

Self-regulation and Chinese character learning strategies in Irish Higher Education

Ph.D. Thesis

Ning Jiang

University of Dublin, Trinity College
School of Linguistic, Speech and Communication Sciences
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Declaration

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Abstract

Chinese language studies have been recently growing in English-speaking nations at a rapid speed, indicating the possible emergence of a boom period of Chinese language learning around the globe. However, despite this surge of Chinese language education, Chinese is still described as one of the most difficult languages to acquire. In the research field of Chinese language learning as a foreign language, few studies have investigated how learners overcome the barriers to acquiring this difficult language and its unfamiliar writing system. Therefore, there remains a severe lack of research on this aspect, especially with regard to Irish students.

This study was conducted to explore alphabet-based learners' language learning strategies and self-regulatory learning in the context of Irish higher education with a mixed methods approach, combining a longitudinal case study of 8 participants over one academic year and a national survey of 115 Chinese language learners in all Irish Higher Education institutions which teach Chinese.

By doing so, this study explored alphabet-based learners' language learning strategies and self-regulatory learning in the context of Irish higher education, among students engaged in the process of Chinese characters acquisition. Furthermore, this study discussed which strategies positively affect students' language learning outcomes in terms of their Chinese character acquisition. Finally, other factors that may affect learners' strategy use to learn Chinese characters and control self-regulation were also discussed in the case study.

As a result, this study firstly approaches the issue of language learning strategies and self-regulatory learning during Chinese character acquisition in Irish higher education. In addition, this study makes a significant contribution to theory-building in the area of language learning strategies through an

application of new concepts to the, as yet, unexplored area of the learning of character-based Chinese writing systems by students from an alphabetic writing system background. In addition, this study explores the application of a mixed research methods in the field of Chinese character acquisition and provides a structured research design for future studies.

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Chapter 1: Introduction

1.1 Chinese characters

Chinese characters are also described as ‘Hanzi’, following the pronunciation of the term used to describe Chinese characters in Chinese (汉字 hàn zì, Chinese characters). Emerging from oracle bone scripts of about 3,000 years ago, Hanzi have evolved four times in history in its shape from bronze inscription, seal script, clerical script to regular script (Huang & Liao, 2002). The development of Chinese characters’ shape can be seen by the example of the characters 和平 (hé píng, peace) in the following table.

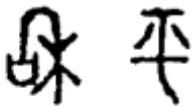
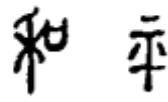
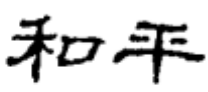
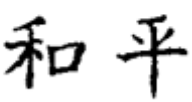
Evolution of script	Character example
Oracle bone script (approx. from the late 2nd millennium BCE)	
Bronze inscription (approx. from the 1300s BCE)	
Seal script (approx. from the 1st millennium BCE)	
Clerical script (approx. from 221 BCE)	
Regular script (approx. from 200 CE)	

Table 1.1: Evolving shapes of the Chinese characters for ‘peace’

Chinese characters are generally described as logograms, combinations of grapheme, pronunciation and meaning. Whilst many of the world’s languages are written in alphabets or syllabaries, the ideograms of Chinese writing system

convey not only pronunciation, but ideas and objects in the form of picture symbols.

From the Han Dynasty (from 206 BCE), scholars classified six different groups of Chinese characters based on the manner in which the characters were formed. These six categories included pictographs (象形, xiàng xíng), ideographic (指事, zhǐ shì), ideographs (会意, huì yì), phonosemantic (形声, xíng shēng), derivative (转注, zhuǎn zhù), and phonetic lone characters (假借, jiǎ jiè) in Shuowen Jiezi, which is earliest dictionary ordered Chinese characters by radicals. As the two latter categories are agreed to address the manner of using characters rather than their creation, the other four character types can be understood as follows:

- *Pictograph*, which describe the shapes of the object they represent
- *Ideographic*, which represent meanings by using symbolic signs or adding symbolic signs to pictographs
- *Ideograph*, which synthesise two or more characters (or components) into one. The meaning is the combination of these characters.
- *Phonosemantic*, which synthesise a character (described as component) with approximately the correct pronunciation (described as the phonetic complement) and one of a limited number of characters that indicates the meaning (the semantic element). This fourth type forms over 80% of Chinese characters (Feng, 1999).

The following table demonstrates these four categories of Chinese characters, with an example of each:

Chinese character type	Chinese characters	Meaning	Explanation
Pictograph	木	A tree, wood	Stylized representation of a tree
Ideographic	本	Root	A tree (木) with the base indicated by an extra stroke
Ideograph	森	Forest	Composed of three trees (木)
Phonosemantic	沐	To wash oneself	Composed of a semantic part 氵 (water) and a phonetic part 木 (mù)

Table 1.2: Examples of different kinds of Chinese characters

Chinese is widely described to be one of the most challenging languages to learn, and even for students from Chinese-speaking cultures, Chinese character acquisition is thought to be the most difficult part of Chinese learning (Wu, 2012). Learners' difficulties in Chinese characters acquisition have been highlighted by a number of studies. Based on an investigation of 10 Chinese teachers and 34 first-year undergraduates in the United States, Samimy and Lee (1997) reported that most of these participants listed writing and reading as the hardest part during the Chinese learning. In Huang's research (2000) on Chinese intermediate learners whose age were between 18 to 28, writing was also pointed out as one of the hardest skills during the process of Chinese acquisition. By using a study conducted during the language training programme for State Department employees (Jackson and Malone, 2010), Everson suggested that learners of Chinese languages spent three times longer to acquire than those who learned European languages. Everson (2011, p. 251) stressed that the character-based writing system "presents special challenges for learners whose first language employs the Roman alphabet", thus indicating that the Chinese writing system to be the main barrier for learners to acquire Chinese as a foreign language.

From the perspective of Chinese writing system, the reasons of these challenges can be presented from two aspects. Firstly, for speakers of Indo-European languages, Chinese represents a complex and unfamiliar writing system which contain both semantic and phonological information. As a result, for decoding

Chinese orthography, learners need to become familiar with a wide number of subcomponents (mainly, semantic and phonetic radicals). There is no direct correspondence between a character and its pronunciation or meaning. A large number of homophones in Chinese (Wong et al. 2010) increase the difficulty to identify characters. Secondly, memorization of thousands of characters is necessary to be functionally literate in the language. When learners first encounter Chinese characters, they usually perceive these characters as novel pictorial representations of meaning without any rules.

1.2 Rationale

Chinese language teaching around the world is a relatively new phenomenon when compared to the traditional practice of teaching European languages. Despite its recent entry into language study options, Chinese language education around the world has boomed from the start of the 21st century, due to the growing economic strength of China and an increase in tourism from China around the world (Ping Fang, 2009).

According to the Chinese Hanban/Confucius Institute Headquarters, over 3,000 universities in more than 100 countries have Chinese classes. In 2009, the number of foreign Chinese learners exceeded 40,000,000 (Chinese Hanban/Confucius Institute Headquarters, cited by Ping Fang, 2009). In 2017, the Chinese Hanban/Confucius Institute Headquarters reported that over 6,500,000 learners took part in the various Chinese tests offered to students around the globe (Chinese Hanban/Confucius Institute Headquarters, 2017).

Compared to many Indo-European languages, Chinese represents an unfamiliar writing system, with characters combining graphemes, pronunciation and meaning within single units. As a result, the information held in this semantic-phonetic system is more complicated than alphabetic writing systems (Qian,

1990), and the memorization of thousands of characters is necessary to be functionally literate in the language. When many learners first encounter Chinese characters, they usually perceive these characters as novel pictorial representations of meaning without any rules. Even for students from Chinese-speaking cultures, Chinese character acquisition is thought to be the most difficult part of Chinese learning (Wu, 2012).

However, due to the short period of time (some six decades) since the establishment of the Chinese official language of modern Mandarin, and the even shorter time since the political opening of China, research on Teaching Chinese as a Foreign Language (TCFL) is scarce. Compared to the traditional practice of European languages, TCFL is a relatively new area in second language acquisition studies, and one in need of further investigation.

Therefore, although research on Chinese characters learning is becoming a field that is increasingly relevant, it remains a topic that few have yet ventured into. Moreover, among the limited existing studies, researchers have mainly focused on an analysis of Chinese characters and the teaching strategies employed. The learner perspective has been generally ignored. Furthermore, to date there has been no specific research on the strategies of Irish learners, or comparative studies among English-speaking Chinese learners.

1.3 Aims

The aims of this study are to gain both a detailed and comprehensive understanding of language learning strategies in the context of self-regulated learning, among students engaged in the process of Chinese characters acquisition. This study will describe, analyse and evaluate the learning strategies of Irish university learners in different stages of Chinese studies, alongside a corresponding comparison with learners from other countries. It is hoped that this

study will make a significant contribution to theory-building in the area of language learning strategies through an application of new concepts to the, as yet, unexplored area of the learning of character-based Chinese writing systems by students from an alphabetic writing system background.

1.4 Overview of the thesis

Following this introduction, the next chapter provides a review of the key literature on and the theoretical development of learning strategies, including the shift to self-regulatory learning and a focus on language learning. This chapter explores some of the significant research into learning strategies of other languages (especially English), as well as substantial research into Chinese character learning in general. In light of the fact that there exists little to no research examining Chinese characters learning strategies in the Irish university learning environments, the chapter also addresses the existence of an information barrier between researchers working within China and scholars in the international academic world. In other words, researchers in China and those elsewhere in this field seem to work separately, rarely acknowledging each other's findings. This lack of cross-over between Chinese-language publications and English-language publications seems to have caused two separate research domains to exist.

Chapter 3 then examines the methodological considerations of the study and presents the approach deployed to respond to the project's research questions. This chapter provides an outline of the research questions, followed by a brief discussion of the methodological considerations. The data collection procedures and analytical tools used in the current study are also discussed. The implementation of the empirical study reported in this thesis occurred in two distinct two phases. In the first phase, learning strategies used by Irish students in the process of Chinese character acquisition were investigated through a

longitudinal case study of eight learners, using the following data collection instruments: semi-structured learner interviews; stimulated recall; eye-tracking; questionnaires. The second phase of the study involved a survey distributed to large sample population targeting all undergraduate students in Ireland enrolled in Chinese courses as part of their Bachelor degree.

Chapter 4 presents and discusses the Phase 1 results of the longitudinal case study in terms of the *strategic learning of Chinese characters*, with data collected via interviews, stimulated recall sessions, eye-tracking sessions and questionnaires. Chapter 5 continues to present and discuss results from Phase 1 collected from the longitudinal case study, in terms of the *self-regulation of Chinese character learning* through motivation control strategies.

Chapter 6 presents the data and findings of Phase 2 of the project, the large-scale survey population administered to a sample drawn from Chinese language learners in Irish universities. It addresses the strategic learning of Chinese characters and learners' self-regulatory capability.

Chapter 7 serves as the discussing and concluding chapter of this thesis. Firstly, the findings of this study will be discussed through responding to the project's the research questions. Following this, the contribution and limitations of this study will be presented. Finally, some future directions for research based on the findings of this study will be proposed.

Chapter 2: Literature Review

2.1 Introduction

This chapter commences with an introduction to the learning strategies and self-regulation in a broader context of psychology. It then goes on to review relevant literature on the theoretical development of learning strategies, language learning strategies and self-regulatory learning. The last section of the chapter focuses on the recent literature regarding learning strategies in the specific context of Chinese character learning.

2.2 Learning strategies

This section will present the theoretical development of learning strategies, within a context of self-regulation. To do so, the early research of learning strategies and the theoretical understanding of self-regulation will be presented in section 2.2.1 and 2.2.2 respectively. Then the connection between learning strategies and self-regulation will be discussed in section 2.2.3.

2.2.1 Early research of learning strategies

Learning strategies are not a new concept, most likely used for thousands of years. It is said that, during the Celtic period in Europe, storytellers spent twelve years to become fully trained in their art. In the first two years, during which time they memorised 250 stories, the storytellers used mnemonic tools to help them remember the narratives (Samida, 2012). In China, Confucius also explored various learning approaches and strategies, recorded in the Analects of Confucius.

The modern research of learning strategies started in the middle of the last century “in the context of human information processing theory, rooted in strictly theoretical conceptions of information processing” (Pressley & Harris, 2009).

Lewis and Pask (1964), for example, proved the existence of learning strategies in “perceptual motor learning under adaptively controlled conditions” (Pask, 1988).

With the development of research into learning strategies, various early understandings and concepts emerged regarding the learning strategies were put forward within the framework of cognitive psychology. In other words, early researchers believed that learning strategies were cognitive approaches or skills during the process of encoding, storing, searching and using information and solving problems. For example, Rigney pointed out that cognitive strategies used in learning activities by students “facilitate the acquisition, retention, and retrieval of information” (1978, p. 165). Furthermore, Mayer (1988, p.11) defined learning strategies as “the behaviours of a learner that are intended to influence how the learner processes information”. These behaviours were explained by examples as “underlining of key ideas in a passage, outlining of the ideas in a lecture, or trying to put some newly learned information into one's own words” (Mayer, 1988, p. 11), which put a focus on using particular skills in processing information during dealing with learning tasks.

In the meantime, the notion of metacognition investigated by researchers and presented as a means of controlling cognition. Dansereau (1985) divided learning strategies into two categories, which are primary strategies and support strategies. The primary strategies refer to learning methods that used during the information processing. Support strategies help learners to control the mental statues, such as setting goals, controlling attention and evaluating learning outcomes. Weinstein and Mayer (1986) also noticed that learning strategies also included skills to create and maintain a positive mental climate during learning. These approaches that Weinstein and Mayer put forward also covered some parts of metacognition, such as enhancing self-efficacy.

Apart from attempts to understand learning strategies, the effects of learning strategies on learning became a focus by academia since the beginning of the research on learning strategies. The positive impact of effective learning strategies on learning achievements has already widely accepted. For example, Pask (1988) discussed the importance of matched learning strategies to the learning tasks. In other words, if the strategies mismatch the learning tasks, the possibilities of failure in learning would increase.

2.2.2 Theories of self-regulation

Similar to research on learning strategies, modern research on self-regulation, i.e. self-regulatory learning, also began in the middle of the 20th century and gained a diversity of research attention in its role in human development between 1960s and 1970s. According to Schunk and Zimmerman (2003), research regarding self-regulation theory can be understood as developing from five key theoretical perspectives: Operant Theory, Information Processing Theory, Developmental Theory, Social Cognitive Theory and Social Constructivist Theory. These are outlined in turn below.

2.2.2.1 Operant Theory

Operant psychologists' understanding of self-regulation starts from Skinner's work (1953). Operant behaviour is conducted in the presence of discriminative stimuli, which decided the occurrence frequency of this behaviour in the future. For example, a student is praised due to his hard work in the school. He might keep working hard to get more encouragement. Conversely, if this student receives negative feedback, such as criticism, from the surroundings. He might not work that hard in the following days. During the interaction with the discriminative stimuli and reinforcement contingencies (Brigham, 1982), individuals establish the process of self-regulation. According to the operant theorists, there are three key subprocesses of the self-regulation as follows,

- *Self-monitoring* refers to deliberate focus on the behaviour with an often recording of the frequency/intensity of that behaviour (Mace & Kratochwill, 1988)
- *Self-instruction* refers to creating or using discriminative stimuli in order to lead reinforcement (Mace et al., 1989)
- *Self-reinforcement* refers to the process that people arrange the behaviour with reinforcement, which results in an increasing possibility of future responding. (ibid.)

2.2.2.2 Information Processing Theory

Researchers that studied information processing theories describe learning as the process of dealing with information in long-term memory with a focus on encoding. From the information processing perspective, researchers did not conduct very specialized studies with a focus on the concept of self-regulation. By contrast, self-regulation is seen as metacognitive awareness. (Gitomer & Glaser, 1987). The awareness includes the following key dimensions:

- *Monitoring* helps learners get the knowledge of the process during the learning, which include understanding the learning task, judging if learners are properly using the corresponding knowledge, evaluating if they understand the task, and so on. (Borkowski & Cavanaugh, 1979; Paris, Lipson, & Wixson, 1983; Baker & Brown, 1984)
- *Self-knowledge* refers to one's understanding of personal abilities, interests and attitudes.

2.2.2.3 Developmental Theory

Developmental theorists focused on the development of self-regulation during the progressive cognitive changes, whereby learners can “exert greater control over their thoughts, feelings, and actions” (Schunk & Zimmerman, 1994, cited by Schunk & Zimmerman, 2007, p. 63). A framework was put forward by Kopp (1982)

to understand the appearance of self-regulation of human being. He presented that children enter the period of self-regulation after 36 months. During this period, children shows an adaptation of behaviour according to the changes of the surroundings.

Schunk and Zimmerman (1997) presented a model to analyse how learners develop the self-regulation during their learning as the following table. “This four-level analysis of self-regulatory development extends from acquiring knowledge of learning skills (observation), to using these skills (emulation), to internalizing them (self-control), and finally to using them adaptively (self-regulation)” (Schunk & Zimmerman, 2003, p. 64). During the early stages of learning, learners are believed by them that do not fully understand how to use skills or techniques to regulate their learning. Instead, they perform according to the social factors. During the advanced learning stages, the social influences normally do not disappear, but play a less important role in learning.

Level of development	Social influences	Self influences
Observational	Models	
	Verbal Description	
Emulative	Social Guidance	
	Feedback	
Self-control		Internal Standards
		Self-reinforcement
Self-regulation		Self-regulatory process
		Self-efficiency beliefs

Table 2.1 Social cognitive model of the development of self-regulatory competence (Schunk & Zimmerman, 2007, p. 64)

2.2.2.4 Social Constructivist Theory

According to Social constructivists, self-regulation is the process of gaining understanding and theories about one’s abilities, the essence of learning tasks, and the approach to regulate strategies and effort to achieve goals (Paris & Byrnes, 1989). All of these are established as a result of consequence of development and experience. In the research area of social constructivist theory, Vygotsky’s work

made him to be “one of the most powerful contributors to our understanding of the sociocultural nature of human learning and self-regulation” (Oxford, 2017, p. 66). Vygotsky’s theory regarding self-regulation supplied a new perspective, which broadened the focus of self-regulatory learning from cognitive psychology to learners’ interaction with the social assistance that happened during the whole process of learning.

Vygotsky put forward a model which was called mediated learning. In this model, mediated learners develop self-regulation by mediation within a sociocultural context. During this process, language plays an important role to provide the assistant or mediation in the form of dialogues. These dialogues can be categorised into three forms, which are social speech (such as talks with other people), egocentric speech (refers to self-talk, but does not fully self-regulate), and inner speech (self-regulation) (Moll, 2014). Benson (2011) clarified that the inner speech is directly related with learner autonomy, which is closely connected to self-regulation. Higher mental process, concluded by Oxford (2017, p. 66), “are internalized via social interaction with a more competent person in the environment (or via interaction with books and other resources)”. Another important part of his theory is the zone of proximal development. The zone of proximal development refers to the distance between learner’s current level and the potential level of development which can be achieved when given a proper instructional assistance. “As teachers or peers provide scaffolding to assist in the process, learners are increasingly able to operate independently” (Schunk and Zimmerman, 2003, p. 67).

2.2.2.5 Social Cognitive Theory

Social cognitive psychologist connected self-regulation with particular contexts. In other words, “in the social cognitive theoretical framework, self-regulation is construed as situationally specific—that is, learners are not expected to engage in self-regulation equally in all domains” (Schunk & Zimmerman, 2003, p. 67). There

are three key subprocesses of self-regulation that have been conceptualized by Bandura (1986) and the following researchers (Karoly, 1982; Kanfer & Gaelick, 1986) which are listed below.

- *Self-observation*: refers to the process of observing behaviour or performance with a consideration of standards
- *Self-judgement*: refers to the process of evaluating one's behaviour by a comparison between the performance and the goal.
- *Self-reaction*: refers to the mental process after self-judgement. Self-reaction was seen as the basis of one's future behaviour.

These five theories described the essence of self-regulation in various dimensions as well as the process of exploration about self-regulation. In summary, self-regulation is not inherent, but have to be developed with a rely on feedbacks from surroundings. Furthermore, self-regulation not only includes the cognitive and metacognitive adjustment based on an understanding of learning tasks, but also contain the interaction with learning situations. In addition, theory and research attest to the connection between self-regulation and achievement processes (Schunk & Zimmerman, 2003). In other words, successful students are not simply learners who understand more, and gain more knowledge, than others. They also have more effective and efficient learning strategies for accessing and using knowledge, and they can motivate themselves, monitor their learning progress and regulate their learning behaviours.

2.2.3 Self-regulation and language learning strategy research

Since the inception of research on self-regulatory learning, learning strategies have been closely connected with the notion of self-regulation, which gained a wide attention especially since the start of the 21th century. For example, Winne and Perry (2000) point to the close relationship by stating that “‘Strategic’ describes the way in which these [self-regulated] learners approach challenging

tasks and problems ..." (p. 553). Panadero and Alonso-Tapia described the connection by a further explanation that "self-regulation is the control that students have over their cognition, behaviour, emotions and motivation through the use of personal strategies to achieve the goals they have established" (Panadero & Alonso-Tapia, 2014, p. 451). Schunk and Zimmerman added a further belief that strategies are a vital part of self-regulated learning by stating that "use of strategies is an integral part of self-regulated learning, because strategies give learners better control over information processing" (Schunk & Zimmerman, 2003, p. 62). This trend, which researchers consider learning strategies within the context of self-regulation, spread to specific research topics. A number of scholars, for example, explored the self-regulated strategy instruction for writing (Alexander, Graham, and Harris, 1998; Graham and Harris, 1996; Harris and Graham 2005; MacArthur 2011; and MacArthur, Philippakos, & Ianetta, 2014).

Correspondingly, a theory of learning strategies was developed and refined as this empirical work progressed, arising from work conducted among particular curricular backgrounds. The next section will present the development of learning strategies, with a focus on the process of language learning.

2.3 Research on language learning strategies

After a brief review of learning strategies, this section will present the development of research on language learning strategies by discussing the key explanatory theories that have emerged in recent years.

2.3.1 Early claims of language learning strategies

In the early stage of research on language learning strategies, scholars explored a wide range of learner behaviours, focussing on classroom techniques, attitudes and learning activities which were eventually grouped together within the term 'strategies'. From the literature reviewed below, early researchers attended to

cognitive skills, such as deducing grammar in learners' learning process, whilst study skills and memorization techniques were described more. In addition, the differentiation between the learning strategies of first language learners and of second learners was not put forward until the next stage.

Rubin (1975) was one of the earliest researchers to conceptualise this topic as a separate area of research. Rubin (1981) defined language-learning strategies as "the techniques or devices that a learner may use to acquire language" (p.42) and later, in 1987, developed a definition of language-learning strategies as "strategies that contribute to the development of the language system the learner constructs and affect learning directly." She discussed the techniques and approaches employed by successful language learners, including processes that may contribute directly to learning and processes that may contribute indirectly to learning (p.124-25). She proposed that processes that may contribute directly to language learning include Clarification and verification; Monitoring; Memorization; Guessing/inductive inferencing; Deductive reasoning and Practice. On the other hand, processes that may contribute indirectly to learning include the creation of opportunities for practice and the use of production tasks related to communication

Other researchers working concurrently in the field also addressed language learner strategies. For example, Stern (1975) listed some strategies of the good language learner from his own experience as a teacher, such as "a personal learning style or positive learning strategies; an active approach to the task" (p.31). Researchers tried to help the "poor learners" (Naiman et al. 1978, p.1-8) by doing so. Other scholars stressed the social dimensions of language learning, including Fillmore (1979). Fillmore's work is described as being more like "social-psychological identity management than directly related to learning per se: join a group; give the impression you understand; count on your friends" (Cohen and Macaro, 2007, p.13). She found that the cognitive strategies behind these social

strategies included the use of stock phrases or formulaic language with a purpose to start and keep the conversation.

During this period, research on language learning strategy was closely related to contemporary psychological theories. Reiss (1981), for example, found that strategy use varied with different cognitive styles and argued that this variation in language processing relied on the cognitive character of the learners. Cognitive strategies refer to the steps, or operations, used in learning or problem solving that requires direct analysis, transformation and synthesis of learning materials. In addition, Wesche (1981) discussed matching the teaching methodology to learners' cognitive type. Rubin (1987) divided learning strategies into cognitive learning strategies and metacognitive learning strategies. In agreeing with Brown and Palinscar (1982) and O'Malley et al. (1983), Rubin recorded metacognitive strategies as: (1) knowledge about cognitive processes, and (2) regulation of cognition or executive control or self-management through such processes as planning, monitoring and evaluating. Furthermore, in this stage, more variables in language learning strategy were noticed and discussed by researchers. O'Malley, Chamot, Stewner-Manzanares, Russo and Kupper (1985), for instance, discussed that higher-level students adopted more strategies. Alvermann and Phelps (1983) found that students in lower grade classes used more inappropriate strategies. During this period, the influence of learners' motivation and self-regulation (Jones, Palinscar, Ogle & Carr, 1987) were firstly linked to language learning strategy research. Finally, O'Malley and Chamot separated the L2 learning strategies from L1 learning strategies and, during this stage, the most representative and influential theory, namely scheme, was developed by O'Malley and Chamot and Oxford. The following subsections will address their studies.

2.3.1.1 O'Malley and Chamot

Grenfell and Macaro commented that O'Malley and Chamot's theory "provided a theoretical background to much language learning strategy research at the time"

(2007, p.16). They define language-learning strategies as “the special thoughts or behaviours that individuals use to help them comprehend, learn or retain new information”. Their classification (O’Malley & Chamot, 1990, p.8) includes three categories as follows:

- Metacognitive strategies, which involve thinking about the learning process, planning for learning, monitoring of comprehension or production while it is taking place, and self-evaluation after the learning activity has been completed.
- Cognitive strategies, which are more directly related to individual learning tasks and entail direct manipulation or transformation of the learning materials.
- Social/affective strategies, which involve cooperative learning and peer interaction to achieve a common goal in learning, for instance and asking questions for clarification.

The theoretical analysis of the role of cognition in learning conducted by O’Malley and Chamot was based on the work of cognitive researchers, in particular John Anderson (O’Malley & Chamot, 1990, p.13). Anderson’s theory distinguished long-term memory from short-term memory and stressed “the active nature of mental processes during learning” (ibid). O’Malley and Chamot point out, “information in long-term memory consists of declarative knowledge, or the facts we know, and procedural knowledge, or the simple cognitive skills and other processes we know how to perform” (ibid.). In contrast, they focussed less on social/affective strategies:

Affective strategies are of less interest in an analysis such as ours, which attempts to portray strategies in a cognitive theory. For purposes of discussion, however, we present a classification scheme that includes the full range of strategies identified in the literature. (ibid., p.44)

As a result, O’Malley and Chamot’s research on learning strategies in second language acquisition focussed on “the differentiation between metacognitive and cognitive strategies, the distinction in long-term memory between declarative and procedural knowledge, the description of stages entailed in acquiring a complex cognitive skill, and the distinction between experts and novices” (ibid, p.144).

However, their research did not address the relationship between individual strategies and measures of second language learning.

2.3.1.2 Oxford's models (1986, 1990)

In Oxford's early model, she firstly divided strategies into direct strategies and indirect strategies. The former deals with the target language, "like the Performer in a stage play, working with the language itself in a variety of specific tasks and situations". (Oxford, 1990, p. 14). The indirect strategies manage learning in a general way "like the Director of the play" (ibid.), who control the learning by supplying a number of functions, such as "focusing, organizing, guiding, checking, correcting, coaching, encouraging, and cheering the Performer, as well as ensuring that the Performer works cooperatively with other actors in the play" (ibid.). Based on this, Oxford divided language learning strategies into six types, which are subdivided into 19 strategy sets as the following table.

	Direct Strategies			Indirect strategies		
	Memory	Cognitive	Compensation	Metacognitive	Affective	Social
S e t	Creating metal linkages	Practicing Receiving and sending messages	Guessing intelligently	Centring your learning	Lowering your anxiety	Asking questions
	Applying images and sounds	Analysing and reasoning	Overcoming Limitations in speaking and writing	Arranging and planning your learning	Encouraging yourself	Cooperating with others Empathizing with others
	Reviewing well			Evaluating your learning		
	Employing action	Creating structure for input and output			Taking your emotional temperature	

Table 2.2 Oxford's strategy system (1990)

Despite this taxonomy, Oxford notes that "the boundaries are fuzzy, particularly since learners sometimes employ more than one strategy at a time" (Oxford, 2001,

p. 167). However, she rejected further distinct classifications, as “this would produce strategy lists that would be overly long, theoretical and filled with mixed levels of behaviour” (ibid.). Her theoretical work was frequently updated by findings from other collaborating researchers. Oxford and Cohen (1992), for example, reformulated the claims by asserting that strategies have the power to “increase attention essential for learning a language, enhance rehearsal that allows linkages to be strongly forged, improve the encoding and integration of language material, and increase retrieval of information when needed for use”.

Based on her strategy taxonomy, Oxford proposed the well-known Strategy Inventory for Language Learning (SILL) as an instrument to measure language learning strategy use. Accordingly, this questionnaire consists of six scales. Oxford published two versions: one for speakers of English learning other target languages (80 items) and another for learners of English as an L2 (50 items). All of the items involve 5-point rating scales from ‘never or almost never true of me’ to ‘always or almost always true of me’. Based on Oxford’s basic idea, questionnaires were designed to understand learners’ Chinese character acquisition, which will be presented in section 2.4.

2.3.2 Reconceptualization of the paradigm of language learning strategies

As the above section has presented, in the area of second language learning research, focus on learning strategies emerged in the late of 1970s. However, since the start of the new century, based on shifts in the definition of language learning strategies and a focus on motivational control strategies, researchers have introduced several new models. In particular, there is an important body of emerging work on self-regulation in foreign language acquisition, such as Tseng, Dörnyei and Schmitt (2006), Weinstein (2009), Oxford (2011) and Rose (2012b), which will be the focus of this section.

The shift in focus grew from criticisms of the definitional “fuzziness” of the two well-known taxonomies of language learning strategies reviewed above, by Oxford and O’Malley and Chamot. For instance, regarding the O’Malley and Chamot classification system, Dörnyei (2005, p.168) claimed:

The odd one out in O’Malley and Chamot’s taxonomy is clearly the last group, ‘social/affective strategies,’ which includes diverse behaviours, such as ‘cooperation,’ ‘questioning and clarification’ and ‘self-talk.’ These strategies are not related to the cognitive theoretical basis outlined by the authors, and they admittedly represent a “board grouping”, a miscellaneous category that appears to have been introduced simply to accommodate all the strategies that did not fit into the first two types, but which could not be left out either.

In relation to Oxford’s theory, Dörnyei (2005) also put forward two substantive criticisms: First, the division of strategies included ‘compensation’ strategies, which are related to the view the language use leads to various opportunities for language acquisition and, therefore, competent employment of communication strategies does promote L2 proficiency, and it has been argued by many that the two processes are so different in terms of both their function and their psycholinguistic representation, that they are best left separate. The second issue concerns the separation of cognitive and memory strategies as if they were independent categories of equal status. Despite this obviously not being the case, as memory strategies constitute a subclass of cognitive strategies, this separation was motivated by observation that most memory strategies are associated with shallow processing, whereas most cognitive strategies are associated with deep processing. Therefore, Dörnyei viewed their systems “compatible” (Dörnyei, 2005, p. 169), and integrated them with four main components.

2.3.2.1 Re-theorization towards memory strategy paradigms

In addition to the incorporation of self-regulation theories into the research framework, there has been notable research relating to memory strategies in the field of cognition. Memory strategies are explained as being mental activities that

improve learners' encoding and retrieval (Bransford et al., 2000; Herrmann et al., 2002). Most memory strategies help learners to remember something they learned in the past. They are "intentional, goal-oriented activities that we use to improve our memories" (Matlin, 2009, p. 450). Several major kinds of memory strategies have been surveyed by previous researchers, including,

- Retrieval
- Encoding
- Organizational strategies
- Imagery

Retrieval refers to "locating information in storage and accessing that information" (Matlin, 2009, p.121), whilst *encoding* refers to learners' initial acquisition of information. During encoding, information is embedded in learners' memory (Einstein & McDaniel, 2004). The encoding specificity principle was concluded by previous researchers; it states that "recall is better if the retrieval context is similar to the encoding context" (Matlin, 2009, p.127). In other words, forgetting often can be noticed when these two contexts do not match (Brown & Craik, 2000; Nairne, 2005; Tulving & Rosenbaum, 2006). *Organizational strategies* are defined as "the attempt to bring systematic order to the material we learn" (Matlin, 2009, p.174). This category of mnemonics "makes sense" (ibid.) as learners need to use deep processing to sort items into categories (Esgate & Groome, 2005).

Furthermore, retrieval is found to be easier for learners with a well-organized framework (Bellezza, 1996; Wolfe, 2005). Chunking, the Hierarchy technique, first-letter technique and narrative technique are proved to be four mnemonics that emphasize organization. *Imagery* refers to "the mental representation of things that are not physically present" (Matlin, 2009, p.22). Mental imagery is observed as a useful device for improving memory in adults, although, in this process, whether information is stored in picture-like analogy codes or language-like propositional codes cannot be confirmed.

2.3.2.2 Re-theorization towards self-regulation

A re-theorization of language learning strategies within a framework of self-regulation and the self-regulatory capacity also occurred at the turn of the century. Macaro (2001) claimed that, “one thing seems to be increasingly clear and that is that, across learning contexts, those learners who are proactive in their pursuit of language learning appear to learn best” (p. 264). Other scholars increasingly recognised that “the important thing about the proactive strategic learners is not necessarily the exact nature of the strategies, tactics, or the techniques they apply, but, rather, the fact that they do apply them” (Dörnyei 2005, p. 190). Following that, some research handbooks (e.g., Hinkel, 2005; Alexander and Winne, 2006; Flippo & Caverly, 2008;) discussed the significance of learners’ self-regulation in many fields. Among them, Dörnyei and Oxford proposed their theoretical systems respectively.

By understanding strategic learning in the paradigm of self-regulation, Dörnyei created a model of motivational strategies. Based on his proposed motivational control strategies and on Kuhl’s (1987) and Corno and Kanfer’s (1993) theory of action control strategies, he proposed his own taxonomy, which consists of five categories (2005, p. 113):

- Commitment control strategies for helping to preserve or increase the learners’ original goal commitment (e.g., keeping in mind favorable expectations or positive incentives and rewards; focusing on what would happen if the original intention failed).
- Metacognitive control strategies for monitoring and controlling concentration, and for curtailing unnecessary procrastination (e.g., identifying recurring distractions and developing defensive routines; focusing on the first steps to take in a course of action).
- Satiation control strategies for eliminating boredom and adding extra attraction or interest to the task (e.g., adding a twist to the task; using one’s fantasy to liven up the task).

- Emotion control strategies for managing disruptive emotional states or moods, and for generating emotions that are conducive to implementing one's intentions (e.g., self-encouragement; using relaxation and meditation techniques).
- Environmental control strategies for eliminating negative environmental influences and exploiting positive environmental influences by making the environment an ally in the pursuit of a difficult goal (e.g., eliminating distractions; asking friends to help one not to allow to do something).

In a later publication (Tseng, Dörnyei, & Schmit, 2006), Dörnyei collaborated with Tseng and Schmitt in the creation of a questionnaire based on this conceptualization, designed to measure students' self-regulatory capacity in the process of vocabulary learning. The results of the validation of this scale "provided empirical confirmation of the soundness of this system" (Dörnyei, 2005, p. 112). According to Tseng, Dörnyei and Schmit, this model of the self-regulatory system provided a clear pattern to measure the self-regulation in second language learning.

