Group	N	Mean	SD	T-test for equality of means		95% Confidence interval of the Difference	
					df	Sig	Lower	Upper
Total MTSs	Group C	2	30.00	1.414	2	0.05	12.915	25.085
	Group D	2	11.00	1.414				
Self-questioning	Group C	2	4.50	0.707	2	0.02	1.349	5.651
	Group D	2	1.00	0.000				
Self or peer assessment	Group C	2	4.50	0.707	2	0.05	-0.042	6.042
	Group D	2	1.50	0.707				

The ratings of lesson observation in the lesson observation forms indicated that group

C teachers have a higher metacognitive teaching practice than group D teachers (see Table 17). Table 18 provided the examples of MTSs in the observed lessons for group C teachers in Hong Kong.

Table 17. The rating for the lesson observation form for group C and D teachers

Group C teachers		**Group D teachers**	
Lessons	**Rating**	**Lessons**	**Rating**
C-1-01	4.40	D-1-01	2.87
C-1-02	4.53	D-1-02	2.80
C-1-03	3.80	D-1-03	3.07
C-2-01	4.33	D-2-01	3.27
C-2-02	4.20	D-2-02	3.00
C-2-03	4.20	D-2-03	3.27
Average rating	**4.24**	**Average rating**	**3.04**

Table 18. Examples of MTSs for group C teachers in Hong Kong

MTSs	The application of MTSs	Students improved their reading
Metacognitive questioning	T: Students, please now reflect: Does the author regret his blame to his father at that time?	S: I think so. Because the author was very young at that time, he did not understand his father. He just felt that his father was wordy and pedantic. Now he is also a father. By recalling the past, he understands his father's love.
Self-questioning	T: You can try to ask questions by yourself. S1: I would like to ask why do adults think shells are pitiful and respectable?	S1: Because this shell slowly bears the small stone with its blood and flesh, which is pitiful. But the shell can be ground into pearls, so its life was respectable and valuable.
Modelling	The teacher modelled think-aloud to students. T: Among the three articles, which author thinks more deeply about shells? Why? Students, let me show you my point of view….	S: I think among the three articles, Xi has a deeper understanding of shells, because it is mentioned in the article that God has created delicate patterns and hard shells for the fragile and tiny life. How merciful this creator's grace is! We should be grateful for life.
Self or peer assessment	T: Compare the performance details of the two groups, which group do you enjoy the most? Please describe the reason.	I think the performance of the second group is more vivid. Because Zhangyun performed his father climbing on the platform, it was very hard, slow and hard. Because the platform is high and dad is fat. And he just walked very slowly, still holding the orange, to climb up, and then down. Their performance is very real.
Learning guide（導學案）	T: Before class, everyone has completed 12 preview questions in Google Form. Let's look at the results of the Learning guide. The correct rate is relatively low. Let's go through this question: is this sentence a direct description or an indirect description…?	S: I think it's a direct description. Because the text mentioned, the cloud in the sky is like a horse, which directly describes where the cloud blows, and the horse runs. This sentence uses the direct description method to present the characteristics of clouds.
Think-pair-share	T: Read the text carefully and design and practice a conversation according to the relevant contents. Group 1-3 are responsible for Paragraph 3;	S (Uncle Lai): I'm afraid I can't treat you well. The food is delicious. This peanut is planted by myself. S (Narrator): Uncle Lai felt that the family had not been so lively for a long time, and

	Group 4-5 are responsible for Paragraph 4; Group 6-8 are responsible for Paragraph 5. Team member "T" plays the role of Uncle Lai; Team member "A" is responsible for narration; Team members E and M play the roles of neighbours.	he was reluctant to part with the author. S (Uncle Lai): Little child, I hope you can visit my home tomorrow! You and your friends are all welcome to me. I have planted a lot of delicious things and you can taste them! See you tomorrow! S (Neighbour): Oh, Uncle Lai is so enthusiastic and kind! S (Neighbour): What a surprise, he is hospitable.
Think-aloud	T: I would like to ask the students, the title is *An ugly shell*, the first two paragraphs are about other shells on the beach, can we delete the contents about other shells? Please speak out what you think, including your judgment, reason, and basis.	S1: I think the contents shouldn't be deleted. Because in these paragraphs, people like the good-looking shells. They picked them up like treasure. However, when seeing the ugly shell, they kick it away. So there is a contrast. S2: I think the first paragraph serves as a foil (襯托). Because the ugly shell was beautiful at the beginning of its life, but it went through the ordeal and the child didn't like it. Adults feel that this shell is pitiful and respectable. Therefore, this paragraph shows the respectability of shells.
Visualised tools	T: Students, please try to fill the picture of Uncle Lai's portrait, write the words that can describe his explicit behaviours outside the portrait, and the words that can represent his internal characteristics within the portrait.	Students described Uncle Lai's characteristics and filled these words of Uncle Lai's characteristics into the picture. 

According to the four teaching stages in the Chinese language course, Figure 20 demonstrated the comparison of the usage of MTSs between group C and group D teachers.

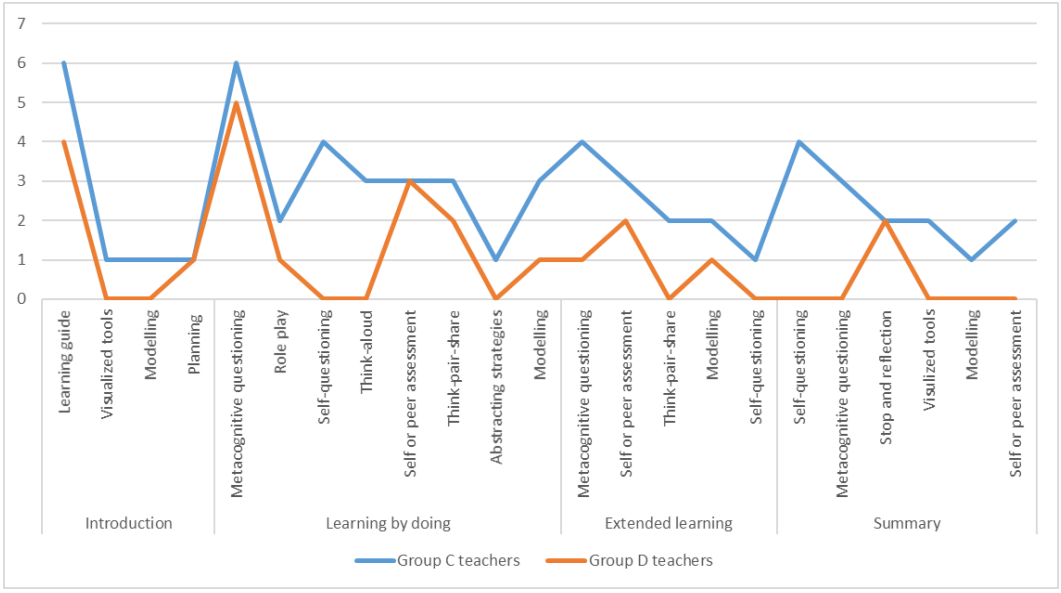


Figure 20. The comparison of the usage of MTSs between group C and D teachers in different teaching stages

In Hong Kong, group C teachers used more MTSs than group D teachers in the *Introduction* stage, such as learning guide (導學案), visualised tools, modelling, and planning. However, group D teachers didn't adopt visualised tools and modelling. In terms of planning, both groups of teachers provided learning objectives of the lesson to the students as the planning of the lesson and asked students, "how would you plan to complete the task". Teacher C-2 made the learning objectives appear on every slide of PowerPoint to give students a gentle reminder of what they would do (see Table 19). Whereas teacher D-1 just told the learning objectives to students, and students were easy to forget.

Table 19. Teaching behaviours of the planning in Hong Kong

	Group C teachers	Group D teachers
Class Observation	T: Before the lesson, I would like to ask how can we analyse the characters' dispositions? S: Analyzing from the specific contents or events. T: Yes! Please look at PPT. In this lesson, we are going to learn the following skills: 1. Analyzing the characters from the events; 2. Understanding various methods of character description. T: I will show the learning goals on every page of PPT for your recalling." (C-2-01)	"Today, we have two learning objectives. The first one is to learn direct and indirect description, and the other is to analyse the structure of the article through the whereabouts of the characters. Let's look at...." (D-1-03)
Interview students after class	S: "The learning objectives reminded me of what to learn, including outlining the contents of the events and analyzing characters in the text."	S: "I almost forget the learning objectives and they don't help me learn."

Learning by doing is the most critical stage of the Chinese language lessons; teachers usually spent the most time and arranged multiple activities to achieve the learning objectives. Based on Figure 20, group C teachers applied metacognitive questionings (N=6), modelling (N=3), think-aloud (N=3), self-questioning (N=4), self or peer assessment (N=3), and think-pair-share (N=2) to help students understand the meaning of the text and analyse of the language of the text. The teachers of group D used fewer types of MTSs in this section, such as metacognitive questions (N=5), think-pair-share (N=2), and modelling (N=1). In Lesson *Sun Yat-sen*, teacher C-1 adopted metacognitive teaching to support students' reflection on their reading. He said in the interview that students mainly focused on Yat-sen's kindness to the children but were easy to ignore his attitude to the guard. I asked reflective questions and promoted students to understand that his consideration of other's feelings.

T: Why didn't Sun Yat-sen immediately blame the guards on the street?

S: Sun Yat-sen didn't want him to lose face. The guard also has dignity.

T: What will happen if he scolded the guard in the street?

S: People around will laugh at the guard.

T: Ok, what do you feel about Sun Yat-sen?

S: He is very kind and approachable.

T: Let's clap for him. His answers are quick and accurate. Hence, we should not only know what the characters do but also rethink why they do it. (C-1-01)

Teachers of group C also used think-aloud to let students speak out about what they think. Based on the lesson observation, both teachers C-1 and C-2 used think-aloud. In Lesson *Uncle Lai*, the teacher organized students to speculate the psychology of the main characters and role play.

S1 (Narrator): One day, the author went to visit a relative. In the afternoon, the author went out for a walk. When walking across a small bridge, a dog yelled at him suddenly and ran fiercely. At this tense moment, uncle Lai came out of the house and drove the dog away. He also invited the author to visit his house.

S2 (The author): This dog barks so loud and seems to come and bite me right away. It's terrible. I'm so scared! Help! Can anyone help me?

S3 (Uncle Lai): Don't be afraid! This dog doesn't really bite. Go! Go! Disobedient dog. There

is a saying that a dog that bites doesn't bark, a dog that barks doesn't bite.

S4 (Neighbour): Wow, uncle Lai is such a nice person. I can't believe my eyes. He is totally different from before. Uncle Lai is so enthusiastic. (C-2-03)

In the stage of *Extended learning*, the teachers in group C always promoted students to revise their understanding by using metacognitive questioning (N=4), self or peer assessment (N=3), think-pair-share(N=2), modelling (N=2), and self-questioning(N=1). While the teachers in group D did not often support students to do so, they only used MTSs four times, involving metacognitive questioning(N=1), modelling (N=1), and self or peer assessment (N=2).

When finishing the main part of the lesson, the teachers in group C tended to organize flexible activities, such as asking students to write a short paragraph to apply the description method or comparing the text with other texts with the same topic. For instance, think-pair-share was used by teacher C-1 to inspire students' critical thinking by asking: "why does the author describe the reaction of the guard in detail? Please discuss in groups, share your opinions with others, and then write down your team's answers on the whiteboard."

Group 1: Because a child stood in the middle of the road, the guard blamed the child. (The teacher wrote: explain the cause)

Group 2: It reflected the low status of the general people at that time, and the guards thought that the child could not talk to Mr. Sun directly. (The teacher wrote: low status)

Group 3: Because the guards think that Sun Yat-sen is the leader, and the dirty child should not talk to him. (The teacher wrote: Sun Yat-sen is supreme)

Group 4: This highlights Sun Yat-sen's love for the people. (The teacher asked: what is this writing technique here? A student suppled: comparison)

Group 5: Because the guards don't respect the child and discriminate against him.

Group 6: There is a contrast between Mr. Sun's noble feelings with the narrow attitude of the guard. (The teacher wrote: comparison) (C-1-01)

After the lesson, teacher A-1 said that "I hope students can help and learn from each other in think-pair-share. Some students that may be weak in reading comprehension can be encouraged by the high-achievers. In addition, I asked students to write their answers on the whiteboard to examine their learning outcomes. They liked this activity because the whole class can see their efforts."

In the stage of *Summary*, the MTSs of self-questioning (N=4), metacognitive questioning (N=3), stop and reflection (N=2), visualised tools (N=2), modelling (N=1), and self or peer assessment (N=2) were used by the teachers in group C. Only the MTS "stop and reflection" was observed among the teachers in group D. Most of the group D teachers concluded the lesson by themselves. And half of the observed lessons by the teachers in group D didn't have a conclusion section. However, all the teachers in group C concluded the lesson with well-designed activities. For example, at the end of the lesson *In the wind*, teacher C-1 used self-

questioning. He encouraged students to conclude what they learned by asking the questions to other groups.

S (Group 1): What is the definition of indirect description we learned in this lesson?

S (Group2): The indirect description is presenting the personality of a character by the people surrounding him or the environment.

T: Right! Now it's group 2 asks questions to group 1.

S (Group2): How to identify the sentences using indirect descriptions?

Teacher: Your question is too broad. Could you please ask more specifically? Or ask them to make a sentence about a specific topic.

S (Group2): Can you say a sentence to describe "Ice" by using indirect descriptions?

Teacher: Group members can help.

S (Group1): The weather is very cold, it becomes very hard to turn on the tap, people cannot screw.

Teacher: Very good answer! Let's give a big round of applause. The weather is cold. It's freezing when you turn on the tap. (C-1-02)

In the interview, teacher C-1 also added that it is important to use strategies for student summary. "Sometimes, I asked students to stop and reflect on what they have learned in the passing 40 minutes. Students can contemplate and look through the notebook. Junior secondary students needed more teachers' guide than senior secondary students."

This study also compared the usage of cognitive teaching strategies of group C and group D teachers (see Table 20 and Figure 21). It is indicated that group D teachers used more questioning and text content analysis. The teachers preferred to elaborate the text by themselves, and students may have less space to think or reflect independently.

Table 20. The total number of cognitive teaching strategies applied by the participated teachers in Hong Kong

Cognitive teaching strategies	**The total number of cognitive teaching strategies (N)**	
	Group C teachers	**Group D teachers**
Questioning	28	38
Content interpretation	9	21
Emotional motivation	8	3
Teacher evaluation	8	4
Note-taking	6	4
Activating prior knowledge	3	5
Teacher summary	2	3

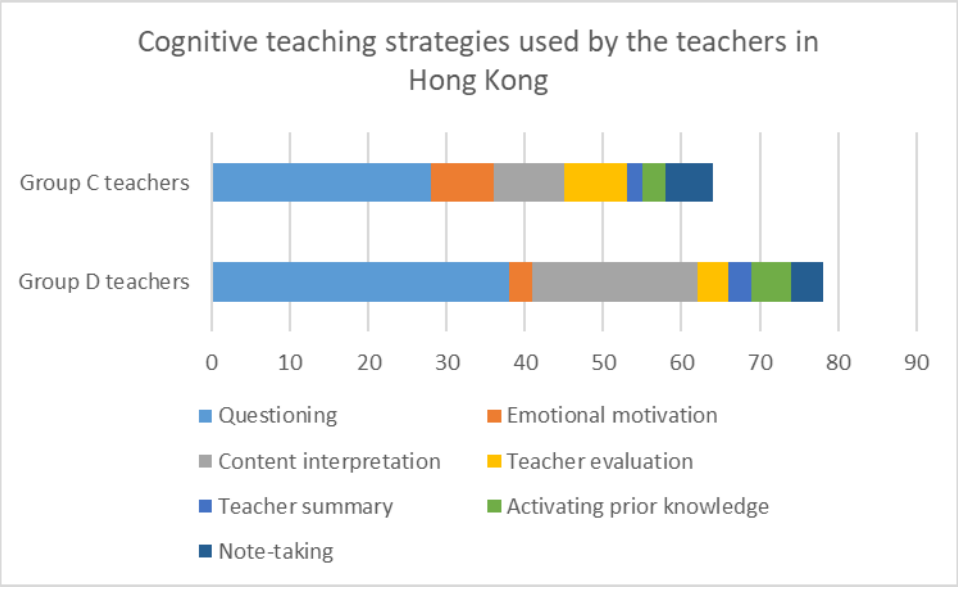


Figure 21. Cognitive teaching strategies used by group C and D teachers in Hong Kong

The application of the teaching strategies by the two groups of teachers can be seen in Figures 22 and 23. Group C teachers paid attention to every stage of the lesson and employed various MTSs to improve students' reading comprehension. Group D teachers used limited teaching strategies, including questioning, teacher evaluation, and text content analysis. Besides, they paid much attention to *Learning by doing*. In the stages of *Extended learning* and *Summary,* group C teachers implemented various MTSs and cognitive teaching strategies to develop students' divergent thinking and support their knowledge application. There are no more than three types of teaching strategies used by Group C teachers in the latter two teaching stages.

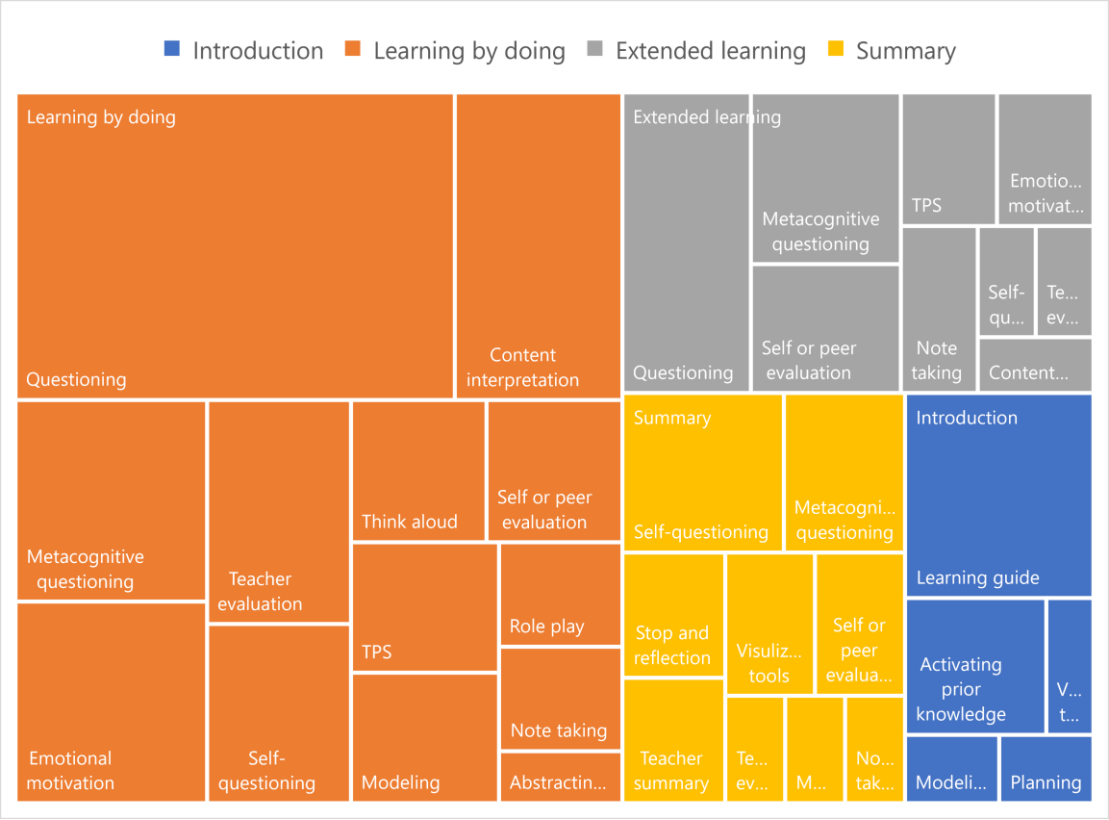


Figure 22. The treemap of teaching strategies by group C teachers in Hong Kong

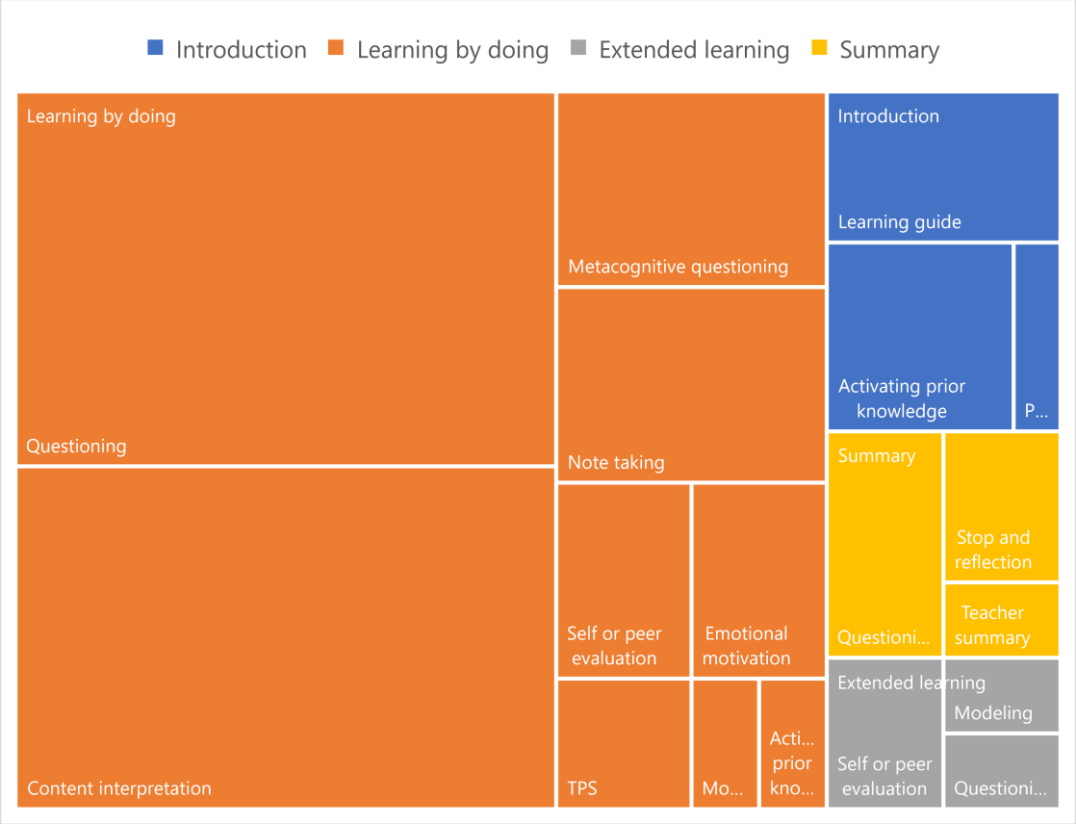


Figure 23. The treemap of teaching strategies by group D teachers in Hong Kong

4. 2 MTSs framework: Similarities and differences of MTSs in the two regions

From the above analysis, the teachers in group A and group C took advantage of more MTSs, such as metacognitive teaching, self-questioning, think-aloud, and think-pair-share, to enhance students' understanding of a text. Whereas the teachers in groups B and D utilized more cognitive strategies such as questioning, content interpretation, and note-taking, students were usually told the meaning of the texts. In this section, similarities and differences in the application of MTSs between Shanghai and Hong Kong were analysed. Then based on the similarity of teachers in the two regions, all these effective practices were structured into a creative metacognitive teaching framework of the Chinese language.

4.2.1 Differences of MTSs in Shanghai and Hong Kong

Table 21 presents the application of MTSs between group A teachers in Shanghai and group C teachers in Hong Kong. Firstly, from a holistic perspective, the frequency of applying MTSs in teaching by the teachers from the Shanghai case school was lower than those applied by the teachers from the Hong Kong case school. Group A teachers in Shanghai used MTSs 47 times, while 60 times for group C teachers in Hong Kong. In addition, the choice of MTSs by group C teachers in Hong Kong is relatively average. For example, metacognitive questioning was used 14 times by group C teachers, self-questioning for nine times, modelling for eight times, self or peer assessment for eight times, learning guide, and think-pair-share for six times, respectively. However, the choice of MTSs by the teachers in Shanghai is more concentrated. For example, metacognitive questioning was used 18 times by group A teachers, think-pair-share, think-aloud, self or peer assessment, and visualised tools were used five times, respectively.

Table 21. The usage of MTSs between the participated teachers in Shanghai and Hong Kong

MTSs	**The total number of MTSs**	
	Group A teachers in Shanghai	**Group C teachers in Hong Kong**
Metacognitive questioning	18	14
Self-questioning	2	9
Modelling	2	5
Self or peer assessment	5	8
Learning guide	2	6
Think-pair-share	5	6
Think-aloud	5	3
Role play	0	2
Stop and reflection	0	2
Visualised tool	5	3
Planning	2	1

Refining learning methods	1	0
Abstracting strategy	2	1
In total	47	60

The researcher conducted one-way ANOVA; the factor is a city (see Table 22). (1) The researcher analysed the MTSs data of group A and C teachers. There is a significant difference in the usage of MTSs between group A teachers in Shanghai and group C teachers in Hong Kong (Sig= 0.028). (2) Concerning the specific MTS, the ANOVA reported a significant difference in self-questioning between group A teachers in Shanghai and group C teachers in Hong Kong.

Table 22. The results of the ANOVA

The usage of all MTSs between group A and group C teachers					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	42.250	1	42.250	33.800	0.028
Within Groups	2.500	2	1.250		
Total	44.750	3			
The usage of self-questioning between group A and group C teachers					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	12.250	1	12.250	49.000	0.020
Within Groups	0.500	2	0.250		
Total	12.750	3			

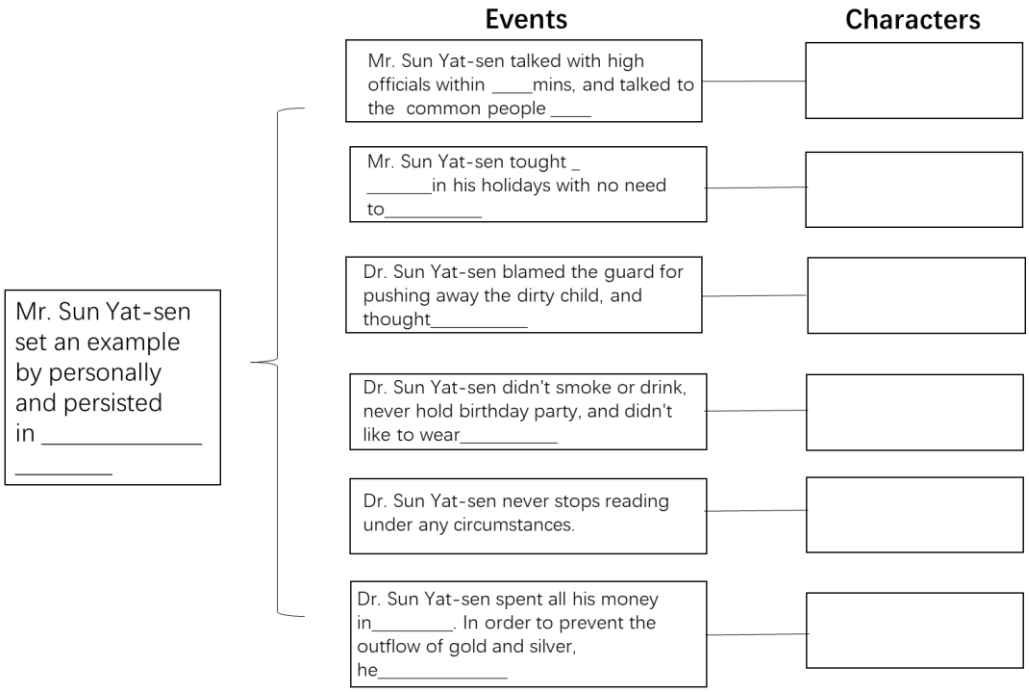
Secondly, the difference in the use of MTSs in Shanghai and Hong Kong is elaborated from the perspective of specific strategies. The most frequently used MTSs of the participated teachers in Shanghai are metacognitive questioning, think-aloud, visualised tools, think-pair-share, and self or peer assessment. For the participated teachers in Hong Kong, metacognitive questioning, self-questioning, self or peer assessment, modelling, think-pair-share, and

learning guide are most frequently used (see Table 21). The differences can be inferred that the teachers of Shanghai case school would like to use the strategies in terms of questioning, and visualised thinking, such as metacognitive questioning, visualised tools, and think aloud; the teachers of Hong Kong case school would like to use the strategies in terms of self-direction and participative activities, such as learning guide, self-questioning, and think-pair-share.

In Hong Kong, a learning guide is applied by all group C teachers. They usually sent worksheets to students before the class as a guideline for their pre-learning. In the interview, teacher C-1 elaborated on how to make a learning guide. “In the interview, teacher C-1 elaborated on making a learning guide to support student independent learning. “I posed some basic questions for general students and helped them have a sense of achievement. I also designed some understanding questions, such as analyzing the characters and explaining the reason. Moreover, more high-level questions, such as the knowledge in addition to the text, were prepared.”

Teachers checked students’ answers at the beginning of the lesson, and some teachers kept on using the learning guide during the lesson. Teacher C-1 said in the interview, “although designing a learning guide may cost me more time, but this method can promote students’ thinking about the new text without my help and foster their self-regulated learning”. For example, teacher C-1 designed a mind map about text structure in the learning guide and let students fill in the blanks according to their preview. As shown in Figure 24, students checked

and revied their mind map with the teacher's guidance.



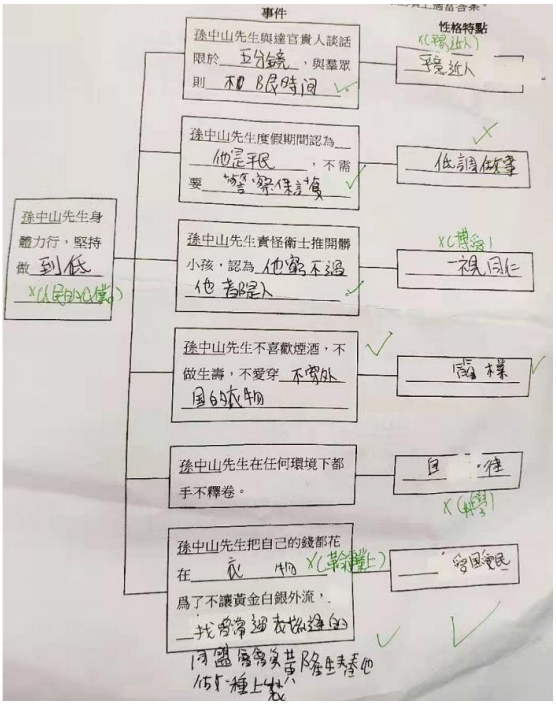


Figure 24. Learning guide of Lesson *Sun Yat-sen*

Both teachers in Shanghai and Hong Kong adopted think-pair-share. However, it is still found that when organizing think-pair-share activities, teachers in Hong Kong provided students with more detailed and clear demands and offered different levels of tasks. Groups that complete tasks before the appointed time can also challenge more difficult tasks. For example, in Lesson *In the wind*, Teacher C-1 provided a basic task: Find out the indirect sentences in the text (6 minutes). He also assigned different contents to different groups: groups 1 and 2 are responsible for paragraphs 1-4, and groups 3 and 4 are responsible for paragraphs 5-8.