For the sake of conceptual clarity, we have decided to model the self-regulatory system proposed in this paper on one particular language learning domain, vocabulary learning, but, at the same time, we offer a detailed description of the procedures used to develop our instrument, so that this can serve as a template for other content areas as well. Thus, we believe that our suggested approach is transferable to researching other facets of second language learning. (Tseng, Dörnyei, & Schmit, 2006, p.79-80)

Concurrently Oxford proposed the Strategic Self-Regulation model by incorporating the self-regulation concept into her framework. This model, "with its rich interdisciplinarity" (Oxford, 2011, p. 41), is "intentionally heteroglossia, echoing the voices and vocabularies of different viewpoints, such as psychological, social-cognitive and sociocultural", while it is thought of as one "unified, logically coherent system". Compared to her previous version, Oxford decreased the dimensions to three:

- *Cognitive Strategies* for remembering and processing language;
- *Affective Strategies* linked with emotions, beliefs attitudes and motivation
- *Sociocultural-interactive Strategies* for contexts, communication and culture.

In terms of L2 learning, she suggested self-regulated L2 learning strategies, which can be seen as her ideal learning status, as follows,

In the Strategic Self-Regulation Model, self-regulated L2 learning strategies are defined as deliberate, goal-directed attempts to manage and control efforts to learn the L2. These strategies are broad, teachable actions that learners choose among alternatives and employ for L2 learning purposes. (Oxford, 2011, p. 12)

Oxford summed up the features of strategically self-regulated learners, who:

- Actively participate in their own learning
- Achieve learning goals by controlling various aspects of their learning
- Regulate their observable performance, and the environmental conditions for learning
- Use strategies to control their own beliefs about learning and themselves
- Cognitively move from declarative knowledge to procedural knowledge with the use of strategies
- Choose appropriate strategies for different conditions, purposes, situations and settings
- Understand that no strategy is necessarily appropriate under every circumstance or for every purpose.
- Show awareness of the relationship between strategy use and learning outcomes.

Based on this re-theorization trend, as well as research on Kanji characters (Japanese characters), Rose (2012b) put forward his model, “as opposed to using a generic framework that would limit the context specificity that strategy research

requires” (Rose, 2017, p. 160). In Rose’s framework of strategic learning (see figure 2.1), “elements from learner strategy and cognitive theory research” was incorporated with “theory of self-regulation, in which is Dörnyei’s motivation control taxonomy” (ibid.).

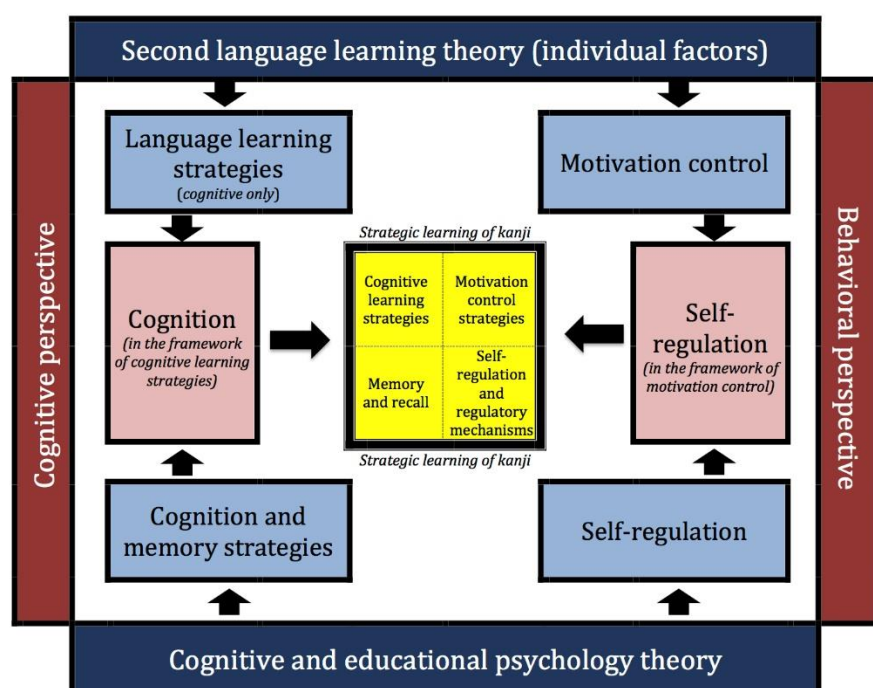


Figure 2.1 Conceptual framework of understanding language learning strategies (Rose, 2017, p.161)

In terms of learning strategies, Rose (2017) proposed three main categories:

- *Visual association*: refers to associating the Japanese characters with its physical form
- *Component Analysis*: refers to breaking down Japanese characters into small components to assist in memorization
- *Mnemonic*: refers to establishing associations between new and already known information by using stories, phrases, etc.

Rose’s research framework (2017) was adopted as a reference in the research

design of the present study. As there has not been any substantial research conducted on Chinese character learning strategies, and only a handful with a framework that combined language learning strategies and self-regulation, this framework bridged a gap in theoretical conceptualisation and shaped the study's methodology.

2.4 Research on Chinese character learning strategies

This section will move from language learning strategies (Section 2.3) to relevant research regarding learning strategies specifically in the area of learning Chinese characters. Firstly, research published in Chinese publications will be presented, followed by research in English-language publications, followed by a comparison of key themes. In this dissertation, as the “first real one and has remained the most popular one” (Daniels & Bright, 1996, p. 8) in the typologies of writing scripts, the tripartite scheme was adopted in comparison. In this scheme, the writing scripts were divided into three types: logogram (a set of written characters that represents word or phrase), syllabary (“a type of writing system whose characters denote syllables, with no deliberate graphic similarity between characters denoting phonetically similar syllables” (Daniels & Bright, 1996, p. xliv)) and alphabet (“a type of writing system that denotes consonants and vowels” (Daniels & Bright, 1996, p. xlii)).

2.4.1 Research on Chinese characters learning strategy in Chinese publications

Several pioneering Chinese researchers conducted early investigations of learner outcomes in the Chinese as a Foreign Language classroom. Feng (1999) drew on psychological theories and suggested that the language teaching practice should follow students' cognitive patterns, which can be derived from the theory of cognition and educational psychology. Shi (1999) proposed five kinds of ability (speaking, writing, identifying, using and checking) that should be fostered within by foreign language learners. Yang (1998) firstly proposed Chinese language

learning strategies in one small-scale investigation on the relationship between strategy use and learning results. However, the sample size was small (only 18 interviewees), and the project did not include significance testing.

Jiang (2000) has written about the lack of research in the field of Chinese character learning strategies. She utilized Oxford's work and found that foreign learners used social strategies, metacognitive strategies and compensatory strategies most often. In contrast, these students seldom utilized mnemonic strategies or affective strategies in their study of Chinese characters. She did not find any relationship between strategy utilization and her interviewees' gender. Finally, Jiang proposed that the structure of Oxford's model should be adapted to suit the characteristics of Chinese language learning. Consequently, Jiang and Zhao firstly put their research focus on Chinese character learning strategies in to a Chinese academic audience, and proposed study eight frequently used learning strategies apt for learning written Chinese, as follows:

- *Stroke Strategy*: Learning Chinese characters by learning strokes and their orders in Chinese characters
- *Phonetic-semantic Strategy*: Learning Chinese characters by learning the pronunciation and meaning
- *Shape strategy*: Learning Chinese characters by imaging them as pictures
- *Induction strategy*: Grouping characters by some characteristics
- *Repeating strategy*: Memorizing Chinese characters by repeating writing them or reading them
- *Social strategy*: Utilizing learned Chinese characters in daily life
- *Evaluating strategy*: Evaluating the development of Chinese character learning
- *Planning strategy*: Setting plans and separate targets for Chinese character learning .(Jiang & Zhao, 2001)

Among these eight strategies, they described the first six as being cognitive strategies and titled the latter two as metacognitive strategies.

According to Jiang and Zhao (ibid.), their work was inspired by Oxford's Strategy Inventory for Language Learning questionnaire (SILL) (Oxford, 1990), early studies of Chinese characters learning from McGinnis (1995) and Ke (1998) and the experiences of Chinese teachers collected by them. In the following years, Jiang and Zhao continued to deepen their research extending their survey work with several different groups of Chinese learners, with a focus on the most effective learning strategies. In 2001, they conducted an investigation among 136 foreign learners from different countries with their framework. Their results (Jiang & Zhao, 2011) can be summarised accordingly:

- Learners used shape strategies, phonetic-semantic strategies, stroke strategy and repeating strategy more often. In contrast, the least popular strategy was induction strategy;
- The choices of strategy are related to the learners' first-language backgrounds. When compared to the learners with an alphabet-base first-language (L1) background, the learners with a character-based L1 background used phonetic-semantic strategy, social strategy, planning strategy and evaluating strategy more often;
- The interviewees valued the importance of characters' components, but did not adopt such strategies in their learning;
- The choices of strategies were related to learners' learning motivation.

In 2003, Liu and Jiang found, through experimental research, that strategies involving the recalling and writing of Chinese characters from memory were better than copying strategies used by students from a non-Chinese cultural background.

Jiang's work shaped a generation of research in the field of Chinese character learning strategies in Chinese publications. By using her methodology, Chinese scholars discussed the strategies of groups of learners with the same nationality. Chen (2009) distributed questionnaires to 65 American students, with a case study of four of them being the secondary source of data. In the questionnaire, remembering strategies were added, which referred to learning characters by remembering the teachers' explanation. In this study, the American students reported their use of strategies as following the sequence of: shape, stroke, remembering, application, repeating, phonetic-semantic, metacognitive and induction. From the case study, proficiency in writing Chinese characters had a positive relationship with a high degree of induction strategy use and metacognitive strategy use. He (2008) divided Chinese characters learning strategies into three categories: *form training strategies* (including font strategy, stroke strategy, sound and meaning strategy); *function training strategies* (including inducing strategy, application strategy and guessing strategy); *native-tongue strategies* (referring to the association with the native tongue of learners). Based on this, He found that the beginner European-American learners' commonly preferred function training strategies and font strategies, whilst they did not use inducing strategies with regard to phonetic and semantic, and application strategies. There was no difference in strategy use between genders.

Zhang (2017) focused on Chinese students from the Czech Republic, finding that the most commonly used strategies were shape strategies and phonetic-semantic strategies and the most uncommonly used were the application strategies. The strategy use was affected by such factors as Chinese characters learning tasks, character proficiency level, previous learning experience and gender. Regarding the French students, Zeng (2013) discussed the relationship among Chinese characters learning achievement, learning motivation and learning strategy. Chinese characters learning strategy was found to be affected by motivation, whilst Phonetic-Semantic strategies were found as positively affecting the Chinese

characters learning achievement. Xu (2014) revealed that a high degree of repeating strategy use by Hungarian students, which negatively affected their Chinese characters learning. The same conclusion of students' preference for repeating strategy was also found in the investigation of Italian students (Xue, 2011). In contrast, Russian students demonstrated a high degree of all of the cognitive strategies in Jiang and Zhao's framework, rather than the induction (Ren, 2011). Ren introduced Oxford's (1989) six categories of strategies (see Section 2.2.1.2), where the Russian participants also reported an infrequent use of emotional strategies. Similarly, there was least use of emotional strategies by Polish students, who preferred social strategies while learning Chinese characters (Liu, 2015).

Among all of the studies, the majority still focused on Asian students. Based on the framework of Jiang and Zhao, Han (2009) and Chen (2015) investigated two groups of Thai learners and proposed that the repeating strategy was always important in their process of acquiring Chinese characters. Similarly, Chen's study (2009) found that their use of shape strategies and repeating strategies ranked as the top two categories. Furthermore, Han's study presented a U-shape curve in the use of shape strategies and metacognitive strategies with the development of Chinese character proficiency. In addition, repeating strategies were preferred by students of all levels, whilst all participants reported a low degree of induction strategy use. Their Chinese characters proficiency level was found to be positively related to induction strategies and application strategies. Similarly, Wang (2017) revealed that the Thai learners from the majors of mechanics, auto maintenance and architecture seldom used stroke strategies and induction strategies, which resulted in corresponding errors. The same conclusion was reached in the investigation of Pichetladarom (2016) and Luo (2017). In addition, Pichetladarom revealed that the frequency of strategy use was affected by learners' language proficiency, learning time and gender. Zhang and Luo (2017) also reached a similar result, which indicated frequent use of form training strategy and less

frequent use of function strategy and least use of metacognitive strategy. The frequent use of repeating strategies was also found among Vietnamese students (Lu & Peng, 2007) based on a 23-participant investigation. In contrast, Vietnamese students reported application as being the second frequent-use strategy.

In terms of students from Central Asia, Fan and Hu (2010) revealed that the participants of their study, who were in the beginning stage of learning Chinese, preferred repeating strategies. In addition, learning achievement in character writing had a significant positive correlation with shape strategies and application strategies. In 2013, Fan continued to explore the differences in strategy use among participants from three countries, namely Kazakhstan, Kyrgyzstan and Tajikistan. He found that frequent use of learning strategies could reduce the corresponding error rate in writing Chinese characters. For instance, Kyrgyzstani students found it less easy to confuse Chinese characters with a similar shape, while they reported frequent use of shape strategies. Yilihamu (2012) added items related to remembering strategies in Jiang and Zhao's questionnaire and found that the Kyrgyzstani students preferred repeating strategies and remembering strategies, whilst not using induction strategies and application strategies, which was highly related to teachers' approaches. However, in Azerbaijan, the most popular strategy among the local learners was the social strategy, with the least popular being the repeating strategy and phonetic-semantic strategy (Zeng, 2015).

In contrast, Japanese students preferred using the induction strategy to learn Chinese (Zhang, 2014). Similarly, Korean students prefer most frequently use compensation strategies followed in order by social, cognitive, meta-cognitive, memory strategies, and the affective strategy is the one least used in resources, (Ren, 2011), which was believed to be due to the cultural connection between South Korean characters and Chinese characters.

Xu (2013) and Zhan (2014) both found that Chilean learners developed their learning strategies in line with their learning progress. At the start of Chinese acquisition, learners would utilize stroke strategies, shape strategies and phonetic-semantic strategies more often. With an increase in Chinese written literacy, they noticed the effectiveness of social strategies. Liang (2015) revealed that African students who studied Chinese in Hebei Province used the strategies of phonetic-semantic, shape, reviewing and application frequently, then application strategies, but not induction strategies. Ma (2007) conducted a nine-month case study with one Nigerian student and found that the learner's written errors declined significantly when the number of his written Chinese characters increased. In terms of his strategy use, certain patterns emerged:

- from whole-word strategies to graphic component;
- an infrequent use of phonetic-semantic strategies;
- the purpose of applying characters transited from gaining knowledge by social interaction metacognitive strategies emerged with the increasing number of known characters;
- the range of induction strategies expanded from the pronunciation to the shape, then the meaning of characters, and the meaning of the words;
- the strategy use affected the learning achievement.

Chinese researchers also began to explore the possibility, and influence, of strategy instruction. In Li's experiment, the experimental group received an extra half-hour of strategy instruction and, after three months, their performance in dictation improved "significantly" (Li, 2009) when compared to the control group. Another study (Chen, 2011) designed a similar programme of strategy instruction and explored its subsequent effects, which revealed that the students' knowledge of semantic, phonetic and positional components would potentially positively influence students' characters acquiring achievement.

2.4.2 Research on Chinese character learning strategies in English-language publications

In contrast to studies published in Chinese journals, few investigations of Chinese character writing strategies have been published in English-language journals. The often-quoted McGinnis' (1999) study is, perhaps, the earliest to investigate students' Chinese characters learning strategies in English publications. McGinnis (1999) conducted a study with 29 first-year college students learning Chinese as a foreign language in a five-week summer immersion programme. The students self-reported that they used a range of strategies, including rote repetition, in creating personal stories of how the characters looked or sounded, and the use of radicals and phonetic components to memorize characters. Furthermore, the former two strategies were utilized the most by the students in their study. This line of research continued to be taken by later researchers. In other words, researchers tended to explore as many learners' strategy variables as possible, rather than concluding them as groups.

Tseng (2000) proposed 15 types of Chinese characters learning strategies used by students from a German-speaking background. Shen's survey (2005) indicated that 95 English-speaking students used over 30 strategies in their Chinese characters learning, such as repeating strategy, quizzing, etc. Shen concluded her findings as being orthographic-knowledge based strategies and metacognitive strategies. Shen (2005) found that, among the various commonly used cognitive strategies, "orthographic-knowledge-based strategies are most heavily used" (Shen, 2005, p.61). This classification, however, was not as widely adopted as Jiang and Zhao's theory in Chinese character learning area. Among other explorations related with Chinese reading strategies, some researchers ventured further to discuss students' preferred metacognitive strategies (e.g. Lee-Thompson, 2008; Wang, Spencer, & Xing, 2009). Zahradníková concluded that component analysis was helpful for beginning learners from a survey of 41 valid participants. In 2016, Zahradníková's research based on a one-semester investigation of 50 Czech

university students revealed the types of strategies they applied. Strategy content analysis identified ten frequently used basic strategies, including Story, Radical, Imagination, Component Comparison, Word, Similarity, Drawing, Emotion, Etymology and Pronunciation. "These strategies are used either independently to elaborate a single piece of information, or in combinations, interweaving two or more pieces of information into one. Strategies show the students' tendency to analyze characters into components, name individual components, and focus on graphic and semantic information, while omitting the phonological information" (Zahradníková, 2016. 117).

In English language publications, researchers also put efforts to discuss the comparison of strategy use between learners from character-language background and those from alphabet-language background. Arrow (2004) did a comparison of Chinese character learning strategies between American students and Japanese students. Although this researcher found that all learners utilized a diversity of strategies, some differences can be found in the investigation. The American students reported a preference of using flashcards and character association, while the Japanese students preferred to the repeating strategies, such as writing characters for many times.

In addition, researchers also focused on the effectiveness of each strategy. Ke is the pioneer in this area. In his experiment which was conducted in 1998, for example, Ke asked students to compare 11 pairs of characters learning strategies. Most participants found that memorizing the whole characters was more effective when compared with identifying repeating components of characters. Furthermore, the importance of learning and memorizing radicals of characters were confirmed by most participants, while only half of them reported that focusing on these radicals was also effective. Kuo and Hooper (2004) also conducted an experiment to understand the effectiveness of learning strategies among 92 high school students, who are all English native speakers. In this experiment, they discussed the

effectiveness of five learning strategies, which are translation, verbal coding, visual coding, visual and verbal coding, self-generated mnemonics coding:

The results indicate that participants who generated their own mnemonics demonstrated higher post-test performance than those in visual coding, verbal coding, and translation groups; subjects in the dual coding group scored higher than those in the translation group. Those who generated their own mnemonics spent more time on task than any other group, and those in the verbal coding group took more time than those in the translation group. Survey and qualitative data suggest that learners' interpretations of the Chinese characters were rooted in their cultural backgrounds and personal experiences. (Kuo & Hopper, 2004, p. 23)

2.4.3 Discussion

In summary, research related to Chinese characters learning strategy can be classified according to three main categories:

1. Descriptions of learning strategies that learners use for character learning, which include comparison between learning strategies that used by learners of character-based languages and those of alphabetic-based languages.
2. Discussion of effectiveness of learners' strategy use.
3. Investigations of strategy instruction and language learning practice.

Jiang and Zhao were the pioneers of research on Chinese character learning strategies in China, from 2001 to 2006. They laid the groundwork for many other Chinese-speaking researchers to deepen the field. In contrast, although some English-language researchers have explored issues relating to strategy instruction and language education, there is no notable group of research which expands to two or more sub-topics in Chinese character learning strategies.

Chinese-led studies, especially those conducted after 2005, were designed mainly to present general or specific strategies of a group of students. Based on this, research began to more deeply explore how learners change their strategy usage with improvement of their Chinese acquisition. Similarly, although the main contributions in English-language academia relating to Chinese character learning strategies were carried out before 2005, their focus was also on a description of the strategies deployed by learners. However, English-language researchers tended to explore as many learners' strategy variables as possible, rather than bringing these together as classifications. Finally, more comparative studies were conducted in English, with Chinese researchers tending to concentrate on groups of learners with the same nationality.

In terms of methodology, a distinct difference can be observed between Chinese and English publications. After their pioneering studies, Jiang and Zhao concluded their classification in terms of Chinese characters learning strategy and designed a corresponding questionnaire, which was utilized by most Chinese researchers when analysing the Chinese characters learning strategies of learners. In excluding an experimental approach to the investigation of the impact of strategy instruction, most studies were designed to observe learners' strategies, and Jiang and Zhao's paradigm was widely used by Chinese researchers up until now. In contrast, most English-language researchers tended to explore more variables in this area, rather than following the Chinese-language paradigm (e.g. McGinnis, 1999; Tseng, 2000; Arrow, 2004; and Shen, 2005). Although this path has been productive, it has led to a lack of systematic theory-building in this area, and a fragmented research field. In addition, more comparative experiments are published in English-language publications, which enhance the validity of their results.

To sum up, it is not difficult to see that there is an information barrier between the researchers from China and other international scholars. In other words,

researchers from China and those from other areas in this field work separately and rarely have any knowledge of the situation of the other side. The lack of communication between those published in Chinese publications and English-language publications has resulted in two separate research environments. Not having the ability to draw on each other's strengths has been one of the obstacles in Chinese characters learning strategy research. Jiang and Zhao, for example, by adapting the structure of SILL (1990) and the early studies on Chinese characters learning from McGinnis (1995) and Ke (1998), established a paradigm in Chinese academia. However, after that, due to lack of communication, very few ground-breaking studies have been conducted in China. Furthermore, in terms of methodology, all of these studies utilized interviews and a variety of questionnaires. There is a need for new research approaches to be adopted. Finally, researchers in the field of Chinese character learning strategies have not always acknowledged that theories related to learning strategies continue to be developed (including in motivation and self-regulation of learners).

2.5 Conclusion

This chapter reviewed previous research that focused on learning strategies, language learning strategies and Chinese characters learning. It was observed that there had been significant research into learning strategies of other languages (especially English), as well as substantial research into Chinese characters learning in general. However, there has been little to no research that has examined Chinese characters learning strategies in Irish university learning environments, over long periods of time, or from the perspective of self-regulation. It was also noted that there is an information barrier between researchers working within China and other scholars in the international academic world. In other words, researchers from China and those from elsewhere in this field work separately and rarely acknowledge the findings of the other. The lack of

communication between Chinese publications and English publications has caused two separate research domains to emerge.

Chapter 3: Methodology

3.1 Introduction

This chapter will describe the project's research design. Firstly, the research questions will be presented, followed by a brief discussion of the methodological considerations. Next, the methodological framework used in the study is discussed, along with the approach that applied the research instruments in the current study. Finally, after an introduction of methods used in data analysis, a detailed description of the study will be presented, which will describe the application of different data collection approaches and provide an overview of the data collected.

3.2 Research questions

This study aims to investigate Chinese character learning in Ireland, in terms of learners' language learning strategies and self-regulation strategies. The specific research questions formulated for this study are below.

In Irish university setting of among students from alphabetic language backgrounds enrolled in Chinese Studies undergraduate degree courses:

1. In terms of learning strategies, how do students learn Chinese characters?
 - a. Which language learning strategies do students display in their Chinese character acquisition?
 - b. How do these language learning strategies develop over one year?
2. In terms of self-regulation, how do learners regulate their learning of Chinese characters?
 - a. Which self-regulation strategies do students display in their Chinese character acquisition?
 - b. How do students' self-regulatory learning develop over one year?

3. Which strategies (language learning and self-regulation) positively affect students' language learning outcomes in terms of their Chinese character acquisition?

3.3 Mixed methods research

This study primarily investigates Chinese characters learning in a natural learning environment using a mixed methods research approach, which combines both qualitative and quantitative methods. Over the past two decades, combining quantitative and qualitative research methods has been “increasingly seen as a third approach in research methodology” (Dörnyei, 2007 p. 42).

According to Dörnyei, quantitative research involves ‘data collection procedures that result primarily in numerical data, which is then analysed primarily by statistical methods’ (Dörnyei, 2007 p.24). Therefore, quantitative research focuses on the study of variables that can capture common features and be easy by counting. In most quantitative research standardized procedures are adopted to reduce any irrelevant values. As a result, quantitative research assumes that the general condition, or universal laws, can be measured through the use of appropriate quantitative instruments.

A qualitative approach can explore research questions in a deep and thorough way by a good understanding the research target. It involves “data collection procedures that result primarily in open-ended, non-numerical data, which is then analysed primarily by non-statistical methods” (Dörnyei, 2007 p.24). This method of research focuses on what people say, how people behave and then creates meaning with what is happening (Gillham, 2000). In the field of L2 learning motivation, individual learners can be observed and described. Qualitative research supports the use of a smaller sample cohort, as well as it being useful for exploring new unfigureered areas or highly complex situations. Furthermore, by

answering the 'why' questions that cannot be answered in quantitative research, the understanding can be largely broadened. In order to explore specific and detailed data, the researcher plays an important role in the study. Consequently, the results can easily be influenced, should the researcher not be good at communication, or have personal biases and idiosyncrasies. In addition, because of the small sample size in most qualitative studies, the results are hardly ever applied to others. Dörnyei discussed (2007, p.34) the strengths of the quantitative method, as follows:

At its best the quantitative inquiry is systematic, rigorous, focused, and tightly controlled, involving precise measurement and producing reliable and replicable data that is generalizable to other contexts. The statistical analytical apparatus is refined and far-reaching and it also offers some in-built quality checks and indices (such as statistical significance) that help readers to decide on the validity of quantitative findings.

Strauss and Corbin (1998, p. 34) described both the characteristics and advantages of mixed methods research:

Qualitative and quantitative forms of research both have roles to play in theorising. The issue is not whether to use one form or another but rather how these might work together to foster the development of theory. Although most researchers tend to use qualitative and quantitative methods in supplementary or complementary forms, what we are advocating is a true interplay between the two. The qualitative should direct the quantitative and the quantitative feedback into the qualitative in a circular, but at the same time evolving, process with each method contributing to the theory in ways that only each can.

To be more specific, the use of a mixed methods approach in this study allows a deeper investigation as well as enhancing validity. Firstly, combining both quantitative and qualitative methods allows deeper *understanding of the phenomenon*. The qualitative and quantitative methods used in this study measure the overlapping, but also different, facets of the phenomenon, yielding an enriched understanding by illustrating, clarifying or elaborating on certain aspects. The assumption, therefore, is that different datasets and approaches to analysis can

produce a fuller portrait of learners' strategic learning of Chinese characters at Irish universities, similar to pieces of a jigsaw puzzle when put together in the correct way (Erzberger and Kelle, 2003). Secondly, this approach allows researchers to *validate findings through triangulation*. As Dörnyei (2007, p.165) concludes, "triangulation has been seen as an effective strategy to ensure research validity: if a finding survives a series of tests with different methods, it can be regarded as more valid than a hypothesis tested only with the help of a single method." Both the qualitative and quantitative aspects of this study are designed to improve the validity of the study, as the results of one part can be verified by the results of the other. The "results obtained by multiple methods do not always produce corroborating or complementary results; however, divergent results can also be illuminating" (Dörnyei, 2007, p.164). Therefore, possible contradicting results may emerge, opening up new research perspectives. This is in response to ongoing calls for research to explore the nuances of contextualised strategy use (see, for example, Tseng et al., 2006; Woodrow, 2005; Rose, 2012a; Rose et al., 2018). The mixed methods approach employed for this current study can not only increase the strength of each method whilst eliminating any weaknesses, but may also improve the validity of the study, as the results from one part can be verified by the results from the other.

3.4 Research design

In this section, the project design will be presented, followed by an introduction of research instruments used in this study. The project was conducted in two phases. Phase 1 comprised a longitudinal case study conducted in a single institution over one academic year involving:

- repeated semi-structured learner interviews which incorporated:
 - stimulated recall tasks
 - eye-tracking tasks

- post-course learner questionnaire.

Phase 2 comprised a national survey of Chinese language learners in all Irish Higher Education institutions which teach Chinese.

The following figure represents an overview of the data collection instruments employed:

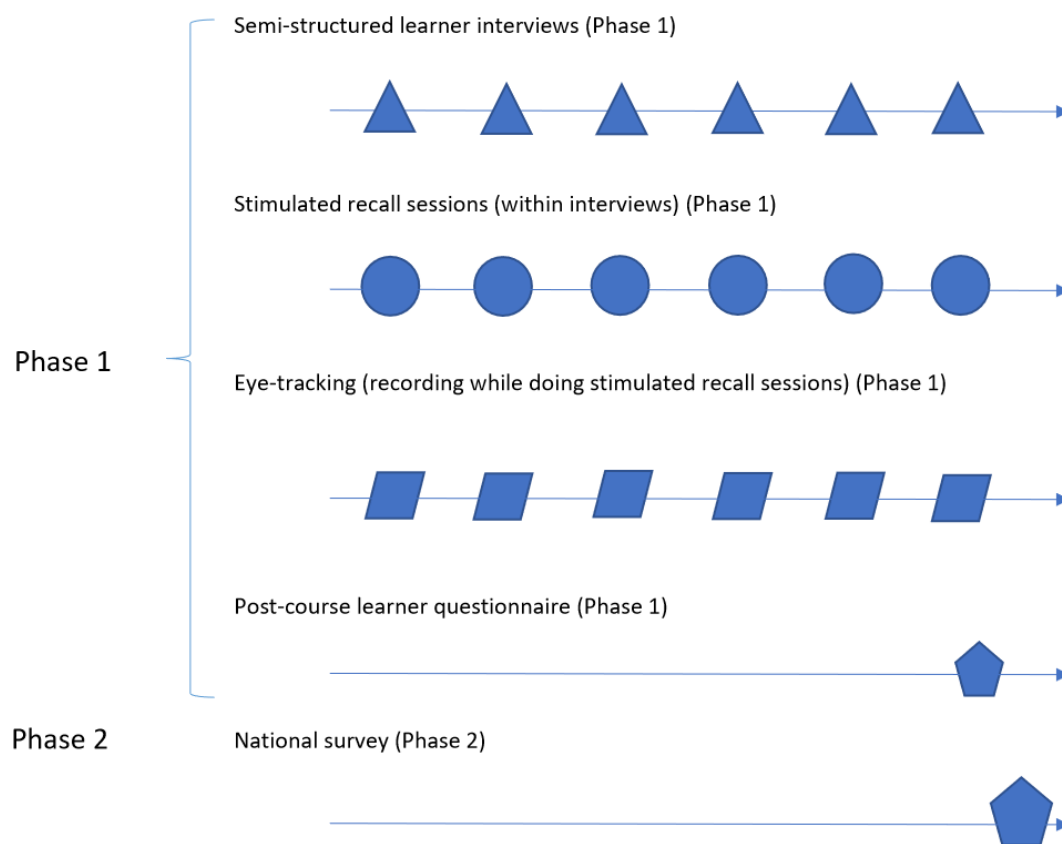


Figure 3.1 Data collection instruments

The following subsections will present the details of the research design.

3.4.1 Research participants

This study was conducted among undergraduate students who were enrolled in Chinese studies degree course in colleges of Irish higher education. This criterion of selecting participants for this study was proposed due to the research aims (see Chapter 1) and a recent research regarding strategic learning, which revealed that strategy use was not only highly individualized (Rubin et al., 2007), but also effected by environment and context (Woodrow, 2005; Grenfell & Macaro, 2007). As a result, the Chinese studies degree course here refers to the bachelor's degree courses, which are provided by Irish universities, which and contains a certain requirement focus of on learning the Chinese language. Consequently, those students who take Chinese as an interest courses or elective courses are excluded in this study. Furthermore, the language background of participants was alphabet-based.

According to Miles and Huberman, “qualitative samples tend to be purposive, rather than random” (1994, p.27). Purposive sampling requires researchers to “handpick the cases to be included in the sample on the basis of their judgement of their typicality or possession of the particular characteristics being sought” (Cohen et al., 2007, p.114). As qualitative instruments were used in Phase 1, the investigation of the case study focused on a group of eight students who were learning Chinese as part of their bachelor degree in one Irish university. During Phase 2, all students from alphabetic language backgrounds who were enrolled in a Chinese Studies undergraduate degree courses in Irish universities were surveyed, and 115 responses were received.

3.4.2 Phase 1: Case study

This study employed a longitudinal case study where “information is gathered about the target of the research during a series of points in time” (Dörnyei, 2007, p. 79). Menard (2002, p. 2) pointed out the target of longitudinal research

approaches: “as a bare minimum, any truly longitudinal design would permit the measurement of differences or change in a variable from one period to another”.

Duff (2007, p. 44) discussed the advantage of the case study method, with particular focus on longitudinal case studies, as follows:

When done well, [case studies] have a high degree of completeness, depth of analysis, and readability. In addition, the cases may generate new hypotheses, models, and understandings about the nature of language learning or other processes. Such knowledge generation is possible by capitalizing on either unique or typical cases in theorizing about particular phenomena that challenge current beliefs. In addition, longitudinal case study research helps to confirm stages or transformations proposed on the basis of larger (e.g., cross-sectional) studies and provides developmental evidence that can otherwise only be inferred.

As case studies are often exploratory, the use of a case study can provide rich and in-depth insight into the strategies employed by learners of Chinese as a foreign language in Irish universities when learning Chinese written characters, as well as a thick description and understanding of the target phenomena. Many of the processes investigated in case studies cannot be adequately researched in any of the other common research methods. This longitudinal case study aims to examine the strategy development and learning performance over time. As van Lier (2005, p. 195) has summarized, “case study research has become a key method for researching changes in complex phenomena over time”. In current language learning strategy research, key scholars have argued for more contextualised research approaches (Woodrow, 2005) and qualitative methods (Tseng et al., 2006; Rose, 2012b). Within the case study, a number of different instruments were deployed (semi-structured learner interviews, comprising stimulated recall tasks and eye-tracking tasks; a post-course learner questionnaire). The design of these four instruments is presented below.

3.4.2.1 Semi-structured interviews

As a qualitative method, interviews are a frequently employed (Dörnyei, 2007 p.134) instrument in qualitative inquiries. As Miller and Crabtree (1999) pointed out, the interview method usually obtains shared cultural knowledge with its turning-taking conventions and expectations for participants. Semi-structured interviews offer a compromise between the two extremes of structured interviews (conducted with a prepared, elaborate interview guide) and unstructured interviews (allowing interviewees' maximum flexibility with unpredictable directions). The purpose of the questions in the interview is to find out "what people know, what they do, and what they think or feel. This leads to questions concerned with facts, with behaviour, and with beliefs or attitudes. This leads to questions concerned with facts, with behaviour, and with beliefs or attitudes." (Robson, 2011, p.280). Although pre-prepared guiding questions and prompts are set, semi-structured interviews are open-minded and the interviewees "are encouraged to elaborate on the issues raised in an exploratory manner" (Dörnyei, 2007, p.136). In other words, the interviewer offers guidance and direction. The interviewee can elaborate with guidance from the interviewer. The semi-structured interview is "suitable for cases when the researcher has a good enough overview of the phenomenon or domain in question and is able to develop broad questions about the topic in advance" (Dörnyei, 2007, p.136).

The guide for the interviews (see Appendix A) was developed based on the example interview schedule for semi-structured interviews used by Rose (2017). This guide was an array of main questions, whose function is to ensure that all research topics were covered during the interview (Hennink, et al., 2010). These topics can be divided into four categories:

- Participants' background information
- The usage of language learning strategies
- The capacity of self-regulation
- Evaluation of one's own learning.

After each main question, several follow-up questions were designed in order to gain a richer understanding or invite participants' further comments. These questions were designed based on Ma's questions in her case study (2007) and Rose's structure (2017). Two type of questions were adopted in this guide, which are open questions and polar questions, with a predominance of open questions.

As Figure 3.1 presents, 6 rounds of interviews were conducted during the investigation. In each round, 8 individual learner interviews were arranged in a face-to-face format between the researcher and each participant, in an office on campus where participants studied. Each interview was conducted in English and lasted between 15 minutes and 40 minutes. In every interview, the main questions were asked. Then areas in which the researcher may prompt the interviewee to comment further followed each main question. Questions regarding participants' background information, designed to gain a good understanding of participants' background, were only delivered once in the first interview. All other questions were asked in all the interviews. All interviews were audio-recorded by a recording device.