Step 1: Team members complete individually.

Step 2: Share your answer with others.

Step 3: Discuss and debate.

Step 4: Show the final answers.

Challenging Task: in paragraphs 9-14, please mark one or more scenes with a fluorescent pen, and explain how the author highlights the power of typhoons by the descriptions of the scenery. (C-1-02)

Students spent 2 mins in thinking by themselves and sharing with their peers for 4 mins. And the different tasks can meet the diversity of students. In the lessons in Shanghai, think-pair-share was also used.

T: Now, students, please discuss and verify the sentences with your peers.

Students began to work together.

T: I saw two students in this group produce the answer. Remember to share your ideas with others. If another student's answer is incomplete, you can supplement the answer. (A-2-03)

The teacher didn't provide the procedure to complete the task step by step; some groups have completed the task, and they have to wait for other groups.

Teachers in Shanghai tended to used metacognitive questioning to promote students' reading comprehension. They asked students questions to promote their metacognitive thinking and revise their reading. The examples are as follows.

T: What strategies do we have to solve this problem?

S: We should dig the deep meaning through the superficial words.

T: Excellent! Let us use this strategy to read this sentence: At this time, the train carriage was quiet. Is there really no sound at this time? What should be the sound in the carriage?

S: The click of the wheel.

T: Yes. Think about it again. Any other sound?

S: The old lady was counting "1, 2, 3……"

T: I agree, the old woman must have been counting her three sons, one, two, three. Therefore, we need to think about not only the superficial meaning, but also the implicit meaning. (A-2-01)

T: Let's rethink, what was omitted in our analysis just now? What aspects have we not thought of yet?

S: We pay attention to the author's view of shops, fences, and trees in the street, but not mention what the author saw when he finally went to the seaside.

T: Very good! Please look through that part. (A-2-03)

T: I have observed that some sentences drawn by students are inaccurate. What's the problem? Should indirect sentences be drawn?

S: Sentences of indirect description should not be drawn.

T: OK. Check your sentences again to think if they are wrong. (A-2-03)

Besides, teachers in Shanghai also would like to employ visualised tools. For example, in Lesson *Uncle Lai*, Teacher A-1 created a fishbone diagram and asked students to fill the diagram to help them understand the text structure. In Lesson *In the wind*, the teacher asked the students to draw the author's road map, and in Lesson *In Berlin*, students needed to draw an impressive scene.

Thirdly, from the perspective of specific teaching stages, the results of teachers' use of MTSs in four teaching stages are analysed (see Figure 25). Consistent with the holistic statistical results, the Hong Kong case school teachers used MTSs on average in each teaching stage. However, in Shanghai, teachers' use of MTSs in the latter two teaching stages is lack.

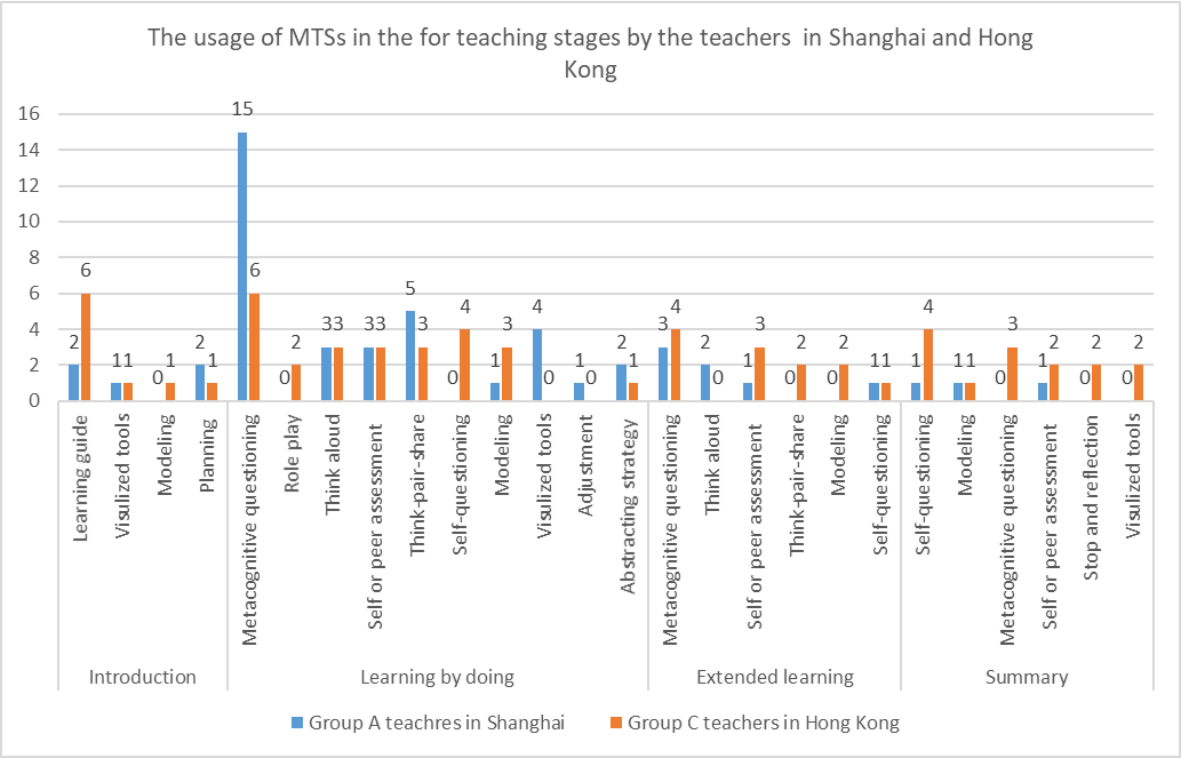


Figure 25. The usage of MTSs between group A teachers in Shanghai and group C teachers in Hong Kong in four teaching stages

4.2.2 Similarities of MTSs in Shanghai and Hong Kong

Firstly, group A teachers in Shanghai and group C teachers in Hong Kong both focused on the extraction, improvement, and application of strategies to solve reading problems. They supported students to mediate and optimize their learning methods to enhance their understanding of the text.

In Lesson *Growth in summer*, teacher A-2 helped students adjust how to read aloud better. The teacher hoped the students to read aloud with emotion. She supported the students to refine the

methods of read-aloud three times. The first round of reading is a group cooperative reading. Students paid attention to sentence patterns, pauses, and rhythm in reading. After that, the teacher asked students to try other methods to improve their reading. Students were encouraged to clap their hands for the second round. Students proposed that when reading aloud, the important content should be stressed. It can be found that the students' reading was vivid. Then, students began to reading aloud for the third round. In this time, students read in freestyle and drummed their fingers on the desks with the rhythm. The students were enthusiastic about reading aloud. A group commented: "Our reading is like rock music!" (A-2-02). In this lesson, teacher A-2 promoted students to reflect on practice, improve read methods and make peer assessments. By supporting the students to improve their reading methods, they can learn how to craft the learning method better.

In lesson *Uncle Lai*, teacher A-1 guided students to understand the theme in the text. Then the teacher abstracted the reading approaches by saying: "When reading a novel, we can better identify the theme through the three aspects: analyzing the characters, the plot, and the environment." Teachers summarise the methods they used before, which is a process of reflection, induction, and integration.

Teachers also paid more attention to revising students' learning, opening their minds, and applying and summarising the knowledge. For example, in Lesson *Sun Yat-sen,* teachers used think-pair-share and self-questioning to debate whether the guard's behaviour is correct or not.

These strategies can deepen students' understanding of responsibility and morality. In Lesson *In the wind*, the teacher asked the students to write a sentence by using the indirect description that they learned just now. The teachers modelled to students how to create the sentence. When students finished, the teacher asked them to assess peers' performance to improve their understanding of writing. In Lesson *Shells*, teacher C-2 produced a table with four well-chosen short articles on the same topic and let students compare the articles to boost their critical thinking.

T: Which of the four texts do you think the author thinks deeply about the shells?

The teacher-guided students to ask themselves questions and form their opinions.

Self-questioning: what kind of shell is this?

Self-questioning: what happened to this shell?

Self-questioning: what is the author's attitude?

Table 23. Students' answers in Lesson *Shell*

Titles/Authors	**1.Objective** ⇨	**2. Observation** ⇨	**3. Emotion**
Shells	S: Ordinary shells	S: The Pearl in the shell is formed by absorbing the eroded material after the invasion of the external debris.	S: The author held the idea that people need to live out their values and increase their values every day.
Shells (Fang jie)	S: Ordinary shells	S: My parents separated, I suffer alone, like a cracked shell.	S: After the parents are separated, the author hopes to build a happy family.
Shells (Xi Murong)	S: Fragile shells	S: Shell is a tiny and fragile life, but it lives meticulously, leaving amazing pearls.	S: The author hopes to leave eternal beauty and memorable things in his short life.

Shells (Jia Pingwa)	S: Deformed shells	S: There are beautiful pearls in the ugly shell, but there is nothing in the beautiful shell.	S: Everything has value. We should pay attention to not only the appearance but also the internal value.

Later, students spoke out their thinking:

S: I think Jia Pingwa's article has a deep thought on shells. The author uses the story of a seashell on the beach to express his views on the value of life. People should embrace imperfections. If we don't have a beautiful appearance, we can learn to never give up in all tough times. I think Jia's work is more profound and worth pondering.

T: Thanks for your answer! Are there any other views to share? Which of the three articles inspired you more?

S: I like Xi Murong's article. Because the shells in this article created a delicate residence through a short life, and the shell's life is different and meaningful. The second article mainly focuses on the appearance of shells, so I think Xi Murong's work is more in-depth. (C-2-01)

Secondly, the teachers in the two regions both pay attention to the formation, speculation, and verification of opinions. In Lesson *Chinese Stone Arch Bridge*, teacher A-1 used reasoning and verification, including the following three steps. Step 1, putting forward the hypothesis. The students analysed the features of a stone arch bridge and a Chinese stone arch bridge. Then the teacher promoted the students to speculate: there are five features of Chinese stone arch bridges, and Zhaozhou Bridge and Lugou Bridge belong to Chinese stone arch bridges. Therefore, students speculated that the two bridges also have these features of the Chinese stone arch

bridge. Step 2, content analysis. In the verification process, students read the parts of Zhaozhou Bridge and Lugou bridge respectively, and analysed the features of the two bridges. Step 3, comparing and contrasting the features of Zhaozhou Bridge and Lugou bridge. The teacher provided a table comparing the two bridges from the three aspects: the common features among the Chinese stone arch bridges, the unique features of Zhaozhou and Lugou bridges, and the author's attitude. Step 4, confirming the hypothesis. The students found that Zhaozhou Bridge and Lugou Bridge have all the features of Chinese stone arch bridges.

Thirdly, the teachers of the case schools in Shanghai and Hong Kong applied emotional motivation strategies to encourage students' engagement in metacognitive learning. They usually provide emotional encouragement to motivate students' persistence in metacognitive learning. The classroom discourses used by the teachers in Shanghai and Hong Kong are listed below.

T: There is one minute left. Let's see if anyone can finish the challenge.

T: Members of the same group can discuss and evaluate other's opinions. Believe in yourselves.

T: Don't worry. It's not easy to act the story. Let us give some applause to support this group.

T: Do you have any questions? Think about it, I believe you can do it.

T: Kevin, smart boy. You're doing better than before.

T: When you have finished, share with us. These two groups are very fast... There are 11 seconds left. When the time is up, it doesn't matter how much they have written. Let's give

them some applause.

The teachers praised students' performance in a different situation. Emotional encouragement is an essential support for teachers when using MTSs. When students encountered difficulties, the teachers affirmed their attempts and inspired them to try different learning methods. Similarly, when students thought metacognitively and answered a question, group A and C teachers didn't judge right or wrong. Appreciation may be the best confidence booster. The teachers appreciated them for what they say and gave them a chance to revise the answer.

4.2.3 MTSs framework that can promote students' learning

Based on the above analysis, this study constructed a framework of MTSs in the Chinese language (see Figure 26). In this framework, a Chinese language lesson incorporates four stages: introduction, learning by doing, extended learning, and summary. The four teaching stages can cultivate students' planning, implementation, revision, and consolidation.

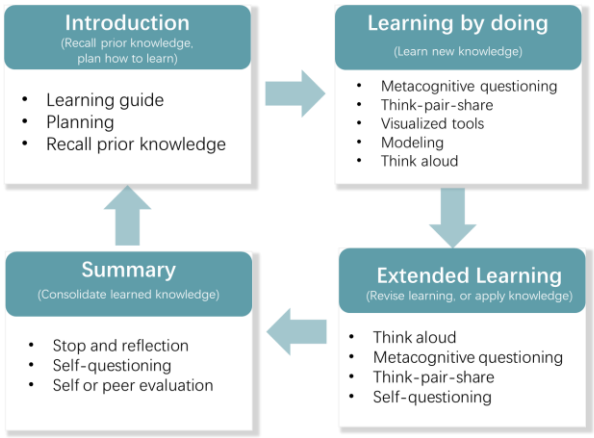


Figure 26. MTSs framework in the Chinese language

At the *Introduction* stage, teachers could use a learning guide and planning strategy to help students recall prior knowledge and plan how to learn. Teachers should present learning objectives with students and ensure that the planning process is explicit and suitable for students. A learning guide serves as an effective method for teachers to know students' reading problems in advance.

The second stage is *Learning by doing*. In this stage, the teacher would guide students to complete the main teaching objectives. Learning by doing stage can be supported by multiple MTSs for monitoring their learning, and teachers should try to avoid the monotonous teaching strategies, such as lecturing and interpretation. To develop students' reading comprehension, teachers should ask metacognitive questions to help students connect, compare, contrast, and check the reading contents and their reading process. Think-aloud can promote students to realize and adjust their thinking. Teachers can model students how to think aloud or self-questioning, which requires students to speak out their metacognitive thinking process. In this process, students have more autonomy to practice by themselves. Think-pair-share is an art between "I" and "We". After independent thinking, students' cooperation and discussion are stressed. Therefore, teachers need to pay attention to the activity arrangement and let students know clearly about thinking-pair-share rather than talking together randomly. Teachers should facilitate students to realize and summarise what reading methods they used, and which one may be most effective, and to adjust the reading methods if needed.

Students are encouraged to revise their learning and rethink what they have read at the *Extended learning* stage, including verifying their guesses, reflecting on problems from different perspectives, and applying knowledge to new contexts. Teachers are recommended to adopt self or peer assessment, think-aloud, or cooperative learning to support students in applying knowledge and reviewing their efforts' effectiveness. Collaborative learning means that teachers may organize short-time teamwork to deepen students' understanding. Think-aloud can support students rethink how to complete the task, and self or peer assessment may help students ponder better ways to solve questions.