3.4.2.2 Stimulated recall task

Data from stimulated recall tasks can reflect of learners' thoughts during their learning, during which these learners are asked to recall their concurrent thinking after being given various kinds of prompts. Mackey and Gass (2005, p.266) gave a definition about stimulated recall as "[a]n introspective technique for gathering data that can yield insights into a learner's thought processes during language learning experiences". Learners are asked to introspect while viewing or hearing stimulus to prompt their recollections. Stimulated recall methodology can be used to "prompt participants to recall thoughts they had while performing a task or participating in an event" (Gass and Mackey (2005, p. 17). DiPardo (1994) also pointed out the advantages of using stimulated recall tasks in research on second

language learning: "stimulated recall is . . . less a unified approach than a flexible tool that has been adapted to widely varied agendas, and attended by a number of specific methodological choices" (p. 168). In addition, "a subject may be enabled to relive an original situation with great vividness and accuracy if he is presented with a large number of the cues or stimuli which occurred during the original situation" (Bloom, 1954, p. 25).

Therefore, stimulated recall tasks were designed within the process of semi-structured interview to understand strategies used by participants when learning Chinese characters in the classroom and at home. The process that was involved in the stimulated recall was retrieval, which was described by Matlin (2005) as locating and accessing information in the memory. During this retrieval, the learners accessed each Chinese character by associating the encoding process used in Chinese characters learning, thus providing clues to how the Chinese characters were memorized. So the stimulated recall in this study examined only the reading of Chinese characters, rather than written production, which may require a different process. More specifically, the writing part regarding Chinese character acquisition was not explored in the research design of this study.

In this study, the stimulated recall was one of the major sources of information in terms of learners' Chinese characters learning processes. Therefore, particular attention had to be paid to the instrumentation regarding its validity. Mackey and Gass (2000, 2005) provided four suggestions to carefully structure stimulated recall:

- Data should be collected as soon as possible after the event to be recalled.
- The stimulus should be as strong as possible to activate memory structures.
- The participants should be minimally trained. In other words, they should understand the procedure, but should not be mentioned with any aspects that are extra or unnecessary knowledge to avoid recall pre-dated

knowledge.

- The participants should not be led or interrupted during the recall process.

During the stimulated recall tasks, students were invited to review a list of Chinese characters and words with the presence of the researcher, while sharing their thoughts on how they recalled each of the Chinese characters and words. The Chinese characters for these first five stimulated recall tasks were randomly picked from the characters they had been taught recently. After each Chinese character, a word presented in the textbook with this character would then be presented. The full list of stimuli was presented in Appendix F. During the stimulated recall, the participants were required to tell the researcher how they could recall each Chinese character that appeared on the screen. The purpose of enrolment of the words was to determine if seeing the words would help the learners to identify the target character. In other words, the learners were still required to focus on the target Chinese character when viewing the words that contained the target character. In the final stimulated recall sessions, a list of Chinese characters and words were picked from the previous five stimulated recall sessions, with the purpose of exploring more long-term recollection processes.

The exact procedure of each stimulated recall task during the semi-structured learner interview is described as follows. On the day of the Chinese characters classes, each participant was interviewed in a private room on the university campus; thus, the data was collected “as soon as possible after the event that was the focus of the recall” (Mackey & Gass, 2005, p.78). Each participant was asked to examine each Chinese character, or words, and then tell the researcher the answer to each item while verbally describing how they had reached that answer. The participants essentially relived the class condition with a spoken format and performed a “talk-aloud” about their cognitive processes, which meets the requirement that “the stimulus should be as strong as possible to activate memory structures” (ibid., p.79).

Prior to the first stimulated recall tasks, the researcher explained the procedure to the participants. During the stimulated recall tasks, the role of the researcher was minimised to the act of changing the slides of Chinese characters for the participant, thus eliminating any research interference and bias. Sometimes, however, the researcher had to ask follow up questions to seek further explanation from the learners, such as: (1) What's the meaning/pronunciation of this character? (2) How do you know that? (3) How do you know the meaning/pronunciation of this character? However, verbal cues from the interviewer were kept to a minimum to strengthen the reliability of the data obtained.

3.4.2.3 Eye-tracking

Eye-tracking technology was also introduced during the semi-structured interviews and stimulated recall tasks, to triangulate participants' responses with another source of data. For example, if a participant suggested in a stimulated recall session that he/she was focussing on a particular element of a Chinese character, the data from an eye-tracker could corroborate this focus through data triangulation.

An eye tracker is a piece of technology that "examines eye movements during the reading process" (Liu, 2014). This approach monitors readers' reading pace and route without causing any interruption to their reading (Hyönä & Nurminen, 2006). An eye-tracker, which is "an electronic device capable of recording eye movements" (Suvorov, 2015), and corresponding software is utilized to record and analyse the data. Holmqvist et. al. (2011, p.3) concluded four large classes of eye-tracking measures as follows,

- Movement measures are concerned with a whole variety of eye movements through space, and the properties of these movements.

- Position measure deals only with where a participant has or has not been looking, and the properties of eye-movements at spatial locations.
- Numerosity measures pertain to the number, proportion, or rate of any countable eye-movement event.
- Latency measures express the duration from the onset of one event to the onset of a second event. Measures of this type also appear in the form of spatial distances.

As a research tool, eye-tracking is seen as “more accessible than ever” and is growing in popularity amongst researchers from a whole host of different disciplines (Holmqvist & et. 2011, p. 1). During the past decade, “a surge of eye-tracking studies in various disciplines can be witnessed, including psycholinguistics, especially with the focus on reading” (Suvorov, 2015). In the field of strategic learning, eye-tracking was noticed and recommended as follows:

This is an area of research where data collection techniques such as stimulated recall are essential, but also where eye-tracking technology would add a further element to providing proof as to which components learners focus on to extract meaning during the encoding and recall processes (Rose 2017, p.157).

In response to this call, the research used eye-tracking technology as an additional dimension of the stimulated recall activity. As eye-tracking was designed as a secondary data source, results from eye-tracking technology were not used to make claims of strategy use in Chinese character learning, but instead to corroborate data from the stimulated recall tasks by adding a further, triangulating, dimension to the self-reported strategy use by the participants. During the stimulated recall tasks, Chinese characters that the student had learned in the previous weeks were displayed on a screen, and in addition to the cognitive processes voiced by the participant, the eye-tracking technology provided insight into elements of the Chinese characters that students examined when recalling the meaning of the characters:

In this study, the Tobii Pro X2-60 eye tracker was used, which is a stand-alone eye tracker. By attaching it to monitors, the data regarding eye movements of participants can be recorded by the corresponding software Tobii Studio. In other words, participants did not need to touch or wear this equipment, which ensured their comfort and freedom of behaviour. In addition, the length of Tobii X2-60 is only 184mm, which minimized the possible distraction caused by the eye-tracker during the investigation.

3.4.2.4 Post-course learner questionnaire

Using questionnaires is an efficient way to collect a large amount of information in less than an hour with low personal investment. Furthermore, the data from a well-constructed questionnaire can be processed quickly, especially by using computer software. In addition, questionnaires are very versatile, which means that, with a variety of people in a variety of situations targeting a variety of topics, questionnaires can be successfully used. As a result, 'the vast majority of research projects in behavioural and social sciences involve at one stage or another collecting some sort of questionnaire data' (Dörnyei, 2007 p.115).

In Phase 1 of this research, a learner questionnaire on Chinese character learning was implemented at the end of the case study. When finished the last interview, participants would be asked to finish the printed version of this questionnaire. The full version of the questionnaire used in this case study is attached in the Appendix (see Appendix B). In the case study phase of the study, this questionnaire was also used as a secondary data collection instrument in order to triangulate data from semi-structured interviews and stimulated recall tasks. The use of a learner questionnaire in this way follows procedures used by Rose (2013), who used questionnaire data to compare qualitative data in his case study of 12 Japanese learners.

Therefore, a post-course learner questionnaire was designed by the researcher to investigate students' Chinese character learning strategies. The questionnaire focussed on strategic learning and the self-regulatory capacity. According to Dörnyei (2009, p.2) "questionnaires with one sufficient (and well-documented) psychometric reliability and validity are not that easy to come by in our field". For this reason, this study adapted questionnaires from other studies in the field of Chinese character learning, Japanese character learning and self-regulation to strengthen the reliability and validity of data.

In this study, the first part of the questionnaire was mainly based on Jiang and Zhao's questionnaire (2001). The version used in the current study is the one quoted by Ma (2007, p. 49). It is a Likert scale questionnaire created with the intention of gathering information about learners' learning strategies of Chinese characters in a setting of learning Chinese as a foreign language. As discussed in Chapter 2, this questionnaire has been adopted by a number of studies (e.g. Han, 2009; Xu, 2013; Zhang, 2017). According to Jiang and Zhao, their questionnaire design was based on the Oxford SILL model. However, criticism of their questionnaire was noticed in this study, such as missing categories of strategies (Li, 2016). For this reason, Jiang and Zhao's questionnaire was adapted and reworded for the current study. Three categories, association, stories and auxiliary tools, were added to this part as cognitive strategies. The former two strategies (association and stories) are from the Questionnaire for the Strategic Learning of Kanji (QSLK), which was developed to be used to measure strategies for Japanese characters learning (Rose, 2017).

The second part of this questionnaire was designed in order to measure the self-regulatory capacity of Chinese character learning, based on the template of the questionnaire SRCkanji (Rose, 2017). Adapted from the questionnaire of Tseng et al. (2006), which is a measure of the self-regulatory capacity of vocabulary learning (SRCVoc), the SRCkanji is "a questionnaire designed to measure self-

regulation of the kanji learning task” (Rose, 2017, p. 171). In terms of the SRCVoc, Dörnyei (2005, p.84) clarified, “the SRCVoc does not measure strategy use but, rather, the learner’s underlying self-regulatory capacity that will result in strategy use”. In other words, questions of this type, such as the SRCkanji and the SRCVoc, can supply an understanding of the underlying self-regulation strategies of learners, rather than learning strategies. Even though the validity of the SRCkanji has not yet been proven, the SRCVoc has been shown to be a valid instrument (e.g. see Tseng et al., 2006; Mizumoto & Takeuchi, 2012).

The four instruments deployed in Phase 1 have been described above. Three of the instruments were incorporated into the format of the semi-structured learner interviews, which also included stimulated recall and eye-tracking in addition to the interview questions. At the end of the longitudinal case study, a post-course learner questionnaire was administered. The findings from these instruments fed into the design of the instrument that was designed for use in Phase 2, a national survey of university learners of Chinese in Ireland, presented in the following section.

3.4.3: Phase 2: national survey

A national survey was conducted after the case study. The purpose of using a survey is to gather information from (a sample of) particular entities. With the information, quantitative descriptors can be constructed to present the attributes of the larger population of which these entities belong to. Groves et al. (2004) described the method of survey as “systematic”, which “is deliberate and meaningfully distinguishes surveys from other ways of gathering information” (ibid., p. 2). As one of the mostly commonly utilized approaches in the research of social sciences, surveys can help to explore the social behaviour and test theories. “In a very real way, surveys are a crucial building block in a modern information-based society.” (ibid., p. 3) Three vital parts of the survey, which are questions,

collecting answers and the selection of the sample, should be considered when designing a survey.

As discussed at the start of this section, the current study was visualised as a two-phase research study. In Phase One, a longitudinal case study approach was adopted to explore a highly contextualised understanding of strategies deployed when learning Chinese characters at one Irish university. In Phase Two, a survey approach was adopted, where a questionnaire was widely distributed to undergraduate Chinese studies students in Irish Universities. This part of the research study was designed to help to generalise the findings of the qualitative part, as well as to afford opportunities to explore key variables associated with strategy use.

The questionnaire used in the survey contained three parts:

1. Participants' background information
2. Language learning strategies
3. Self-regulation Strategies.

Parts 2 and 3 contained exactly the same questions as the post-course learner questionnaire administered at the end of the case study. A background section was added to the national survey, in order to obtain key information on participants. In Part 1, single-choice and open-ended items were designed to understand students' background in terms of: 1. Year level; 2. Previous Chinese learning; 3. Chinese character proficiency; 4. Native language background. The full version of the survey is presented in Appendix C.

As the number of students in Ireland who take Chinese studies as their bachelor's degree course was not very large, all students who were enrolled in bachelor degree courses regarding Chinese Studies were provided an opportunity to

complete this survey. In order to achieve a better response rate, the questionnaires were in printed form and physically distributed to learners as a group, following Dörnyei's suggestions (Dörnyei, 2005, p. 113):

In social research the most common form of administering questionnaires is by mail; however, educational research is different in this regard, as administration by hand is typically more prominent than a postal survey. In applied linguistic research, group administration is the most common method of obtaining completed questionnaires, partly due to the typical targets of the surveys being language learners within institutional contexts, and it is often possible to arrange to administer the instrument to them whilst they are assembled together, such as for a lesson. This method allows for a few questionnaire administrators being able to collect a very large amount of data within a relatively short time.

Consequently, potential participants were first introduced to the study via an in-class announcement a few days in advance, and, on the day of the survey, paper questionnaires were distributed to them by the researcher or the students' course co-ordinator between their Chinese classes. Instructions were provided in terms of explaining the purpose and significance of the survey. The participants were asked to complete the questionnaire alone, without discussing it with others.

3.4.4 Piloting

The research instruments were piloted to check for their validity and feasibility. The group selected for the pilot was a group of six volunteer students who were learning Chinese in the same university where the case study was conducted. The pilot interviews, stimulated recall and eye-tracking took place in the same office with that of the case study. This group was chosen as their study experience resembled that of the participants in this study, and they were, thus, deemed suitable to provide feedback on the questionnaire. The piloting of this study was conducted in June, 2016. Before each piloting, the purpose of the study and data collection format were explained and the confidentiality of data was guaranteed. Afterwards, participants were invited to participate in the semi-structured

interview, including the stimulated recall and eye-tracking tasks. These participants were also asked to complete the questionnaire.

The pilot study participants were requested to evaluate the clarity and other possible problems that may affect their understanding and responses. The pilot study led to some interview questions being refined as well as allowing the researcher to experience asking probing and clarifying questions for a deeper response in the stimulated-recall tasks. In addition, the character font of the stimulated recall tasks was changed in order to use the same font in the textbooks, following suggestion by participants. Finally, more options were added to some questions in the background section of the questionnaire based on the information that shared by these six participants. For example, for the item on what kind of Chinese classes that participants had taken before being enrolled in degree course, additional formats of Chinese classes were added.

3.4.5 Research ethics considerations

Understanding research ethics are an essential part of any study with human subjects. Five principles regarding ethical considerations during the investigation were put forward by Hennink et al. (2010), including informed consent, self-determination, minimization of harm, anonymity and confidentiality. Ethical considerations have been carefully managed throughout this study.

During the design stage of the study, an application form was submitted to, and approved by, the Research Ethics Committee in the School of Linguistic, Speech and Communication Sciences of Trinity College, Dublin. Prior to formally conducting the case study, each participant in the case study was invited to read the project's Participant Information Leaflet which highlighted the main points of this study, including its scope, data collection processes, storage and management of the data, and confidentiality and anonymity issues. Participants in Phase 1 were

then invited to sign a consent form at the start of the project. Phase 2 participants were informed of the same details at the start of the questionnaire (see Appendix C), and informed that further completion of the survey would be taken as consent.

During the survey, the ethics committee of all institutions were contacted by the researcher to obtain official approval. The content regarding consent was placed at the start of the questionnaire, which clarified that consent forms were seen as signed by participants when they returned the questionnaire. During the study, participants were reminded that participation was on a voluntary basis, and that they had a right to withdraw at any stage without need to explain, or any negative consequences.

In order to minimize any possible harm, the environment and devices used in the investigation were carefully picked to make sure the comfort of the participants, including using a non-contacting eye-tracker which was comfortable for all. In terms of the anonymity and confidentiality of participants, participant's names were replaced with pseudonyms in all transcriptions and the thesis, with the key stored separately and then destroyed. Any personal information that may indicate the identity of participants in the case study was removed. The national survey was an anonymous survey. The original recordings and all copies were available only to the researcher and supervisor. The interview transcriptions were deleted from the recorder as soon as they were transferred to computer immediately after each interview. Hard copies records were locked in a secure location, and all digital data were password-protected.

Having discussed the research instruments employed in this study, the process of analysing data that collected through these instruments will be presented in the next section.

3.5 Data analysis

In this section, the project's approach to qualitative and quantitative data analysis is described. Firstly, the coding process of the current study will be introduced. Then further analysis based on the coding work will be described in the next section.

3.5.1 Data coding

Dörnyei (2005, p. 250) suggests that “most research methods texts would confirm that, regardless of the specific methodology followed, qualitative data analysis invariably starts with coding”. Codes are “tags or labels for assigning units of meaning to the description of inferential information compiled during a study” (Miles and Huberman, 1994, p.56). The action of coding “involves highlighting extracts of the transcribed data and labelling these in a way that they can be easily identified, retrieved or grouped” (Dörnyei, 2005, p. 250). Richards (2005, p. 85-86) provided a useful explanation of the coding process in qualitative research:

In common use, “coding” refers to data reduction either by a system of symbols (as in Morse code which reduces everything to dots and dashes) or by numbers (as in the coded boxes to tick on a questionnaire) ... but qualitative coding is about data retention. The goal is to learn from the data, to keep revisiting it until you understand the patterns and explanations.

Dörnyei (2005) introduced a three-level system of coding used in qualitative research as follows:

- *Open coding* constitutes the first level of conceptual analysis of the data. The textual data is ‘broken open’ into chunks whose length usually varies between a long phrase, a line, a sentence, or even a short paragraph.
- *Axial coding* extends the abstracting process from first-order concepts to higher-order concepts. The researcher makes connections between

categories, thereby attempting to integrate them and group them into more encompassing concepts that subsume several subcategories.

- *Selective coding* is the final stage where a 'core category' is selected to concentrate on in the rest of the analysis and the writing up of the study. This core category will be the centrepiece of the proposed new theory.

With the aim of coding data effectively, researchers need to develop a coding scheme based on an understanding of the coding process. Regarding to the creation of codes for coding schemes, Miles and Huberman (1994, p.58) suggest:

One method of creating codes – the one that we prefer is that of creating a provisional “start list” of codes prior to fieldwork. The list comes from the conceptual framework, list of research questions, hypotheses, problem areas and/or key variables that the researcher brings to the study.

Following the guidelines suggested by Dörnyei, and Miles and Huberman, the current study's list of codes was generated based on the research questions and conceptual framework, including the key variables. The list of codes is provided in Table 3.2. In the following two sections, the detailed consideration in terms of generating codes for this study will be provided.

Starting list of codes for analysing data	Code	Main data source	Secondary data source
Background BG: Characters BG: Previous study: <i>Type</i> BG: Previous study: <i>Length</i> BG: Previous study: <i>Activities</i>	BG BG-CHA BG-TYP BG-LEN BG-ACT	Interview	
Language learning strategies <i>Language learning strategies: Direct strategies</i> LLS: <i>Stroke</i> LLS: <i>Component</i> LLS: <i>Shape</i> LLS: <i>Stories</i> LLS: <i>Association</i> LLS: <i>Induction</i> LLS: <i>Repeat</i> LLS: <i>Application</i> LLS: <i>Auxiliary Tools</i> <i>Language learning strategies: Indirect strategies</i> LLS: <i>Planning</i> LLS: <i>Evaluation</i> LLS: <i>Collaborative</i>	LLS LLS-DS LLS-DS-STR LLS-DS-COM LLS-DS-SHA LLS-DS-STO LLS-DS-ASS LLS-DS-IND LLS-DS-REP LLS-DS-APP LLS-DS-AUX LLS-IS LLS-IS-PLA LLS-IS-EVA LLS-IS-COL	Interview Stimulated recall tasks	Questionnaire Eye-tracking
Classroom practice CP: <i>Activities</i> CP: <i>Instruction</i> CP: <i>Interest</i> CP: <i>Usefulness</i>	CP CP-ACT CP-INS CP-INT CP-USE	Interview	Questionnaire
Self-evaluation SE: <i>Strategy use</i> SE: <i>Study habits</i> SE: <i>Difficulty</i>	SE SE-STR SE-STU SE-DIF	Interview	Questionnaire
Self-regulatory strategies MC: <i>Commitment</i> MC: <i>Metacognitive</i> MC: <i>Satiation</i> MC: <i>Emotional</i> MC: <i>Environmental</i>	MC MC-COM MC-MET MC-SAT MC-EMO MC-ENV	Interview	Questionnaire
Other	OT	Interview	

Table 3.1 Starting list of codes for qualitative data analysis

3.5.1.1 Conceptual framework

In terms of language learning strategies, Jiang and Zhao's conceptual framework (2001) was considered foundational in generating codes for the study, with reference also to Rose's (2017) research on Kanji learning. As discussed in Chapter 2, Jiang and Zhao's framework regarding Chinese character learning strategies is one of the most representative models in this area. Their framework has been adopted by a number of studies regarding Chinese character learning as a

reference model, which confirmed the reliability of this framework for use in the area. In addition, as there is only a limited number of studies to date that have studied Chinese character learning strategies, with even fewer using a framework combined language learning strategies and self-regulation, Rose's (2017) framework based on research on Japanese character learning strategies was also adopted as a reference point for this study.

As presented in Chapter 2, Jiang and Zhao's studies of language learning strategies can be divided into three major categories: Character decoding strategies, direct strategies and indirect strategies. This taxonomy is also in light of Shen's (2005) work related with the orthographic-knowledge-based learning strategies. Character decoding strategies are defined as making use of the orthographic knowledge about Chinese characters, such as radical knowledge, graphemics, semantics and phonetics, as cues to encode character. Direct strategies are defined as "processes that may contribute directly to learning" (Grenrell & Macaro, 2007, p.11). Indirect strategies refer to metacognitive strategies, which are defined as "controlling cognition through the co-ordination of the planning, organization and evaluation of the learning process" (Oxford, 2001, p. 166).

Under each of these two major categories, researchers have articulated specific learning strategies. In terms of self-regulatory learning, Dörnyei's model of motivational strategies (2005; 2013, p.99) was mainly considered by the researcher, also previously used by Rose (2017) to explore Japanese character learning. The conceptual framework for data coding in this study is provided in the following table:

Category	Sub-category	Strategy name
Language learning strategies	Character decoding strategies	Stroke strategy
		Component strategy
		Shape analysis
	Direct strategies	Association
		Induction
		Repeating
		Application
		Auxiliary tools
		Stories
	Indirect strategies	Planning
		Evaluation
		Collaborative
Self-regulatory strategies	N/A	Commitment control
		Metacognitive control
		Satiation control
		Emotional control
		Environmental control

Table 3.2 Conceptual framework for coding

3.5.1.2 Process of coding

After taking previous conceptual frameworks into consideration of coding the data, the researcher started to label all data collected from qualitative approaches (interviews and stimulated recall). Before the process of coding, the data were transcribed manually for further analysis. The NVivo program was utilized to organise and code the transcription data. Saldaña (2013, p. 31) acknowledged the ability of NVivo in coding as to “organise evolving and potentially complex coding systems into such formats as hierarchies and networks for at a glance user reference”.

During the coding, major themes in the transcribed data were coded with specific nodes, which were a collection of references regarding specific categories. The full list of NVivo nodes which emerged during the process of open coding is provided in the table below. Five key themes emerged: participants’ background information; strategy instruction within the classroom; language learning strategies; self-regulatory learning; self-regulation. The sub-themes and constituent components are outlined in Table 3.3 below.

NVivo node
• Previous Chinese learning • Motivation to learn Chinese • Feelings about learning Chinese characters before this study • Strategy teaching in the classroom • The effectiveness of strategies taught by teachers • The approach to teaching strategies by teachers • Other activities related to strategy use in the classroom • Learning strategies ○ <i>Stroke</i> ○ <i>Component</i> ○ <i>Shape</i> ○ <i>Association</i> ○ <i>Induction</i> ○ <i>Repeating</i> ○ <i>Application</i> ○ <i>Auxiliary Tools</i> ○ <i>Stories</i> ○ <i>Metacognitive</i> ○ <i>Evaluation</i> ○ <i>Collaborative</i> • Self-regulation • <i>Motivational control</i> • <i>Commitment control</i> • <i>Satiation control</i> • <i>Emotional control</i> • <i>Environmental control</i> • Learning outcomes • Recent feelings about learning Chinese characters • Reasons that caused the learning outcomes

Table 3.3 Nodes from NVivo

3.5.2 Quantitative data analysis

In terms of the eye-tracking dataset, the tasks recorded different parameters of eye movement from each participant's left eye, such as fixation points, using the algorithm provided by the Tobii machine. Following the coding method of Huettig and McQueen (2007), each eye fixation was represented by a dot and then presented as various figures. Then, within-case and cross-case data analysis would be conducted in this case study part.

Eight post-course learner questionnaires were also collected during the case study. Due to the small sample size of the case study, the results from these questionnaires were only used to compare data from the primary instruments by providing a further dimension of participants' reports, and were subjected to basic descriptive analysis.

The data from the national survey was manually inputted to SPSS (24.0), the software package which is 'most commonly used in applied linguistic and educational research' (Dörnyei, 2007 p. 198). The data were firstly tested for normal distribution with the Kolmogorov-Smirnov test and for homogeneity of variances with Levene's test. Then Orthogonal Rotation analysis was conducted to find out if each item was grouped under the appropriate factor as Table 6.3 and Table 6.4. Four items with low loadings (loading < 0.3) were deleted. Then, the internal reliability was calculated using Cronbach's Alpha Coefficient (Cronbach, 1951). The results indicated that the data set was suitable for further statistical tests, which are displayed in Chapter 6.

3.6 Description of the study

This section will focus on implementation of the project by introducing the setting, participants, research procedures used in the implementation of the case study and then the survey. In each Phase, an overview of collected data will be presented as well.

3.6.1 Phase 1: Case Study

This section will present how the case study was organised and conducted in detail followed by an overview of data collected in the case study.

3.6.1.1 The setting of the case study

Students in Ireland can enrol for Chinese Studies in either a three-year degree or four-year degree course, with the third year being spent at one of the partner universities in China. The programme for Chinese studies in Ireland is designed for beginners; hence, no prior knowledge of Chinese is required. In all years of the programme, Chinese language (Mandarin) is compulsory. Universities have adopted the HSK¹ standards for preparing their curriculum and assessment to nurture proficient learners of Chinese language, and use the same textbook series *New Practical Chinese Reader*.

The case study was conducted in an Irish university that provides one of the only two Bachelor of Arts programmes in Chinese Studies available in Ireland. In this undergraduate programme, students can choose a variety of modules in Chinese Studies. Mandarin Chinese courses are compulsory for every student. With the increasing popularity of Chinese learning, student numbers are growing steadily. A sizeable number of undergraduate students have enrolled in this programme every year since 2015. The university year is organised according to two semesters of 12 weeks, with one study week per semester. Written examinations take place at the end of each semester. The schedule of the academic year is presented in Table 3.4

¹ The Hànyǔ Shuǐpíng Kǎoshì (HSK) (汉语水平考试), refers to China's only standardized test of Standard Chinese language proficiency for non-native speakers.

Week	Action
1-6	Teaching
	Study Week
7-12	Teaching
	Christmas Vacation
	Exam Weeks
Week	Action
1-6	Teaching
	Study Week
	Easter Vacation
7-12	Teaching
15	Exam Weeks

Table 3.4 Academic Year

Within the Chinese Studies degree curriculum, the students were expected to attend scheduled classes for the first 11 weeks. Each week, the participants in this case study had three 1-hour lectures and two 1-hour tutorials. During the lectures the students were taught three-weekly lists of Chinese characters and they engaged in Chinese language instruction based on the textbook *New Practical Chinese Reader 2*, the content of which was also reviewed in tutorials. The students took oral exams in the 12th week. This Chinese language module was assessed by in-class assessments (20%), oral exams (30%) and university-scheduled written exams (50%). The arrangement of each semester's teaching and assessment is set out in the following table.

Week 1 – Week 5	Week 6	Week 7 – Week 10	Week 11	Week 12	After Week 12
3 one-hour lectures and 2 one-hour tutorials per week	2 one-hour lectures and 2 one-hour tutorials; 1 in-class assessment	3 one-hour lectures and 2 one-hour tutorials per week	2 one-hour lectures and 2 one-hour tutorials; 1 in-class assessment	No lectures or tutorials. Oral exam.	Final exam.

Table 3.5 Chinese language curriculum

3.6.1.2 Participants in the case study

As discussed in section 3.4.1, this study was limited to students from a non-character language background, as previous research noted that prior experience of a character-based script in learners' first language background can provide an advantage to learners of a character-based L2 (for example, Japanese language learners have prior knowledge of Chinese characters, due to their use within the Japanese writing system). In Phase 1, the case study was also limited to students who are fluent in English, as the interviews would be conducted only in English. This study, therefore, aimed to include students with the same language learning background.

After initial interviews with 30 potential participants with various Chinese proficiency levels, nine participants from the same class were selected, offering a diverse range of proficiency and strategy use, but a similar language learning background. Their class was in its second year of the undergraduate programme at the time of conducting this study, having reached Lesson 14 of their textbook series *Practical Chinese Reader* and finishing at Lesson 22 at the end of the study. Even though the sum of new characters of the second year (196) is similar with that of the first year (180), the difficulty of these new characters increased significantly.

After the first interview, one of the participants left the university due to personal reasons. However, as the research had already started and case study methods are responsive to such on-the-ground changes, the remaining eight participants fulfilled the research requirements so no further participant was added. The coordinator of the undergraduate class assisted in the recruitment of the participants by sharing information about the project with potential participants, through distribution of the participation information leaflet. The following table provides a summary of the eight participants who participated in the case study, with initials replacing participants' names.

Participants	Chinese language proficiency	Gender
TD	High	Male
FH	High	Female
HD	High	Male
KX	Medium	Female
MX	Medium	Male
OS	Medium	Female
OK	Low	Male
GY	Low	Female

Table 3.6 Case study participants

The proficiency levels in the above table were based on the first dictation test results and the observation results as assessed by their course co-ordinator during the first week of the academic year. ‘Low’ indicates that their knowledge of Chinese characters is lower than the class average; ‘intermediate’ indicates an average knowledge of Chinese characters; ‘high’ indicates an above-average knowledge.

3.6.1.3 Administration of the case study

After the piloting phase, an introductory recruitment interview was organized by the researcher with all potential participants to explain the study briefly and determine if they suited the study in terms of their language background. The case study was conducted over a period of one academic year starting from September, 2016, consisting of two 12-week semesters. The case study comprises a repeated semi-structured learner interview which incorporated a stimulated recall task and eye-tracking. A post-course learner questionnaire was administered to all eight participants at the end of the study. The full interview lasted up to one hour: the interview portion took between 15 minutes to 40 minutes to complete, whilst each stimulated recall session lasted between 10 minutes to 22 minutes.

The interviews were organized in an office at the university. The office was near the classrooms where students attended their Chinese language courses.

Comfortable chairs and soft drinks were offered in each interview. Before each interview, the research would make sure that participants were happy to proceed and comfortable to with all aspects of the interview. The semi-structured interview portion was completed, followed by the stimulated recall tasks. Participants were asked to sit in front of the screen of the computer where 10 Chinese single characters and 10 Chinese words with these characters were shown one by one. These characters were typed in black Times New Roman font on a white background at 200 font size, in order to make the characters fully legible. When these characters were shown in the screen, students were asked to translate the characters and to explain how they remembered these characters. The eye-tracker, attached to the bottom of the screen, recorded the whole process of the stimulated recall tasks. After the stimulated recall tasks, participants were offered the opportunity to share any further comments. At the end of the last interview, each participant was invited to complete a post-course learner questionnaire in hard copy.

3.6.1.4 Overview of data collected in the case study

As presented in subsection 3.6.1.3, six rounds of semi-structured interviews were arranged with all participants of this case study. Each interview was conducted with a same guide (Appendix A). Four main topics designed for this guide were described in section 3.4.2.1. Based on these four main topics, a number of sub-topics were discussed in the interviews, which is given below.

Main Topics	Participants' background information (Only discussed in the first interview)	The usage of language learning strategies	The capacity of self-regulation	Evaluation of one's own learning
Sub-topics	Previous Chinese learning experience	Language learning strategies that taught by the teacher	Commitment control	Self-evaluation and the possible reasons
	Initial motivation to enrol in Chinese Studies major	Language learning strategies usage	Metacognitive control	Possible supplements uncovered in the interview
		Learning hours	Satiation control Emotional control Environmental control	

Table 3.7 Topics discussed in semi-structured interviews

The stimulated recall tasks were completed by participants within the interviews, which was designed to understand the strategies during the process of Chinese character learning from another aspect. As a result, data collected through stimulated recall task described participants' ability in recognizing characters and language learning strategies usages. As discussed in Chapter 1, Chinese characters are seen as combinations of grapheme, pronunciation and meaning. As a result, participants' ability in recognizing characters was judged by their ability to identify the pronunciation and meaning of characters. If one participant failed to name either dimensions of one Chinese character, they were recorded as fail to recognize this character. Correspondingly, the strategies will focus on how students recognize the meaning and pronunciation of Chinese characters when seeing them. To sum up, the data collected from the stimulated recall tasks as the following table.

Participants' Chinese character knowledge	Language learning strategy use
The meaning of the target Chinese character	Strategies to recognize the meaning of the target Chinese character
The pronunciation of the target Chinese character	Strategies to recognize the pronunciation of the target Chinese character

Table 3.8 Topics discussed in stimulated recall tasks

In terms of data collected from the eye-tracker, the data were exported from the recording software Tobii Studio and transferred to SPSS. As a result, data collected through the eye-tracking approach provided a table of numerical values, which presented different parameters of eye movement, such as fixation points. A sample of raw data was given in the following figure 3.2. Based on these data, tables and figures were generated to explain the patterns when participants were recognizing characters.

1: StudioTestName	Test 2	RecordingDuration	RecordingResolution	FixationFilter	RecordingTimes	LocalTimeStamp	EyeTrackerTime stamp	FixationIndex	SaccadeIndex	GazeEventType	GazeE
1	Test 2	P08	521663 1280 x 1024	I-VT filter	9515	11.25.29	1487589134386550	.	1	Saccade	
2	Test 2	P08	521663 1280 x 1024	I-VT filter	9531	11.25.29	1487589134402890	1	.	Fixation	
3	Test 2	P08	521663 1280 x 1024	I-VT filter	9550	11.25.29	1487589134421060	1	.	Fixation	
4	Test 2	P08	521663 1280 x 1024	I-VT filter	9566	11.25.29	1487589134437240	1	.	Fixation	
5	Test 2	P08	521663 1280 x 1024	I-VT filter	9584	11.25.29	1487589134455430	1	.	Fixation	
6	Test 2	P08	521663 1280 x 1024	I-VT filter	9601	11.25.29	1487589134472180	1	.	Fixation	
7	Test 2	P08	521663 1280 x 1024	I-VT filter	9619	11.25.29	1487589134490440	1	.	Fixation	
8	Test 2	P08	521663 1280 x 1024	I-VT filter	9637	11.25.29	1487589134508120	.	2	Saccade	
9	Test 2	P08	521663 1280 x 1024	I-VT filter	9654	11.25.29	1487589134525610	.	2	Saccade	
10	Test 2	P08	521663 1280 x 1024	I-VT filter	9671	11.25.29	1487589134542260	.	2	Saccade	
11	Test 2	P08	521663 1280 x 1024	I-VT filter	9687	11.25.29	1487589134558930	2	.	Fixation	
12	Test 2	P08	521663 1280 x 1024	I-VT filter	9701	11.25.29	.	2	.	Fixation	
13	Test 2	P08	521663 1280 x 1024	I-VT filter	9701	11.25.29	.	2	.	Fixation	
14	Test 2	P08	521663 1280 x 1024	I-VT filter	9704	11.25.29	1487589134575600	2	.	Fixation	
15	Test 2	P08	521663 1280 x 1024	I-VT filter	9721	11.25.29	1487589134592290	2	.	Fixation	
16	Test 2	P08	521663 1280 x 1024	I-VT filter	9737	11.25.29	1487589134608990	2	.	Fixation	
17	Test 2	P08	521663 1280 x 1024	I-VT filter	9754	11.25.29	1487589134625640	2	.	Fixation	
18	Test 2	P08	521663 1280 x 1024	I-VT filter	9771	11.25.29	1487589134642320	2	.	Fixation	
19	Test 2	P08	521663 1280 x 1024	I-VT filter	9788	11.25.30	1487589134658990	2	.	Fixation	

Figure 3.2 Sample of raw data collected from eye-tracking

As section 3.4.2.4 presented, a post-course learner questionnaire was administered. This comprised two main sections: language learning strategies and self-regulatory learning. There were 12 subsections in the former section and 5 in the latter. The number of items per questionnaire category is listed in the following table.