At the *Summary* stage, the teachers in Shanghai adopted self-questioning and modelling. As mentioned in section 4.1.1, teacher A-2 asked the students to add a title to the picture they draw and describe the reasons for the whole class. Other teachers in shanghai concluded the class by themselves. The Hong Kong case school teachers supported students to summarise the lessons more flexibly. Some teachers asked students to stop and reflect on what they have learned. Other teachers organized a competition about self-questioning between groups. This method can not only increase students' engagement but also consolidate the knowledge they have learned. Some teachers let students use visualised tools to draw pictures and write the keywords in the corresponding place on the images. These approaches are conducive to stimulating students' learning interests, revisiting learning contents, and evaluating their learning outcomes.

Teachers embedded the metacognitive process, such as planning, monitoring, and evaluation,

into their daily practices. In addition, the teachers can use several strategies simultaneously according to the needs of the instruction. The teachers should provide substantial encouragement to students, help students monitor their learning progress and become self-regulated learners.

4.3 The impacting factors to teachers' behaviours of MTSs

In this section, the researcher traced the causes of the teachers' metacognitive teaching performance from curriculum standards, teacher beliefs, and teacher knowledge of metacognitive teaching.

4.3.1 Curriculum standard

Shanghai has always been considered as a pioneer in curriculum reform in mainland China. The curriculum standard in Shanghai follows the general framework of national curriculum demands. However, Shanghai is given the privilege of experimenting with reforms by exploring Shanghai's experiences. In Hong Kong, a significant reform document, "Learning to Learn" was released in 2002 (Curriculum Development Institute, 2001). In 2017, the Education Bureau updated the curriculum, including the Chinese language, to "Learning to Learn 2.0". The curriculum standards affect the metacognitive teaching practice of teachers in both regions. As teacher C-2 mentioned in the interview, "the curriculum standards are guidelines for our teaching. I have this document in my drawer. My colleague and I often discussed how to implement the curriculum standards, and we also try to understand deeply about the content of

the standard."

The two documents, "Secondary Educational Curriculum Guide: Chinese Language Education" in Hong Kong and "Chinese Language Curriculum Standard" in mainland China are analysed in Table 24 (CDC, 2017; MoE, 2017).

Table 24. The curriculum standards of the Chinese language in HK and mainland China (Shanghai)

	Hong Kong	**Mainland China (Shanghai)**
Subject Orientation	Instrumentality and humanity	Instrumentality and humanity
Curriculum Objectives	Improve the ability of reading, writing, listening, speaking; develop thinking skills, aesthetic ability and self-regulated learning skills; cultivate morality; identity with Chinese culture, etc.	Key competencies of Chinese language Construct and apply the Chinese Language; develop and promote thinking; appreciate and create aesthetics; cultural understanding and inheritance.
Curriculum Content	Reading, writing, listening and speaking.	Eighteen learning task clusters.
Learning Objectives	From Primary 1 to Secondary 6, cultivate the ability of reading, writing, listening, speaking, and thinking skills, strengthen communication, arouse creativity, develop interest, habit and ability to learn Chinese independently, and lay a foundation of lifelong learning.	1.Read and think more, observe life from multiple perspectives, enhance Chinese accumulation, and enrich the spiritual world. 2.Develop the ability of independent reading. 3.Independent writing, free expression. 4.Enhance interpersonal skills, etc.
Learning Objectives (Reading)	Cultivate reading abilities such as reading comprehension, analysis, perception and appreciation, master reading strategies, promote reading quantity.	Reading practical texts and grasping the main content and key information accurately and quickly improves students' thinking and evaluation.
Teaching Strategies/ Advice	**Teaching strategies** Direct teaching, creating learning situations, modelling, guidance,	**Teaching advice** To promote the overall development of the key competencies of Chinese

	dialogue, conversation, and inquiry learning. The strategies should include effective questioning, high-quality feedback, knowledge construction, and knowledge application.	subject; fully understand the characteristics of learning task clusters and deal with the relationship between them; create a comprehensive learning situation, implement self-regulated, cooperative, and inquiry learning, etc.

Concretely speaking, both the curriculum standards of Shanghai and Hong Kong point out that the subject of the Chinese language is a communicative tool and requires the unity of instrumentality and humanity. Driven by this demand, Chinese language education needs to cultivate students' Chinese literacy, improve their ability to use language, and consider the influence of morality and culture. Therefore, the teachers of the case schools in Shanghai and Hong Kong applied multiple metacognitive teaching methods to promote students' writing, reading, communicating, and debating using the Chinese language. Besides, the Chinese language course also strengthens the cultivation of the individual's moral character and correct values.

Although possible teaching advice is provided to teachers, the curriculum also stresses the curriculum's flexibility throughout. The curriculum guide of Hong Kong proposes that "a flexible curriculum framework should be provided for Chinese language learning." The curriculum should strive to provide more space for primary and secondary schools to cope with students' diversified learning." Although the Chinese language is the mother tongue of most students and these students have accumulated rich language experience from their daily lives, some non-local students living in Hong Kong have different starting points of the Chinese

language. The teachers should help students flexibly learn the Chinese language under the curriculum framework. The curriculum guide supports teachers to deal with the curriculum to cater to students' diversity. Teachers are encouraged to shape their course in their teaching style and implement the teaching strategies to fit the particular students and circumstances.

Besides, the Chinese curriculum guide of Hong Kong proposed that teachers should nurture students' self-regulated learning. Middle school students already have abundant subject knowledge of the Chinese language. Therefore, the teachers should cultivate students' independent ability of Chinese language learning through metacognitive teaching. Metacognitive teaching can help students develop self-regulated skills, learn Chinese in an all-around way, improve the depth and breadth of Chinese learning, and lay the foundation for lifelong learning (Pang, 2017).

In the curriculum guide in Hong Kong, the learning objectives of self-regulated learning are:

(a) cultivating students' ability to acquire knowledge, construct knowledge, use knowledge, and monitor learning;

(b) improving their interest in self-regulated learning and nurturing a good attitude and habits of Chinese language learning.

(c) achieving the learning objectives of various learning areas through a range of learning activities.

Teacher C-1 said in the interview, "the curriculum guide proposed the objectives of self-

regulated learning, and it changes my perception about teaching. It is not enough to ask students to repeat or copy the answer. Teachers should be equipped with the teaching skills to boost students' reflection, monitoring, and evaluation."

In the curriculum guide in Hong Kong (CDC, 2017), it is clearly stated that "before students are required to preview, teachers should offer them clear scope and clear guidance" (P36). In the learning process, students gradually learn to monitor, adjust, reflect, and evaluate their learning process consciously. Besides, teachers are suggested to develop students' ability of language knowledge application, error-detection, critical thinking, and creation of new knowledge.

Based on Shanghai's curriculum standard, the teachers should incorporate self-regulated learning skills in their teaching practice. Students are guided to analyse, monitor, and reflect on their learning process of the Chinese language. The teachers in middle schools need to cultivate higher-order thinking of students by acquiring, constructing, and applying the knowledge independently. Teacher A-2 said, "curriculum standard makes recommendations for nurturing independent learners. I think students should be supported to monitor and select appropriate reading strategies, including setting goals, summarizing, finding clues, and recognizing details by themselves."

Shanghai curriculum standard emphasizes that teachers should choose appropriate evaluation

methods to diagnose students' learning achievements. In the metacognitive context, teachers can use MTSs to help steer students toward self-regulated learning. Students should be encouraged to work with others, assess the answer by themselves, reflect on their thinking process, and improve their answers. This kind of self or peer assessment can stimulate students to assess and improve their learning performance. Teachers are advised to strengthen the evaluation process so that students would review the level of achievement towards their goals and whether they need to craft their learning process. The curriculum guide in Hong Kong mentions that students need to be responsible for their learning performance. Therefore, the teachers should provide opportunities for students' reflective thinking and improve their independent learning. The students could discuss the evaluation criteria for actively examining the learning performance and better understanding their learning strengths, weaknesses, and learning achievements.

4.3.2 Teacher's beliefs of metacognitive teaching

According to the questionnaire findings, group A and C teachers have a higher belief in the benefits of metacognitive instruction than group B and D teachers. The researcher calculated the average score of the items about teachers' beliefs between group A and C teachers, and group B and D teachers. The findings are shown in Figure 27. It can be seen that group A and C teachers believed that MTSs positively impact students' learning. They were more willing to use MTSs in their teaching practice for supporting students' planning, monitoring, and evaluation. Besides, they believed that MTSs could facilitate students to be self-regulated

learners.

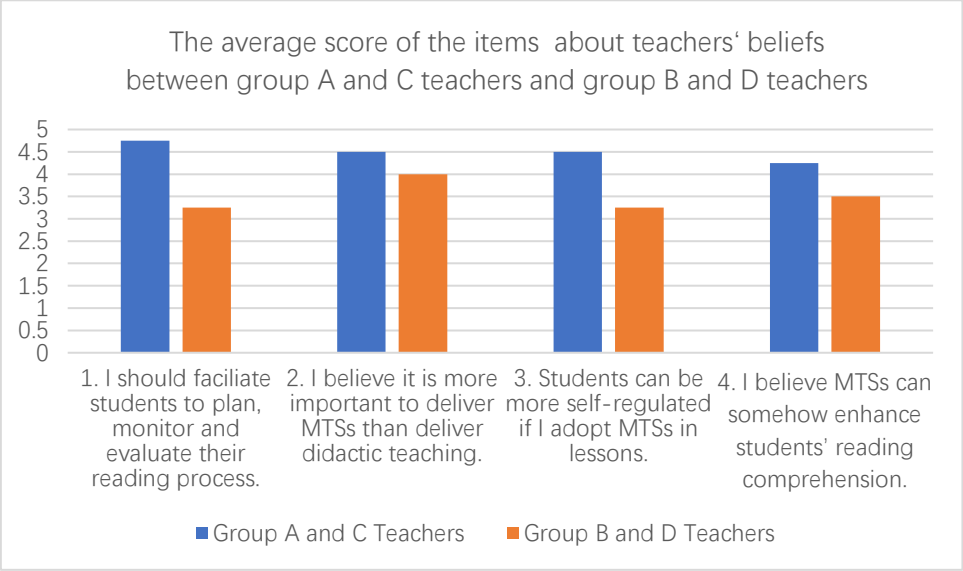


Figure 27. Teacher beliefs of metacognitive teaching for the teachers in Shanghai and Hong Kong

Through the interview, group A and C teachers also shared that they believe MTSs can facilitate students' reading comprehension. Teacher C-1 mentioned that high-achieving students always perform better in constructing metacognitive ability. These students can select learning strategies properly and check their understanding. Therefore, he designed a learning guide to help students learn, preview before class, and consolidate knowledge after class.

Teachers C-2 said, "some teachers use the traditional teaching method to let students copy the notes in the Chinese language. However, I think students' reading ability is decreasing by using this teaching method. This may lead to many problems, such as students cannot think and rely on their teacher for answers. I always use metacognitive teaching methods to help students

learn independently." He proposed his teaching belief, that is "fishing is much better than giving them fish".

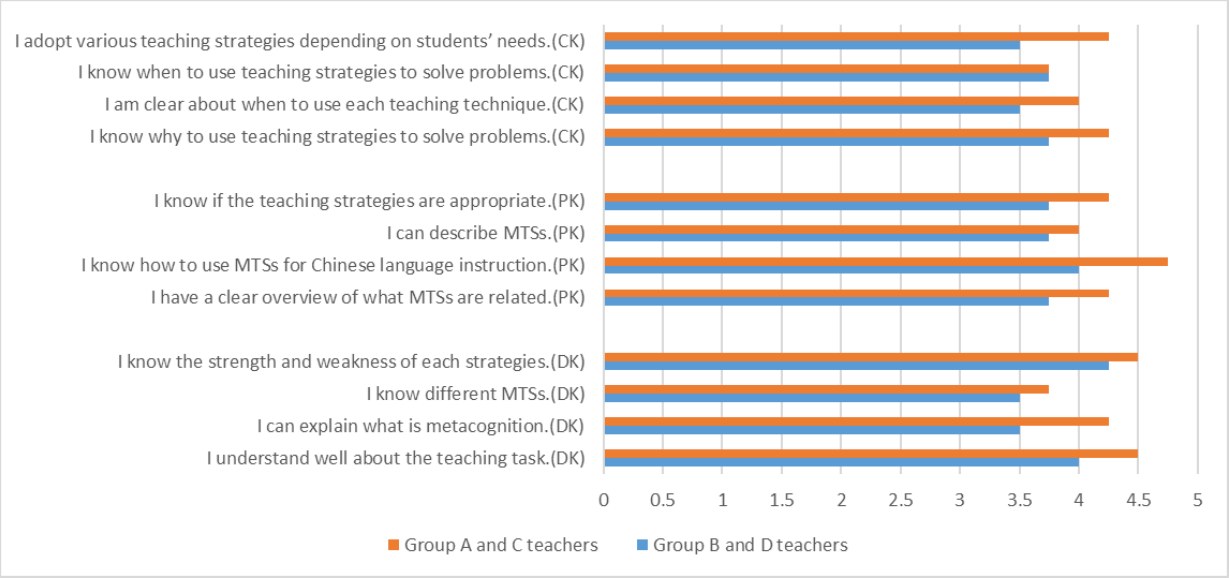
Teacher A-1 shared her perceptions of metacognitive teaching. She found that students with a strong sense of metacognition know how to learn in a better way. Teachers A-1 believed that if students can make a plan before reading, they may learn with purpose. "I think the students with the competency of self-reflection and self-checking can increase their understanding. Most of the time, students can't understand the article because they use inappropriate reading strategies, and they don't realize about it."

Sometimes, the teachers are not sure they may succeed in using MTSs, but they are willing to try creatively. "In Lesson of *In Berlin,* I adopted MTSs and attempted to ask students to draw a picture and think aloud about why they draw it and what does the picture wants to deliver to us. It is the first time for me to design such an activity. But I think it is worth doing." (A-2)

They even shared that it is a sign of their professional development when students preferred to self-questioning and students were indeed more skilled in raising questions. "Students are reluctant to ask questions at first. But I often encourage them and explain how to ask questions. This is what we should do to help students think independently. I think metacognitive teaching increases my professional development." (C-2)

4.3.3 Teacher's knowledge of metacognitive teaching

Group A and C teachers have plenty of knowledge of metacognitive teaching, including declarative knowledge, procedural knowledge, and conditional knowledge. The results of the Teacher Metacognition Inventory (TMI) showed the teachers' perceptions relating to their metacognitive knowledge (see Figure 28). The average scores of each item by group A and C teachers and group B and D teachers were calculated. It is found that group A and C teachers have a higher score of metacognitive knowledge. They said that they know what are metacognition, MTSs, and the strength of each teaching strategy. They can describe how to implement the MTSs and how these strategies can be used in the Chinese language lessons.



Note: DK means declarative knowledge, PK means procedural knowledge, and CK means conditional knowledge.

Figure 28. Teacher knowledge of metacognitive teaching for the teachers in Shanghai and Hong Kong

Based on the interview, group A and C teachers have sufficient **knowledge of metacognitive**

teaching. Teacher A-2 explained the concept of metacognition, and she said, “metacognition is the cognition of cognition. It is the regulation of one’s understanding, referring to individuals’ thinking about what strategies they use and why they use these strategies”. “I think metacognitive process refers to preparation before learning, adjustment, reflection, and the evaluation after learning.” Teacher A-1 also elaborated how metacognition influenced student learning. She set an example. “When a student analyses whether the answer is correct, he checks the way of thinking and revises his answer. ” The teacher regarded this process as the typical practice of metacognition.

Furthermore, group A and C teachers can elaborate on metacognitive teaching. As teacher C-2 mentioned, metacognitive teaching was instructional behaviours for supporting students to plan their learning, monitor their understanding, and finally evaluate. “I always use metacognitive teaching methods and integrate them into the daily teaching of the Chinese language.”

When asked group A and C teachers “what metacognitive teaching strategies do you know”, they can answer various metacognitive teaching strategies, such as think-aloud, mind map, self-questioning, and so on. They also illuminated how to design and implement metacognitive teaching.

Teacher C-1 explained the characteristics of metacognitive teaching by distinguishing the difference between “mutual learning” and “co-learning”. He explained, “mutual learning”

meant that students checked and discussed the answers with their peers before class; "co-learning" meant the activity of think-pair-share during the classroom teaching. Students shared ideas, rehearsed, and achieved the discussion result to complete the task."

Group A and C teachers have a clear concept of metacognition. They know different types of MTSs and can explain the characteristics of metacognitive teaching. However, group B and D teachers relatively lack such knowledge. For example, teacher B-2 said that she had never heard of "metacognition" and did not know much about self-regulated learning. Teachers D-1 and D-2 said that they were not familiar with metacognitive teaching.

Group A and C teachers also presented **procedural knowledge** of MTSs. They know how to use MTSs and support students to practice the strategies correctly. Teacher A-2 helped the students ask questions and reflect on their learning. "The first-round reading was to let students have a general impression of the text. In the process of the second-round reading, I promoted students to ask questions and find out the sentences they don't understand. The students circled relevant sentences and simply made comments. In the third-round reading, students found relevant details and clues to solve these problems."

Teacher A-1 shared her experience of organizing group activities. "Before the group work, I introduced the tasks to the students and distributed the work. Then, the students began group activities. I walked around in the classroom and gave support when they encountered problems.

Later, students reported their findings cooperatively. Finally, the groups assessed other's performance." Students had their roles in teamwork, and they participated in the class actively.

Teacher C-2 said that at first, the students didn't know how to think aloud. Then she modelled to them and encouraged them to act like her. Some students wrote down the keywords of what their thought, and then looked at the note to speak out their thinking process. Because teachers know metacognitive teaching, they can guide students on how to practice the strategies.

Group A and C teachers have **conditional knowledge** of when and why they would adopt MTSs. Teacher C-1 said that "many students cannot grasp the useful information to achieve understanding. What we have done is to realize students' learning problems in time. At these times, I adopt MTSs to arouse students' reflection and support them to correct their understanding. If I provide the answers directly, the students cannot think independently, and their reading ability cannot be improved."

Teacher C-2 stated that she used different MTSs in suitable situations. She encouraged the student to think aloud when they cannot understand the reading contents, and used think-pair-share when students should cooperate to complete a big task.

Teacher A-1 said that she often provided a few minutes for students' review of their learning process at the end of the lesson. Teacher A-2 said, "when exploring text structure, I usually

encourage the students to create a mind map. If the text is a novel, I will guide students to self-questioning what they don't understand about the story. They are motivated to explore the character's thoughts and fate."

Based on the above interviews, group A and C teachers have rich and well-connected knowledge structures of metacognitive teaching. They are familiar with the concepts of metacognition and metacognitive teaching. Moreover, these teachers have a clear perception about how to guide students to implement metacognitive teaching step by step, and they can also decide when and where to use MTSs properly.

4.4 Summary

First, the investigation of teachers' use of MTSs in Shanghai and Hong Kong is presented respectively in this chapter. Group A and group C teachers utilized MTSs more times than group B and group D teachers to promote students to plan, monitor, and reflect on their learning. The difference is significant between the two clusters of teachers, according to the results of the t-test. In Shanghai, the most common strategies used by group A teachers are metacognitive questioning, think-aloud, visualised tools, think-pair-share, and self or peer assessment. In Hong Kong, group C teachers used the following strategies more often: metacognitive questioning, self-questioning, self or peer assessment, modelling, learning guide, and think-pair-share. Concerning cognitive teaching strategies, group B and D teachers are more likely to use questioning, content interpretation, and teacher evaluation than the other two groups.

And their students mainly relied on the teachers' explanations and took notes to copy blackboard-writing. Group A and group C teachers effectively enhanced students' self-regulated learning skills and their reading comprehension.

Second, the differences in the teacher performance of using MTSs in Shanghai and Hong Kong are investigated. (1) There is a significant difference in the usage of MTSs between group A teachers in Shanghai and group C teachers in Hong Kong according to the one-way ANOVA. Group A teachers used MTSs 47 times, and group C teachers used MTSs 60 times. Participated teachers in Shanghai use MTSs less frequently, mainly focusing on metacognitive questioning and think-aloud. For participated teachers in Hong Kong, every metacognitive teaching strategy was used frequently. (2) In terms of specific strategies, participated teachers in Shanghai were willing to adopt questioning and visualization teaching strategies. Hong Kong case school teachers tended to use self-directed and student participative strategies. (3) From the perspective of the teaching stage, the teachers of the Hong Kong case school paid attention to these four teaching stages. The teachers of the Shanghai case school paid attention to the *Introduction* and *Learning by doing* stages in the lessons. Sometimes they didn't organize the *Extended learning* and *Summary*.

The findings also presented the similarity of the teachers' performance in using MTSs in Shanghai and Hong Kong. (1) Group A and group C teachers in the two regions focused on reading methods, selecting, comparing, and improving strategies to fit students' learning. (2)

Students were supported to pose questions, formed and checked their opinions, and evaluated others' points of view. (3) Both participated teachers in Shanghai and Hong Kong provided students emotional supports to encourage their self-regulated learning. All these similarities in teaching can constantly promote students' long-term reading comprehension and their learning to learn abilities.

An MTSs framework (Introduction, Learning by doing, Extended learning, and Summary) is concluded based on the findings from Shanghai and Hong Kong. This framework provides an internal mechanism of how to cultivate students to be self-regulated learners. Teachers need to help students plan their learning by setting learning goals and posing reading questions. Then students should be supported to learn new knowledge, solve reading problems, and monitor their learning in the stage of *Learning by doing.* Teachers should assist students in revising their learning in the stage of *Extended learning* and consolidating the learned knowledge in the stage of *Summary*.

Third, the factors influencing teachers' behaviours of MTSs include curriculum standard, teacher beliefs and their knowledge of metacognitive teaching. First, the curriculum standards in both regions emphasize fostering students' self-regulated learning. They guide Chinese language teachers to adopt MTSs in their classroom teaching. Second, group A and C teachers believed that metacognitive teaching could promote students' self-regulated learning. Third, group A and C teachers have more knowledge on metacognitive teaching than group B and D

teachers, and their knowledge of metacognitive teaching promoted them to implement MTSs.

Chapter 5. Discussion and Conclusion

This chapter discusses the findings and makes connections between the results and existing research. The effective MTSs adopted by group A and group C teachers in Shanghai and Hong Kong are discussed. The findings confirm that metacognitive teaching can support students' self-regulated learning and improve their reading comprehension. The similarities and differences of the use of MTSs in the two regions reveal the teaching characteristics in the natural classroom context. These findings can deepen the understanding of how to apply metacognitive teaching in the Chinese language. The MTSs framework linking with students' development of metacognition is discussed. This chapter also explains the factors promoting teachers' metacognitive instruction from curriculum standard, teachers' beliefs and knowledge of metacognitive teaching. Moreover, the implications of the study's findings for curriculum implementation in Shanghai and Hong Kong are discussed.

5.1 Effective MTSs enhancing student learning

The MTSs that teachers used in Shanghai and Hong Kong were discussed in this section. Students exposed to metacognitive teaching are better able to enhance their learning than the students in the classes that didn't emphasize metacognitive teaching.

5.1.1 Effective MTSs in Chinese language courses in Shanghai

The Shanghai case school teachers mainly utilized metacognitive questioning frequently (18

times) to arouse students' reflection on their learning. In the observed lessons, the teachers asked students to reflect on what they are learning, how they think, or whether they can understand to enhance their reading comprehension. Compared with the traditional strategy "questioning", metacognitive questioning can promote students to think critically. Metacognitive questioning provoked students' learning process and made them learn independently. This finding is similar to the research on metacognitive questioning, which suggests that the effective regulation for learning could be enhanced among learners through teacher's reflective questions (Teng, 2016; Yılmaz & Keser, 2017). Metacognitive questions are increasingly applied in language classes. Teachers of the Shanghai case school posed metacognitive questions to help students abstract their learning methods used in the lessons and provoke them to reflect on the improvement of their learning methods. This instruction strategy was advocated by Mevarech and Kramarski (2003), Kim and Lim (2019). They found that metacognitive questioning can promote students to monitor their learning, review their learning process and improve their learning methods. As mentioned in the study conducted by Wilson and Smetana (2011), effective teachers would use metacognitive questioning flexibly to support students to compare and contrast sentences, analyse the characters' behaviours, and understand the author's emotions.

The findings of this study indicated that the teachers of the case school in Shanghai employed visualised tools frequently (15 times). Visualised tools can effectively enhance students' understanding of the observed lessons. Schaffer (2017) held the similar idea that visualised

tools allowed students to detect errors by comparing their thinking diagrams with others. There is a piece of evidence that error detection is facilitated by the visualization tool. For example, in Lesson *Chinese stone arch bridge,* students drew different diagrams to present the relationships among "stone arch bridge", "Chinese stone arch bridge", "Zhaozhou Bridge", and "Lugou bridge". Interestingly, without the teacher's comment, the students who did not make the diagrams correctly realized the problems of their drawings by comparing their diagrams with others'. In this example, visualization promoted students' realization of their misunderstandings. As Makarova (2016) mentioned that visualised tools could connect by single meanings to a structured image. The teachers in this study assisted students in visualizing the referred information and exploring the internal relationship of these contents. Visualised tools were also used to help students organize the knowledge of the whole unit or entire book by the participated teachers. This is consistent with the opinion by Elena Aleksandrovna et al. (2017), who said that "with the methodically competent use of visualization methods, students can not only plan their education process, evaluate results and monitor progress but also make the transition to higher levels of cognitive activity, and master the subject content as well."

In this study, think-aloud was used (5 times) by the Shanghai case school teachers. Think-aloud is a monitoring strategy of MTSs, students are encouraged to make their thinking processes explicit by speaking out their thinking process. The teachers in this study asked students to share their analysis of the reading contents. If they cannot do well, they can record the keywords in a notebook, organize the information, and say it aloud. The students rethought and reread

the texts and identified the clues to make sense of what they read to complete tasks. Oster (2001) also strengthened the importance of think-aloud about presenting and revising their thinking process and sharpening their understanding. The teachers of the Shanghai case school found that think-aloud could push the students to think further and help them form coherent thinking. Students also used think-aloud to summarise the whole learning process, including what they can't do initially, how to solve the questions, and what they learned at the end of the lesson. This finding is in line with Syamsul, Chairina, & Chentenei (2018) idea who claimed that think-aloud might lead to deep thinking and promote self-regulation.

5.1.2 Effective MTSs in Chinese language courses in Hong Kong

The findings indicated that the frequency of MTSs adopted by group C teachers is significantly higher than group D teachers. The results of the t-test indicated a significant difference between group C and D teachers in using self-questioning and self or peer assessment. Both strategies strengthen students' identity as self-learners to actively interact with new information and reinforce independent behaviours for solving problems (Ataman & Özsoy, 2009). In the observed lessons, teachers modelled students and encouraged them to self-questioning. Through modelling strategy, students would be clear about what questions should be asked to promote their reflective process (Methe & Hintze, 2003). For example, students may ask, "do I understand these contents", "what might happen next", and "how do they feel about the contents". Students imitated self-questioning with the teacher's guidance. Students' performance revealed that modelling was a direct and effective strategy for promoting students

to investigate, understand, and connect the reading information. Like Oyetunji (2013) mentioned, self-questioning is an ongoing process of generating questions before, during, and after reading to understand the text. In this study, teachers also promoted students during the whole learning process, which sparked curiosity about what was being read. The students followed a set of steps to pose, think, predict, explore, and answer questions. As stressed in the study of Othman et al. (2014), self-questioning supported students to be self-regulated readers by posing questions and solving questions by themselves.

The findings showed that all group C teachers in Hong Kong utilized learning guides in their lessons. Teacher C-1 mentioned in the interview that although he spent more time preparing the learning guide, it was helpful for students' self-directed learning with these supporting materials. This strategy provided a framework for students about how to read an article before, during, and after learning, such as activating their prior knowledge, making a list of questions about what they didn't understand, and recalling what they learned, which was helpful of nurturing students to be independent learners (Bian, 2016; Ko, 2018). What should be of concern is that teachers in Hong Kong analysed the students' questions in the learning guide and selected representative questions as the main focuses of teaching during the lesson. This finding is consistent with Zhao (2015)'s opinion. He proposed that students should use the learning guide before class, raise their questions and bring these questions/expectations to the class. A significant beneficial effect of the learning guide is that the learning guide can support students to find the problems they can't understand in pre-reading and set learning goals in the

course.

According to the findings, think-pair-share was adopted six times by Hong Kong teachers. The teachers instructed the students to use this optimized and interactive learning mode to enhance student learning skills (Kristine, 2017). In the observed lessons, the teacher asked group members to think the questions by themselves. Then they could communicate with others about the consideration of the discussed questions. Through sharing, students explained their understanding, discussed and connected peers' views to form group answers. This process enabled students to study cooperatively and increase their sense of learning involvement (Kramarski & Mevarech, 2003). By exchanging ideas with each other, group members improved their understanding. The finding is in line with Regina et al. (2007) research, which justified that think-pair-share positively impacted students' reading comprehension. In addition, Simon (2020) proposed that think-pair-share can also be used as an assessment tool. This study unravelled that students improved their reading comprehension by learning from others' opinions, providing and receiving comments about the given topic. Critical assessments can increase students' evaluation and refining ability to their reading.

5.2 Similarities and differences of MTSs in Shanghai and Hong Kong

5.2.1 Similarities of MTSs in Shanghai and Hong Kong

The teachers of the case schools of Shanghai and Hong Kong both often adopt metacognitive questioning, think-pair-share, and self or peer assessment. This result echoes the analysis in the

literature review in section 2.2.4 (MTSs of Shanghai and Hong Kong teachers in the existing literature) that these strategies cover all kinds of student thinking patterns, from individual thinking, to pair thinking, small-group thinking and collaborative class thinking. These strategies may arouse multiple-level discussion, and provide students more chance for reflecting on and evaluating their thinking process, methods and outcomes of learning. For the teachers' performance of the case school in Hong Kong, the findings are consistent with the previous analysis in the literature review in section 2.2.3 (Analyzing, comparing, and contrasting MTSs in Shanghai and Hong Kong) that the teachers in Hong Kong would like to use self or peer assessment and think-pair-share to promote self-regulated learning. For the teachers' performance of the case school of Shanghai, the findings are similar to the analysis results in the literature review that planning-monitoring-evaluation is the most frequently used strategy in Shanghai. The studies in the literature review were well-designed and holistic-implemented empirical studies. The researchers carefully designed the teaching to cover each metacognitive teaching procedure (e.g. planning, monitoring, and evaluation). However, the metacognitive instruction from the Shanghai case school was observed in a natural classroom context. The teachers are more likely to use multiple MTSs, including metacognitive questioning, self or peer assessment, to promote students' planning, monitoring, and evaluation. They embedded these strategies into the Chinese instruction and assisted students in organizing their learning properly, reflecting on their learning cooperatively, and evaluating the progress and results. The findings that MTSs facilitated students to self-check their understanding and take control of their learning are echoed by the study of Van Kraayenoord (2010). Lam (2018)

proposed the similar idea that the teachers could choose MTSs to help students engage in introspection; therefore students can think about how to learn and adopt appropriate strategies to complete the specific task effectively.