Main Category	Sub-category	No of Items
Language learning strategies	Stroke	3
	Component	2
	Shape	1
	Stories	3
	Association	9
	Induction	11
	Repeat	4
	Application	3
	Auxiliary Tools	3
	Planning	6
	Evaluation	6
	Collaborative	3
Self-regulation	Commitment	4
	Metacognitive	4
	Satiation	4
	Emotional	4
	Environmental	4

Table 3.9 Questionnaire categories and number of items (case study)

3.6.2 Phase 2: survey

This section will present the implementation of Phase 2 of the research project. The survey was administered to all students who were enrolled in Chinese Studies degree courses in Irish universities. More specifically, the inclusion criteria for participants were as follows:

- Participants should be from alphabetic language backgrounds.
- Participants should be current students of Chinese Studies.
- Participants should be full-time undergraduate students registered in a Chinese Studies degree course in Irish higher education. Students who were studying Chinese as an extramural or elective course were excluded from this study.

Before the survey, the researcher sent details of research ethics approval to each university. After receiving the relevant institution's approval to proceed, invitations with a brief introduction of this study were delivered to the Chinese

departments of these universities. With instructions and help of each department, the survey, which was printed in A4 paper by the researcher, was distributed by the Chinese language instructors of these universities to potential eligible participants in June, 2017. The aim of the study and information regarding consent were outlined on the front of the questionnaire. Students were invited to finish the survey alone and return to their instructors.

3.6.2.3 Overview of data collected in the survey

During the survey, 115 questionnaires were returned. The response rate is 88%. However, as there were negatively worded items in the questionnaire, with some participants marking only one side of the rating scale, as well as omitting more than 10% of the items, these were excluded from analysis. Consequently, 108 questionnaires were analysed.

As section 3.4.3 presented, the survey contained three parts: 1. Participants' background information; 2. Language learning strategies; 3. Self-regulation Strategies. The second and third parts were previously deployed to the eight learners in the case study, without any change. A background section was added to the survey in order to gain information on participants that had been captured by interview during the case study. The number of items that were designed to assess each subsection of each subsection was listed in the following table.

Main Category	Sub-category	No of Items
Background information	Year-level	1
	Previous Chinese learning experience before university	4
	Previous life experience in China	3
	Chinese character knowledge	1
	Native language	1
Language learning strategies	Stroke	3
	Component	2
	Shape	1
	Stories	3
	Association	7
	Induction	11
	Repeat	2
	Application	3
	Auxiliary Tools	3
	Planning	6
	Evaluation	6
	Collaborative	3
Self-regulation	Commitment	4
	Metacognitive	4
	Satiation	4
	Emotional	4
	Environmental	4

Table 3.10 Questionnaire categories and number of items in each category (Survey)

In summary, the data set of the whole investigation can be concluded as the following table.

		Data collection instruments	Data set
Phase One	Case Study	Semi-structured interviews	1200 mins of voice recordings (c. 25 mins per learner interview)
		Stimulated recall tasks	720 mins of voice recording (15 mins per learner interview)
		Eye-tracking	720 mins eye-tracker recording (15 mins per learner interview)
		Post-course learner questionnaire	8 responses
Phase Two		Survey	108 responses

Table 3.11: Data set

3.7 Conclusion

The research methodology designed for this study was outlined in this chapter. Firstly, after presenting the research questions, it was argued that a mixed methods Research approach was the most appropriate methodological framework by pointing out the importance of triangulation for studies regarding language learning strategies. Then the research design, along with the research instruments was described. Data collection for the current study took place in two phases: a case study and a survey. A detailed explanation of each phase was presented, including the research participants selection, the data collection instruments, the pilot studies and the research ethical consideration. Furthermore, the approach of data analysis was given, followed with an overview of data collection process. Finally, the data set was described.

The following two chapters will present the results of the case study in terms of the strategic learning of Chinese characters, focussing in turn on language learning strategies (Chapter 4) and then on self-regulation (Chapter 5).

Chapter 4 Language Learning strategies use

4.1 Introduction

In this chapter, the language learning strategies regarding the learning of Chinese characters will be categorised according to the framework derived from Jiang and Zhao (2001) and Rose (2017), with supplements from Shen's work (2005). It is firstly divided into three major categories: character decoding strategies, direct strategies and indirect strategies. The data for character decoding strategies will be explored in three sections: Stroke, Component, and Shape. Then the data for direct strategies will be examined in six sections: Association, Induction, Repeating, Application, Auxiliary tools and Stories. Although the concept of indirect strategy use has been widely replaced by motivation control strategies in the self-regulation component, in the framework of this study they were actually proposed to understand the two aspects of one question. In other words, the self-regulation model examines the overall self-regulatory capacity of learners, while the indirect strategy items are designed to investigate the strategies themselves. The data for indirect strategies will be presented in three sections: Planning, Evaluation and Collaborative.

4.2 Data organisation

The results are presented and examined by applying a taxonomy based on previous studies in terms of learning strategy (Jiang and Zhao, 2001; Shen, 2005; Rose, 2017). Firstly, the character decoding strategies, direct strategies and indirect strategies applied to the Chinese characters learning task are analysed, respectively. Under these three main categories, the use of each strategy are presented with reports from the interviews and examples from the stimulated recall tasks, and explained with the eye-tracking results, followed by the results from the questionnaire. As the items of each strategy are varied, only the mean

scores are analysed and presented in this chapter. In addition, the data of eye-tracking in this study is only to explain the use of one category of strategies. In other words, if participants use two or more categories of strategies to learn one Chinese character, eye-tracking data is not provided.

4.3 Character decoding strategies and Chinese character learning

In this section, the character decoding strategies applied by participants in terms of the Chinese character learning tasks will be discussed. The use of each strategy will be presented with reports from the interviews and examples from the stimulated recall tasks, and explained with the eye-tracking results, followed by the results from the questionnaires.

4.3.1 Stroke

The stroke strategies relate to the strategies of breaking a Chinese character into individual strokes and learning the characters based on the understanding of the strokes and the stroke orders in each Chinese character. According to the learners' reports, this strategy was mainly used when information was encoded for memory storage, which can be seen in two aspects. One is analysing the Chinese characters learning task by identifying the strokes. Another is memorizing the characters by the stroke order. The following two reports from the interviews explain these two usages of stroke strategies.

HD: Some characters are very easy to learn. Some more challenging, when did the more strokes, the harder they get. (Interview 1)

KX: I break them into the components if I know the meaning of all the components. But if I don't, then I tend to just leave as it is. And just learn then by stroke order. (Interview 6)

During the stimulated recall sessions, use of stroke strategies garnered one of the lowest responses of any strategy group. Only MX mentioned this strategy four times during the stimulated recall sessions. The following example is the only one

where he could successfully recognize the character by using the stroke strategy only.

MX: The little strokes in the middle. The strokes in the middle remind me in the box. Just strokes. Straight away came to me. (困, Stimulated recall task 3)

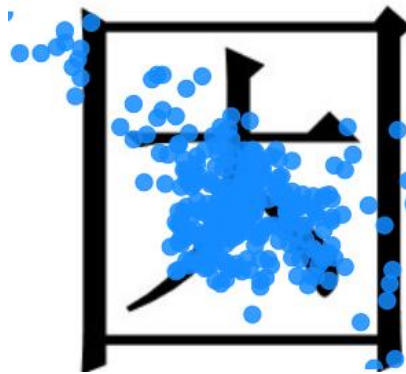


Figure 4.1: The fixation points of the character 困 (kùn, sleepy)

As in the above figure, the data from the eye-tracker supported MX's words. When he was looking at the the target character 困 (kùn, tired), most of his fixation points were on the strokes in the middle of this character. In other cases, MX did not report the stroke strategy only, but also the repeating strategy, such as the following example, when MX tried to identify the character 同 (tóng, same). In other words, few of the participants relied only on the stroke strategy when they were trying to recall particular Chinese characters in this investigation.

MX: When you see the stroke order. Write it for a long time. (Stimulated recall task 4)

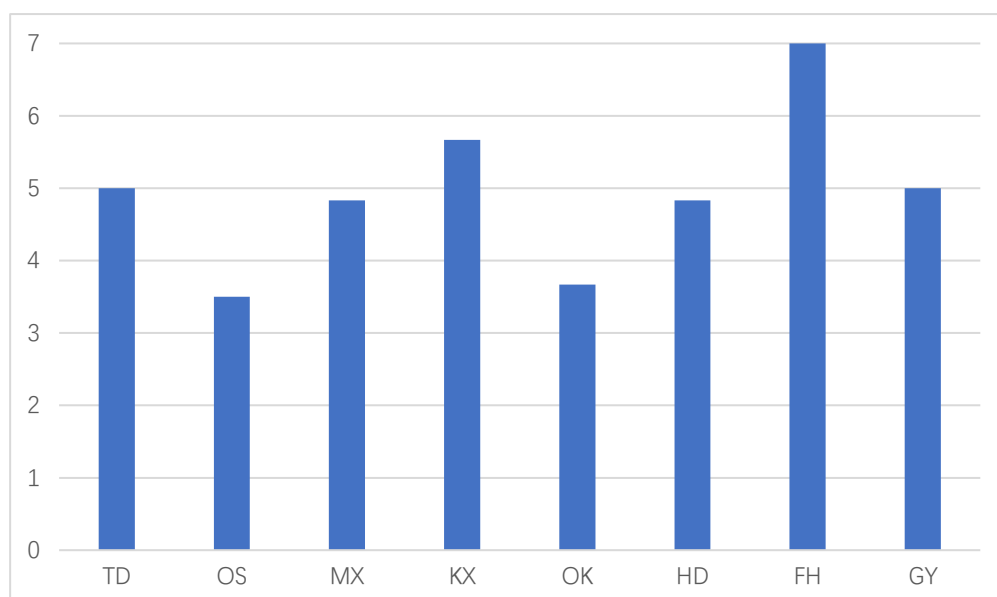


Figure 4.2. Scores of the stroke strategy of each participant

The data from the questionnaire supported the findings from the interviews and stimulated recall tasks. As the basic elements of a Chinese character, strokes cannot be entirely ignored by the participants. MX, FH and KX assigned high scores (above 5) to the stroke strategy in the questionnaire, although FH did not stress her focus on this strategy, which will be discussed in Section 4.5.

4.3.2 Component

Component strategy is the strategy of breaking a Chinese character into its smaller components in order to better understand and remember it. In this case study, all of the participants displayed some level of component analysis during the stimulated recall tasks, although their analyses were not linguistically correct, such as OK's report, when they were trying to recognize the character 因 (yīn, because). In this example, OK broke down the character 因 as two components: 口 and 大. According to the Chinese linguistic explanation, 口 is a component referring to a framework. However, OK saw this as 口 (kǒu, mouth), which has a similar shape to 口 (square) but a different meaning.

OK: 因. It's very simple character cause two characters we already know. The mouth component, and then 大. And it's very simple character for both. Square and 大 is very simple character. (Stimulated recall task 3)

Higher-proficiency learners would develop this kind of strategies further to break down the Chinese characters into phonetic components and semantic components. As explained in Chapter 2, most Chinese characters can be classified as phono-semantic compound characters. In other words, learners can easily identify the pronunciation and meaning of one phono-semantic compound character by understanding the different components in the character. A few examples from the stimulated recall sessions are listed below, to illustrate how this strategy was utilised by those participants.

KX: 记, I remember from 记者. And I remember 自己. And I remember the language component. So just separate the component. (Stimulated recall task 2)

FH: 花. It has the plant top. I suppose I learned from the character 化妆, the bottom one. So that would be the pronunciation component. (Stimulated recall task 3)

TD: 踢. The left side is foot. The right side is 易, 容易. So I know the pronunciation. 踢 and 易, sounds similar. The foot, I know it's kick. It means kick. (Stimulated recall task 4)

In the first example, KX divided 记 (jì, remember) into 讠 and 己. She firstly explained that the latter was pronounced as 己 (jǐ), which is the phonetic component. Then, she discussed how the former is the language component, which indicates the meaning of this character. Similarly, in the second example, FH recalled the pronunciation by the phonetic part 化 (huà) and the meaning by the semantic part “plant top” 艹. In the third example, TD also successfully identified the pronunciation clue 易 (yì) and the meaning clue 足 (foot radical). The following two figures, which were presented as examples, recorded the change of gaze points by the time sequence when KX and FH tried to recognize the corresponding

character. The data shows that their fixation points moved between the two components that they divided other than focusing on a certain point. In other words, KX divided 记 into 讠 and 己 and, therefore, her gaze moved between the left part and the right part. In the next figure, FH divided 花 (huā, flower) into an upper part and below part. Correspondingly, her sight was recorded as moving between the upper part and the below part.

记

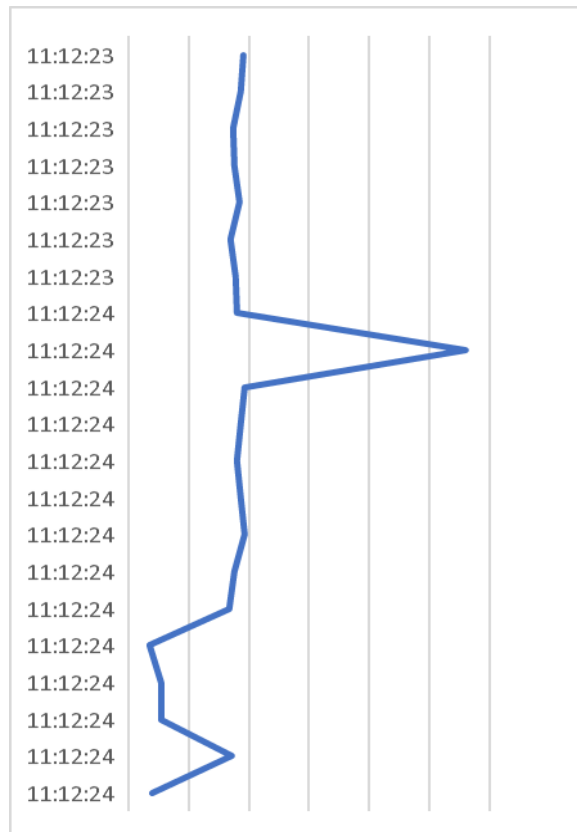


Figure 4.3: Time-course graph with fixation points of the character 记 (jì, remember)

花

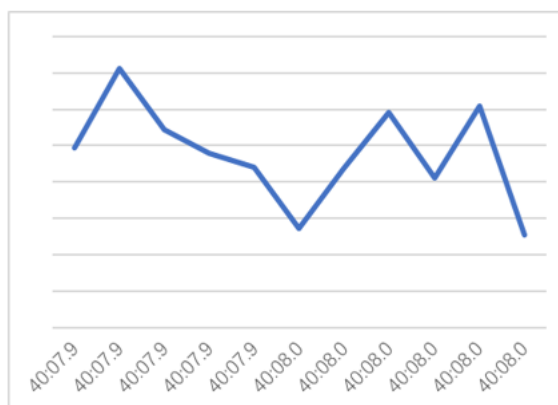


Figure 4.4: Time-course graph with fixation points of the character 花 (huā, flower)

However, as the participants of this case study are in their second year of their systematic Chinese learning, they are not sufficiently advanced to identify all of the components of each character. During the whole investigation, most of the participants could only identify the most common and obvious radicals. As a result, the learners sometimes used component analysis as a tool to break down a Chinese character into smaller parts, and then employed other strategies to remember the unfamiliar components. In terms of these smaller parts, some of them even cannot be identified as radicals, which showed a lack of related knowledge of participants.

FH: 铁. I remember because the left part is metal. I don't know what the right component is. But also write a lot of times. (Stimulated recall task 2)

KX: 像. The left is person. The top right is inside. The Bottom on the right is like 家. I don't know why I remember the pronunciation. Cause it's different from the other 象. (Stimulated recall task 2)

HD: 汽. Water radical. It's to do with steam. First care is steam power. It looks like steam, are they? (Stimulated recall task 2)

TD: 裹. I remember 果 in the middle. So I can see the pronunciation. And I learned it a lot for 包裹. From 包, I can see a lot of pronunciations. (Stimulated recall task 2)

FH identified the metal component 钅 (metal radical) in the first example, which is also the semantic radical in this character. As she could not identify the right component, she changed her strategy to repeating to remember this component. In the second example, KX also identified the semantic part 亻 (person radical), which represents a person. Then, she memorised the right part by associating the right component with another character 家 (jiā, home). Similar to KX, after pointing out the semantic component 氵 (water radical), he associated the right part with steam and got the correct meaning. Different to these three examples, TD identified the phonetic part 果 (guǒ), which enlightened him regarding the pronunciation of this character. Then he explained that he was using the repeating strategy to memorise the whole character. As explained at the beginning of this chapter, eye-tracking data were not analysed for a combination of strategy use.

Furthermore, it can be easily seen that only understanding the components of one character, respectively, rather than combining them into one character in one organisable way cannot help learners to memorize characters. The following examples suggest this.

GY: Cause it looks like 是. But it's not. I guess to make. Because I think that looks like 是, to be. And the hand. So like it means. (Stimulated recall task 4)

KX: I see water part. I don't know the pronunciation. (Stimulated recall task 2)

In this example, GY is trying to identify the character 提 (tí, lift). When seeing this character, she recognized the right component 是 (shì, to be) immediately and the left component after a short consideration, which means hand. However, she still failed to recall this character. In the next example, KX only identified the water component (氵) of the target Chinese character 汽 (qì, steam), but she could still not recognize this character.

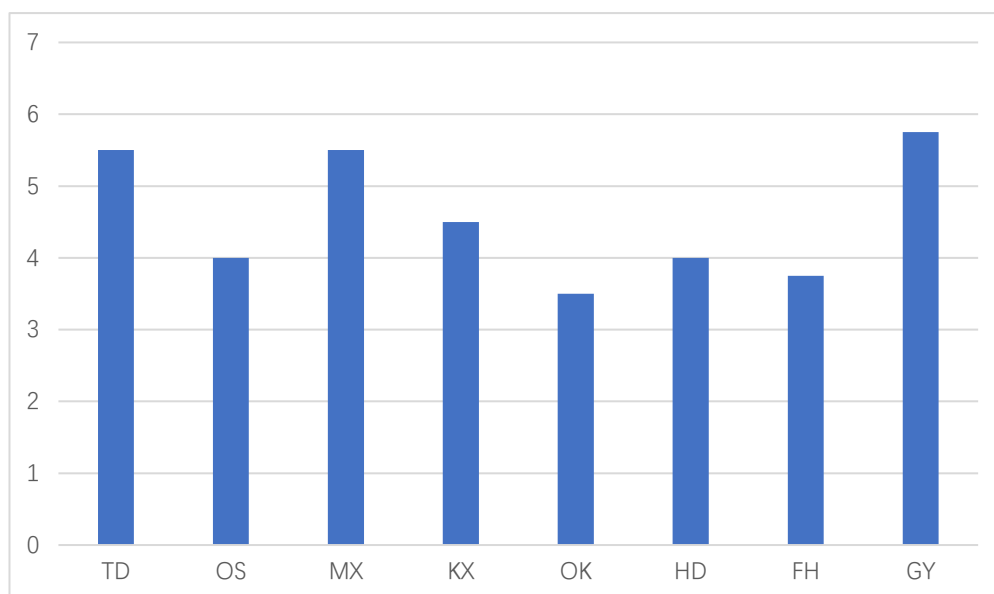


Figure 4.5 Scores of the component strategy of each participant

The data from the questionnaire supported the participants' reports in the interviews and stimulated recall tasks. According to the above table, all of the students showed a certain level in using component strategies.

4.3.3 Shape

Shape strategy refers to learners' characters learning based on memorising each Chinese character as an entirety. Only FH and TD mentioned this strategy during the interviews in this case study. According to the reports from the stimulated recall tasks, none of the participants successfully recognized Chinese characters by using shape analysis only. In other words, the shape strategy was used with a combination of other strategies during the process of recalling Chinese characters, such as the first example from FH's report. She combined the shape strategy with repeating strategies.

In the first example, the unique shape of this character is her mnemonics, which can also be found in the data from the eye-tracker. As Figure 4.4 presented, when FH recognized the character 恭 (gōng, respectful), her fixation points covered

every stroke of the character. When compared with Figure 4.1, this indicates that FH recognised the character by the shape strategy, rather than by the stroke strategy. In terms of TD, he only explained how he used this strategy during the interviews.

FH: I never see that shape of such characters. (恭[gōng, respectful], Stimulated recall task 3)

TD: Sometimes I visualize it. Just look at the character then visualize in my head. (Interview 6)



Figure 4.6: The fixation points of the character 恭 (gōng, respectful)

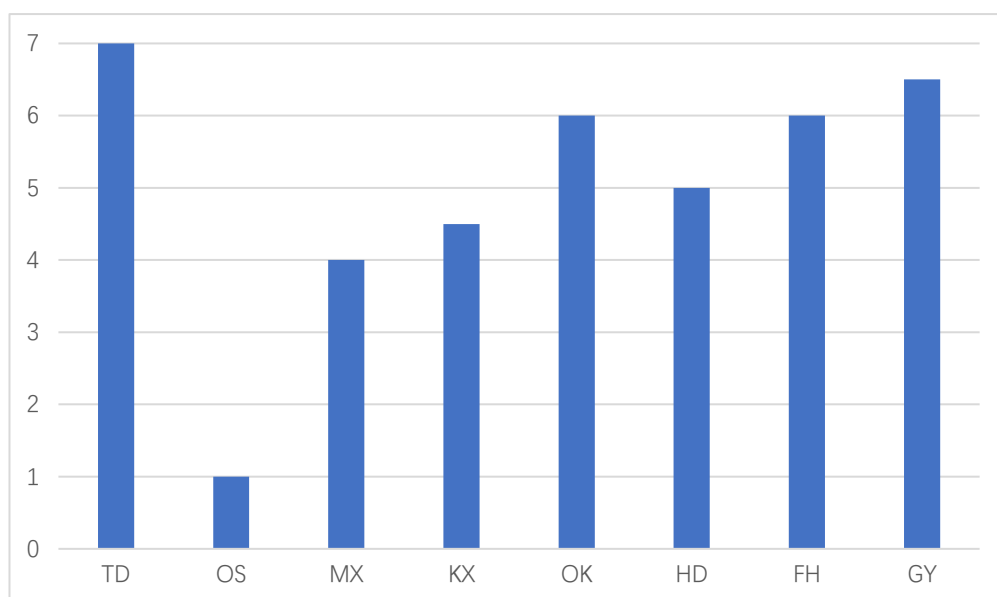


Figure 4.7 Scores of the shape strategy of each participant

Similar to the component analysis, all of the participants, apart from OS, did not give low scores to the shape strategy in the questionnaires, and the scores of GY were above 6. However, this is not noticed in the interviews or stimulated recall tasks, which will be explained in Section 4.5.

4.4 Direct strategies and Chinese character learning

In this section, the direct strategies applied by participants in terms of the Chinese character learning tasks will be discussed. The use of each strategy will be presented with reports from the interviews and examples from the stimulated recall tasks, and explained with the eye-tracking results, followed by the results from the questionnaires.

4.4.1 Association

The association strategy helped the learners to memorize the Chinese characters by connecting the learning tasks with retrieval cues, which are not directly related

to the character. During this investigation, the broad strategy can be divided into a number of sub-strategies, which were:

- *Symbolic association*: associating Chinese characters with symbols, such as the English alphabet,
- *Character association*: associating one Chinese character with another Chinese character
- *Personal life association*: associating one Chinese character with personal life

4.4.1.1 Symbolic association

With regard to symbolic association, only HD recorded some usage in the stimulated recall session, during which associations were made more with the English alphabet than with other known symbols. Examples of how HD associated the Chinese characters with the English alphabet are shown below.

HD: It looks like the letter G. The second radical. So it makes the sound G. I just know the meaning. (记 [jì, to remember], Stimulated recall task 2)

HD: This part looks like an H, for hot. This part looks like sweat drops. That's how I remember. (热 [rè, hot], Stimulated recall task 2)

In the first example, HD associated the component 己 out of the target character 记 (jì, to remember) as the letter G, which indicated to him the pronunciation 记. In the second example, when trying to recognize 热 (rè, hot), HD combined symbolic association with pictorial association. He associated the top right component 丸 as a symbolic representation of the letter H and the bottom component 灬 as a pictorial representation of sweat drops. Both guided him to the meaning of this character. The following figure recorded the change of gaze points by the time sequence when HD tried to recognize the character in the first example above. The data shows that his fixation points stayed on the right part 己 for a long time when he was recognizing this character. Compared to KX's report and eye-tracking data

of the same character in Section 4.2.2, whose gaze moved between the left part and the right part in order to recall 记(jì, to remember) by component strategies, HD's eye-tracking data supported his account that the right component was his mnemonics. He used association strategies to recall the character, rather than other strategies.

记

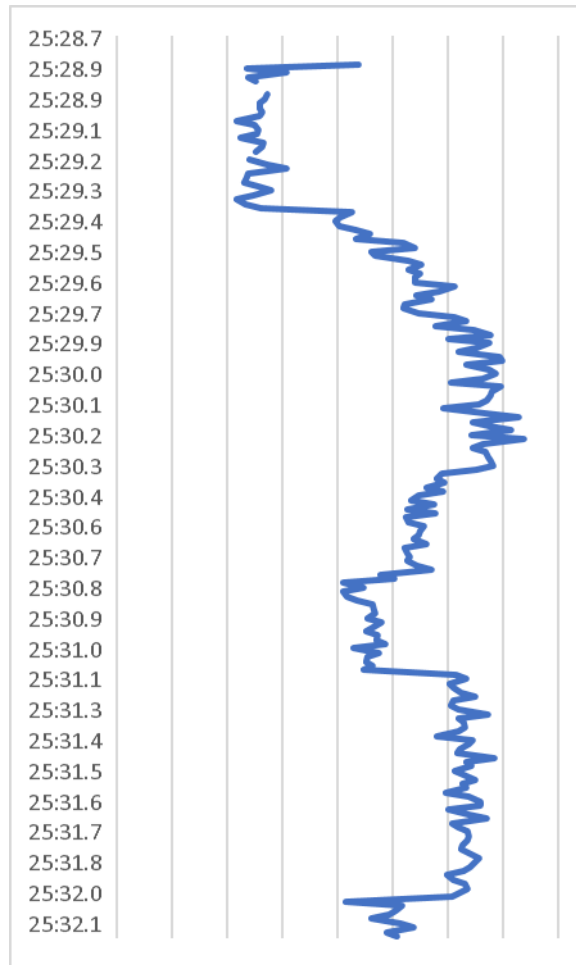


Figure 4.8: Time-course graph with fixation points of the character 记 (jì, to remember)

4.4.1.2 Character association

With regard to the association of one character to another character, two participants acknowledged their use of this strategy.

MX: You have 比. 比赛 (Stimulated recall task 4)

OK: I thought 习 is here. And I thought the characters with 习 as a word. 习 in the 习惯 is the only one that I can think of. (Stimulated recall task 3)

In the first example, MX, firstly, cannot recognize the target character 赛 (sài, compete). When shown the compound word with this character 比赛 (bǐ sài, compete), MX quickly identified the whole word and expressed that the retrieval cue was the other character. In the second example, the eye-tracking record (Figure 4.9) of OK provided information during the process of recognizing the word 习惯 (xí guàn, habit). As the figure presented, OK identified the first character 习 (xí, habit) for a very short time. Then, his fixation stayed on the latter character 惯 (guàn, habit) before he successfully recognized the whole word. His report during the stimulated recall task explained this phenomenon. By identifying the other character with less strokes, he only knew the word 习惯 (xí guàn, habit) with this character. As a result, he could infer the target character.

习惯

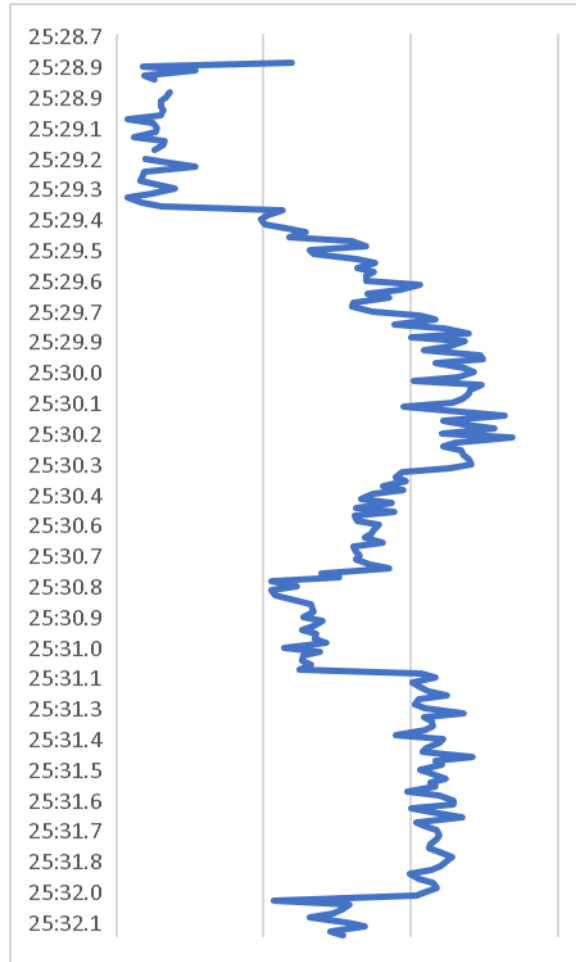


Figure 4.9: Time-course graph with fixation points of the word 习惯 (xí guàn, habit)

During the stimulated recall tasks, OKN's high reliance on this strategy can be easily noticed, which also resulted in his increasing failure rate in recognizing the target Chinese character. Similar to OKN's condition, any trial for recalling one Chinese character by association with another character in one word makes it very difficult to succeed. This is due to the diversity of Chinese characters use. A Chinese character can be in a number of compound words with different meanings

and pronunciation. As a result, except for blinding words, it is very difficult to get the exact character with this strategy, such as in the following example. In this example, the target word is 器 (qì, instrument). When seeing the word 乐器 (yuèqì, music instrument), OKN quickly recognized the easy character in this word 乐 (yuè, music), but he still got confused by two words with 乐 (yuè, music), which are 乐器 (yuèqì, music instrument) and 乐曲 (yuèqǔ, music songs). At the end, he did not recall the character.

OK: Going to make a few guesses here. As you can say here, I guess 乐器 and 乐曲. We learn both characters in the chapter at around same time. And first characters are the same. So for me most attention will goes towards the first character. And then the second character is kind of, just it is what it is. But I will remember the word from the second character. So it's just a guess say if it wasn't 乐曲. It has to be 乐器 something else with 乐 in it. (Stimulated recall task 3)

4.4.1.3 Personal life association

According to this case study, the learners' personal related experience during their learning, such as their efforts for various exams, was also mentioned during the stimulated recall tasks, although, in some cases, this association was discussed with other strategies.

FH: from the HSK. (右 [yòu, right], Stimulated recall task 4)

OK: Because it's part of last chapter we did. That makes a little bit easier because more fresh in my mind. I remember the first character. When I see the character beside it. I associate the two. That's how I remember then. (角 [jué, role], Stimulated recall task 6)

In the first example, FH explained that her HSK exam preparation is the reason why she can recognize the character 右 (yòu, right). In the latter example, OK associated the word 角 (jué, role) with his learning experience. Then, he also combined character association to identify this word. When using this association as learning strategies, the participants in this case study normally spent a shorter time recognizing the target characters than with using other strategies. As a result,

the eye-tracker caught only very limited information during less than one second, such as in the first example. The eye-tracking data showed that, after a glance at the top of this character, FH recognized the character 右 (yòu, right) within one second. As a result, not many fixation points are shown in this figure.



Figure 4.10: The fixation points of the character 右 (yòu, right)

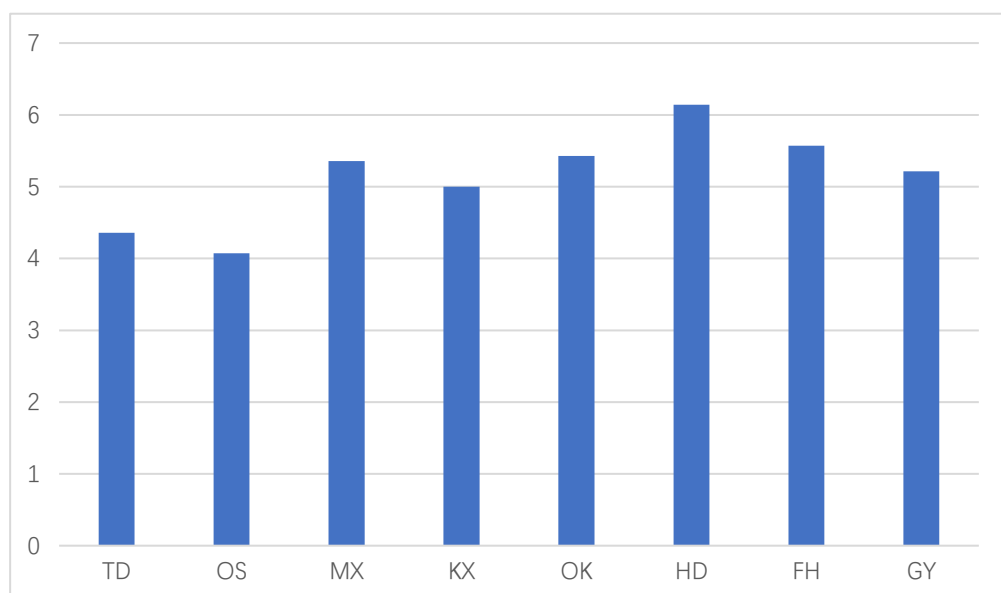


Figure 4.11. Scores of the association strategy of each participant

Similar to their reports, none of the participants reported low scores for this strategy. From the 8 participants, 6 of them assigned 5 or above. The remaining 2 participants' scores also exceeded 4.

4.4.2 Induction

In this case study, the high-proficiency and medium-proficiency learners used induction strategies, which can be divided into comparing and grouping characters based on various specific rules. When making comparisons, the participants would pay attention to the differences or similarities between two or more characters with a similar shape or pronunciation. Their explanations are displayed as follows,

OS: But if there is a similar character, I just make sure I know the difference between each character. So I don't confuse them. If they look similar but with different meanings. Sometimes I just see the components and do the meaning. (Interview 6)

MX: Sometimes I compare. So it's like this character is similar to the top of this character. That bit on the top, that bit on the bottom like. (Interview 6)

TD: If I try to learn a character, if it's a new character, I try to guess the meaning and pronunciation of it. And I look it up and see if it's correct or not. And then I just figure out what the pronunciation is, maybe has something in the character that makes the sound like that from the characters that I already learned maybe. They have one part the same. (Interview 6)

During the stimulated reviews, their responses also reflected their usage of this strategy. In the following first example, KX compared the right bottom part of the target character 像 (xiàng, similar) with 家 (jiā, family). Then, she compared with another 象 (xiàng, elephant) to get the pronunciation of this character. By using this strategy, HD also recalled the pronunciation of 惯 (guàn, habit) in the second example, by comparing this character with 贵 (guì, expensive), which shares a similar shape and pronunciation with the target character. The corresponding eye-tracking data (Figure 4.13 and Figure 4.14) of these two examples all suggested that, during their recognition process, they obviously put more attention on the

corresponding components that they used to compare. This comparison can be seen as their mnemonics. As a result, they naturally put more focus on such parts.