The teachers in the case schools in Shanghai and Hong Kong supported students to extract, improve and apply the learning methods for solving problems. And they both focused on facilitating students to think critically, revise their learning, and justify their hypotheses. Studies on MTSs suggested that students reflect on appropriate approaches to learning and subsequently revise students' learning process. This perspective finds support in the research carried out by Oster (2001) and Nell K and P. David (2008). They also observed that strategy research has increasingly focused on monitoring learning strategies in the language class. Effective strategies always depend on students' reflection on what is suitable for them. These instructional strategies can be seen as responses to various contextual changes locally and globally. Teachers need to teach students subject knowledge and learning skills that can be applied in different situations. The strategies that have highlighted teaching reading strategies and developing students' thinking levels revealed the changes of the instructional system, such as lesson plan, implementation, and lesson evaluation. Chinese instruction aims to help students learn how to think, such as comparing and monitoring their strategies, making predictions, recognizing confusion, and making an inference (Liu, 2009; Yeung, 2015). Besides, the evaluation of the curriculum from the Education Bureau also points to the cultivation of students' learning ability. Students are encouraged to develop their metacognitive abilities and

apply these abilities to read different kinds of articles.

It should be noticed that the teachers of the case schools in Shanghai and Hong Kong often provide emotional encouragement to motivate students' persistence in metacognitive learning. In the lesson observation, group A and group C teachers provided full encouragement for the students. As Fisher (2016) said, teachers should encourage students' emotions and thoughts to implement self-regulated learning and take more responsibility for their learning progress. Sometimes students encountered difficulties when think-aloud, think-pare-share, or self-questioning. Teachers would offer them emotional support to reflect on their learning process and help them exercise autonomy to promote their engagement. The findings are similar to the idea by Ruzek et al. (2016), who posited that teachers' praise of students' group work could enhance their motivation and confidence to complete the task. This finding is in line with the opinion by Zimmerman and Bandura (1994) that teachers should enlist emotional supports to motivate learners' efforts to achieve success.

5.2.2 Metacognitive teaching framework promoting students' learning

Based on the findings, a framework for metacognitive teaching was constructed, which involved four stages: introduction, learning by doing, extended learning, and summary. In comparing this four-stage (newly developed) framework with Gilmore's framework (2019) (introduction-development-consolidation-conclusion) and Hedlund's framework (2020) (engage-build-consolidate), both three frameworks involved the introduction and conclusion

stage. However, the instructional process to develop students' knowledge and skills is strengthened by Gilmore's and Hedlund's framework, while the four-stage framework included learning by doing. Moreover, the learning stage is a dynamic and metacognitive process. The students can learn by themselves in the activities than listen to the teacher, and they should monitor their learning. This viewpoint is braced by the study of Roberts et al. (2019), who held the idea that the indispensable lesson stage is "play and learn" to provide students more chance to practice and experience. The next stage is "cumulative review" in their research, which means that teachers help students regulate their learning. In this study, these two processes ("play and learn" and "cumulative review") are intertwined. It is called "learning by doing" in this study. The teachers may use MTSs, such as metacognitive questioning, think-pair-share, to promote students' understanding and monitor their understanding. After the stage of learning by doing is extended learning. When the students finish the previous stage, they may critically think and revise their progress, justify their hypotheses to form an empirical understanding, or reflect on learning methods in a new context. The findings are supported by Ko and Xu's (2018) study, in which extended learning refers to reviewing the learning and applying the methods to a new environment.

From the data, it is also found the multi-level behaviour by the teachers of the case schools in Shanghai and Hong Kong in each teaching stage (see Table 25). In the stage of introduction, the teachers need to support students make a learning plan. 1st level behaviour is making a learning plan by teachers. Some teachers may let students choose what they want to learn in

the 2nd level. In the 3rd level, the teacher would support students set achievable learning objectives by considering students' needs and text features. In the stage of *Learning by doing*, the teacher should facilitate students to learn through comparing and choose appropriate methods or improve the methods to achieve their learning goals. In the stage of *Extended learning*, some teachers give students extend-readings to broaden their cognition. Some ask students to apply knowledge or skills to deepen their cognition. While an even better way is to support students to revise learning and justify their predictions to create a new comprehension. In the *Summary* stage, some teachers in group B and group D concluded the lesson by themselves; it would be better to facilitate students to conclude what they learned. And it would be more recommended if teachers can guide students to evaluate and consolidate their learning process and summarise what they learned.

Table 25. Teacher behaviours of different levels in the metacognitive teaching framework

	Introduction	**Learning by doing**	**Extended learning**	**Summary**
1st level	Teacher proposes learning objectives	Promote students to acquire knowledge	Help students extend reading to broaden their cognition	Teacher concludes the lesson
2nd level	Students propose learning objectives	Promote students to acquire knowledge and identify what methods are used	Help students apply knowledge to deepen their cognition	Students conclude what they learned
3rd level	Teacher integrates student needs and text features into learning objectives	Promote students to acquire knowledge by comparing, selecting or adjusting their learning methods	Help students revise learning and justify predictions to create a new cognition	Students evaluate the learning process and conclude what they learned

5.2.3 Differences of MTSs in Shanghai and Hong Kong

5.2.3.1 The differences in overall number and types of MTSs used by the teachers in Shanghai and Hong Kong

From a holistic perspective, the frequency of applying MTSs by the teachers from the case school in Shanghai (47 times) was lower than those applied by teachers from the case school of Hong Kong (60 times). The result of ANOVA showed a significant difference in the frequency of using MTSs between group A and C teachers. This finding aligns with the analysis result in the literature review (Xiao, 2008) that teachers in Hong Kong used MTSs more often than those in Shanghai. It is found in the literature review that the teachers in Hong Kong used more kinds of MTSs than teachers in Shanghai. It is the difference between the findings of this study. According to this study, the types of strategies used by the teachers in the two regions are similar. The teachers in Shanghai used 10 types of MTSs, and the teachers in Hong Kong used 11 types of MTSs. We further found that teachers' choices of MTSs in Hong Kong are relatively average; the choices of MTSs by teachers in Shanghai are more concentrated. It can be observed that the students in Hong Kong are more engaged in their learning. They could develop reflective thinking, recognize the reading problems, and rectify them as their teachers modelled self-questioning frequently. Students' positive metacognitive learning behaviour and reading comprehension identified in this study echoes with the PISA report, which claimed that students in Shanghai and Hong Kong have a high performance in their learning achievements.

As Lo (2012) pointed out, education in Shanghai and Hong Kong presented a clear focus on

"helping students develop learning to learn skills that enable them to adapt to the new environment." Sum-cho et al. (2007) analysed that the teachers in Hong Kong always design, implement, and evaluate effective instructional strategies that can promote open, interactive, reflective, and critical learning in classroom teaching.

In Hong Kong, "Learning to Learn-The Way Forward in Curriculum Development" Education Reform was proposed in 2001, and the curriculum reform has updated to a new stage in 2017. The curriculum reform policy in Hong Kong keeps on consistent and continuous (Forlin, 2010). Self-regulated learning has been carried out for a long time. The teachers in Hong Kong have accumulated rich teaching experience to cultivate self-regulated learners. In Shanghai, the textbook of the Shanghai version has been replaced by the new textbook compiled by the Ministry of education of China, which represents the end of the second-round curriculum reform in Shanghai. Tao (2014) proposed that the second-round education reform has deeply rooted the "student-centred" concept in educators' minds. However, educational experts are still discussing the effectiveness of the second-round education reform. During this period, teaching strategies have not changed significantly (Guo, 2019). As mentioned above, implementing the new curriculum reform of "Key Competencies for Chinese students' development" in 2016 has become a core issue to develop students' self-regulated learning abilities (Cui & Shao, 2017). Teachers are willing to apply efficient teaching methods to cultivate self-managers, but these new teaching methods have not yet internalized the professional abilities they can freely use (Lin, 2019). Therefore, the teaching strategies used by

the teachers of Shanghai case school are not flexible and rich enough.

Hong Kong and Shanghai have different teacher training systems. Teacher training in Shanghai is an administrative arrangement. Teachers are under administrative pressure and have to attend the training courses provide by the education management department at the district level (Zhang et al., 2016). Some of the courses may not meet the needs of teachers' professional development in different schools, but they must participate in order to complete administrative tasks. Schools in Hong Kong often conduct training projects for in-service teachers to improve teaching quality. The school-based training focuses on providing teachers with expertise, instructional skills and professional approach to solve specific instructional problems faced by schools (Cheung & Yuen, 2016). In addition, teachers in Shanghai attend cooperative meetings to prepare their lessons, convey the spirit of the education documents, and divided the tasks assigned by the school teaching section. These activities are called "Jiaoyan" policy (教研製度) (Huang et al., 2016). Teachers rehearsal the lesson many times with their colleagues to polish every step of the teaching and achieve a "perfect lesson", which has the potential to neglect the students' real needs (Lin, 2019). In Hong Kong, lesson study or learning study serves as an effective platform for teachers to prepare the lessons and craft teaching strategies. They usually identify the critical feature of a lesson and organize these contents in a flexible way to promote student thinking. Teachers work together and discuss their lessons to develop their teaching pedagogy and cater to student diversities. Therefore, teachers in Hong Kong are more probably to adopt effective teaching strategies for enhancing students' learning.

5.2.3.2 The differences of specific MTSs used by the teachers in Shanghai and Hong Kong

From the perspective of specific strategies, the findings indicated that the teachers of Shanghai case school would like to use questioning and visualised strategies. In contrast, Hong Kong case school teachers are more likely to use self-directed and participated strategies. Chinese teaching in Shanghai is "content interpretation-orientated" (Li, 2006), which means teachers would like to pose questions to provide scaffolding and promote content interpretation. Qian (2012) declared that Chinese language teachers should understand students' learning experience and their learning process, guide them to achieve the meaning of the texts. Accordingly, participated teachers of Shanghai case school are more likely to ask a series of questions to help students understand better.

Moreover, Shan (2015) proposed that Chinese language teachers in Shanghai paid attention to text structure, the organization of information, and the logic of words. The teachers adopted visualised tools to help students explore the relationship between different words, sentences, and chapters during their reading (Xiao, 2008). Visualised tools can facilitate students to organize the information, develop their thoughts, structure the texts, and create new ideas. Hence, the teachers of Shanghai case school are prone to use different kinds of visualised tools to reveal the internal logic of the text.

According to the analysis of the one-way ANOVA, the usage of self-questioning of group A

teachers was statistically different from those of group C teachers. Hong Kong case school teachers used this strategy 9 times, while Shanghai teachers used it only 2 times. Mok et al. (2007) proposed that teachers in Hong Kong pay more attention to motivating students to reflect on their learning effectiveness by asking questions by themselves. Students can provide themselves with a solid internal orientation for solving questions by self-questioning. It is beneficial to detect errors, monitor strategy use, and make adjustments about learning (Kramarski & Zoldan, 2008). Although the teachers in the case school in Shanghai adopted many MTSs for shaping self-directed learners, influenced by the traditional teaching culture, teachers still need to offer students more opportunities for exploring the answer and reflection independently (Xiao, 2001).

Chinese teaching in Hong Kong is "ability cultivation-orientated" (Lau, 2013). The Secondary Education Curriculum Guide in Hong Kong says, "Chinese teaching should break the limitation of learning in the classroom and make students study in an all-around way. Teachers should improve students' self-regulated learning and lay the foundation for their lifelong learning (P17)". Therefore, the teachers of the case school in Hong Kong provided a learning guide to students to support their self-regulated learning before the lesson.

Furthermore, the curriculum guide required the teachers to give students rich and balanced Chinese learning activities to engage in listening, speaking, reading, writing, and language application. Teachers try to establish various learning modes to enhance students' reading

comprehension of the article. For example, teacher C-1 adopted role play and asked students to act according to the plot of the text to show the dialogue, body movements, and emotional expression of the characters. Participated teachers in Hong Kong also designed extended reading and facilitated students to apply the learned method to a new context. It is a purposeful and deliberate practice for teachers to use strategies to organize different reading activities. Such practice is helpful for students to master the key points of learning, use and practice the language, and master the reading skills. Therefore, with the impact of the curriculum guide, the Hong Kong case school teachers are more likely to use self-directed and participated strategies.

5.3 The factors promoting teachers' performance of MTSs

5.3.1 Curriculum standard

The Chinese curriculum standards in Shanghai and Hong Kong both focus on developing students' self-regulated and learning to learn abilities to cater to society's demand. Therefore, participated teachers in the two cities used MTSs to facilitate students to learn independently and think broadly and deeply. The finding was consistent with the study by Edmonds (2000), who declared that curriculum standards impacted teachers' perception of curriculum development and their implementation of that curriculum. As a document of OECD reported, the curriculum reform in Shanghai and Hong Kong reduces the focus on rote learning. It enhances the emphasis on deep understanding, the ability to applying knowledge, and the ability to think independently and creatively (OECD, 2011). It has been clearly stated in the Hong Kong curriculum guide that thinking abilities are the basis of language application. To

improve students' Chinese literacy, teachers must cultivate students' high-level thinking skills to analyse and solve problems by themselves and give full play to their imagination and creativity. The curriculum standard of Shanghai also puts forward the development of students' thinking. Teachers need to support students to boost their intuitive thinking, image thinking, logical thinking, critical thinking, and creativity, as well as improve thinking quality, such as profundity, agility, and flexibility through Chinese language learning (Cui & Shao, 2017). Therefore, in the lesson observation, the teachers in Shanghai and Hong Kong have the similarity of supporting students to summarise and refine their learning methods, cultivate students' critical thinking, and test their hypotheses. They tend to follow the course guidelines to help students plan learning methods, formulate strategies and monitor the effectiveness of the strategies to enhance their problem-solving abilities.

Furthermore, analysis of curriculum standards can be applied to explain the different behaviours of teachers in Shanghai and Hong Kong. The findings showed that the frequency for applying MTSs by the teachers of the case school in Hong Kong was higher than those applied by the teachers of Shanghai case school. The curriculum standard in Shanghai proposed that teachers should pay attention to nurture student self-management. However, it is still ambiguous what teaching methods can be applied to cultivate self-regulated learners. Shanghai's syllabus doesn't point out how teachers create learning experiences to achieve such goals. No specific strategies are proposed for teachers to carry out. The curriculum guide in Hong Kong provides various teaching strategies in combination with teaching objectives, such

as games, competitions, role play, group learning, discussion, and debate, etc. (CDC, 2017). Among them, the course guide mentioned the *modelling* strategy; in such, teachers should demonstrate to students about the reading methods to solve the problems in reading. Teachers can also design metacognitive questions to encourage students to reflect on their learning process efficiently. Students can get inspiration from teachers' questions, revise their views, change their learning strategies, and self-monitor their learning. Therefore, this study found that the frequency of applying MTSs by the participated teachers in Hong Kong was higher than that of Shanghai.

From the perspective of specific teaching stages, the teachers in Hong Kong use MTSs on average in each teaching stage. However, in Shanghai, teachers' use of MTSs in the latter two stages was lack**.** The curriculum guide in Hong Kong pointed out four curriculum contents in the Chinese language: listening, speaking, reading, and writing. It is found that the teachers in Hong Kong always integrated different contents in one lesson, such as reading and writing, or reading, speaking, and writing. This finding echoes the opinion of Sun (2009), who noticed that teachers designed multiple tasks to cultivate students' Chinese literacy with the guide of Curriculum standards. Therefore, in the stage of *Learning by doing*, teachers in Hong Kong promoted students to read and understand the text independently. In the stage of *Extended learning*, they enhanced students to argue/debate the ideas that appeared in the text or write a paragraph for knowledge application. As Ng (2015) further mentioned, curriculum reform in Hong Kong suggested teachers focus on every stage of teaching to promote students to think,

implement, revise, and evaluate their learning, rather than just let them remember the knowledge. Based on the above discussion, participated teachers in Hong Kong pay attention to every stage of metacognitive teaching. In terms of curriculum contents in Shanghai, as Sun (2009) mentioned, curriculum standard does not clearly explain the curriculum contents. Due to the lack of specific guidance of the curriculum standard, sometimes teachers might ignore applying the language in different fields. Teachers determine teaching content depending on textbooks, which may lead to an overfocus on the content analysis. Therefore, participated teachers in Shanghai used various MTSs in the stage of *Learning by doing* to promote content analysis but neglect the teaching stage of *Extend learning* and *Summary*.

5.3.2 Teacher's beliefs of metacognitive teaching

This study reveals that teachers have created a metacognitive instructional practice based on their beliefs of metacognitive teaching. Almost all group A and C teachers in the two regions are convinced of the benefits of metacognitive teaching to students' development of their thinking and learning habits. These beliefs mirrored teacher perceptions of the education reform, encompassing their creativity of teaching methods, catering to student needs, shifting their roles to learning facilitators (Gilakjani & Sabouri, 2017).

Effective teaching demands an apparent belief which guides Chinese language teachers' practice of their teaching pedagogy. The interview by group B and D teachers doesn't really think about the educational vision. Teacher D-2 said that it was unnecessary to adopt advanced

teaching methods to develop students' self-regulated ability because students' learning abilities were very poor. It wasn't easy to support their independent learning. Gregoire (2003) stated that teachers will not choose MTSs if they don't have these beliefs. Group A and C teachers believed students are capable of metacognition. Teacher A-2 observed how high achiever students learned and found the relationship between their good performance and metacognition, such as planning and monitoring the learning. She believed that MTSs could enable students to master effective learning methods. As Xu (2012) mentioned, teacher beliefs promote them to choose and modify their teaching methods appropriately.

Kuzhorska (2011) stressed that teacher beliefs greatly impact their roles and teaching climate. As teacher C-2 said, he tried to avoid didactic teaching and adopted creative teaching methods to nurture more self-regulated students. The findings derived an expectation by the teachers that they would like to transfer their role of lecturers to co-constructors of the knowledge with students. Teachers with metacognitive beliefs tended to create an environment where students could independently regulate their learning and explore and adjust their learning strategies. This is similar to the research of Nsengimana et al. (2020), who asserted that teachers might change the classroom climate as they believe that MTSs are necessary. The environments can enable students to develop the skills and confidence to become effective self-directed learners.

Beliefs play a critical role in teachers' classroom practices (Yook, 2010). From the interview with teachers A-1, A-2, C-1, and C-2, the teachers of Shanghai and Hong Kong case schools

believe their metacognitive instruction can promote students' development in their understanding of the texts. Metacognitive teaching took place in group A and C teachers than group B and D teachers. These findings echo the ideas of Lombaerts et al. (2009) that teachers' beliefs can influence their decisions making about their teaching behaviours. Teachers may improve their performance by refining their belief systems. As teacher A-2 shared, she was reluctant to try modelling before, but now she would like to use the new methods by demonstrating them to the students; she said, "now I am not afraid of making mistakes". Therefore, Teachers' beliefs influence their teaching behaviours, guide their decision-making and interactions with the learners. Beliefs facilitate teachers to form curricular decisions, lesson plans and identify MTSs that should be used in the classroom.

5.3.3 Teacher's knowledge of metacognitive teaching

Teachers' practices are driven by teachers' beliefs and their knowledge to carry out the teaching tasks. It is found that group A and C teachers were equipped with more metacognitive knowledge in the following three aspects: declarative knowledge, procedural knowledge, and conditional knowledge. This knowledge supported them to utilize metacognitive teaching to enhance students' reading comprehension. The finding is similar to the research findings by Dudley (2013). He conducted experimental research and found that teachers' knowledge can contribute to their teaching behaviour, and eventually promote students' gains in achievement. Hill et al. (2005) believed that teachers should equip comprehensive knowledge of metacognitive teaching to shape their practice. According to their study, mathematics teachers

should have declarative knowledge to mastery mathematics concepts and understanding what methods could be used to deliver the math's concepts. The Math teachers should pose procedural knowledge to describe mathematical procedures to student. They should have conditional knowledge to analyse the conditions in which students could apply the methods for problem-solving.

Regarding declarative knowledge, group A and C teachers can describe metacognition and articulate the strengths and weaknesses of teaching strategies they applied. This finding aligns with Tishman, Perkins, and Jay's (1995) study that teachers' knowledge and think skills drove their teaching practice in authentic classroom teaching. However, group B and D teachers can't fully elaborate on metacognition and the MTSs they adopted clearly.

Regarding procedural knowledge, group A and C teachers knew how to implement MTSs in Chinese language teaching. For example, teacher C-2 explained the steps of think-pair-share to the researcher. However, group B and D teachers didn't clearly understand how to conduct MTSs. For example, teacher B-1 asked students to think-pair-share, but she did not know the procedures of this strategy. This finding echoes the opinion of Patricia, Steven, & Karen (1998), who highlighted that teachers should prepare themselves with "how-to" knowledge to provide students with detailed guidance.

Metacognitive teaching requires declarative and procedural knowledge and conditional

knowledge, such as when and why to use MTSs in the curriculum. Loewenberg Ball et al. (2008) and James (2007) proposed that teachers should consider the learners' factors to choose appropriate strategies. The literature provided insights that MTSs should be used depending on the situation. Teachers' conditional knowledge supported teachers' use of MTSs properly (American ethnologistRegina et al., 2007). Shi and Zheng (2020) suggested that teachers should broaden the knowledge of different MTSs, and apply these teaching strategies to specific teaching contexts to promote students' understanding of the texts.

5.4 Conclusion

Under the background of new curriculum reform in Shanghai and Hong Kong, this study aims to investigate teachers' behaviours of metacognitive teaching in the two regions and what factors may contribute to teachers' performance of using MTSs. Besides, this study explored a metacognitive teaching framework for teaching Chinese language that may promote students' self-regulated learning.

According to the lesson observation and interview, MTSs that can benefit students' metacognitive learning process and their reading comprehension in Shanghai and Hong Kong, respectively, are identified in responding to the first research question. The frequency of MTSs used by group A teachers is significantly higher than those of group B teachers. Metacognitive questioning, visualised tools, think-aloud, and think-pare-share are the most frequently used MTSs for group A teachers. In terms of the four teaching stages in a Chinese language course,

group A teachers tended to use planning and learning guide in the *Introduction* stage. They used metacognitive questioning, think-pair-share and visualised tools in the stage of *Leaning by doing*. Metacognitive questioning was applied in the stage of *Extended Learning*, while self or peer assessment et al. were applied in the *Summary* stage.

In Hong Kong, the total number of MTSs by group C teachers is greater than group D teachers. And there is a significant difference between the frequency of metacognitive teaching strategies used by group C and D teachers. In terms of using each MTS, there is a significant difference between group C and D teachers in using self-questioning and self or peer assessment. The most commonly used MTSs for group C teachers are metacognitive questioning, self-questioning, modelling, self or peer assessment, learning guide, and think-pair-share. According to the four teaching stages, group C teachers tended to utilize learning guide and planning in the *Introduction* stage, metacognitive questioning, self-questioning, think-pair-share in the stage of *Learning by doing*, metacognitive questioning, self or peer assessment in the stage of *Extended Learning*, and self-questioning et al. in the *Summary* stage. However, group B and D teachers in the two regions would like to adopt many questioning strategies and content interpretation.

In responding to the second research question, the differences of MTSs used by group A and group C teachers were analysed. From a holistic perspective, the frequency of applying MTSs of the teachers from the Hong Kong case school is significantly higher than those of the

teachers from the Shanghai case school. The ANOVA reported a statistically significant difference in using self-questioning between group A teachers in Shanghai and C teachers in Hong Kong. The types of strategies used by teachers in the two regions are similar, the teachers of the Shanghai case school used 10 types of MTSs, and the teachers of the Hong Kong case school used 11 types of MTSs. We further found that teachers' choices of MTSs from the Hong Kong case school are relatively average. The choices of MTSs by the teachers of Shanghai case school are more concentrated. From the perspective of specific strategies, the teachers of the Shanghai case school would like to use the strategies in terms of questioning and visualised thinking, such as metacognitive questioning, visualizing- tools, and think-aloud. The Hong Kong case school teachers would like to use the strategies in terms of self-direction and participative activities, such as learning guides, self-questioning, and think-pair-share. From the perspective of specific teaching stages, participated teachers in Hong Kong organized the metacognitive activities carefully in each teaching stage. However, in Shanghai, participated teachers were more focused on the stage of *Learning by doing*. They often neglected the stages of *Extended Learning* and *Summary*.

The similarities of MTSs used by the teachers of Shanghai and Hong Kong case schools were analysed. First, teachers in Shanghai and Hong Kong would like to use metacognitive questioning, think-pair-share, and self or peer assessment. Second, participating teachers in Shanghai and Hong Kong supported students to extract, improve, and apply the learning methods for solving learning problems. Moreover, they both focused on facilitating students to

revise their learning, think critically, and justify their hypotheses. Third, it should be noticed that participated teachers in Shanghai and Hong Kong often provided emotional support to motivate students to engage in learning.

This study identifies that the choice of MTS for enhancing student learning outcomes is depended on different teaching stages of a lesson and the student metacognitive learning progression. The MT framework includes four stages: introduction, learning by doing, extended learning, and summary. This systematic framework corresponds to various stages of the metacognitive learning process of planning, implementation, refinement, and consolidation. The introduction refers to promoting students to make a learning plan, and students participate in the lesson with their learning problems and expectations. Learning by doing means students should be guided to select strategies in learning activities and monitor their learning process to understand what they read. Extended learning means revising their knowledge application, adjusting the strategies properly, and regulating their efforts to reinforce learning. Summary means teachers support students to evaluate their learning outcomes and conclude what they learned.

In responding to the third research question, three influencing factors were investigated. The first factor identified by this study is curriculum standards. The Chinese curriculum standards in Shanghai and Hong Kong both emphasize developing students' self-regulated abilities and learning to learn skills. The curriculum standard in Shanghai didn't provide specific teaching

advice on how to teach. In contrast, the curriculum guide in Hong Kong provides sufficient teaching strategies to teachers for nurturing students' self-management efficiently. The curriculum guide also promotes teachers to take advantage of different kinds of activities, such as think-pair-share, competitions, role play, discussion, or debate, etc. The second factor is teachers' beliefs of metacognitive teaching. This study reveals that teachers' beliefs of metacognitive teaching influenced their instructional practice in Shanghai and Hong Kong. These beliefs mirrored teacher perceptions of the education reform, including adopting metacognitive teaching methods, catering to students' needs, shifting their roles from lecturer to facilitator of student learning. The third factor is teachers' knowledge of metacognitive teaching. Teaching practice is driven by their knowledge of metacognitive teaching, including declarative knowledge, procedural knowledge, and conditional knowledge. Such knowledge supported them to utilize metacognitive teaching. Students can be helped self-regulate their learning process to enhance their reading comprehension.

5.5 Implication and limitations of this study

5.5.1 Implication

This study shed light on teaching practice for Chinese language teachers. It is recommended that Chinese language teachers could use MTSs to help students with self-directed learning. Teachers should devote substantial instruction time to develop students' reflective thinking and encourage them to monitor their learning process. MTSs should be adopted flexibly so that students can understand what and how they should do it. Teachers could guide students to select,

reflect, and craft strategies put forward questions, monitor the problem-solving process, and eventually solve the problems. What should also be paying attention to is that studying teaching strategies of the form is not sufficient; teachers should apply MTSs to make learners engaged and learn effectively. Emotional support and well-organized activities could contribute to motivating students' engagement in metacognitive learning.

An MTSs framework is proposed with four teaching stages: introduction, learning by doing, extended learning, and summary. This framework can nurture students to plan, monitor, reflect and evaluate in learning. Through lesson observation, the researcher found that teachers can use the MTSs framework to promote students to regulate their learning process and increase their reading comprehension. This practical framework could be used as an instructional guide for Chinese language teachers and applied to many Chinese-speaking areas. Furthermore, the MTSs framework could also provide important directions for educators to evaluate Chinese language courses.

Although the curriculum standards demand teachers cultivate students' self-regulated learning ability to adapt to the changing society, it does not mean that teachers can implement teaching strategies conducive to students' self-regulated development in subject learning. Teachers in Shanghai lack the advice and guidance on teaching strategies. More often, many teachers also use quite traditional teaching methods they are familiar with. This study indicated that teachers in Hong Kong used more metacognitive strategies because the curriculum guide for the Chinese

language in Hong Kong put forward clear suggestions on teaching strategies. Therefore, this study suggests that teaching strategies should be taken as the direction of curriculum development, and practical and optional MTSs should be included in the curriculum standard. In this way, teachers can be more aware of how to teach to improve students' learning to learn abilities.

This study can inspire educators to upgrade the curriculum evaluation system. Previously, the evaluation of teaching mainly focused on the teaching strategies of the cognitive level. Teachers evaluated whether they can use strategies to encourage students to remember, discover, understand, master, or analyse. This teaching belongs to the cognitive level. This study finds that teachers also need to cultivate students' metacognitive abilities and use MTSs to develop students' planning, monitoring, and evaluation. Therefore, the dimension of the instructional evaluation system should include metacognitive teaching. Education Bureau may assess teaching from a metacognitive perspective. Accordingly, traditional classroom evaluation that oriented cognitive strategy should be improved to promote teachers to adopt MTSs.

The findings of this study provide valuable references for teacher professional development. Education Bureaus or schools should design training projects to develop teachers' beliefs and enrich their knowledge to enhance teachers' metacognitive teaching skills. It is found that teachers' behaviours of using MTSs are influenced by their beliefs and knowledge of metacognitive teaching. Such behaviours remind us those teacher educators or school leaders

should provide opportunities for teachers to construct a shared vision of metacognitive teaching and develop their knowledge about MTSs. Training courses should be provided to the teachers by incorporating their beliefs and knowledge into the course content.

In short, this study could provide valuable references for Education Bureaus and schools for professional teacher training, shed light on updating teacher instructional pedagogy, and contribute to the continuous development of curriculum reform from a metacognitive teaching perspective. The MT framework represents common features of Chinese language instruction and can be refined to adapt to schools in a different context.