KX: 像. The left is person. The top right is inside. The Bottom on the right is like 家. I don't know why I remember the pronunciation. Cause it's different from the other 象. (Stimulated recall task 2)

HD: It looks a bit like 贵. 贵, 惯, sounds similar. (Stimulated recall task 3)



Figure 4.12: The fixation points of the character 像 (xiàng, similar)



Figure 4.13: The fixation points of the character 惯 (guàn, habit)

In terms of grouping characters, only two participants, TD and HD, reported their application during the stimulated recall tasks, but only TD successfully recognised the target character. He grouped a few words that contain the same character. By doing so, he would deepen his memory of the meaning of the character. In the following instance, TD enumerated three words when he saw the target character 优 (yōu, excellent), which are 优美 (yōu měi, beautiful), 优秀 (yōu xiù, outstanding) and 优点 (yōu diǎn, advantages).

TD: 优. 优美优秀优点. I know a few characters, words with this. Like 优美 is very beautiful. 优秀 is very good. Some good, very good. Just linking 优 together. (Stimulated recall task 6)

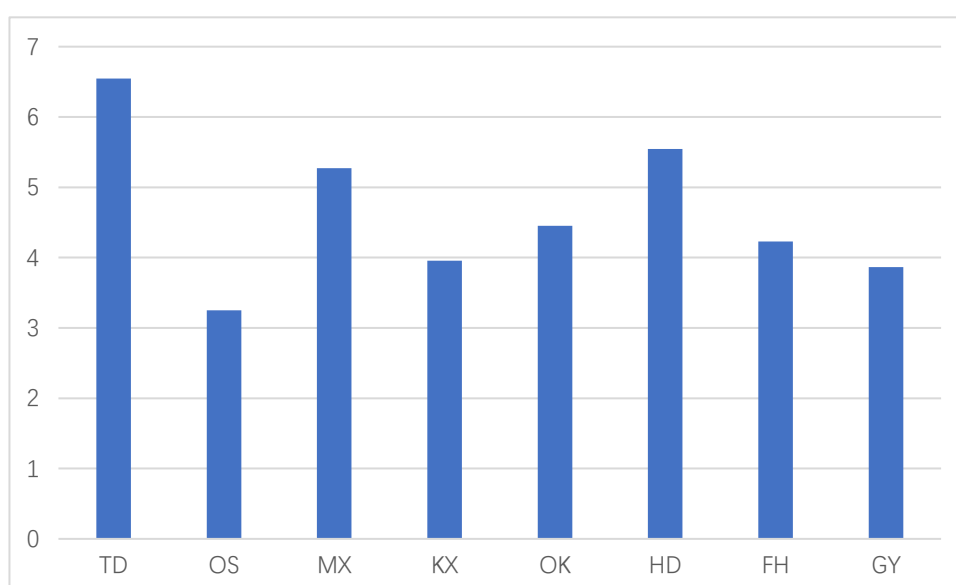


Figure 4.14. Scores of the induction strategy of each participant

Within this questionnaire, items of the induction strategy also conclude these two parts of induction (comparing and grouping). As a result, TD and HD assigned the highest scores to this strategy among all of the participants, as shown in the above table. Furthermore, OK's average score was 4.5 in this category, which is in contrast to the observation of the interviews and stimulated recall sessions. This will be explained in Section 4.4.

4.4.3 Repeating strategy

The repeating strategy was the most frequently used method by the participants in this case study. When asked to describe their learning approach in Chinese characters learning, all of the participants would start from the repeating strategy, according to nearly every interview during this year, such as the following examples.

FH: Write them down repetitively. Trying to guess what the characters were by covering the English. (Interview 6)

OS: I just write them out, like key sentences and individual words over and over again until I know them, can recognize them. (Interview 6)

HD: Just like usual, I just write out the text and read this thing. (Interview 6)

TD: Write them out a few times and testing myself. (Interview 2)

GY: I've been doing my usual. Just kind of rewriting and rewriting. But I don't think it's working. (Interview 4)

MX: Same as last time. Just write them out and listen. (Interview 2)

KX: I learned by cosily rewriting them. So I spend the whole page rewriting one character until I know it. And if I look after them. (Interview 1)

OK: Pretty much as I would always do. Just doing the work that assigned to me, assigned thorough the workbook, assigned in the Monday class. So listening the class, doing the work assigned to me, and if I have time, I sometimes do the work, maybe just repeating the characters, something like that. But if I am busy, then I won't do that. (Interview 6)

However, in the stimulated recall sessions, participants seldom only reported a single use of repeating strategies to memorize characters. The repeating strategy was usually utilized by a combination of using other strategies, such as the following examples. In the first example, FH firstly associate the target character 旅 with another character. Then she made a further explanation that she also used the repeating strategy. In the second example, after mentioning his use of the repeating strategy, MX spent more time to show his use of the induction strategy.

FH: It's with another word in the same chapter. So I remember them together. Write a lot of times and think about the pronunciation. (旅 [lǚ, travel], Stimulated recall task 1)

MX: Just from writing it out. 京剧, actually, that's what I saw it straight away, cause the same sort of opera, 北京. So once I saw that, that's what 京剧 came to me first, and then I saw that. (越 [yuè, a name of one kind of opera], Stimulated recall task 5)

In addition, the eye-tracking data regarding any combination use of strategies was not analysed in the current study.

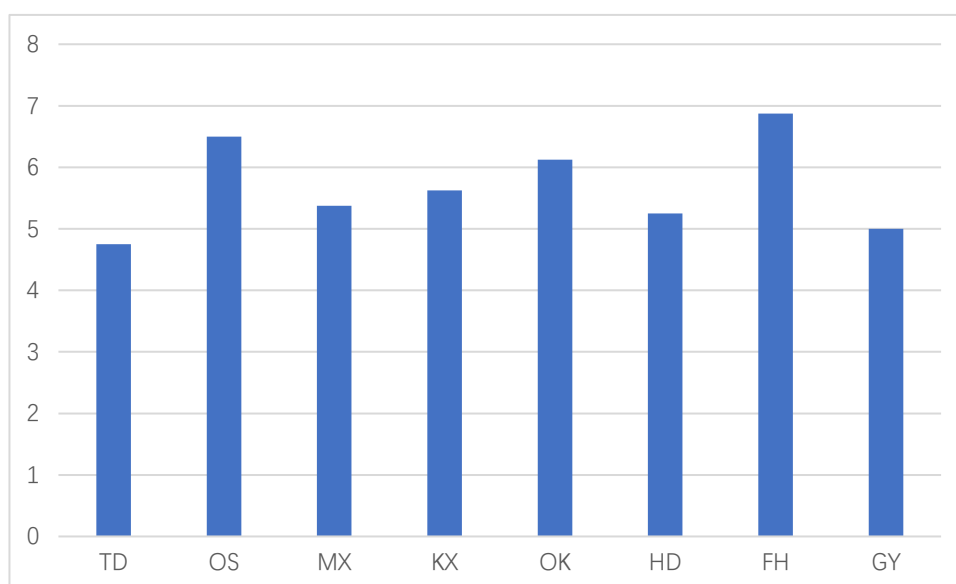


Figure 4.15. Scores of the repeating strategy of each participant

Except for TD's, the results from the questionnaire match the high quote of the repeating strategy during the whole investigation, especially in the participants' description of their frequent strategy use of the repeating strategy in the interviews.

4.4.4 Application

The application strategy helped the learners to memorise the Chinese characters by using learned Chinese characters outside the classes, which is an equivalent of Social strategy of Jiang and Zhao's framework (2001). In this investigation, only 5

participants mentioned their usage of the application strategy. According to their reports, as follows, they exposed themselves to a Chinese language environment by various means, such as Chinese movies, TV shows, Chinese language partners and Chinese apps. Different to KX and MX, the other three participants used Chinese only when they tried to engage in a Chinese language environment, which avoided the influence of their native language.

MX: Not that much. I feel difficult to, sort of, watch Chinese movies and find a language partner.

KX: I like watching Chinese, like reality TV shows. And sometimes movies, if I can find good enough English subtitles cause a lot of times subtitles are not great. So I don't know what's going on. I don't know if it helps me specifically how to write characters. But I think it helps me learn how people more use characters. In cause like, in Chinese books, you learn the grammatical way. But it's not the necessary people use in their speaking. So I think it helps me more learn how to use characters in more informal way.

TD: Yeah, speak with Chinese people, like to listen to Chinese language. Recently I haven't watched the series. But yeah, I watched 欢乐颂. For learn characters, they are very helpful. Because I read the Chinese subtitles to see character. I use my phone to take the character when I am watching. I don't stop or I just used to if I miss something. I just saw some words. I don't pause it. (Interview 6)

FH: Yeah. I watch a couple of Chinese shows mostly cartoons because they have easier Chinese. I'd have thought it was full of characters and things kind of I get used to listening and me and at the same time.

HD: I watch Chinese movies and stuff. I like old Kongfu Movies. I have another app, like Chinese news articles. They have HSK 3 and HSK 4 articles. They are news articles on the app. I learn most in the instant message. That's how people talk every day. And then translate as well. You can translate. Like before my oral exam, I was talking with people. I say I want say this and them correct you. It's like a teacher on your phone. That's good.

During the stimulate recall tasks, similar with the repeating strategy, the use of application strategies were put forward by participants with other strategies. In other words, learners never rely on the application strategies only to identify

characters, such as the following example. When recognizing 恭, TD firstly used the component analysis to identify the top part. Then he explained that he used for many times. Apparently, a combination of these two strategies made him recognize this character successfully.

TD: 恭. The top is 共。 Just seeing 恭喜恭喜. I always say that. (恭[gōng, respectful], Stimulated recall task 3)

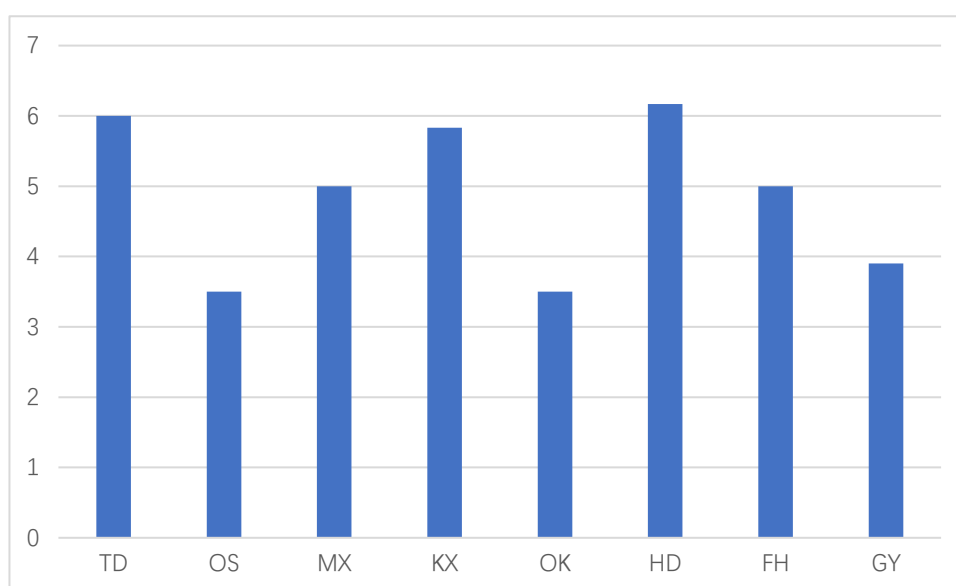


Figure 4.16. Scores of the application strategy of each participant

In terms of the application strategy, the data from the questionnaires confirmed all of the participants' reports. The scores of OS, OK and GY, who did not report any use of the application strategy, were the lowest three in the above table. In contrast, the remaining five assigned high scores all above 5.

4.4.5 Auxiliary tools

In this investigation, the participants also reported their usage of a number of auxiliary tools. However, when compared to the other strategies, auxiliary tools were not preferred by the participants of this case study, which is also reflected by the following results from the questionnaires (Figure 4.18).

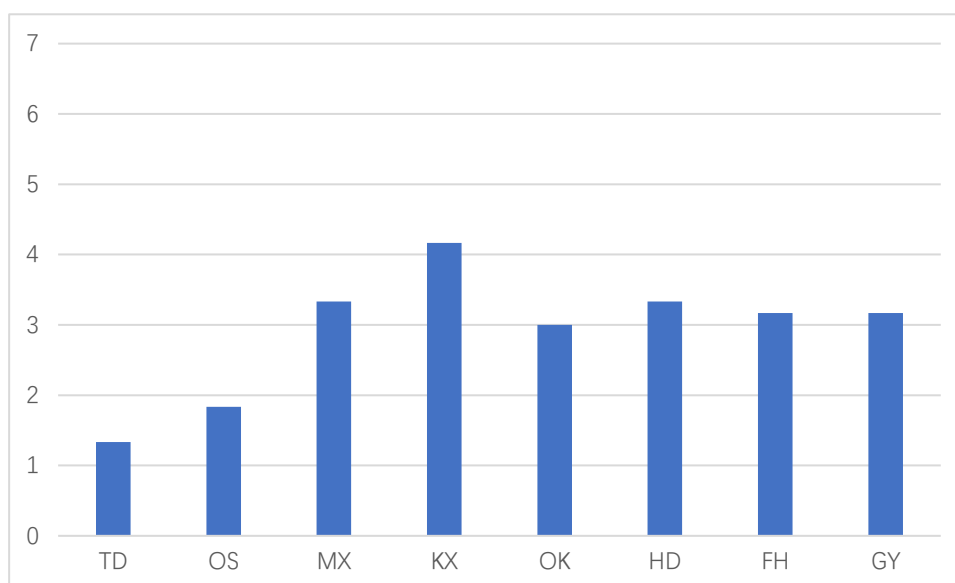


Figure 4.17. Scores of the auxiliary tools strategy of each participant

Among these tools, flash cards were mostly mentioned. The participants who used flash cards would normally make these cards by themselves and write Chinese characters and corresponding English explanations and/or pronunciation on that card to help them memorize the Chinese characters.

FH: I Writing them out on flash cards and then put in the English and the Pinyin on the back so I kind of test myself. I'm just looking at the character. (Interview 1)

GY: I right now like, so right now I like what I think I'm gonna say hopefully what it was like. and then any words I know I don't know I'll put on a flash card and I can stick the flash to my cash register at work. So whenever there's no one in the shop I can read it while I'm there and I can look over. (Interview 6)

KX: I also wrote Chinese character on sticky notes and stick them on corresponding items in order to associate the Chinese characters with meaning. You know the yellow poster notes. I'd like write character on, like stick on something, like chair, table or like a book. Then that way I see it, I see the character and try to learn that way. Cause I learn better by pictures. (Interview 5)

The participants also reported their wide use of the latest technologies, such as various apps and an online dictionary.

KX: If I listen, I will try to remember the pinyin. Because subtitles move so fast. I cannot always match up what they are saying with subtitles. So I will try pick up on the pinyin more. And then if I can remember the pinyin, then I look it up in online dictionary later on to find the character.

HD: I have another app, like Chinese news articles. They have HSK 3 and HSK 4 articles. They are news articles on the app. (Interview 6)

However, during the whole investigation, the participants did not discuss their usage of these additional tools for a long time, when compared to other strategies. In other words, when asked to describe their strategy use in Chinese characters learning tasks, they would not focus on their application of auxiliary tools, which would normally be reported as a supplementary approach to learn Chinese.

4.4.6 Stories

The strategy of stories refers to making stories according to the Chinese characters, in order to help the process of memorizing. Use of the story strategy was reflected in the stimulated recall data, as in the following examples, which is normally based on mixed use of component strategies or shape strategies. In other words, none of the participants can recognize the characters by only using the strategy of making stories in this case study.

KX: That's full character for 邮. The right component kind of reminds me some hand into like post office. Under right it's like a person put his hand into the post-box. (Stimulated recall task 1)

HD: The sun coming up over the line. (早 [zǎo, early], Stimulated recall task 1)

FH: I remember kind of, by the shape. It reminds me the shelf of books. (典 [diǎn, dictionary], Stimulated recall task 2)

OS: It looks like a bed. (卧 [wò, lying down], Stimulated recall task 4)

In the first example, KX was discussing how she remembers the character 邮 (yóu, post). She imaged the left part 由 as a post office and the right part 阝 as a hand putting something into the post box. HD described the character 早 (zǎo, early) in the second example. According to HD, this image is the sun (日, the upper part of this character) coming up over the horizon (十, the below part of this character). Then he associated this picture with the meaning of this character. In the third example, by picturing the character 典 (diǎn, dictionary) as bookshelves, FH connected this character as a dictionary on the bookshelf. OS related the left part of the character 卧 (wò, lying down) as a bed in the last example. By doing so, she successfully identified this character. HD's eye-tracking data was presented as an example in this category. The following figure recorded his fixation move when recognizing the character 早 (zǎo, early). As he described, the upper image is a sun, and he imaged this character as a sunrise. Correspondingly, his fixation moves showed a trend from the below part to the upper part.

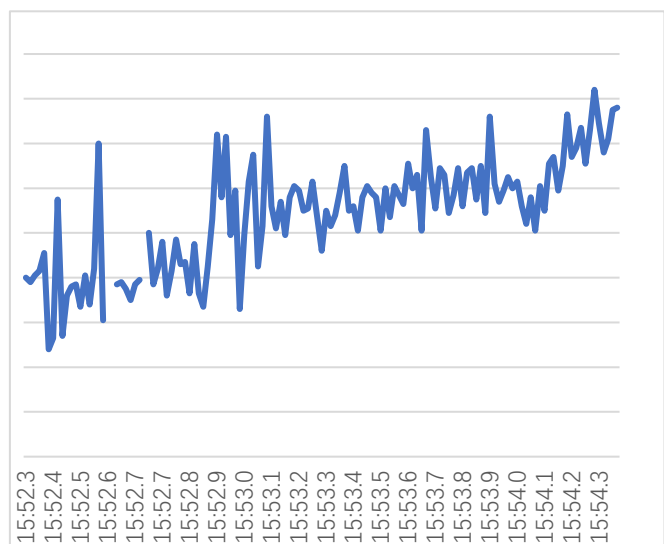
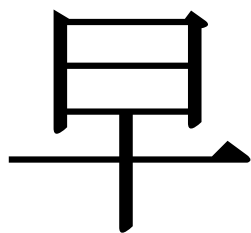


Figure 4.18: Time-course graph with fixation points of the character 早 (zǎo, early)

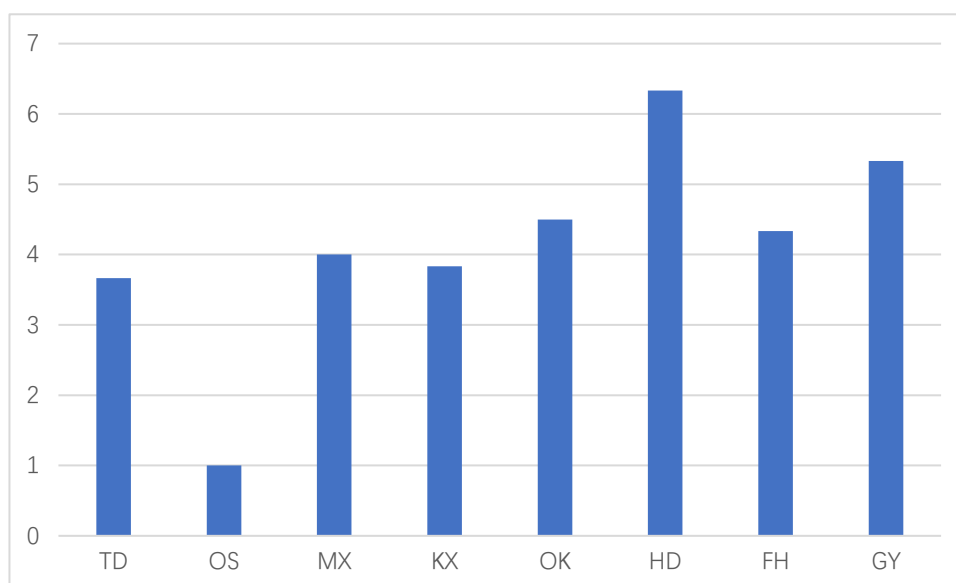


Figure 4.19. Scores of the stories strategies of each participant

The data from the questionnaire confirmed the data of the interviews and stimulated recall sessions. Even though examples of using stories can be noticed during the stimulated recall sessions, these examples are only records, in terms of this strategy, of most of the participants, such as OS. As a result, the use of stories in this case study cannot be identified as being frequent for most of the participants.

4.5 Metacognitive strategies and Chinese characters learning

The current study has retained Bourke's terminology of indirect strategies, which will be examined in the following chapter. Therefore, indirect strategies will be briefly examined under the sub-categories of Bourke's research (1996), which will be presented and defined in the sections below.

4.5.1 Planning learning

This section will explore the strategies used by the participants in the planning of their Chinese characters learning, as evidenced in the interview data and questionnaires. It is important to note that the planning of learning from a

motivational perspective in the form of commitment control strategies will be discussed in the following chapter, and the data relating to goal setting will also be discussed in that chapter.

The data from the interviews revealed the cases of all participants exhibiting a certain degree of strategic use of planning learning strategies. The high-proficiency group, TD, HD and FH, was able to demonstrate a high strategic plan, which is quantifiable, feasible and assessed to be manageable based on a clear understanding of their ability, as the following example indicates. Furthermore, in this case study, only the high-proficiency learners reported the preview stage before the classes.

TD: During the summer I want to do a thousand characters. So I think now I have a thousand.

Interviewer: But since last September?

TD: No, I just cover what we have and go a little bit ahead. Two chapters.

Interviewer: You are not a little bit.

TD: Yeah. But what I have to know, I try to know that. And go a little bit ahead. Anticipate for the next class. But I never go too far. Cause I feel to forget what we need to know now. (Interview 1)

OS, MX and KX was grouped to a medium level regarding their planning strategy use, which is less organized without the process of previewing and often incorporated into every-week routine, such as the following report.

KX: I try to at least learn the necessary words in the text. I work at the weekend. So the dictations is on Monday. I never prepare for that, I study Chinese characters on Wednesday. So I never prepare for the Monday. So it looks really bad. Cause I finish early on Wednesday. So I spend my time learning the characters. (Interview 1)

GY and OK were concluded as a low level regarding their planning strategy use due to the lack of the evidence in their reports regarding the management of time and process in Chinese character learning tasks. Their description of planning process

was vague, but with a high focus on exams other than learning Chinese characters with the course routine.

OK: Learning as many as I can, not fall too far behind. Well, not fall behind at all really, which hoping for. (Interview 5)

GY: Right now like it's for the essay at the end of it. like everything else is kind of, because I'm sitting for the paper now. Everything else is kind of on the page. So it's been focusing on grammar and suffered for the exam. but the last question that hundred fifty words. on the topic I've been just working on vocab for that. so I have my three essays I said earlier and then I've got all the words I should know by now or it like a new word because the painting was going to really different Hope doesn't come up. but I'm learning how to say it like the Last Supper, Leonardo da Vinci. I'm never going to need again. but I'm just learning it just for now. (Interview 6)

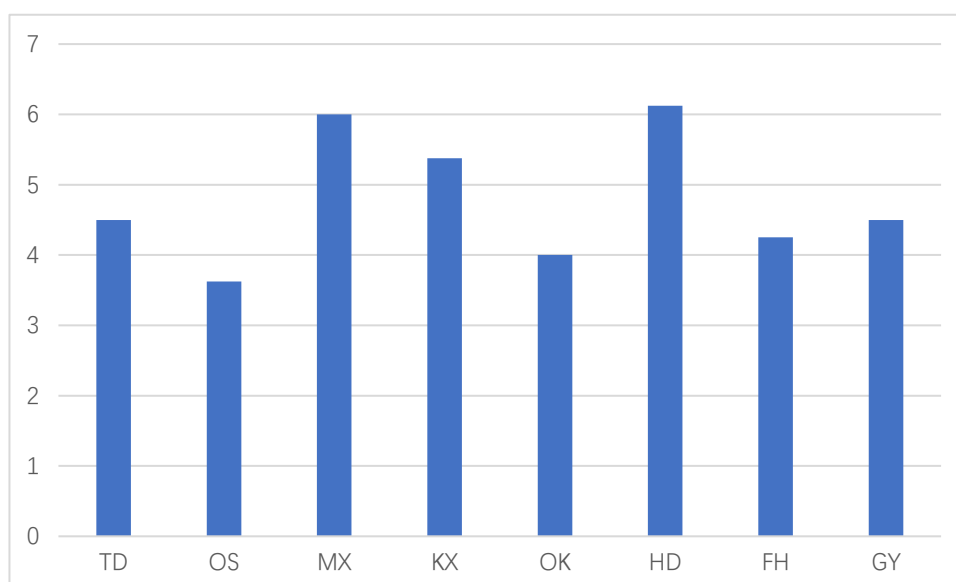


Figure 4.20. Scores of the planning strategies of each participant

The data from the questionnaires confirmed the above conclusion from the interviews and stimulated recall sessions, except for TD and FH. TD assigned a score of 2 to item 33, which is “I have a set time each day/week which I spend learning characters”. However, he would not set any time to learn characters. In contrast, as he can always maintain high concentration, which will be presented in Section 5, he can learn Chinese characters at any time. In addition, he believes that he also learned Chinese characters while using the application strategy. In other

words, he can learn Chinese characters by exposing himself to a Chinese characters' environment, such as meeting with Chinese friends. It is difficult to set a time for learning characters, as he would not ensure that they would discuss any characters he did not know during a meeting. In terms of FH, she assigned low scores to item 41, which is "I set myself goals and objectives for what I wish to achieve each week". According to FH's explanation, she would change the duration to set short-term goals. As a result, she actually disagrees with the word each week.

4.5.2 Evaluating learning

Evaluating the learning of Chinese characters in this study refers to strategies that assist in the evaluation, or testing, of Chinese characters and their learning process. As Rose discovered (2017, p.97) in Japanese characters learning, the interview data in this case study indicates that the evaluation of learning of Chinese characters "becomes inexplicably intertwined when put into practice by the participants. Interview and stimulated recall data indicated that study strategies and self-testing strategies happened simultaneously;" that is, for most of the participants, the study of new Chinese characters involves immediate self-testing and reviewing these Chinese characters. In the terminology of memory strategies, the learners were engaged in retrieval practice, before devoting time to encoding, which is reflected in the following reports.

TD: I just write them out a few times and test myself.

HD: Look at the text and remember the sentence and write the sentence out. And if there is a character I cannot remember, I will look at again, and I write it on the side. And I keep writing. And I might have a few characters at the end I don't remember. So then I learn them and write them out again and again. I read the sentences first. And then I recover, then write, then try to remember the whole sentence. And then I do dictation on the characters I don't remember after.

KX: I usually just get a sheet of paper, and just picking character, and constantly writing them out until I know it. And then I go through the, the work book. And then there is like, questions like, using new characters to write a passage about getting the directions to the shop. Then I try to do them, see if I can use the word I learn in the right context. It's mainly setting down, just getting paper and rewriting them until I know them.

In this case study, the interview data over the year revealed that most of the participants' evaluation learning was closely related to the manner in which Chinese characters are continuously tested in the Chinese Studies curriculum. This fact can be seen in the following statements of how they prepared for their exams. Before the final exam, their teacher would give them three topics to prepare for the final section, which involved writing a 150-character article according to a specific topic, which would be chosen by the teacher from three topics. As a result, most of the students would put their review focus on this part.

OK: Most of my focus is gone into what I believe will come up in the in the summer exam, especially the writing competition at the very end. And as I said before I find for those tests if you can figure out how to come up with an adequate or good answer in the writing piece than in doing so the writing piece is one hundred fifty words. You have to write one hundred fifty words. So in doing that you've learned about it. And because we have tree options you've learned four hundred fifty words by trying to come up with a good answer for that. So you've got a very stable very good foundation for building on what else you're going to need to know for the rest of the rest of the exam. And the rest thing will be Looking at the reading comprehension but mostly it's about learning the characters later on need to know in order to do a good writing piece.

OS: Key sentences. Prepare 150 characters. The last question. And review key sentences in each chapters. Write them over and over again. And learn them in the key sentences. So you know like not on their on. But kind of how to use them.

MX: So learn off the essays. So learn off the last essay. Then just write out the text and learn them off. So just like you take a sentence. And then sort of write it out. And then the more you know, you sort of maybe you see the sentence and might look away to write a few words you know already. And then you might look up to get the other words you might not know.

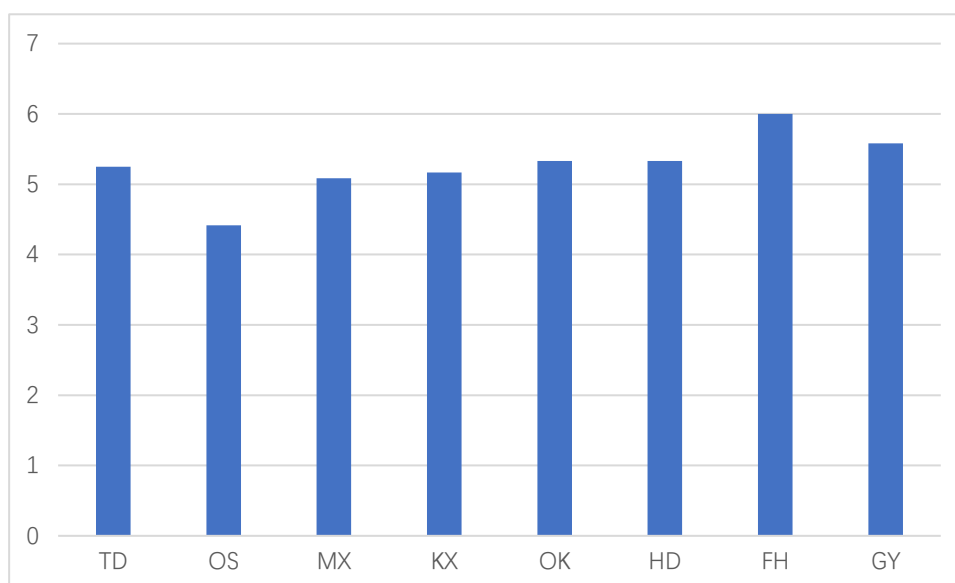


Figure 4.21. Scores of the planning strategies of each participant

The data from the questionnaires supported the conclusion of the interviews. All of the participants gave a positive response to evaluation learning. Furthermore, all of the participants assigned over 6 to Question 47, which is “I focus on characters that are likely to come up in an exam.” This suggests that this examination-oriented nature of Chinese language courses has a detrimental effect on students’ review of Chinese characters.

4.5.3. Collaborative learning

The collaborative learning of Chinese characters in this study is explored in three main categories: (1) Studying with others; (2) discussing knowledge with others, and (3) peer testing and review of Chinese characters. The female participants responded more frequently than the male learners in this section. In the following three excerpts, KX, OS and GY described their collaborative learning experience, which correspond to the three dimensions, respectively.

KX: JieYi and FH. When they sit there to do work, they are sitting down to do the work. They are not going distracted by like talking about what news is on or what’s new like, big music anything like that. They are sitting down to do the work for an hour. So they are going to just do the work for an hour, take a break or get food whatever. Then I don’t want to, I won’t distract other people

either if they don't want to do work. But I don't like sitting there when other people doing things and I not do anything. That usually makes me work then. Because I want to do some to pass the time. Sometimes if I am not motivated enough, and then I sit with them. Cause I know if that's just three of us and two of them do work. And then I don't want to sit there. Like I want to sit there to talk to them to distracting them doing work. But I want to kill time as well. I have my phone turned off. I just sit there and eventually start to work to pass the time.

OS: I just have to, just kind of working, like ask someone in my class, if I cannot get the teachers. And someone in my class, they love to explain, lots of time like.

GY: It's mostly I don't like studying on my own. So I normally have a person beside you. So the biggest distraction is more than two people. I cannot study. I have KX with me. So we test each other.

In the first two excerpts, KX and OS also explained the benefit of studying with peers, which is an increase in enjoyment, productivity and motivation, although KX's report below touches on issues of distraction during collaborative learning.

KX: GY talked for a lot. So I know if I want to actually get proper work done, not to study with GY. GY will study like 20 minutes and take a break. And I need more twenty minutes time to study.

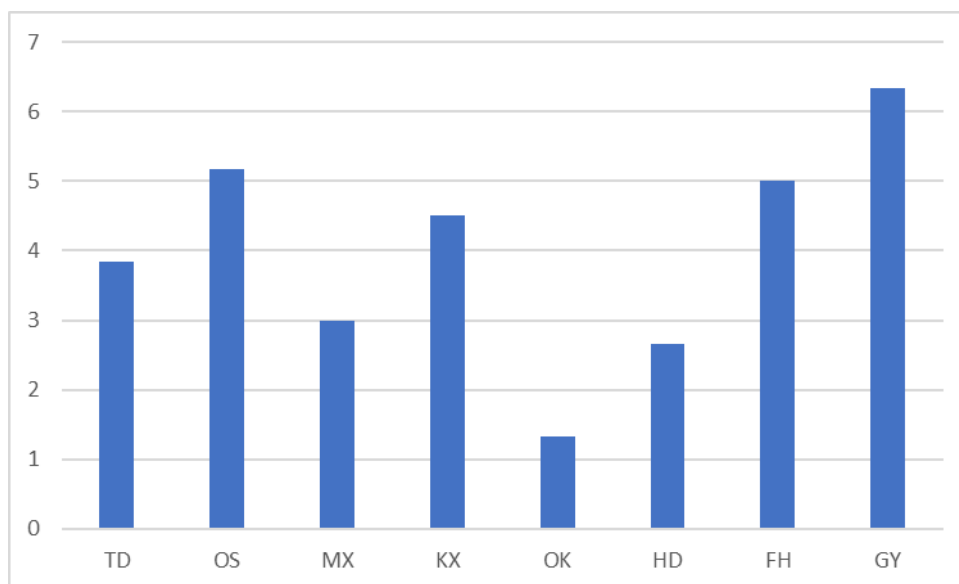


Figure 4.22. Scores of the collaborative strategies of each participant

The data from the questionnaires supported the conclusion of the interviews. As in the above table, four female participants assigned high scores, while the remainder expressed lower responses in this part.

4.6 Discussion

To sum up, the level of the participants' use of language learning strategies in this case study can be concluded as in the following table. This table is mainly based on the participants' reports during the interviews and stimulated recall tasks. Overall, the results from the eye-tracking and questionnaire supported this summary, with a few exceptions. GY reported frequent use of the strategy of induction in the questionnaire. However, she did not report any usage of these strategies during the interviews. In addition, as she cannot recognize most of characters during stimulated recall tasks, she cannot explain her cognitive process, but described the component and the shape of the characters. In other words, although she assigned medium or high scores to these characters, no evidence can be observed to support that during the interviews and stimulated recall tasks. A similar condition occurred with OK's reports on his strategy use of the shape strategy and induction strategy.

Participants	Chinese character proficiency level	Stroke	Component	Shape	Association	Induction	Repeating	Application	Auxiliary tools	Stories	Planning Learning	Evaluation Learning	Collaborative Learning
TD	High	Medium	High	High	Low	High	High	High	Low	Low	High	High	Medium-low
HD	High	High	High	Medium	Medium	High	High	High	Low	High	High	High	Low
FH	High	High	High	High	Medium	Medium	High	High	Low	Medium	High	High	High
KX	Medium	Medium	High	Medium	Medium	Medium	High	Medium	High	Medium	High	High	High
MX	Medium	High	Medium	Medium	Medium	Medium	High	Medium-low	Low	Low	Medium	High	Medium-low
OS	Medium	Medium	Medium	Low	Medium	Medium	High	Low	Medium	Low	Medium-high	High	Medium
OK	Low	Medium-low	Low	Low	High	Medium	High	Low	Low	Low	Medium-low	High	Low
GY	Low	Medium-low	High	Low	Low	Medium	High	Low	Medium	Low	Medium-low	High	High

Table 4.1. Summary of language learning strategy us

From the analysis of this chapter, all of the participants showed their preference of repeating strategies and evaluating strategies, while reported using Auxiliary tools and stories strategies infrequently. In addition, a linear approximation between learners' achievement and the use level of application, induction and planning can be seen from this case study. Among these three strategies, the application strategy and the induction strategy were found to be positively related to Thai learners' Chinese characters proficiency (Han 2009, Wang, 2017). Furthermore, such a correlation between application strategies and learners' achievement was also reported in a study of Central Asia learners (Fan and Hu, 2010).

In addition, previous research into language learning made an assumption that the better language learners utilise a wider range of language learning strategies than the less advanced learners, which has not been supported by any studies into Chinese characters learning prior to this study. In other research regarding the language learning strategy, O'Malley and Chamot (1990, p. 128) found once that "more effective students used learning strategies more often and had a wider repertoire of learning strategies than did less effective students". Oxford also stated that "Research shows that greater strategy use is often related to higher levels of language proficiency" (p.167). More recently, Grenfell and Macaro (2007, p.15) also offered similar statements:

Successful and highly motivated learners adopted more strategies, especially those involving planning, evaluation and monitoring. Poorly motivated pupils, on the other hand, employed a limited set of strategies and were less ready to act strategically.

In the field of Asian language learning strategy research, Bourke's (1996, p.131) and Rose's (2017, p.43) studies also supported this claim, as is shown below:

The most successful students in the kanji recall tasks were the ones who used the highest number and widest variety of strategies [which] concurs with the claim by Oxford (1989: 199) that more effective students use

strategies more ‘consciously, purposefully, appropriately and frequently than do less able students’.

In summary, language learning strategy theory suggests that the more efficient learners use a greater number and wider range of strategies. Research also suggests a connection between strategy use and language achievement.

This study also supported this assumption in the area of Chinese characters learning strategy, to some degree. As in the two tables above, this research also suggests a connection between strategy use and language achievement by reaching the conclusion that more proficient Chinese characters learners employ a greater number and wider range of Chinese characters learning strategies. This can be more obviously noticed from the opposite perspective. To be more specific, when compared with the other participants, the low-proficiency learners use less strategies in this case study, which is obvious from the above two tables in this section.

However, when only comparing the high-proficiency learners’ language learning strategy use with the medium-proficiency learners’, this case study did not find sound evidence to support the above assumption. This is something also noticed by other researchers in an over-time study investigating the learning of English as a second language by Japanese students, as is presented below.

Low reported strategy use is not always a sign of ineffective learning. Also, reportedly high-frequency use of strategies does not guarantee that the learning is successful. In a casual class observation, one might see some learners working eagerly and using many strategies, but . . . [they] do not employ those strategies effectively. Studies relying solely on frequency data may miss this point. Because frequency results alone do not explain everything about strategy use, it is necessary to include other indices of learners’ Learning Strategies and Self-Regulation behaviours that reflect their decision making. “The more, the better” is not always the case in strategy use. (Yamamori et al., 2003, p. 384)

In this case study, the reason can be their self-regulatory level, which will be discussed in Chapter 5.

4.6.1 Changes of learning strategy use

During this one-year investigation, it was noticed that all learner's uses of language learning strategies did not experience any dramatic change. In other words, despite some small fluctuation, which will be discussed later in this section, the learners' level of strategy use remained stable during this long period.

As presented in Chapter 3, the participants would have various exams at the end of this academic year and, therefore, the teacher arranged review classes instead of the students learning new Chinese characters. Correspondingly, the Chinese characters that were reviewed in the class were put into the last stimulated recall task, which also provided an opportunity to track the changes of learning strategy use by comparing the learners' two reports regarding the same character.

Although the following two examples discuss the same character 邮 (yóu, post), the reports of TD and FH show high-proficiency learners' tendency to develop induction and application strategies by using strategies for a single character. In other words, when reviewing Chinese characters, the higher-level participants preferred grouping a number of characters by some particular rules. Here, teachers may not explain the rules, while the characters are also from other sources, rather than from the content of the course. The following comparisons present this change.

TD: Just see many times (from the text book). (Stimulated recall task 1)

TD: 邮, 由 on the left is 由. I know a few characters with 由. 加油.

Interviewer: Who told you that? We didn't teach you.

TD: I just learned it. (Stimulated recall task 6)

FH: left part is a mail box. (Stimulated recall task 1)

FH: This, looking at component on the left, kind reminds me mail boxes. So I always associate it with post. And then I suppose for the character on the

right, the kind of associate with a person, even though it doesn't really mean a person. But it's just a picture like someone at a mail box. I think it's the component on the left that's the pronunciation. So I kind remember the pronunciation, I know from writing it out. But there is also one I kind remember the one on the left means, it sounds like you.

Interviewer: As far as I know, we didn't teach the left one.

FH: I think because there's been several characters we've learned that have had the left component in them. And they pronounce you as well. So I think I also associate pronunciation with that character. (Interview 6)

4.6.2 Combination of learning strategy use

As Zahradníková (2016, p. 117) revealed, “these strategies are used either independently to elaborate a single piece of information, or in combinations, interweaving two or more pieces of information into one.” The participants reported similarly in this case study, albeit far less combinations than in Zahradníková's research. The following is a list of all of the combinations with examples:

1. Association + Component

GY: It's so completed. There are two components with each other. Cause it's so different word. The right two is like two holding fans. That's how I remember the pronunciation. (翻 [fān, turn around], Stimulated recall task 1)

OK: We did that for dictation. So that would be fresh my mind. I recognize this because it looks like a few different characters. Like the person radical on the left. (像 [xiàng, similar], Stimulated recall task 2)

HD: Because that's the water radical. It's to do with steam. And the first part was steam power. So that's what I remember. (汽 [qì, steam], Stimulated recall task 2)

OK: I recognize it from the other character without the radical, as money. But I also recognize recently from the book. And I remember it being the end at the sentences. (远 [yuan, far away], Stimulated recall task 4)

TD: I know 方 is on the right side, so the pronunciation. In the lesson 22, it's 访问. (访 [fǎng, interview], Stimulated recall task 5)

2. Association + Repeating

FH: It's with another word in the same chapter. So I remember them together. Write a lot of times and think about the pronunciation. (旅 [lǚ, travel], Stimulated recall task 1)

3. Component + Repeating

FH: I remember because the left part is metal. I don't know what the right component is. But also write a lot of times. (铁 [tiě, steel], Stimulated recall task 2)

TD: I know lots of. Bottom of 化. Different tones. I see the character a lot. I know the top is grass. I say that. But like I say like I know this means grass. Sometimes I don't think about it. I just see. I don't know why I saw this. I see it a lot times. I've heard it. (花 [huā, flower], Stimulated recall task 3)

TD: I remember the right part 巳. That's the pronunciation. And I just write for a lot of times. (记 [jì, remember], Stimulated recall task 2)

4. Component + Induction

KX: The left is person. The top right is inside. The Bottom on the right is like 家. I don't know why I remember the pronunciation. Cause it's different from the other 象. (像 [xiàng, similar], Stimulated recall task 2)

MX: Cause I remember 所以, 但是, so I knew it's one of them. The boxes, yeah, the boxes. Just sort came with the boxes. Cause no other character has boxes. (虽 [suī, although], Stimulated recall task 5)

FH: This, looking at component on the left, kind reminds me mail boxes. So I always associate it with post. And then I suppose for the character on the right, the kind of associate with a person, even though it doesn't really mean a person. But it's just a picture like someone at a mail box. I think it's the component on the left that's the pronunciation. So I kind remember the pronunciation, I know from writing it out. But there is also one I kind remember the one on the left means, it sounds like you. (邮 [yóu, post], Stimulated recall task 6)

5. Induction + Association

FH: I remember from the top part like 弟弟. Recently I write it wrong. So I remember it. (费 [fèi, fee], Stimulated recall task 2)

6. Component + Application

TD: 恭. The top is 共. Just seeing 恭喜恭喜. I always say that. (恭 [gōng, respectful], Stimulated recall task 3)

7. Component + Shape

FH: I remember mostly is the bottom component is 早. Just the shape the character, help me to write the character, together remind me the pronunciation. (早 [zǎo, early], Stimulated recall task 3)

8. Repeating + Induction

MX: Just from writing it out. 京剧, actually, that's what I saw it straight away, cause the same sort of opera, 北京. So once I saw that, that's what 京剧 came to me first, and then I saw that. (越 [yuè, a name of one kind of opera], Stimulated recall task 5)

9. Stories + Component

KX: That's full character for 邮. The right component kind of reminds me some hand into like post office. Under right it's like a person put his hand into the postbox. (邮 [yóu, post], Stimulated recall task 2)

10. Stories + Shape

FH: I remember kind of, by the shape. It reminds me the shelf of books. (典 [diǎn, dictionary], Stimulated recall task 2)

As chapter 1 discussed, as logograms, Chinese characters are widely believed to be combinations of grapheme, pronunciation and meaning. In other words, if one learner would like to learn one character, this student has to memorize these three dimensions. In this study, when learning Chinese characters, learners are noticed to combine strategies to remember these different dimensions, respectively. For example, in the last example, MX memorised the pronunciation and the grapheme of the character 越 (yuè, a name of one kind of opera). Then he explained how he understood the idea, by grouping two words (京剧 [jīng jù, Beijing Opera] and 越剧 [yuè jù, Shaoxing Opear]) with similar meaning. In addition, the eye-tracking data regarding such combination use was not analysed in the current study.

4.6.3 Implicitness of Strategy usage

During the previous five interviews, when required to describe their Chinese characters memorising strategies, a few participants mentioned only the repeating strategy in two sentences in some of the interviews. The remainder also spent

most of their responding time describing their learning experiences regarding the repeating strategy and then mentioned other strategies within one or two sentences. However, when the participants tried to recall the characters, their responses were not as closely connected to the repeating strategy as what was indicated in the interviews. During the stimulated recall sessions, most of the participants would use other strategies to explain why they successfully recalled some characters. By doing so, the high-proficiency and medium-proficiency learners found that they would usually utilise other strategies when rewriting the characters. These strategies they used were varied.

MX: Write the text out. So just like you take a sentence, and sort of write it out. The more you know, the sort of maybe you see the sentence, and you might see the words you know already. Then you might look up to get another word you might know. You might sort of recognize different components, making memorize from writing them out, you memorize more. Like how you memorize the stroke order. I compare.

HD: Look at the text and remember the sentence and write the sentence out. And if there is a character I cannot remember, I will look at again, and I write it on the side. And I keep writing. And I might have a few characters at the end I don't remember. So then I learn them and write them out again and again. I read the sentences first. And then I recover, then write, then try to remember the whole sentence. And then I do dictation on the characters I don't remember after. Like characters, you could group together, same radicals together, same stroke order stuff. I always think them together. I naturally do it. I think. I watch Chinese movies and stuff. I like old Kongfu Movies. I have another app, like Chinese news articles. They have HSK 3 and HSK 4 articles. They are news articles on the app. I learn most in the instant message. That's how people talk every day. And then translate as well. You can translate. Like before my oral exam, I was talking with people. I say I want say this and them correct you. It's like a teacher on your phone. That's good.

As in the examples above, when rewriting Chinese characters to memorise them, HD also applied the induction strategy and the application strategy, while MX used the component strategy, association strategy and the stroke strategy. However, the participants reported that they had not realised this until being asked. In other

words, they may interiorise these strategies when memorising Chinese characters, supported by HD's report above and by the following answer from FH.

Interviewer: So you just said you write them out and test yourself. But I also notice when recalling characters, you will also say other explanations, like, this component means this, that component means that. Is that because when you write them out, you naturally think all these characters are made by these components?

FH: Yeah.

During this case study, in order to maintain a consistent procedure in each interview and stimulated recall task, although this phenomenon was noticed in the fourth interview, it was not purposed to the participants until the sixth interview. As a result, the reason of this phenomenon cannot be fully understood due to the lack of data. Two possible reasons were put forward to try to explain this condition in Chapter 7.

4.6.4 Lack of Instruction

In terms of the medium-proficiency and low-proficiency learners, their usage of this strategy placed heavy reliance on previous knowledge and teachers' explanation. If they encountered a learning task, the components of which they had not previously learned or had not been analysed by teachers, they would cease to use this strategy, such as in KX's report.

KX: I break them into the components if I know the meaning of all the components. But if I don't, then I tend to just leave as it is. And just learn then by stroke order. Unless explained in the class, then I wouldn't.

In contrast, the high-proficiency learners also presented their thoughts based on teachers' explanations and knowledge they had accrued from other sources.

In this case study, the strategy instructions from teachers were mainly presented when teaching Chinese characters. Therefore, most of the instructions were reported as being explanations based on some particular character, other than learning strategy instruction. For example, the teacher would break a Chinese character into small components and reveal the special links of the components with pronunciation and meaning of the character. However, during this process, the teacher would not give a further explanation of this strategy, such as how this strategy works or when this strategy can be used.

4.7 Conclusion

To sum up, this chapter presented the language learning strategies use based on the data collected from the case study, along with the related changes. In addition, from the analysis of this chapter, all of the participants showed their preference of repeating strategies and evaluating strategies, while reported using Auxiliary tools and stories strategies infrequently. In addition, a linear approximation between learners' achievement and the use level of application, induction and planning can be seen from this case study. In addition, participants were observed to combine two strategies to learn one Chinese characters. During the whole investigation, no evidence can prove that participants changed their learning strategies. Finally, a lack of instructions in terms of learning strategies can always be noticed from the start of the investigation. In the next chapter, another part of results collected by the case study will be presented, in terms of participants' self-regulatory learning and strategies to control self-regulation

Chapter 5: Self-regulation, motivation control and Chinese character learning

5.1 Introduction

This chapter will present and discuss the results collected from the case study in terms of the self-regulation of Chinese character learning, through use of strategies to control the self-regulation. Firstly, the data from the study will be presented under the five categories of motivational strategies to understand participants' self-regulation. Then, the changes concerning self-regulatory learning throughout the study will be explored.

5.2 Self-regulation and motivation control strategies

In the following analysis, Dörnyei's model of motivational strategies (2013, p.99) will be utilised, which has previously been used by Rose and Harbon (2013) to explore character-based learning. This taxonomy of strategic learning has its origin from the psychological concept of self-regulatory mechanisms and social cognitive theory in learning. The results of this study will be presented under the five categories. In each section, the data from the interviews will be firstly analysed and concluded by tables. Then, the results from the questionnaire will be presented. As five items of each category in the questionnaire were designed to gain an understanding of one aspect of self-regulation, only mean scores will be analysed and presented in this chapter. By doing so, the findings related to students' self-regulation in Chinese characters learning could be crosschecked with the case study for reliability and validity.

5.2.1 Commitment control strategies

Commitment control strategies refer to students' ability to set and reach goals in their learning. Correspondingly, the researcher explored the commitment control

strategies in two aspects in this study, which are the participants' goal setting and their willpower to achieve their goal. According to the analysis of these two parts, each participant was assigned a commitment control level rating of high to low, which will be used for a later discussion. The participants who have clear goals and strong willpower were assigned a high rating by the researcher (and verified by a second researcher). The participants who have no goals related to learning Chinese characters and weak willpower were assigned a low rating. In this study, goal setting has a high interrelation with the participants' willpower to achieve their goals. As a result, the conditions in which the participants have two opposing extremes in goal setting and willpower will not be discussed. Table 5.1 lists the rating and outlines a simple summary of the participants' reports.

Although the questions relating to commitment control strategies clearly prompted the participants to respond in terms of Chinese characters study, nearly all of the students connected their Chinese characters learning goals with their general Chinese learning goals or Chinese proficiency tests (HSK). Among the eight interviewees, five had Chinese-characters-related goals, two of whom specified numbers. The remaining three had non-specific Chinese-characters-related goals, and described their goals as improvement of communication skills and the complement of their course.

TD, for example, had very specific and established goals in his Chinese characters learning with clear timeframes and deadlines. In addition, he always reported strong willpower to achieve his goals. As a result, he was assigned a high commitment control level.

TD: During the summer I want to do a thousand characters. So I think now I have a thousand. What I have to know, I try to know that. And go a little bit ahead. But I never go too far. Cause I feel to forget what we need to know now. (Interview 1)

TD: I think I have a lot of willpower. (Interview 1)

FH expressed a similar level of goal setting in the learning of Chinese characters. In the next group with a lower rating, although HD did not have a long-term goal related to Chinese characters, his short-term goal was related to Chinese characters.

HD: this year I want to do the HSK 3 and then next year in China I want to do the HSK 4 and maybe next year I will do HSK 5. (I) Yeah just finished a new chapter in the book every week and try to finish all day just write the text to know the characters. But it doesn't always work. (Interview 1)

However, his willpower demonstrates fluctuation within this investigation, resulting in him being assigned a medium-high level.

Interviewer: Are you satisfied or confident about your willpower?

HD: Yeah. You can always do more I think but I think I'm putting in a good effort anyway. (Interview 1)

Interviewer: How do you think about your willpower since we last met?

HD: Good. This week is my week. (Interview 2)

Interviewer: How do you think about your willpower since we last met?

HD: Not good in Chinese. But I achieved a lot for Computer science this week. I am nearly finishing my Chinese essay. Today I will do a lot of Chinese. I will achieve a lot of good work. (Interview 6)

Similar to HD, KX and MX had specific Chinese-characters learning goals, but with fluctuating willpower. They were put in the same commitment-control-level group.

OS was grouped as medium, as she did not have any specific Chinese-characters learning goals, but showed steady and strong willpower.

OS: not like fluent because that takes years. But understand the sentences and be able to make all the conversation and stuff like that. First to pass my exams and then in the long term to make conversations like that. (Interview 1)

Interviewer: How would you think of your willpower to achieve these goals?

OS: Strong. Because test need to be done. (Interview 1)

OK and GY were grouped as low commitment control level. They did not have any specific Chinese-characters goals and displayed weak willpower during the investigation.

Interviewer: Do you have any Chinese-characters learning goals?

OK: For the first months. It going back to first year before she went in Chinese and the first month two month 3 month yes. We only had about a dozen or so. Then they start building the book over 150 new characters in a week. It's very easy to lose the track. I am busy with geography. Yes you might not tend to focus on learning all the characters for time and then try and learn them all in one group after a week or so so. Whether it's a good strategy I think so.

Interviewer: How do you think of your willpower to achieve your goal?

OK: Strong in general. But isn't learning Chinese. Sometimes you would be tempted to procrastinate even when you're not busy purely. Because some part of that is laziness and part of it is you're having to travel up and down. You might be tired at the end of the week. So, and it's kind of play the role there and you just don't feel you have the energy to be there in Chinese. But I am good at when I, when I have energy and time. I am good at being sitting down at and learn Chinese characters especially coming close to in class assessment next week. (Interview 1)

GY: It's enough to let us survive when they go to Shanghai. There's the major goal no one star going quicker than them because I feel like I'm falling behind some of the people a lot. So I feel I go from kind of a one to catch up and that's my current goal.

Interviewer: How do you think of your willpower to achieve your goal?

GY: Quite lazy but I've been trying to think back to the character as well especially as the test next week so I am working hard this week. (Interview 1)

Participant	Summary	Commitment control level
TD	Goal: To learn Chinese characters a little bit ahead of the class routine Willpower: strong	High
FH	Goal: To learn 500 words for HSK 3; To learn enough characters for the exam and the exchange year in China Willpower: strong	High
HD	Goal: The long-term goal was to pass HSK 6. The short-term goal was to review characters in each chapter of the textbook. Willpower: Fluctuated	Medium-high
KX	Goal: To learn the necessary words in the text Willpower: Fluctuated	Medium-high
OS	Goal: To pass the exam and make fluent conversation. Willpower: Fluctuated	Medium
MX	Goal: To learn words for HSK 3; To learn enough characters for the exam and the exchange year in China Willpower: Fluctuated	Medium-high
OK	Goal: To get a better result in the exam Willpower: Fluctuated but weak at most times	Low
GY	Goal: to catch up the course Willpower: Fluctuated but weak at most times	Low

Table 5.1 Summary of commitment control strategies and levels

The results from the questionnaire supported the participants' reports. However, no participants selected very low scores (below 4) in these questionnaires, which conflicts with GY's and OK's reports, as shown above. As a result, as in the summary in Section 5.4, their commitment control level was still concluded based on their interviews.

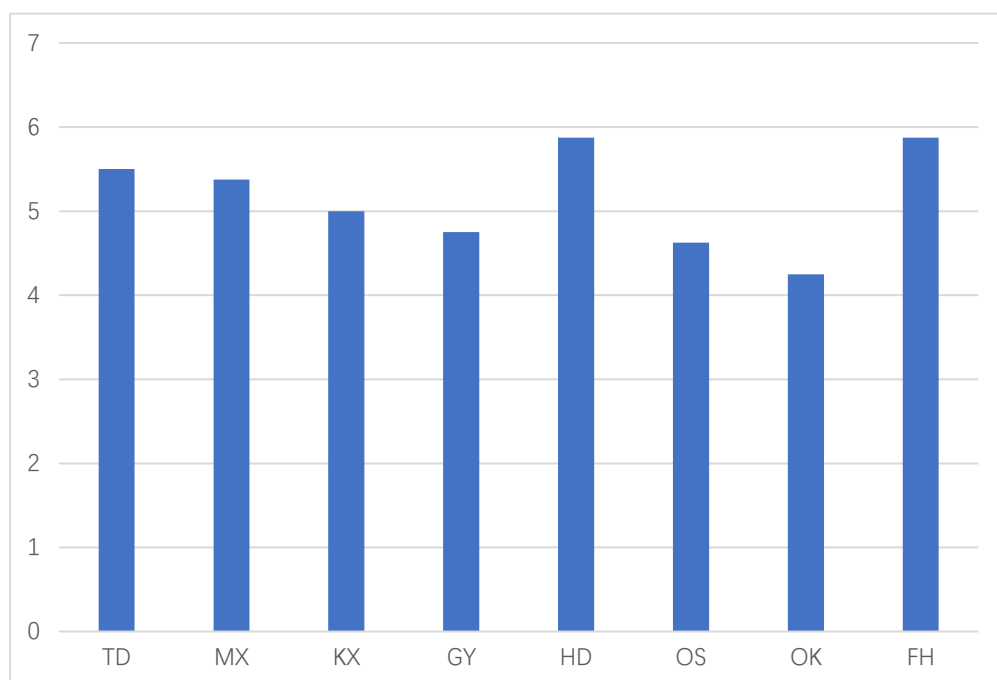


Figure 5.1 Results of commitment control levels from questionnaires

5.2.2 Metacognitive strategies

According to Dörnyei's theory, metacognitive control strategies explore learners' ability to control procrastination and concentration during their studies. During the whole investigation, all participants experienced difficulties in controlling procrastination and concentration in their Chinese characters learning. TD was the only exception in terms of controlling procrastination during the study. According to his reports, he never procrastinated in terms of Chinese characters learning. In the last interview, he explained the reason, as follows,

Interviewer: So you never procrastinate for anything?

TD: I don't know. I like it. I do procrastinate. But I like to do things now. I don't like. I don't like fall things off unless I don't like it. If I like doing something, I want to do it now. (Interview 6)

His case shows how learners' motivation affects their learning. In terms of concentration, TD kept reporting that he felt it difficult to be distracted until the second last interview. The distraction then continued to the last interview.

TD: Now with scholarship I feel easily distracted. Think too much about them. So. Yeah, quite a lot of time. But usually I am not. (Interview 5)

(Sixth interview)

TD: Sometimes, on Wechat. (Interview 6)

When viewing this, TD has methods to enhance his concentration.

TD: Just quiet, find a quiet place. Stop looking my phone. Just practice concentrating.

Interviewer: How did you practice?

TD: I don't know. I just focus, focus. The more I focus, the better you are. Focusing. (Interview 5)

In the same level group, some of the other participants reported that, even though they suffer from procrastination and distraction in Chinese characters learning very often, they have efficient strategies to control that. Among these strategies, the most common is to divide the study into short sessions and take a break as a reward.

HD: I set an alarm on my phone for half an hour or 40 minutes then I just study for that time and then after that I can go down to have a cup of tea or something take a rest. And then I do it again and if you concentrate on your books for about half an hour then it's easier to take a Break. You deserve it. (Interview 1)

OS: I set two hours and take a break. Like a timetable. (Interview 1)

The participants in the next group (medium-level) were positioned somewhere in between suffering from procrastination and distraction and controlling it, and their metacognitive control level fluctuated with the course setting. In other words, upcoming exams motivated them to stop the procrastination and distraction.

KX: Sometimes. Sometimes I procrastinate, like oh I have exam for this subject (which refers to other subjects but not Chinese). Like later one day, I will procrastinate and focus on that more. Because the dictation is only. The

marks don't means anything towards actually grades. I keep a little calendar on my wall. And I mark off days that I have things done by. So I got HSK marked. I mark Christmas exams, CAs, stuff. Cause then let's me see how long I have left kind of study for. Cause I don't like carry the day before the exam. So I start maybe 3 or 4 days before. (Interview 1)

FH: Suppose I keep myself busy with certain goals like I need to have this much amount done. So that keeps me focusing on it. (Interview 6)

MX: But you always find procrastinating when you on a computer, like you are looking Chinese characters. And you find you are on Facebook watching car video like 2 hour later. (Interview 1)

MX: No as much, no. Cause I had exams. I had to, sort of, do as much as you can within a certain time. You have to get that done within one hour. You have do whatever you had to do. (Interview 3)

The other two participants cited their awareness of incredible issues with procrastination and distraction during the whole investigation. Towards the end of this study, both of them started to put forward methods to solve the problems. Even though they experienced similar issues, their specific behaviour and responses varied. Regarding OK, he clearly understood his condition, but, initially, he believed that he could finish his work before the deadline. In addition, according to his reports in terms of other strategies, he did not have any strategies to stop procrastination and distraction.

OK: Stop procrastination not necessarily because the best thing to do for revising for a test is to start at least the week before. And pace yourself and do some work on Monday and some work on other days my time of thought is that some revision is better. So, if you revise very hard for the last two three days maybe even one day depends on if you're if you're busy that's what we called cramming. because you tread provision in two days but you know it is better than doing nothing. So far, so far is it worked out for me. It's ok. It's not just Chinese, so it's effective for performing well in exams. Maybe not for procrastination because you still procrastinate anyway.

Interviewer: Did you feel easily distracted when reviewing Chinese characters?

OK: I Kept being distracted very easily. That's essentially procrastination because you just feel well I do this, I can do that instead. so yeah I probably am distracted easily especially if there isn't any if it's not.

Interviewer: Do you have any methods to enhance your concentration?

OK: Because it all depends how necessary the work is. If I need to do work now I feel I need to do which is usually a few days before important exams or so. Unable to do with them in a week yourself it's very easy for me to get to stress. Sometimes I end up doing as I talk to myself about how I'm going to revise work when I should be revising. I lose concentration not decided to stay. If I decided to watch TV instead of studying. It's kind of lose. ya I don't really have any measures to stop myself from getting distracted other than if I have to do the work then I do it. (Interview 1)

However, in the following interviews, he advised that, sometimes, he even procrastinated when reaching the deadline. In other words, he could not reach his target because of his lack of concentration. When realising this, he put forward some strategies to enhance his concentration during the final interview. The effectiveness of these methods in Chinese characters learning were not reported by OK, as he would leave the review for Chinese characters until two days before the exam.

OK: Do you know it in the same way that kind of most things. You know, you don't actually want to, if you feel that something going to be difficult or boring, very hard to trying start something. Once you start something you you can't keep going at it. And if you start and, you probably start and keep going. But you don't push yourself to start it, then you never started. It depends how motivated or determined I am. How the particular task is. So less motivated you are, the more likely you are leave it toward to the deadline. Then you naturally kind of, say "I haven't done any revision for that. So if I am really focused on the in-class assessment for Thursday, I put all my tension to. I could start anytime I want. But naturally, usually some sort of thing that you also have to put focus on in between. And it's very hard to try to motivate yourself to be one thing.

Interviewer: Do you have any methods to stop procrastination?

OK: Yeah I just I just I just motivate myself. I kind of think and I try and change my, my mindset I'm like Why am I doing this I mean like well I'm doing it because I've got tests and it's like but I want to do well. It's the same

thing about the reason why I'm stressed. I use out to combat it, I also do little things kind of psychology with myself to turn make me interested in one hundred and setting smaller goals for myself like saying OK Well all I have to do this, learn this character, and then I learned I learned that character. And kind of setting small goals for yourself and then kind of patting yourself on the back when you, when you succeed. Because I like, I like to succeed, I to do run things so if I take that I'm if I am achieving something, it makes me a lot easier to control procrastination. (Interview 5)

For GY, she noticed that she was continuously suffering from procrastination and distraction from the first interview, which was caused by various factors, according to her reports. Different to OK, she kept trying to get rid of these issues by attempting various approaches. During the middle of the investigation, she even sought help from mental counsellors.

GY: Just laziness. I get distracted by another subject like I always think I gave an English essay due on the 14th of December and start two months ago but no sign of initiative. But I have had so many tests and some other essays due for sports because I was the first when I saw it on the. Just I just bad at things up. (Interview 1)

GY: I just don't like to do work. I do enjoy learning. But I don't want to work. So I will think any excuse to not work. I have an essay to due next week. But I start to do it one month ago. Because I don't want too stress.

Interview: So if you feel stressed, you will procrastinate.

GY: Yes. I distracted myself when procrastinating under stress. (Interview 5)

GY: Because I don't not like doing exams. I don't like writing essays. so like especially if it's a topic like. I like Chinese but like I don't like to write an essay for Lu Laoshi (teacher) and Liu Laoshi (teacher). I have to write essay for her. But I don't care if I don't want to write it because I don't like it. so I'm just I don't want to do it. But I have done it now to me. so it's just like just do it. (Interview 6)

Interviewer: Do you have any methods to stop procrastination?

GY: What I used to do is that I was usually go back to write a list of everything I need to do, and just tick it off. That completely helped me. So I used to do

when I doing my leaving cert like three years ago. So probably I should go back to that. (Interview 5)

Interviewer: Do you have any methods to stop distraction?

GY: I have to turn that off, as a child like, everything off recently. And it's like if I'm sitting with someone else happens that beside me so they'll watch me and make sure I don't do anything. I've stopped drinking a lot of the coffee as well. So I'm not as hyper. or like I don't drink like sugary drinks anymore. I've just been drinking water. So if I going to drink coffee I got like I could get to interest some of the around me. or like if I drink lots of sugary drinks or eat lots of chocolates and stuff, like stop paying attention, and like a child when you get them chocolates and they want to run around the room. I just like them too interested in everyone else's. (Interview 6)

Participant	Summary	Metacognitive control level
TD	Never procrastinated, but sometimes distracted. Had effective strategy to enhance concentration.	High
FH	Procrastinated, but can concentrate when necessary	Medium
HD	Procrastinated and distracted, but has effective strategies to control them	Medium-high
KX	Procrastinates, but can concentrate when necessary	Medium
OS	Procrastinated and distracted, but has effective strategies to control them	Medium
MX	Procrastinated, but can concentrate when necessary	Medium
OK	Chinese characters are always left to the last minute.	Low
GY	Severe distraction. Tries to find effective strategies to enhance concentration.	Low

Table 5.2 Summary of metacognitive control strategies and level

All of the participants' reports were supported by the questionnaire, except for TD's. He assigned 2 for item 8, which related to learners' special techniques to prevent procrastination. From his first three interviews, however, it can be seen that he did not suffer from procrastination. In the late of the case study. He began to face distracting issues, but could solve them very quickly. As a result, controlling it was not necessary for him.

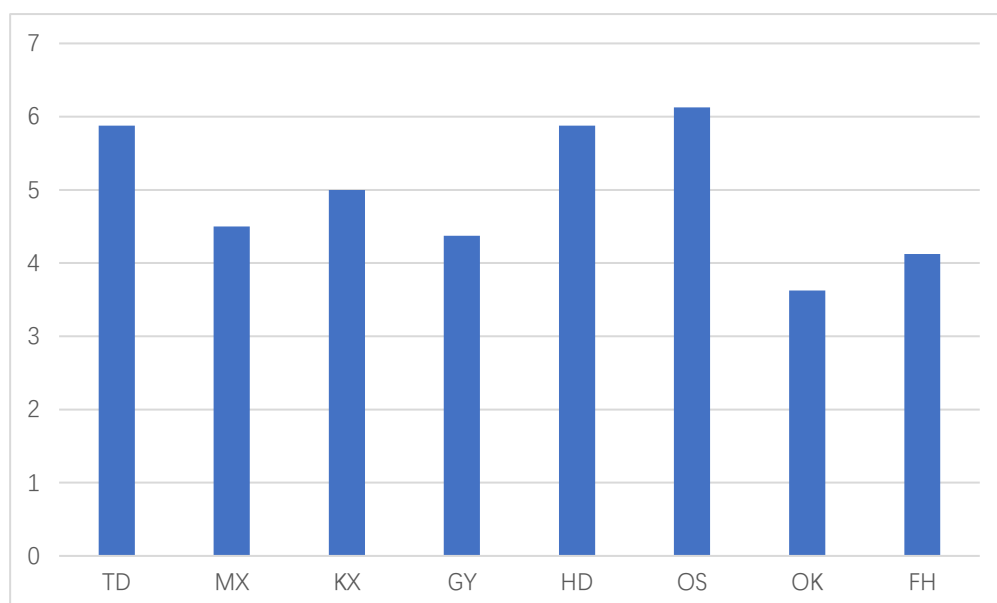


Figure 5.2 Results of metacognitive control levels from questionnaires

5.2.3 Satiation control strategies

Satiation control strategies helped the learners to eliminate boredom and to add extra attraction or interest to the task. Similar to the previous two strategies, the students' feedback varied, as shown in the following table. Overall, none of the participants displayed a low-level in satiation condition or any failure to control their boredom. This is mainly due to the course system of the university, which was explained in Chapter 3 in detail. In this university the participants attend, students can choose up to four majors in the first year and then drop two in their second year. The students of this study were in their second year when the data was collected, which showed their initiative to complete the Chinese studies degree course.

In the high-level group, TD and FH expressed strong interest in learning Chinese characters. TD derived his motivation from his interest in Chinese language, while FH was highly motivated in learning itself.

TD: No. I just happy to do Chinese. I love Chinese. (Interview)

Interviewer: Have you ever felt bored?

TD: Sometimes I felt bored when I already know them, the text. But I just leave them and come back. So that's OK. (Interview 6)

FH: Well I think I'm also more vague because I just love learning. (Interview 6)

In the next group, HD reported boredom in several interviews. However, according to his reports, this did not bother him, because of his strategies to control his negative feelings, which he also utilised to control his procrastination and distraction, although, during the last interview, which was held after the academic year and before the final exam, HD reported that he felt bored when only reviewing the Chinese characters. Furthermore, he did not mention any strategies to control this feeling. As a result, he was assigned a medium-high level.

HD: I will always be a little bored studying but it's it's worth it if you learn it.

Interviewer: Do you have any unique methods to get rid of the feeling of bored?

HD: Yeah, just, just giving myself a break every half an hour. (Interview 1)

HD: Study get bored after a while, isn't it. If there is new material, I don't get bored. If I am reviewing, I will be get bored.

Interviewer: What do you mean by new material?

HD: Like if I doing a new chapter, new words, like stuff. (Interview 6)

The participants of the next group (medium-level) faced satiation control problems, which were often described with other negative feelings about the difficulties in learning Chinese characters. However, in terms of the satiation part, these students all displayed their strategies.

KX: Not bored, but irritated. I get bored when I have to spend really long doing my homework. That's not in Chinese. So if I write things with Pinyin, I

get really bored doing really fast. Cause I try not to use Pinyin so much. I try to focus more on characters. (Interview 1)

GY: I think it's easier start because it's new. But then the longer you spend on the words. And sometimes I feel like there's a word. If I'm still learning in a week later I am not going to learn it. I feel like I've already given up on it. And then that's when they get really bored. But when it's new words I'm interested in seeing the shaping from different components or what it means. Lot of the time I study in different places. So I might study one week in the library and then I study upstairs in the Phoenix and then may get bored there. And I may study in the common room, and I put earphones in. I always move around because if I use the one place I get bored as well. (Interview 1)

Interviewer: So are you still a little bit bored, impatient, like last year?