5.5.2 Limitations

Due to the limitation of research time, this study selected four schools and eight teachers to participate in this research. Therefore, the findings may not represent the overall picture of teachers' metacognitive teaching behaviours in Hong Kong and Shanghai. It is known that many factors might affect teachers' instructional behaviours, such as teaching materials, student factors, and so on. This study tries to avoid students' differences by selecting samples with similar initial scores. It is an objective fact that the text cannot be completely unified. The researcher coordinated the teachers in Shanghai and Hong Kong to use the same texts in some lessons. Furthermore, this study aims to examine teachers' use of MTSs to provide suggestions for the improvement of instructional pedagogy and their teaching behaviours. Therefore, different teaching materials are considered to be an unimportant factor for influencing teachers'

performance and are not discussed in this study.

This study investigated effective MTSs in Shanghai and Hong Kong and discussed the similarities and differences of using MTSs from a holistic perspective, specific MTS perspective, MTSs in the teaching stages, and comparing with cognitive teaching strategies. A potential limitation is that this study didn't analyse MTSs by categorizing them. The standard of categorizing MTSs, especially in the Chinese language context, can be explored in further research.

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Appendices

Appendix 1

Checklist of assessing metacognitive awareness for teachers

(For identifying the sample)

1= strongly disagree, 2= Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Teacher metacognitive experiences	I always worry about students feel tedious in my classroom.	1 2 3 4 5
	I am worried that I can't control the pace of classroom teaching well.	1 2 3 4 5
	When my classroom teaching fails, I always feel anxious.	1 2 3 4 5
	When I successfully complete the classroom teaching task, I feel very relaxing.	1 2 3 4 5
	When I make a satisfactory teaching program, I feel unquenchable excited.	1 2 3 4 5
Metacognitive knowledge about self	I know well about the concepts, principles, and methods of the subject I teach.	1 2 3 4 5
	I can quickly adjust my condition before I begin the lesson.	1 2 3 4 5
	I know very well about why I have some certain advantages in teaching.	1 2 3 4 5
	I am well aware of my strengths in teaching.	1 2 3 4 5
	I am well aware of my weaknesses in teaching.	1 2 3 4 5
Teacher metacognitive planning/ monitoring/ reflection	I always set a specific teaching goal for each lesson.	1 2 3 4 5
	I prepare for the unexpected situations that may arise in the classroom.	1 2 3 4 5
	I pay attention to the changes of my emotion in class.	1 2 3 4 5
	I check regularly to what extent students comprehend the content while I am teaching.	1 2 3 4 5
	I re-evaluate the appropriateness of my teaching goals after each lesson.	1 2 3 4 5
	I reflect on whether my teaching performance is proper after each lesson.	1 2 3 4 5

(Jiang, Ma, & Gao, 2016)

Appendix 2

Reading Comprehension Test

不可或缺的城市風景——斑馬線

班級：　　姓名：

①說起斑馬線，我們最熟悉的，由多條相互平行的白實線組成的人行橫道線，因kùsi斑馬身上的條紋而被稱為斑馬線。

②斑馬線的起源可以追溯到古羅馬時期的「跳石」（見右圖）。當時四輪馬車與行人混行引發了許多道路堵塞和交通事故。於是，人們在馬路上砌起凸出路面的「跳石」，行人可以踩著它們穿越馬路。「跳石」成為一種指示行人過街的標識，這就是斑馬線的祖先。1951年10月31日，世界上第一條斑馬線在英國誕生。

③最有名的斑馬線也在英國。1969 年，著名的披頭士樂隊發行了最後一張唱片——《艾比路》，該唱片的封面為四位歌手走在倫敦艾比路的一條斑馬線上。2012 年，艾比路斑馬線被英國政府提升到文物地位，成為倫敦的文化地標。

④斑馬線像是攔腰搭在道路上的白色飄帶，看似簡單樸素，卻不是隨意畫出來的。按照設置規範，斑馬線最小寬度為3米，可以根據行人流量以1米為一級予以加寬，行人越多的地方斑馬線越寬。構成斑馬線的白色平行粗實線的線寬為40～45釐米，兩條平行粗實線之間的距離為60～80釐米。在什麼情況下需要設置斑馬線呢？一是未設置人行過街設施的路口，二是行人橫過道路較為集中的路段。

⑤作為城市交通生態中的一個重要標識，斑馬線在指引車輛和行人有序通行、保護行人安全方面具有重要的作用。在漫漫車流中，法律賦予了斑馬線上行人優先的路權，機動車臨近時須減速避讓，遇到行人正在通過時還應停車讓行。斑馬線作用的發揮，需要機動車尊重行人的路權，也需要行人珍惜自己的權利，兩者缺一不可。

⑥然而，現狀並不令人樂觀。由於機動車和行人互爭斑馬線，致使斑馬線成為交通事故的多發地。據統計，我國近三年發生在斑馬線上的交通事故多達1.4萬起，致死人數高達3898人。機動車未按規定讓行，行人在斑馬線上「散步」等是導致事故的主要原因。

⑦現在，為了提高斑馬線的醒目程度，更好地發揮其作用，有的城市在斑馬線色彩搭配和視覺效果等方面進行了大膽嘗試，如彩色斑馬線、3D立體斑馬線等。隨著手機的普及，「低頭族」看手機過馬路成為新的安全隱患，為此有的城市推出了閃燈斑馬線——在斑馬線上安裝多條醒目的燈帶，斑馬線在燈帶的映照下與路口的信號燈同步變換

顏色，為「低頭族」過馬路提供有效的警示。

⑧斑馬線是城市中一道不可或缺的風景。唯有守法守序，才是對這道風景的最好守護——這，需要每一個人的努力。

1. 解釋詞語含義。（2分）

「低頭族」是指_____

2. 下列對第④段內容的理解，正確的一項是（　　）。（3分）

A. 斑馬線的寬度根據規範不應超過4米。

B. 構成斑馬線的白色粗實線須平行排列。

C. 斑馬線的寬度與人流量無關。

D. 所有的路口都應設置斑馬線。

3. 依據文本內容，摘錄相關資訊並作概括，完成下表。（8分）

資訊摘錄	資訊概括
(1)_____是斑馬線的祖先	斑馬線的起源
1951年，世界上第一條斑馬線在英國誕生，這條斑馬線是(2)_____	斑馬線之「最」
斑馬線可以指引車輛和行人有序通行，(3)_____	(4) _____

4. 第⑥段畫線句運用了列數字的說明方法，作用是_____。（3分）

5. 文中提到，有的城市對斑馬線設置進行了大膽嘗試，你是否認同？請結合文本內容簡述理由。（4分）

酸 橙

①金華的親戚送了我家一麻袋的柳丁。橙甜，汁液淌嘴角。吃了橙，手也捨不得馬上洗，用舌頭舔一遍，把橙汁舔乾淨。村裡沒有人種橙。父親說，這個橙好吃，下次來你帶兩棵橙苗來。

②第二年，我家後院的空地上種上了橙苗。

③又三年。柳丁樹高過了瓦屋，開了花。樹冠傘形，圓圓的，撐開的傘一樣。柳丁花白白的，五片花瓣，中間黃色的花芯。滿樹的花，綠葉白花披在樹上。我每天早上，起床第一件事，便是去看柳丁花。花開時節，正是雨季，雨滴滴答答，也不停歇。每下一次暴雨，花落一地，樹下白白的一片。雨季結束，花也謝完了。花凋謝了，青色的黃豆大的柳丁，結了出來。

④柳丁的皮還沒發黃，青藍青藍，但個頭已經塞滿一隻手掌心了。我便跑去摘柳丁吃，用刀切開，掰開肉瓤，黃白色，汁液飽脹。我塞進嘴巴，又馬上吐出來，眯起眼

睛，渾身哆嗦。母親笑了起來，是不是很酸啊。我說，牙齒都酸痛了，沒見過比它更酸的東西，比醋還酸。母親說，沒熟透的果子都酸不溜秋的，等皮黃熟透了，酸就變成甜了。

⑤皮黃了，和油菜花一樣黃得澄明純粹，可柳丁還是酸得牙齒漂浮。我對這棵柳丁樹再也指望不上了。可父親不死心，說，還是霜降呢，冬至以後肯定甜蜜蜜，野柿子也是冬至後甜蜜蜜的。過了冬至，剝柳丁吃，還是酸。

⑥金華的親戚又來了，我們這才知道原來是他給錯了樹苗。我們全家徹底死心了。柳丁吊在樹上，再也無人問津。

⑦柳丁熟了，唯一吃它的，是鳥。鳥啄食的柳丁會腐爛，掉下來。沒有啄食的柳丁，不落地，還吊在枝椏上，第二年又返青。

⑧過了幾年，橘子樹蓬蓬勃勃，樹冠有一個稻草垛那麼大。看著滿樹的花，我大哥不免歎氣，說，這棵橘子樹，像一個漂亮的女人卻生怪胎。我書讀不好，母親以柳丁樹作例子，教育我：「你看看這棵柳丁樹，好看，結的柳丁卻難吃，是沒用的。做人也一樣，肚子裡要有貨」。

⑨有一次，我表哥來，他是鎮裡有名的廚師，看著樹上黃澄澄的柳丁說：「酸橙？這可是個好東西！燒魚，用半個柳丁，放點鹽煮，比什麼都鮮，什麼佐料也不用放。做酸湯也好，不用醋不用酸菜，是做酸湯最好的料了。」我母親說，哪有用酸柳丁燒菜的。表哥掌勺，燒了魚，燒了酸湯。我母親吃了，說，確是好味道，一個酸橙，燒出兩個好菜。

⑩鄰居知道了酸橙可燒鮮魚，燒酸湯，家裡做喜事，提一個籃子來，向我母親要十幾個酸橙。提籃裡，還拎十幾個雞蛋來。我母親怎麼也不收，說，以前覺得沒用，現在可以提鮮，算是沒白白種了它。

⑪後來，我父親患了一種病，就是打嗝，怎麼也控制不住。一次，有客人來，見我父親不停打嗝，說，你這個病是不是好幾年了。父親說，是啊，大小醫院看了十幾家，沒結果。客人是個醫生，他說，有一樣東西，可以斷病根，只是很難找。父親說，打嗝太難受了，難找也要找。客人說，用酸橙泡水喝，喝三個月，便好了。我父親把他拉到後院，客人滿臉驚喜：「這就是酸橙，熟後不落蒂，四季有鮮果。」

⑫有一年，村裡來了一個收木料的人，對我父親說，這棵樹要不要賣呢？我出好價錢。父親說，收它幹啥？收木料的人說，酸橙木打木床，比任何木頭都好，蚊子不入屋。我父親說，錢再多，也會用完，樹卻年年開花，是錢換不來的。

6. 第③段畫線句運用了_____的修辭方法，其表達效果是_____。（3分）

7. 下列對⑨—⑫段內容的理解，正確的一項是（　　）。（3分）

A. 表哥知道“我”家有酸橙，專程來燒酸魚湯。

B. 母親現在覺得酸橙有用，捨不得和鄰居交換。

C. 從醫生的話可以看出，酸橙並不是多見之物。

D. 父親為給自己做床，不願意高價賣掉酸橙樹。

8. 種上橙苗後，「我們全家」對橙的情感變化過程是，從_____到_____再到驚喜。（4分）

9. 文章寫的是酸橙，卻從吃甜橙寫起，目的是：(1)_____；(2)_____。（4分）

10. 文章借酸橙表達了深刻的思想，請寫出兩點。（6分）

_____

答案：

不可或缺的城市風景——斑馬線

1（2分）低頭族 是指總是低頭看手機，不注意行路的人。
2.（3分）B
3.（8分）古羅馬時期的「跳石」（2分） 最有名的斑馬線是（英國倫敦）艾比路斑馬線（2分） 保護行人安全（2分）斑馬線的作用（2分）
4.（3分）具體說明近三年來，我國發生在斑馬線上的交通事故之多，後果之嚴重（2分），強調了重視斑馬線作用的重要性（1分）。
5.（4分）評分說明：態度正確，結合文本內容（2分），理由恰當（2分）。 【答案示例1】認同。這些大膽嘗試增強了視覺效果，使斑馬線更醒目，讓行人和車輛能更清楚地注意到斑馬線，尤其是為「低頭族」提供了有效的警示，能更好地發揮斑馬線的作用。感謝關注“沈姐的語文課堂”微信公眾號！
【答案示例2】不認同。斑馬線有嚴格的設置規範，對其顏色、寬度、間距等都有明確的規定，隨意改變既不符合設置規範，也有可能對路人的視覺造成干擾，不利於發揮斑馬線的作用。

酸 橙

6.（3分）比喻（1分），形象生動地寫出了樹冠圓圓的形態，表達了「我」對柳丁樹的喜愛（2分）
7.（3分）C
8.（4分）期待（2分） 絕望（2分）
9.（4分）寫出了柳丁的甜，與後文酸橙的酸形成強烈的反差。 引出下文種橙苗的內容，交代了酸橙的來由。
10.（6分）評分說明：從人對事物價值認識的角度作答。答對一個要點給3分，答對兩個給6分。 要點：有些看似“無用”的東西，卻有特別珍貴的價值。發現一個事物的價值要經歷一定的過程。要善於從多角度去認識一個事物的價值。凡物皆有價值，不要輕易否定。

Appendix 3

Teacher Metacognition Inventory (TMI)

1= Strongly Disagree, 2= Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

1.	I should engage students in reading activities to promote them to plan, monitor and evaluate their learning process.	1	2	3	4	5
2.	Students can be more self-regulated if I adopted metacognitive teaching strategies in lessons.	1	2	3	4	5
3.	I believe it is more important to deliver metacognitive teaching to cultivate an independent learner than deliver didactic and directive teaching.	1	2	3	4	5
4.	I believe that metacognitive teaching can somehow promote students to understand the text.	1	2	3	4	5
5.	I understand well the teaching task.	1	2	3	4	5
6	I can explain what is metacognition.	1	2	3	4	5
7.	I know different metacognitive teaching strategies.	1	2	3	4	5
8.	I know the strength and weakness of each strategy.	1	2	3	4	5
9.	I have a clear overview of what MTSs are related to.	1	2	3	4	5
10.	I know how to use metacognitive teaching strategies for Chinese language instruction.	1	2	3	4	5
11.	I can describe the teaching strategies.	1	2	3	4	5
12.	I know if the teaching strategies are appropriate.	1	2	3	4	5
13.	I know why to use teaching strategies to solve problems.	1	2	3	4	5
14.	I am clear about when to use each teaching technique.	1	2	3	4	5
15.	I know when to use teaching strategies to solve problems.	1	2	3	4	5
16.	I adopt different teaching strategies depending on the situation.	1	2	3	4	5

(Zohar & Schwartzer, 2005; Balcikanli, Cem, 2011)

A. Teacher beliefs of metacognitive teaching	
I should facilitate students to plan, monitor and evaluate their reading process.	I believe it is more important to deliver metacognitive teaching to cultivate an independent learner than deliver didactic and directive teaching.
Students can be more self-regulated if I adopted metacognitive teaching strategies in lessons.	I believe metacognitive teaching strategies can somehow enhance students' reading comprehension.

B. Teacher knowledge of metacognitive teaching		
B-1. Declarative Knowledge	**B-2. Procedural Knowledge**	**B-3. Conditional Knowledge**
I understand well the teaching task.	I have a clear overview of what MTSs are related to.	I know why to use teaching strategies to solve problems.
I can explain what is metacognition.	I know how to use metacognitive teaching strategies for Chinese language instruction.	I am clear about when to use each teaching technique.
I know different metacognitive teaching strategies.	I can describe the metacognitive teaching strategies.	I know when to use teaching strategies to solve problems.
I know the strength and weakness of each strategy.	I know if the teaching strategies are appropriate.	I adopt various teaching strategies depending on students' needs.