MX: yeah, times, yeah. You would like it's frustrating when you was learning a language and you don't get it straightaway. It doesn't really click like all the time. So you do the times you frustrated. But you just have to realize that's what learn is. It's hard to learn a language. not everyone learns Chinese so it's difficult. But you just always think about china. Just when you are there, you will chill out when you come out with degree. Every one says you just. It's hard now but in 3 years time, you get a Chinese business degree. And you had a year abroad in china like. (Interview 1)

OK: I feel easily bored when I am trying to study. But when I am studying, I don't feel easily bored. I find, oh, it's kind of interesting. That's what I trying to tell myself. I feel interesting when I am actually studying. Because it's challenging. It's stimulating your brain. But it depends on what happened. Some characters, it's simple. You just write that. Other characters, are more difficult. How I am going to do is, you write a character. And you take the book away, and try to. Then you go, ah, I miss that a bit. So you. And then you go like, I am going try it again. And you get it right. Yes, you are right. It's kind of you send yourself tiny victories that you really getting. Like, it's a really tough character. I get that. (Interview 5)

However, as this investigation lasted for one year, from the reports of OK and GY there was a tendency for their strategies to lose the control of their satiation condition. As a result, their level is concluded as medium-low in the table. OK viewed Chinese characters learning as a boring task when studying complex characters. Furthermore, he did not put forward any strategies to solve this problem and left these difficult characters to the “last minute”. GY reported that

she felt impatient during learning and, at the time of the last interview, she had still not put forward any effective solution to resolve that.

Participant	Summary	Satiation control level
TD	Enjoyed Chinese characters learning. Satiation control is not necessary.	High
FH	Enjoyed Chinese characters learning. Satiation control is not necessary.	High
HD	Was able to regulate boredom in the Chinese characters learning task	Medium-high
KX	Displayed some satiation control	Medium
OS	Displayed some satiation control	Medium
MX	Displayed some satiation control	Medium
OK	Displayed some satiation control	Medium-low
GY	Displayed some satiation control	Medium-low

Table 5.3 Summary of satiation control strategies and level

The questionnaire supported the data from interviews. TD and FH were assigned the highest score among all of the participants.

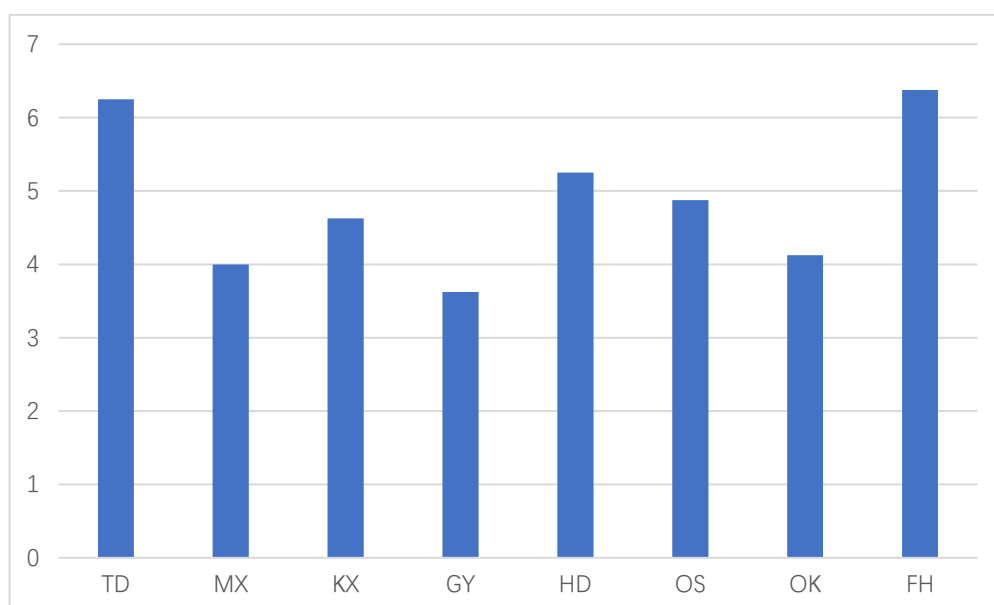


Figure 5.3 Results of satiation control levels from questionnaires

5.2.4 Emotion control strategies

Emotion control strategies explore how learners deal with emotional states, such as frustration, stress and depression, which may affect their language learning (Dörnyei, 2005). Emotion control seemed to be a great problem faced by the students during their Chinese characters learning, during which the majority of the students experienced two or more kinds of negative feelings.

TD is the only exception. According to his reports, he never showed a negative status in terms of his Chinese characters learning. In the same group, even though FH and HD reported that they experienced some negative feelings in two interviews, they further advised that these problems would disappear during the process of learning.

Interviewer: So since this September, do you have any negative feelings?

TD: Sometimes I feel it's. I found the classes are slow. But that's my fault. It has to be slow.

Interviewer: You never feel bad about your Chinese character learning?

TD: No. I am happy.

Interviewer: You feel the classes are too slow. Then what did you do about this feeling?

TD: I just concentrate on my listening. So if it's slow. I just concentrate on what the teacher say. I am still practice listening. It's not a waste of time. I feel people's mistakes. So that's good practice. I know what's wrong, what's correct. So it's never a waste of time. (Interview 1)

Interviewer: How do you feel about your Chinese character learning since we last met?

TD: Good.

Interviewer: Do you have any negative feelings about your Chinese character learning?

TD: No.

Interviewer: I'm just curious how can you always keep a good feeling to learning Chinese?

TD: Because I'm interested in it. (Interview 6)

All of the other participants associated these negative feelings with the increasing difficulty of the Chinese characters learning task, which was showcased in comments by KX, as follows.

KX: I think I was shocked of the amount of new words in each chapter. Cause compare to last year, it's like twice as many. And I wasn't expecting that really. So I think it's just shock the amount of them. And then the topics seems a little bit more random this year. Like last year you learned your family, your educational. This year we learn your dresses, library, paying fine. So the topic seem. (Interview 1)

As a result, these six participants indicated that they felt frustrated, impatient, annoyed, worried, bored, stressed and intimidated, and overwhelmed. As can be seen from their reports, most of them experienced one or two feelings at the same time.

MX: Yeah, times, yeah. You would like it's frustrating when you was learning a language and you don't get it straightaway. It doesn't really click like all the time. So you do the times you frustrated. But you just have to realize that's what learn is. It's hard to learn a language. Not everyone learns Chinese so it's difficult. But you just always think about china. Just when you are there, you will chill out when you come out with degree. Everyone says you just. It's hard now but in 3 years' time, you get a Chinese business degree. and you had a year abroad in china like. (Interview 1)

KX: There are some characters I hate to learn. Because they are so completed. So many small bits into them. It's definitely frustrated. If I know when I doing my reading comprehension, I can recognized the character. So when I know if I should know that but it's wrong. And I don't. I learned it wrong for the last ten mins. Sometimes I get impatient because I spend so long write them out. Then I get impatient then because I have learned it again. And it's wrong anyway. But I do get impatient when learning characters, especially it looks really simple. Cause I think like, why you cannot learn, like five strokes. Even I spent there like five, ten minutes. I do get impatient.

OK: Tired. Maybe you get closer, you are in the middle of the semester, so you got a lot work on both Chinese and geography. So maybe I feel like a little bit intimidated. Maybe slightly, not as relaxed I want to be.

OS: I think sometimes I just get stressed because I can't make the sentences. then I find out I get annoyed when I can't do it. (Interview 1)

Only GY experienced three or more negative feelings in terms of the Chinese characters learning task during the whole investigation.

GY: I am very overwhelmed because they took their pinyin out of the book so it was very kind of forced you can learn them quicker. But I do recognize them English quickly now than they did for show. But it's. But pinyin. A for wine. but I do understand what the book says. I just don't know how to say it. (Interview 6)

GY: I get afraid because I feel like overwhelmed for the characters. But the more time I spent, I feel better I get. So just kind of time thing I have to put it done. (Interview 3)

GY: Really bored but I knew that's what I had to do. And I kept like I take like five minute breaks every half hour and set of like a twenty minute break every hour instead like shorter breaks. Helped a little bit but I couldn't go for as long then. So that I had to take like take a five minute break every half hour for two three hours and then I'd take an hour break. And I've been more of an experimenting really what like taking breaks. But not pushing myself like too hard because I'll stop paying attention. I'll just you know when you're writing and even paying attention to what you're writing so I won't remember. And I am impatient. That's just me as a person. That's not to do with Chinese. I'm just impatient. So like when I am learning languages like. Because I hate when I hate to say something in English but I don't know the word for it in another language. So when I was writing the essays I was getting really frustrated. Because I had to keep rewriting a sentence. Like I come up with a sentence because I do English as well like my sentences and only really complicated. but then it's like I have to dumb it down because I don't know how to say like really long words in Chinese. So it's just keep like cutting it down and making a thought actually remember it like it was really frustrating. but now that I have it set it up. I'm happy to I'm a lot better once I got inside I know what I'm doing so I can move on. (Interview 6)

As well as reporting the emotions incurred with Chinese characters learning, all students, except TD, discussed pressure and worry when their interviews were close to the exams. The following reports of OK can reflect the overall condition of the participants.

OK: And also stress because you're worried about. You're worried about how you're going to do when you get tested on your own Chinese. And you're worried about falling behind or falling further behind about.

In addition to maintaining physical health, such as staying hydrated, the main strategy utilized by those who had to deal with negative feelings was just to remain focused on their studies.

*Interviewer: Do you have any methods to get rid of your negative feelings?
KX: Not yet. but I think I just want that group and work have the same Pinyin together and that way I can just learn them all that way and then just like picking the character based on the contacts because otherwise I'm going to get really confused and translate things very wrongly.*

Participant	Summary	Emotional Control level
TD	No emotion problems	High
FH	Seldom has emotion problems, which would disappear during the process of learning	High
HD	Seldom has emotion problems, which would disappear during the process of learning	High
KX	Some emotional control strategies	Medium
OS	Some emotional control strategies	Medium
MX	Some emotional control strategies	Medium
OK	Some emotional control strategies	Medium
GY	Some emotional control strategies, but faced more negative feelings	Medium-low

Table 5.4 Summary of emotional control strategies and level

In terms of the questionnaire, the data briefly reflected the trend of the conclusion of the interviews. However, apart from stress, the items had to be reworded to include more negative feelings in the future, in order to measure emotional control to a greater extent.

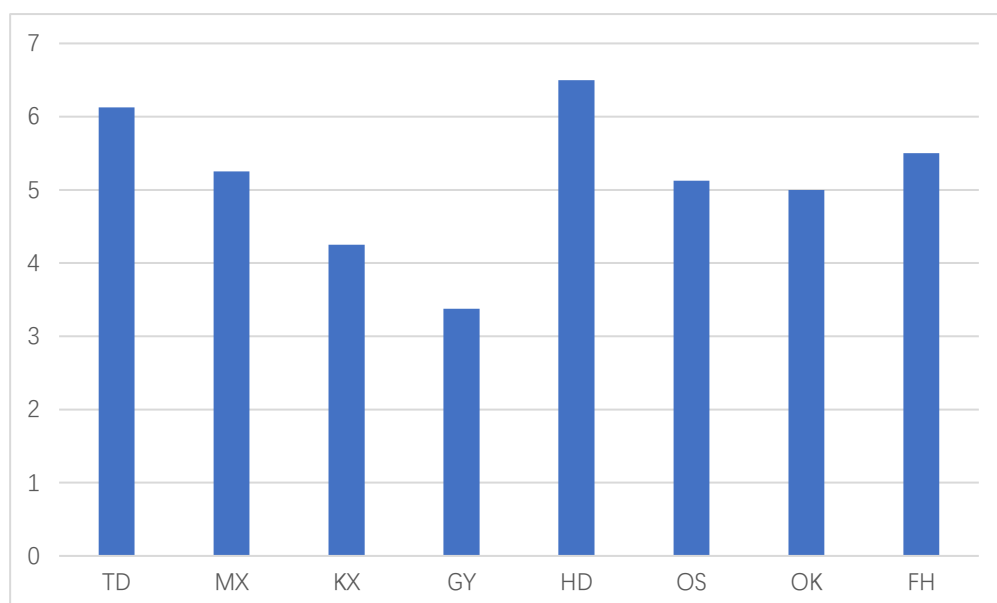


Figure 5.4 Results of emotional control levels from questionnaires

5.2.5 Environmental control strategies

Environmental control strategies examine how learners control their learning environment in order to achieve their learning goals (Dörnyei, 2005). In other words, a high environmental control level means that the learners' have a strong ability to adjust their learning time and place to eliminate the negative effects. The interview data indicated that all of the learners showed a high level of environmental control during the whole investigation, even though their productive time and places varied. The following two examples show how the learners controlled their learning environment.

Interviewer: So will you find any productive time and place for your learning?

KX: Probably on Wednesday and Thursday. Since there is only of two lectures and each day, so it's have a lot more free time. People don't seem to be in college so much. So I can just kind of go sit somewhere quiet actually study.

Interviewer: So any productive place?

KX: usually in the Phoenix because I don't like studying in quiet. And then things isn't too loud so I can actually concentrate on what you do. You don't need talk at and shout at them quietness. Cause you go home, because if it's

too quiet then I get too distracted. Because I have to look around and see what everyone else is doing and why they are quiet. So I need the noise to make me think, OK, there is still people around me.

Interviewer: So will you find any productive time and place for your learning in terms of Chinese characters?

OS: Library. In the morning and stay until lunchtime.

Int: Do you have any unique methods to control your learning environment?

OS: I get up early in the morning and set a timetable. Study two hours and take a rest.

Participant	Summary	Environmental Control level
TD	Effective environmental control strategies	High
FH	Effective environmental control strategies	High
HD	Effective environmental control strategies	High
KX	Effective environmental control strategies	High
OS	Effective environmental control strategies	High
MX	Effective environmental control strategies	High
OK	Effective environmental control strategies	High
GY	Effective environmental control strategies	High

Table 5.5 Summary of environmental control strategies and level

The questionnaire data confirmed the findings from the interviews. All of the participants marked scores of 5 or above to all items, except for TD and FH. TD gave 4 for item 18 and 3 for item 19 in his questionnaire, while FH assigned low scores for items 17 and 19 in her first questionnaire. After finishing the questionnaire, they explained, respectively, that, because of their strong motivation in learning, they did not focus on the learning environment very much at the start. However, with the improvement in the difficulty of Chinese characters learning tasks, they believe that the learning environment could affect their learning.

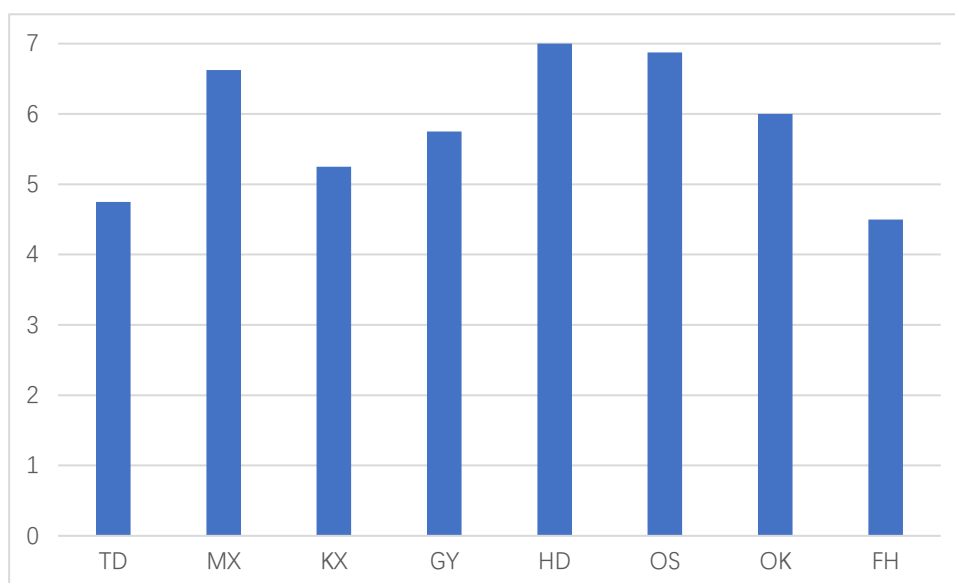


Figure 5.5 Results of environmental control levels from questionnaires

5.3 Changes in self-regulation throughout the duration of the study

After presenting participants' self-regulatory learning and strategies to control their self-regulation during the period of the case study, the related changes will be explored in this section.

5.3.1 Remaining stable

During this one-year investigation it was noticed that the level of every learner's self-regulation did not experience any dramatic change. In other words, despite some small fluctuation, which will be discussed in the next section, the learners' level in each part of the self-regulation remained stable during this long period, which is more obvious in the commitment control and environment control. Among all categories, the high-level group is the most stable group in all of the categories of self-regulation, except for the metacognitive control. For example, although FH changed her words in each interview, her responses did not change in the satiation control category.

Interviewer: How do you feel when learning Chinese characters?

FH: Not bored. Focused. (Interview 1)

Interviewer: How do you feel when learning Chinese characters?

FH: A little bit pressure. But that's OK.

Interviewer: Do you feel easily bored?

FH: No. (Interview 2)

Interviewer: How did you feel when learning Chinese characters since we last met?

FH: It's alright. There is a lot covered this chapter. I think I went fine.

Interviewer: Do you feel easily bored?

FH: No. (Interview 3)

Interviewer: How did you feel when learning Chinese characters since we last met? Do you feel easily bored?

FH: No. (Interview 4)

Interviewer: How did you feel when learning Chinese characters since we last met?

FH: Confuse a little bit. That's only the start. By time I study them, it gets bit better.

Interviewer: Do you feel easily bored?

FH: No. (Interview 5)

Interviewer: Do you feel easily bored?

FH: No, not bored. (Interview 6)

In addition, there is also consistency in the participants' level in each category of self-regulation. In other words, except for environment control strategies, the participants in this investigation did not show a high-level in one category and a low-level in another category.

5.3.2 Fluctuation

Despite the general trend of the students' self-regulation remaining stable during the whole investigation, a small fluctuation can be noticed, due to two main reasons, and a greater fluctuation can be noticed in the medium level group and low-level group.

The first cause of this fluctuation was all assessments, including dictations, HSKs and exams. As described in Chapter 3, the dictations were organised by the teacher and conducted in classes. The results would not affect the students' final yearly report. As a result, these weekly dictations mainly helped some participants to plan their commitment control strategies by establishing regular goals. When the teachers did not organise dictation, the learners' would not have strong willpower to revise the characters. Three participants reported such a condition.

MX: yeah. even if it's not created, like we have to do the dictation. We have to do the exams and assessments. So the dictations are good cause they give you sort of idea how are you doing in the lesson, if you did great. so you are not sort of pressure when you do. You are not really like I have to. So you sort like just learn if you see the dictation. you get back maybe you got 3 or 4 things wrong. You might look over that and for next week. And you make sure I do a bit more, and come up will be much better for actually assessments you get graded.

OK: We don't do dictation as often as. If I have any major suggestions, I think we should do dictations every week. You know, we rely on that. Last dictation I remember is the dictation before our last meeting. We haven't got any in-class dictation. Like we write on the paper, write this, and write that. That hasn't happened. Mostly the only assessment we really got is on the Monday. We go thought the workbook. But that's over the weekend. My main recommendation, I think definitely we should do dictation every week. Because the way I look at it is, I understand we don't get assessed on these dictations. But I think that would work for someone like me. As I said, I am a competitive person. I want to do well if I perform a test. If you don't revise for the dictations, I cannot do that very well.

Interviewer: But as you just said, the dictation won't get assessed. So probably it's not a competition.

OK: Yeah. Well, it's not a competition, even not the exams. They are not the competitions. But as a competitive person, I would like to do well. But if you get the questions back, and you get 2 out of 50 correctly. That's bad scores. Someone like me want to get high scores. You will think I want to get high scores next time. I say myself in someway not motivated, or not disciplined. If the teacher says OK we are going to do the dictation on Friday. Unless you don't want to, unless you don't attend the class, you have to do that dictation. And you have to get the results back if it doesn't mean anything.

All of the participants paid more attention to the HSKs and exams than to dictations. As explained previously, the HSK exam is China's only standardised test of Standard Chinese language proficiency for non-native speakers. In addition, the participants in this case study needed the HSK results to apply for a scholarship for their exchange year in China. It can be easily observed, thus, that these different kinds of exams also helped learners to plan their goals and increase their willpower. Three participants mentioned once that their long-term goal was to pass the different HSK exams in various learning stages. Nearly all of participants reported that their short-term goal was to achieve a good performance in the coming in-class assessments or exams. In addition, the students' emotion control level would be lower than normal before the HSKs and exams, due to the high level of pressure, such as in the following report of KX.

KX: It was a lot more stressful this month because we just have HSK last weekend. So I was trying to go back over all the old characters and learned new characters. So the new characters are forgotten about very quick. It's been more harder than last one. I'm hoping it will be easier now because HSK's done, away. So I had more time to actually concentrate on it. And I was more afraid I wouldn't get everyone revised for the HSK when trying to learn new characters. So I just stopped for new characters and did HSK work instead. Cause HSK is more important. (Interview 2)

The second reason is the learning content. Four participants reported once on this. Two of these learners, who were mainly affected in terms of their emotion control level, would put more effort into a topic they felt was more useful. When learning other topics, they would not do their best when studying related Chinese characters. As a result, they would have less negative feelings. Regarding the other two learners, their satiation control levels varied with the level of difficulty of the Chinese characters learning tasks. Should the task be more difficult, then their satiation control level would be lower.

The following explanation of KX is a good example of the former, while OK's words will explain the latter.

KX: I didn't feel that stress. Because the chapter. Because they are not practical. If they are practical chapters, I think I will be more stress. Because I want to try to keep the characters more. And the more practical they are, the more I want to learn them. (Interview 4)

OK: As I said, depends on characters. Recently, because they are characters, not letters. You look them and. If you look them fine, usually you remember them very easily. But there are some characters, that's a lot of tiny, little parts. And that immediately made you comprehensive, so they take more to learn. So roughly it about half characters are like that, half characters are the other way. As I said I happen to be distracted. Sometimes there are not much differences between bored and distracted.

5.3.3 Influence among different categories

During this investigation, it can be noticed that the different categories of self-regulation did not separate from each other, as the system of self-regulation is dynamic and inner interactive, which can explain the consistency of each learner's level. In this section, the influences of each category on the system will be presented with examples.

5.3.3.1 Influence of Commitment control

Learners' commitment control can affect their metacognitive control level and satiation control level. In this investigation, low commitment control aggravated the learners' problems in controlling their procrastination, distraction and satiation. For instance, OK stressed a number of times that his priority is his other major, being Geography. As a result, he did not set any specific goals in terms of the Chinese characters learning task.

OK: I try not to fall behind in class. That's my main focus. Because geography is my main focus. My Chinese is my minor. But I want to do well in geography. It's not about being perfect. It's about being good at Chinese characters,

remembering Chinese characters as much as I can. I don't have a routine that you have to do this and that. I am not that type of person.

Consequently, he may easily get distracted when he has more important tasks to consider. In addition, boredom appeared more in his reports, especially when faced with more difficult tasks, due to him setting a Chinese characters learning goal.

OK: One part I was sorting things out, in terms of geography. I just back to the trip and I have to submit work. Then I have to submit my work and making sure it's OK. Then collecting them and look at what comments on it. And the other part is just laziness I suppose.

OK: As I said, depends on characters. Recently, because they are characters, not letters. You look them and. If you look them fine, usually you remember them very easily. But there are some characters, that's a lot of tiny, little parts. And that immediately made you comprehensive, so they take more to learn. So roughly it about half characters are like that, half characters are the other way. As I said I happen to be distracted. Sometimes there are not much differences between bored and distracted.

5.3.3.2 Influence of Metacognitive control

Their metacognitive control level influences learners' commitment control and emotional control. In this study, the learners' procrastination and distraction intensified their negative emotions. In addition, due to the lack of control of their learning process, they kept setting short-term or minimal goals for their learning to escape the repercussions of not achieving unmanageable commitments. GY, for example, described herself as an "impatient person" and "very easy to get distracted". She discussed this influence during the last two interviews.

GY: I feel like I'm an uphill battle for this for the Chinese exam on the twenty fifth. It's going be hard. But I've got a lot of time but I don't want to think that I have a lot of time because I'll just leave it for the last minute. Like properly do it every day do a probably every day and I get lazy, like I always do.

GY: Right now like it's for the essay at the end of it. like everything else is kind of, because I'm sitting for the paper now. Everything else is kind of on the page. So it's been focusing on grammar and suffered for the exam. but the last question that hundred fifty words. on the topic I've been just working on vocab for that. So I have my three essays I said earlier. And then I've got all the words I should know by now. Or it like new words because the painting was going to really different. Hope doesn't come up. but I'm learning how to say it like the Last Supper, Leonardo da Vinci. I'm never going to need again. but I'm just learning it just for now.

Interviewer: Did you set your goal for yourself or mostly?

GY: It's been weekly now. Because I don't have enough time to go monthly of the monthly exam.

5.3.3.3 Influence of satiation control

The findings from the case study indicate that their satiation control level affects the learners' commitment control and metacognitive control. In this study, the boredom they felt towards Chinese characters tasks led the learners to find it difficult to start their learning. During their studies, they tended to set short-term or quickly achievable goals for their learning. Among the participants of this study, OK, as a last-minute learner, reported this influence once when discussing his procrastination problems.

OK: Do you know it in the same way that it kind of most things. you know you don't actually want to you know, if you feel that something's going to be difficult or boring, it is very hard to try and start something. Once you start something, you kind of keep going out of. and if you start it and you probably start then you kind of keep going and you do it for, you know, however amount of time that you want to do for. but if you don't, if you don't push yourself to start it. then you don't start. It depends on how well motivated or determined I am to do a particular task. So less motivated you are, the more likely you are leave it towards deadline. And your natural kind of, say, I haven't done any revision for it. Although there are people that you know that that doesn't care if you just do no revision form of the tests whatsoever. So I think that I think in that way I'm better than quite a few people.

In contrast, TD, who kept reporting a very high satiation control level, always linked his high level of other categories with this, as the following examples show.

Interviewer: I am curious why you seldom procrastinate?

TD: I don't know. I like it. I like to learn. I do procrastinate. But I like to do things now. I don't like, I don't like put things off unless I don't like it. If I like something, I like to do it now.

5.3.3.4 Influence of Emotional control

Learners' commitment control level and metacognitive control level are affected by their emotional control ability. During this investigation, the learners with a low ability to control their negative feelings often preferred choosing easily achievable goals. In addition, because of their failure to overcome this feeling, they very easily got distracted or procrastinate to get rid of the feeling, such as in the reports of MX and GY.

MX: Sometimes you got distracted, just, cause you are tired. You noticed yourself like oh exams like, what I have to do with them. Cause you don't want to do the work. Cause it's hard, like oh, so much to do, like distracted you.

GY: I always procrastinate. I get very distracted recently. I think that's because I am so stressed. I don't want to think what's going on. During the last two to three weeks, I always like very panic about exams and having everything in on time. I have essay due today as well actually. I didn't finish that.

5.4 Discussion

To sum up, the self-regulation level of the participants in this case study can be concluded as in the following table. Higher-level participants showed a higher level in commitment control, satiation control and emotional control, compared with lower-level participants. By contrast, all participants showed a very high level in terms of controlling the learning environment during the process of Chinese

character acquisition. In addition, most participants showed a lack of effective strategies to control their metacognition. As concluded in the last section, despite some small fluctuation, the learners' level remained stable during this long period. In addition, there is also consistency in the participants' levels in each category of self-regulation.

Participant s	Chinese character proficiency level	Commitment control level	Metacognitive control level	Satiation control level	Emotional control level	Environmental control level
TD	High	High	High	High	High	High
HD	High	High	Medium	Medium-high	High	High
FH	High	Medium-high	Medium-high	High	High	High
KX	Medium	Medium-high	Medium	Medium	Medium	High
OS	Medium	Medium	Medium	Medium	Medium	High
MX	Medium	Medium-high	Medium	Medium	Medium	High
OK	Low	Low	Low	Medium-low	Medium	High
GY	Low	Low	Low	Medium-low	Medium-low	High

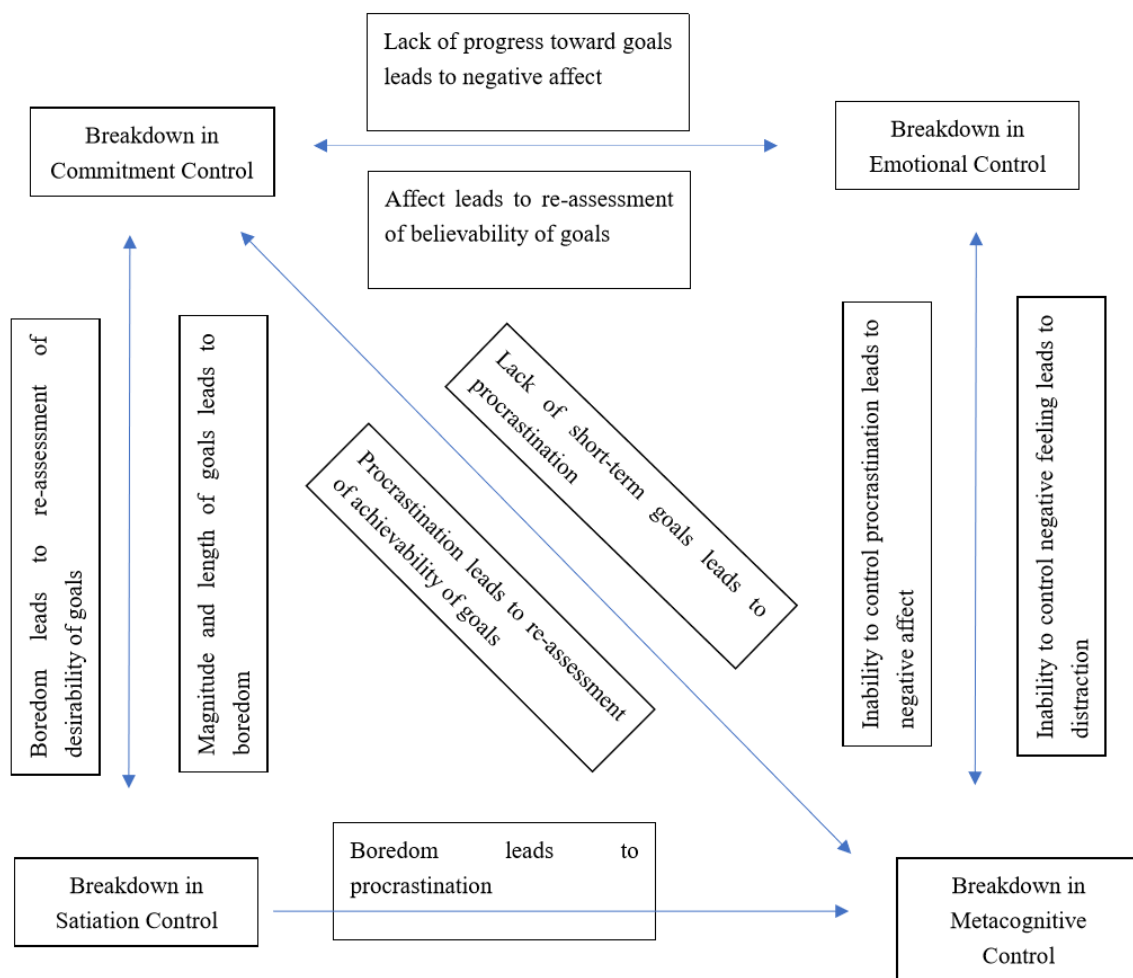
Table 5.6 Summary of self-regulation

From the above table, it can generally be concluded that the students' Chinese characters proficiency levels are highly correlated with their self-regulation control level, except the environmental control condition, although two exceptions appear in metacognitive control level (HD and OS). As Dörnyei and Oxford concluded, self-regulation plays a vital part in learning, not only influencing the effectiveness of language strategy use, but also deciding learners' status.

After researchers started to accept that examining the strategies that these 'good' learners applied was not a fruitful direction, they set out to capture the secret of the strategic learners' 'proactiveness' by focusing on the self-regulatory process and the specific learner capacity underlying it. Thus, scholars increasingly recognized that the important thing about the proactive strategic learners is not necessarily the exact nature of the strategies, tactics, or techniques they apply, but rather the fact that they do apply them (Dörnyei, 2005, p. 190).

In the cover photo, which I photographed in Nepal, the boats represent vehicles intended to take learners across the vast lake of language learning. Language learners without strategic self-regulation row unsound boats aimlessly and confusingly and sometimes capsize, but strategically self-regulated learners row sound boats effectively toward learning goals. Excellent strategy instruction and assessment can add to the power and direction of every boat on the lake (Oxford 2017, p. ii).

In addition, this study did not find any evidence of environmental control being used by the participants to regulate another form of self-regulation control. The participants in this study similarly reported controlling their study environment to alleviate boredom (by changing the study environment regularly) or negative feelings (by working with other classmates), or factors that may lead to procrastination (by creating an environment free of distractions). However, this case study also found that there is a complex and close relationship among the other four categories, that is, a breakdown in any category of self-regulation control has a clear impact on other categories, which is illustrated in the following figure based on Rose's (2012a, p. 96). Compared with Rose's results, this study suggests that emotional control and metacognitive control influence each other, rather than having a one-way impact. It can be observed in every level group that failure of emotional control may increase the degree of distraction, and finally cause procrastination.



Peer-support can be noticed in this case study. For example, HD's method to prevent distraction, as mentioned in Section 5.1.2, came from his girlfriend. He then shared this approach with MX, in order to improve his metacognitive control level. Another instance is linked with the collaborative learning in the last chapter. According to KX's report, her metacognitive control level would improve if she stayed with FH, because she can focus on studying for a longer time. As a result, she sought to study with FH and allow FH to help her to concentrate on Chinese learning.

However, none of the participants reported any support or guidance from other sources if they did not ask for it in this case study, and there was no evidence of them being supplied with any instructions in terms of managing their self-

regulation. This may be another reason that the participants' self-regulation did not experience dramatic changes during this academic year.

This case study indicates that the lack of necessary support affected the lower-proficiency level more than the others. GY, for example, showed a very low level in all aspects of self-regulation, except for environmental control. The high level of procrastination and distraction made her fall behind in the teaching process. The building-learning load would not only not stop her negative feelings, but also increase her boredom when learning. Consequently, her results in the stimulated recall sessions kept getting worse. At the beginning, she could identify 2 or 3 characters in the first stimulated recall session, but from the fourth session onwards, her scores stayed below 1.

5.5 Conclusion

This chapter presented participants' self-regulation and strategies to regulate their learning based on data collected from the case study. Higher-level participants showed a higher level in commitment control, satiation control and emotional control, compared with lower-level participants. All participants showed a very high level in terms of controlling the learning environment during the process of Chinese character acquisition. Most participants showed a lack of effective strategies to control their metacognition. Despite some small fluctuation, learners' levels remained stable during this long period. Finally, apart from peer supports, participants did not get any instruction regarding strategies of self-regulation during the whole investigation. In the next chapter, findings from the national survey will be presented.

Chapter 6: Survey Results

6.1 Introduction

This chapter will discuss the results of the large-scale survey in terms of strategic learning of Chinese characters and learners' self-regulatory capability, which was examined through analysis of data obtained from the questionnaire. This survey was conducted after the case study, as part of a second phase of the research in order to generalise the findings of the case study to a wider population. As the number of students who take Chinese studies as their bachelor's degree course is not very large, all students of Chinese studies were provided with an opportunity to complete this survey. The quantitative phase of the research study helps to generalise the findings of the qualitative phase, as well as to afford opportunities to explore key variables associated with strategy use, which were not possible with the small sample from phase one. In other words, in this section, the quantitative approach will be used to answer all research questions with data collected from a population that aimed to include all Chinese language learners in Irish universities. The results will be presented and explored by drawing on a taxonomy based on the previous framework of the case study, to ensure comparability of the quantitative and qualitative results. To be more specific, the data will be presented and discussed by same frame work of the case study, which consists of two main categories: language learning strategies and self-regulation.

6.2 Participants

The distribution of participants' year level and language proficiency are presented in Table 6.1.

		HSK Level						Total
		1	2	3	4	5	6	
Year level	1	9	13	11	1	1	0	35
	2	1	12	26	3	1	0	43
	3	0	1	9	13	6	1	30
Total		10	26	46	17	8	1	N=108

Table 6.1: Cross-tabulation of participants' year level and language proficiency level

The data were firstly tested for normal distribution with the Kolmogorov-Smirnov test. Eight of the tests performed on the transformed data suggested that the assumption of normality had been violated (Table 6.2) but an examination of Q-Q plots (Figure 6.1) show that this violation was not severe. Snijders (2011, p.10) confirmed that "the t-test is robust against non-normality; this test is in doubt only when there can be serious outliers (long-tailed distributions – note the finite variance assumption); or when sample sizes are small and distributions are far from normal". As a result, this study used t-tests for its analysis based on it meeting other requirements including examination of the Q-Q plots and a lack of serious outliers. In addition, Spearman's Ranked Correlation was conducted following Dörnyei's (2010) suggestions for using a non-parametric statistical analysis to analyse Likert-type scale data.

Strategy	Asymp. Sig. (2-tailed)
Stroke	0.13
Component	0.05
Shape	0.00
Association	0.20
Induction	0.20
Repeating	0.00
Application	0.00
Auxiliary tools	0.20
Stories	0.00
Planning	0.20
Evaluating	0.00
Collaborative	0.00
Commitment	0.02
Metacognitive	0.11
Satiation	0.10
Emotional	0.20
Environmental	0.00

Table 6.2 Kolmogorov-Smirnov test for normality

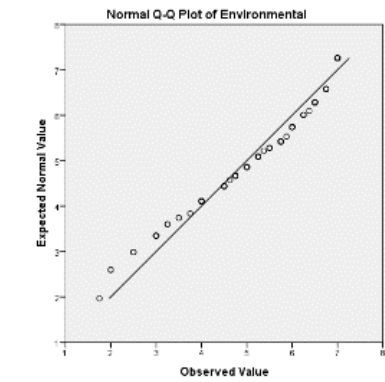
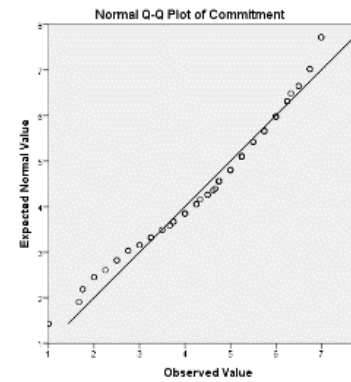
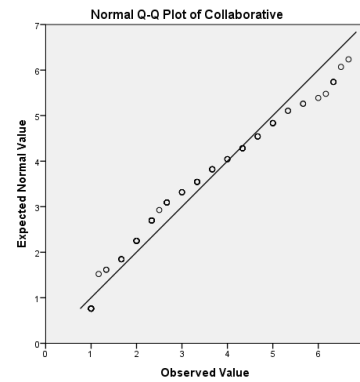
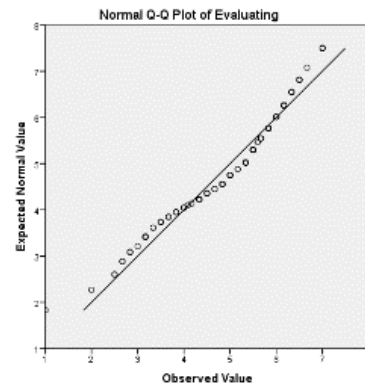
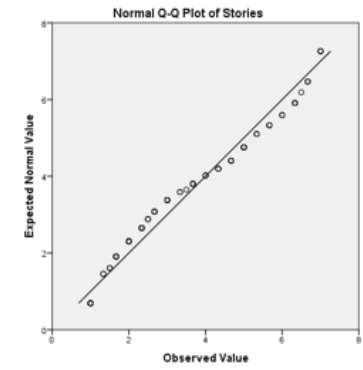
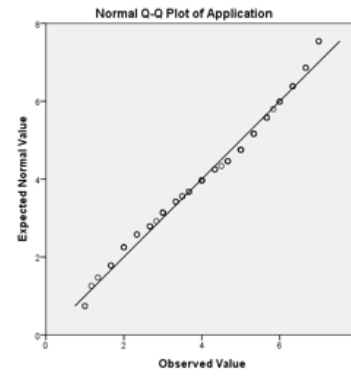
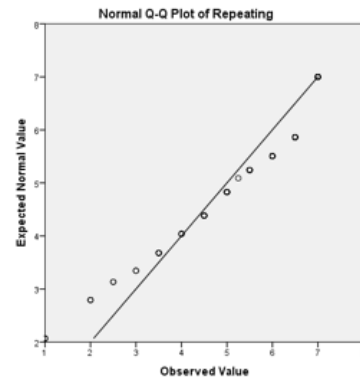
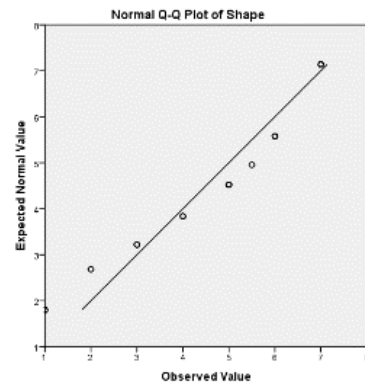


Figure 6.1 Examination of Q-Q plots for normality

Then Orthogonal Rotation analysis was conducted to find out if each item was grouped under the appropriate factor. As many items were analysed, the results were split into two parts: language learning strategies and self-regulation strategies, which were presented in Table 6.3 and Table 6.4 respectively. Four items with low loadings (loading < 0.3) were deleted, which are 5, 7, 26, 27.

Finally, the internal reliability was calculated using Cronbach's Alpha Coefficient (Cronbach, 1951). The results indicated that the data set was suitable for further statistical tests, which are displayed in Table 6.5.

	Strokes	Component	Shape	Stories	Association	Induction	Repeating	Application	Auxiliary tools	Planning	Metacognitive	Collaborative
1	.45											
2	.86											
3	.87											
6		0.78										
8		0.68										
28			0.72									
10				0.80								
11				0.77								
12				0.40								
17					0.81							
18					0.80							
19					0.42							
29					0.31							
30					0.60							
31					0.83							
32					0.45							
4						0.51						
13						0.55						
14						0.40						
15						0.84						
16						0.85						
20						0.59						
21						0.58						
22						0.59						
23						0.80						
24						0.47						
25						0.53						
9							.68					
35							.84					
38								.62				
40								.73				
43								.57				
34									.70			
36									.85			
37									.78			
33										.63		
39										.65		
41										.81		
42										.73		
44											.47	
45											.83	
46											.62	
47											.61	
48											.53	
49											.59	
50												.71
51												.77
52												.80

Table 6.3: Orthogonal rotation test scores ad factor loadings of items (Language learning strategy part)

	Commitment	Metacognitive	Emotional	Satiation	Environmental
1	.572				
2	.688				
3	.701				
4	.593				
5		.606			
6		.799			
7		.838			
8		.871			
9			.609		
10			.593		
11			.474		
12			.637		
13				.791	
14				.771	
15				.723	
16				.528	
17					.762
18					.785
19					.801
20					.774

Table 6.4: Orthogonal rotation test scores ad factor loadings of items (Self-regulation strategy part)

Strategies	Cronbach's Alpha	N of Items
Stroke	0.77	3
Component	0.65	2
Shape	1.00	1
Stories	0.74	3
Association	0.71	7
Induction	0.85	11
Repeat	0.75	2
Application	0.64	3
Auxiliary Tools	0.63	3
Planning	0.71	6
Evaluation	0.77	6
Collaborative	0.77	3
Commitment	0.79	4
Metacognitive	0.88	4
Satiation	0.80	4
Emotional	0.80	4
Environmental	0.86	4

Table 6.5: Reliability estimates for self-regulated language learning questionnaire

6.2 Strategy use of participants

Table 6.6 presents the descriptive statistics of all participants' language learning strategy use. Oxford (1990, p.300) explains that the overall average tells how often you use strategies in the language strategy questionnaire. As a result, in this questionnaire, the mean scores that fall between 1.00 and 3.00 are defined as low level strategy use, 3.00 – 5.00 as medium level use, and 5.00 – 7.00 as high level strategy use. As the table shows, the mean scores of most strategies that Irish undergraduate students utilized in their Chinese character learning was between 3 to 5. In other words, participants reported using most language learning strategies and self-regulation strategies at a medium level.

The only exception among the language learning strategies were 'repeating' strategies. The score (5.58) indicated that repeating strategies are the most frequently used strategy among the Irish students, followed by 'shape' strategies (M=4.93) and 'evaluating' strategies (M=4.96), whose mean scores nearly reached 5. This means that participants of this survey preferred using repeating strategies, shape strategies and evaluating strategies during the process of learning Chinese characters. In terms of self-regulation strategies, participants reported the frequent use of environmental control strategies (M=5.43), followed by commitment control (M=4.72), emotional, satiation and metacognitive control strategies respectively.

Strategy	Mean	Std. Deviation
Stroke	4.33	1.61
Component	4.64	1.50
Shape	4.98	1.90
Association	4.47	1.09
Induction	4.12	1.12
Repeating	5.59	1.62
Application	4.31	1.50
Auxiliary tools	3.65	1.65
Stories	3.50	1.82
Planning	3.74	1.51
Evaluating	4.96	1.23
Collaborative	3.19	1.77
Commitment	4.72	1.39
Metacognitive	3.91	1.57
Satiation	4.15	1.46
Emotional	4.18	1.51
Environmental	5.43	1.34

Table 6.6: Descriptive statistics of participants' language learning strategies

6.2.1 Year level and strategy use

In order to analyse if learners' year-level affects their strategy use, the Spearman's Ranked Correlation Coefficient was run to explore possible correlations between each strategy (dependent variable) and learners' year-level (independent variable). The results (Table 6.7) show that the use of stroke strategies had a significant negative correlation with learners' grades ($\rho = -0.37, p < 0.001$). In other words, the higher year-level of learners, the less interests were shown by them in the use of the stroke strategy.

Strategy	Year-level	
	Correlation Coefficient	Sig. (2-tailed)
Stroke	-.36**	0.00
Component	-.11	.25
Shape	-.07	.50
Association	-.03	.77
Induction	-.12	.25
Repeating	.02	.86
Application	-.13	.20
Auxiliary tools	.09	.34
Stories	-.14	.16
Planning	-.01	.88
Evaluating	-.12	.21
Collaborative	-.11	.27
Commitment	-.13	.19
Metacognitive	-.05	.58
Satiation	-.03	.79
Emotional	-.01	.94
Environmental	.03	.79
***. Correlation is significant at the 0.01 level (2-tailed).		

Table 6.7: Correlation coefficient between the year-level and strategies

6.2.2 Learning background and strategy use

Among all 108 participants, 23 of them studied Chinese before they enrolled in higher education. As Figure 6.2 presents, most of the participants (13) attended the Interest-oriented Chinese classes or for YCT (Youth Chinese Test) course that supplied by high schools. Apart from this path, other approaches to learn Chinese before the higher education were reported as primary schools (3), self-study (2), online courses (1), weekend classes (1), and university courses for public (1). Two participants did not indicate their courses while choosing other.

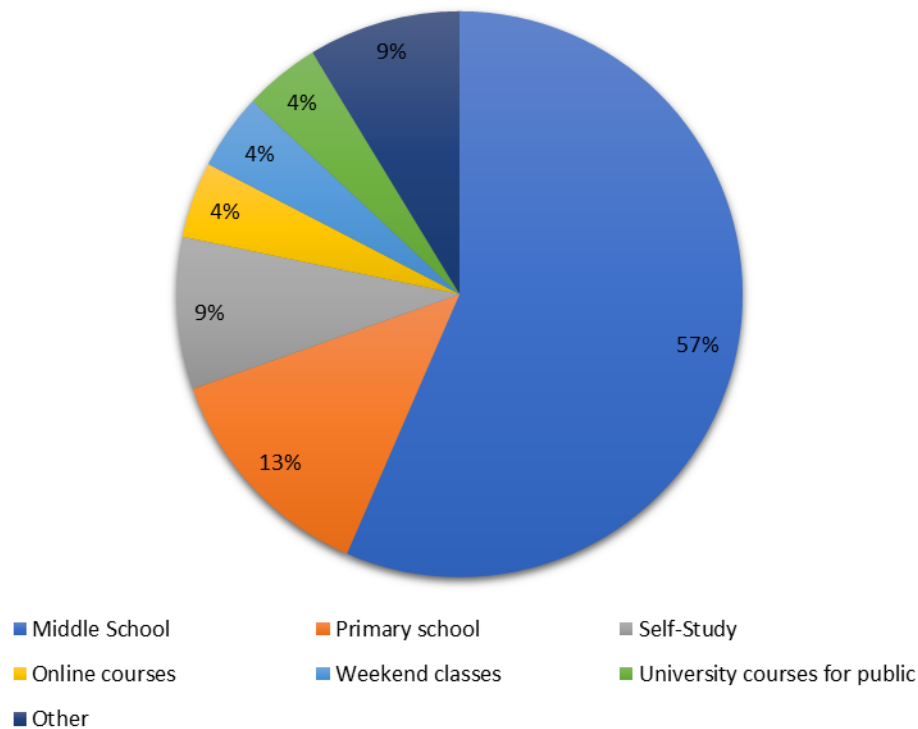


Figure 6.2 Types of previous Chinese learning experience

The relation between participant's previous Chinese learning experience and their strategy use was analysed by t-test with previous learning experience as the independent variable and strategies as the dependent variables. Two groups were created for comparison, with students with no prior Chinese learning experience in one group (n=23), and those with previous learning experience in the other group (n=85). Levene's test of assumption of homogeneity of variances was found not to have been violated, as none of the two groups (with previous Chinese learning experience, and without previous Chinese learning experience) across groups was significant ($p > 0.05$). According to the result of t-test in Table 6.8, participants' previous Chinese learning experience before the university did not have effects on learners' strategy use.

	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	90% Confidence Interval of the Difference	
					Lower	Upper
Stroke	1.35	.18	.51	.38	-.12	1.13
Component	.60	.55	.21	.35	-.38	.80
Shape	.49	.63	.22	.45	-.53	.96
Association	.35	.73	.09	.26	-.34	.52
Induction	.42	.67	.11	.26	-.33	.55
Repeating	-1.01	.31	-.39	.38	-1.02	.25
Application	1.03	.30	.36	.35	-.22	.95
Auxiliary tools	.35	.73	.14	.39	-.51	.79
Stories	.50	.62	.21	.43	-.50	.93
Planning	.33	.74	.12	.36	-.47	.71
Evaluating	-.45	.66	-.13	.29	-.61	.35
Collaborative	-.08	.93	-.04	.42	-.73	.66
Commitment	1.04	.30	.34	.33	-.20	.88
Metacognitive	.94	.35	.35	.37	-.27	.96
Satiation	.18	.86	.06	.35	-.51	.63
Emotional	1.06	.29	.37	.35	-.21	.96
Environmental	.00	1.00	.00	.32	-.52	.53

Table 6.8: The t test of learner's strategies and previous learning experience before university

Over half of the participants (58) reported that they visited China when doing this questionnaire. Among these participants who once visited China, 31 of them attended Chinese courses when they were in China, which in the form of university courses (27), primary courses (2) and other without notes (2). A t-test was run with their previous visit to China as the independent variable, with those who had no experience visited China before in one group (n=50), and those with previous experience visiting China in the other group (n=58). The between group variation of strategies was analysed, in order to check if previous visits to China influenced learners' strategy use. Levene's test revealed that the assumption of the homogeneity of variances had not been violated for these two groups ($p > .05$). Table 6.9 shows that students' experience in China did not impact their use of strategies.

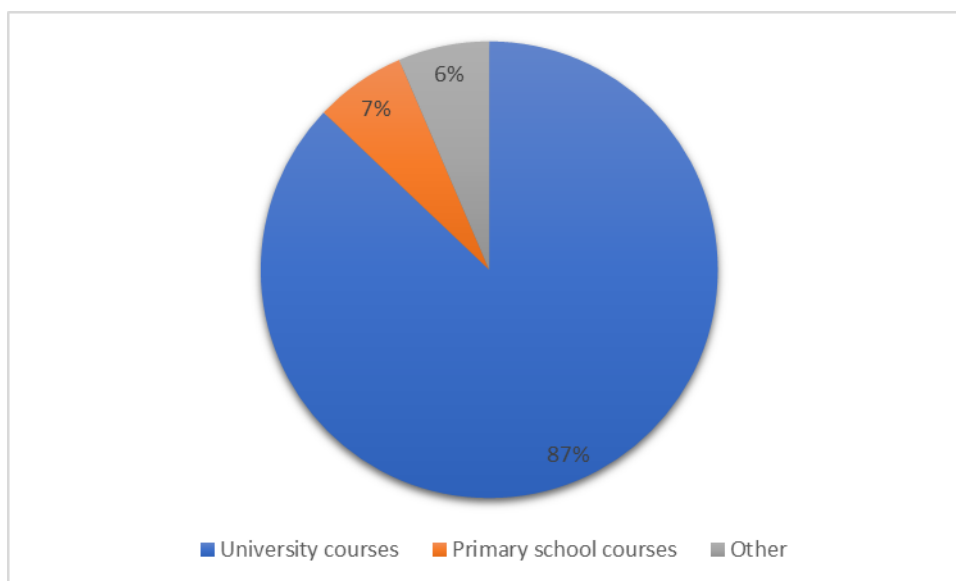


Figure 6.3 Types of previous visits in China

	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	90% Confidence Interval of the Difference	
					Lower	Upper
Stroke	-.41	.68	-.13	.32	-.67	.41
Component	-.51	.61	-.15	.30	-.66	.35
Shape	-1.47	.15	-.54	.37	-1.15	.07
Association	-.47	.64	-.10	.21	-.45	.25
Induction	.49	.63	.11	.22	-.26	.47
Repeating	-.55	.58	-.18	.33	-.72	.36
Application	-.30	.77	-.09	.30	-.59	.41
Auxiliary tools	1.15	.25	.38	.33	-.17	.93
Stories	1.10	.27	.40	.36	-.20	1.00
Planning	.50	.62	.15	.30	-.35	.66
Evaluating	.18	.86	.05	.25	-.37	.47
Collaborative	-.58	.56	-.20	.34	-.77	.37
Commitment	.20	.84	.06	.28	-.41	.52
Metacognitive	.10	.92	.03	.30	-.47	.54
Satiation	-.61	.54	-.18	.29	-.66	.30
Emotional	.01	.99	.00	.30	-.49	.50
Environmental	.14	.89	.04	.27	-.42	.49

Table 6.9: The t test of learner's strategies and their experience in China

6.3 Relationship between learners' strategies and language achievement

In order to answer the third research question, surrounding the question of which strategies affect learners' achievement in Chinese characters learning, a Spearman's Ranked Correlation Coefficient Test was conducted to explore the relationship between Chinese character learning proficiency from participants'

strategy use. The findings (Table 6.10) revealed that learning proficiency had a significant positive correlation with planning strategies ($\rho=0.16$, $p<0.1$) and emotional control strategies ($\rho=0.18$, $p<0.1$). In other words, by understanding participants' use of planning strategies and emotional strategies, assumptions be made regarding the learning outcomes of their Chinese character acquisition.

Strategy	Language Proficiency	
	Correlation Coefficient	Sig. (2-tailed)
Stroke	-.14	.14
Component	-.03	.79
Shape	-.02	.88
Association	.09	.35
Induction	.04	.67
Repeating	.06	.54
Application	.14	.14
Auxiliary tools	.04	.66
Stories	-.13	.19
Planning	.20**	.04
Evaluating	.07	.50
Collaborative	.04	.70
Commitment	.12	.20
Metacognitive	.12	.23
Satiation	.09	.33
Emotional	.22**	.02
Environmental	-.04	.97
**. Correlation is significant at the 0.05 level (2-tailed).		

Table 6.10: Correlation coefficient between Chinese character proficiency and strategy use

Considering that learners' grades affected their strategy use, which was discussed in section 6.2, the data was separated by learners' year-level in order to get a more accurate result. Spearman's Ranked Correlation Coefficient was conducted in each data set to explore the relationship between learners' Chinese character learning achievement (dependent variable) and their strategy use (independent variables). Table 6.11 revealed that the learning achievement of first-year participants had a significant positive correlation with Planning ($\rho = 0.44$, $p<0.1$) and Metacognitive Control ($\rho = 0.35$, $p<0.5$).

Strategy	Language Proficiency	
	Correlation Coefficient	Sig. (2-tailed)
Stroke	.02	.92
Component	.04	.83
Shape	.07	.69
Association	.12	.49
Induction	.15	.39
Repeating	.20	.24
Application	.13	.45
Auxiliary tools	.14	.42
Stories	.02	.91
Planning	.44***	.01
Evaluating	.24	.16
Collaborative	.03	.88
Commitment	.26	.14
Metacognitive	.35**	.04
Satiation	.12	.48
Emotional	.08	.63
Environmental	.03	0.85
***. Correlation is significant at the 0.01 level (2-tailed).		
**. Correlation is significant at the 0.05 level (2-tailed).		

Table 6.11: Correlation coefficient between the language proficiency and strategy use (first-year participants)

The findings of Table 6.12 show that second-year participants' degree of Chinese character proficiency had a significant positive correlation with Application ($\rho = 0.42, p < 0.01$), Commitment Control ($\rho = 0.32, p < 0.05$) and Emotional Control ($\rho = 0.47, p < 0.01$). In other words, for second-year students, their Chinese character learning achievement was significantly related to the use of application strategies, commitment control strategies and emotional control strategies.

Strategy	Language Proficiency	
	Correlation Coefficient	Sig. (2-tailed)
Stroke	.25	.11
Component	.07	.66
Shape	.18	.24
Association	.17	.29
Induction	.14	.38
Repeating	.06	.69
Application	.42***	.01
Auxiliary tools	-.20	.23
Stories	.08	.60
Planning	.12	.44
Evaluating	.05	.76
Collaborative	.19	.23
Commitment	.32**	.04
Metacognitive	.20	.21
Satiation	.29*	.06
Emotional	.47***	.00
Environmental	-.03	.83
***. Correlation is significant at the 0.01 level (2-tailed).		
**. Correlation is significant at the 0.05 level (2-tailed).		
*. Correlation is significant at the 0.1 level (2-tailed).		

Table 6.12: Correlation coefficient between the Chinese character proficiency and strategy use (second-year participants)

In terms of the final-year participants, their achievement of Chinese characters learning had a significant positive association with Application ($\rho = 0.31, p < 0.1$) and Emotional Control ($\rho = 0.31, p < 0.1$), while a negative correlation with Stories ($\rho = -0.46, p < 0.05$). This demonstrates that in terms of final-year participants, their use application strategies, and emotional control strategies may positively affect their Chinese character learning outcome. In contrast, stories strategies may become less effective for these students as they progress in their study of Chinese characters.

Strategy	Language Proficiency	
	Correlation Coefficient	Sig. (2-tailed)
Stroke	-.10	0.61
Component	.17	.37
Shape	-.04	.83
Association	.12	.55
Induction	.24	.20
Repeating	-.12	.54
Application	.31*	.10
Auxiliary tools	.02	.91
Stories	-.46**	.01
Planning	.22	.25
Evaluating	.28	.13
Collaborative	.15	.44
Commitment	.28	.14
Metacognitive	.19	.32
Satiation	.01	.95
Emotional	.31*	.10
Environmental	-.18	.35
**. Correlation is significant at the 0.05 level (2-tailed).		
*. Correlation is significant at the 0.1 level (2-tailed).		

Table 6.13: Correlation coefficient between the Chinese character proficiency and strategy use (final-year participants)

6.4 Discussion

For learners of Chinese from alphabetic language backgrounds learn Chinese characters in Chinese studies degree courses at universities in Ireland, participants reported using most language learning strategies and self-regulation strategies at a medium level. The only exception among the language learning strategies is repeating strategies, which were the most frequently used strategies among the Irish students, followed by shape strategies and the evaluating strategies. In terms of self-regulation strategies, participants reported a frequent use of environmental control strategies, followed by commitment control, environmental, satiation and metacognitive control strategies respectively. Furthermore, learners' strategy use was unaffected by their previous experience in learning Chinese or involvement in visits to China. By contrast, there was a negative relationship between participants' year-level and stroke strategy use.

Finally, planning strategies and emotional control strategies were found to affect learners' Chinese character learning outcomes.

Considering that learners' grades affected their strategy use, which was discussed in section 6.2, the data was separated by learners' year-level in order to get a more accurate result. Regarding first-year learners, their Chinese character proficiency were positively influenced by planning strategy use and metacognitive control strategy use. For second-year students, their Chinese character learning achievement was positively correlated with the use of application strategies, commitment control strategies and the emotional control strategies. In terms of final-year participants, their use of the story strategies, application strategies, and emotional control strategies may affect their Chinese character learning outcomes.

6.4.1 Triangulation between case study and survey methods

Generally, results from the survey and the case study confirmed the findings from these two research approaches, which were conducted to study the same research questions respectively. Participants all reported using most language learning strategies and self-regulation strategies at a medium level. The only exception among the language learning strategies is repeating strategies, which were the most frequently used strategies among the Irish students, followed by the evaluating strategy. In terms of self-regulation strategies, participants reported a frequent use of environmental control strategies. As this study found that the year-level would affect learners' strategy use, in addition to that participants of the case study were in their second year, both of the quantitative data and qualitative data revealed that Chinese character learning achievement of second-year learners was significantly related to the use of application strategies, commitment control strategies and emotional control strategies.

This indicated the external validity and internal validity of this study. In terms of internal validity, the data of the survey confirmed the findings of the case study, which means that factors affecting internal validity was well controlled. All findings and the corresponding explanations based on the data are convincing.

The issue of external validity has been conceived of as a good extent to which the findings of this study can be generalized across populations and contexts (different higher education setting). This also indicates the possibility to utilize the research instruments in another research setting of Chinese character learning.

6.5 Conclusion

This chapter has presented the results of the large-scale survey in terms of strategic learning of Chinese characters and learners' self-regulatory capability, which was examined through analysis of data obtained from the questionnaire. Triangulation between findings from the case study and results from the survey was also discussed. The concluding chapter to this thesis will respond to the study's research questions, drawing on all data and both phases of the project.

Chapter 7: Discussion and Conclusion

7.1 Introduction

The previous three chapters have examined the results of the study and discussed these results in relation to previous research findings respectively. The aim of this final chapter is to frame these results, in order to answer the overall research questions of the study. It will also revisit the limitations of the current study, in order to suggest areas for further investigation.

7.2 Research question 1. In terms of learning strategies, how do students learn Chinese characters?

Data from both the case study and the survey revealed that the participants used most language learning strategies at a medium level. However, all of the learners showed a common preference for certain strategies in the setting of this study. In terms of language learning strategies, a *repeating strategy* was most frequently used by the participants. Previous literature indicated the frequent use of repeating strategies among most learners of Chinese with varied language proficiency from alphabet language backgrounds (Jiang and Zhao, 2001; Lu and Peng, 2007; Chen, 2009; Han, 2009; He, 2009; Fan and Hu, 2010; Xue, 2011; Yilihamu, 2012; Xu, 2014; Chen, 2015; Zhang and Luo, 2017). In contrast, Japanese and Korean students showed a low interest in using repeating strategies, which was explained as being a result of their character language background (Jiang and Zhao, 2001; Qiao, 2013). The popularity of this strategy for learning Chinese calls into question its efficacy, in considering repetition is considered “an extremely poor technique for memorization” by cognitive scientists (Payne & Wagner, 1992, p. 91), as it encodes at a much shallower level. Matlin (2005) agrees, drawing on research into memory strategies, that simple repetition of information is a poor method of memorization, due to the shallow level of processing.

A second popular strategy is evaluation. In many studies of strategic Chinese character learning, evaluation strategies are discussed within a metacognitive strategy category. Previous studies (e.g. Chamot, 1987; Shen, 2005; Sung, 2012) claimed that use of evaluation, as part of the metacognitive strategies used by

second language learners, is limited. This finding of the current study contradicts this claim, by providing evidence of many learners in the study using evaluation strategies regularly.

In contrast, the most uncommon language learning strategy is the use of stories by the participants in the study. This finding reflects a difference between Irish undergraduate students and learners of Chinese in other countries, who have been shown to value story-like mnemonic strategies (e.g. McGinnis, 1995; Zahradníková, 2016). Moreover, the students in Ireland did not display a preference for collaborative learning. In other literature (e.g. Oxford, 1996) collaborative learning has been grouped as part of a social strategies category. The finding that Irish students did not engage heavily in collaborative learning is in contrast to other studies of students from an alphabet-based language background, such as previous strategy-related research into Polish students (Liu, 2015) and Azerbaijan students (Zeng, 2015).

Apart from these trends in strategy use that were commonly popular across the participant group, the data revealed that the participants' preferences for other strategies varied greatly. Not one participant reported frequent use of all the strategies in the case study. Similarly, none of them marked high scores to all categories in the survey. Moreover, this study finds some evidence of participants' judgement of the value of a certain strategy. In other words, the interview data showed that the participants viewed the worth of each strategy differently, by judging if one strategy was useful for Chinese character learning. Therefore, this study concurs with previous studies that claim individual preference of learning strategies (Jiang and Zhao, 2001; Nyikos & Oxford, 1993; Grenfell & Macaro, 2007; Oxford, 2017).

7.2.1 Changes in learning strategy use

During the one-year data collection, it was discovered that the learners' use of language learning strategies did not show any dramatic change over time. In other words, despite some small fluctuation, the learners' choice and application

strategies remained stable throughout this long period. As presented in Chapter 3, the participants would be taking various exams at the end of this academic year. The teacher would arrange review classes rather than introducing new Chinese characters towards the end of the academic year, which provided an opportunity to view the strategies the students had used on the same characters at the beginning and towards the end of the year. Correspondingly, the Chinese characters that were reviewed in each class were chosen as the stimulus in the last stimulated recall task, which also provided a chance to track the changes in learning strategy use by comparing the two reports regarding the same character. When comparing the two time periods, it is obvious that most reports stayed the same in the two individual reports.

However, there were also two groups of reports based on the same character, from TD and FH, that showed high-proficiency learners' tendency to develop induction and application strategies from using strategies for a single character. In other words, when reviewing Chinese characters, the higher-level participants preferred grouping a number of characters by some particular rules. Here, the rules may not be explained by teachers, while the characters were also from other sources, rather than the content of the course. This concurs with Ma's (2007) observation on a learner during a longitudinal research, in terms of learners' induction strategy use.

7.2.2 Combination of learning strategy use

The current study also revealed that some participants mixed the use of two strategies to memorize a character. However, the kinds of creative combinations observed in this study (10 combinations) were far less common than in previous studies, such as a study of Chinese learning by Czech students (Zahradníková, 2016). Based on the reports of the case study, the most popular combination was component + association. The second most frequently used combination was component + repeating. Furthermore, the strategy of component analysis was the most popular strategy to make these combinations, appearing in 60% of all combinations.

This can be attributed to the characteristics of Chinese characters. As Chapter 2 presented, as logograms, Chinese characters are widely believed to be combinations of grapheme, pronunciation and meaning. In other words, when learning Chinese characters, learners have to memorize three dimensions of each character: the sound, the idea and the form of picture symbols. As a result, when combining strategies, the learners were actually using various approaches to remember these different types of information. In addition, for most Chinese characters, the different components in one Chinese character normally carry these dimensions respectively. This can explain why the strategy of component analysis was frequently used in the combinations with other strategies, that is, the students applied different strategies to the individual components of the characters.

7.2.3 Implicitness of strategy usage

The interview data presented that, when required to describe their Chinese character memorizing strategies, a few participants mentioned only the repeating strategy by very simple sentences in some interviews. For the rest, they also spent most of the responding time describing their learning experience regarding the repeating strategy and then mentioned other strategies within one or two sentences. However, when the participants tried to recall the characters in the stimulated recall tasks, their responses were not connected to the repeating strategy as closely as what was demonstrated by them in the interviews. During the stimulated recall session, most of the participants would use other strategies to explain why they successfully recalled some characters. By doing so, the high-proficiency and medium-proficiency learners were found to be usually utilizing other strategies when rewriting the characters. The strategies used varied between the learners. This finding is consistent with Rose's (2013) investigation of learners of Japanese, where self-reported strategies on a questionnaire differed to those revealed in a stimulated recall. Thus, this study concurs with Rose's recommendation, in that stimulated recall is useful in strategy research to elicit less consciously used strategies.

During this case study, and in order to maintain a consistent procedure in each interview and stimulated recall task, although this phenomenon was noticed during the fourth interview, the related questions for the participants were postponed until the sixth interview. As a result, two possible reasons were put forward to gain an understanding of this condition. 1) Combination of strategies use: In this study, the participants obviously reported other strategies when they were reporting the usage of the repeating strategy, as discussed above. Here, the repeating strategy was found to be used in combination with other strategies. In other words, learners use the repeating strategy for memorizing most Chinese characters, whilst combining various other strategies at the same time. This may cause a low report of other strategies. 2) Automatic strategy use: Although the purposefulness of strategy use was mentioned by “100% of the definitions” (Oxford, 2017, p. 38), Purpura (2014, p. 533) pointed out that learning strategies are “a thought or behaviour used by learners to regulate SFL [second or foreign language] learning or used ... [may be engaged either] consciously and deliberately, or unconsciously and automatically, to further learners’ processing while learning or while performing “language tasks”. In addition, Griffiths revised her previous definition of learning strategies by dropping her support of consciousness as a necessary feature of learners’ use of strategies. However, even though the participants’ reports indicated automatic use of learning strategies, this cannot be confirmed by this case study and needs a further research design.

7.3 Research question 2. In terms of self-regulation strategies, how do learners regulate their learning of Chinese characters?

In this section, all five dimensions of learners’ self-regulation will be presented by three sections. The commitment control, emotional control and satiation control will be merged in one section (7.2.1) due to similar pattern within the learners. Then the metacognitive control and environmental control will be discussed respectively in the following two sections.

7.3.1 Higher-proficiency learners maintain a high-level of commitment control, emotional control and satiation control

Regarding Chinese character study, the case study findings revealed that the participants of higher-level language proficiency showed a steady high level of commitment control during the academic year. Both long-term and short-term goals were considered by them, which were quantifiable, feasible and assessed to be manageable based on a clear understanding of their ability. Furthermore, the willpower of the higher-proficiency learners to achieve their goal always remained at a high level. TD, for example, previewed the textbook before the academic year and aimed to master 1,000 characters, while the course requirement at the start was 350 characters. During the academic year, he set short-term goals, such as remembering every character in each text and learning two chapters ahead of the teachers' progression in the curriculum. In addition, HD set his long-term goals by organizing the HSK exams in each semester and his short-term goals according to the learning outcomes of each lesson. In contrast, the lower-proficiency learners' goal remained vague, smaller and shorter-term, such as passing tests, or learning the necessary words in the text. Furthermore, despite some of the lower-proficiency participants also having longer-term goals, their willpower level did not stay at the same high level as the higher-proficiency learners' and was easily influenced by other external reasons, such as tiredness caused by long travel distance to school, homework of other classes, etc.

With regard to emotional control, the participants of higher language proficiency in the case study seemed to be consumed with far fewer emotional problems, as well as being more adept at dealing with them, when compared to the lower proficiency participants. The high-proficiency participants in the case study, such as HD and TD, reported never experiencing any negative feelings in relation to their Chinese character learning tasks. FH reported a feeling of pressure in several interviews, but stressed that it was not an immediate problem for her. The case study also revealed other emotional factors, which are listed according to the frequency of being reported, such as: frustration, worry, being overwhelmed, tiredness and shock. However, the stress caused by the increasing difficulty of

Chinese character learning tasks was reported most frequently, and all other negative emotions came afterwards and were associated with a lack of progress.

In terms of satiation control, the students of high-proficiency reported a continuous interest in learning Chinese characters, as opposed to the lower-proficiency students, who reported sometimes becoming bored with the Chinese-character-learning tasks. During the whole investigation, TD and FH did not show any boredom associated with any Chinese characters. Another high-proficiency learner, HD, reported boredom only when reviewing Chinese characters. There was no reported low satiation control level among participants in the case study perhaps, due to the setting of the case study which involved picking participants who had elected to study Chinese studies as part of their degree course,

In summary, as Dörnyei (2005) and Oxford (2017) concluded, self-regulation plays a vital role in learning, as it not only influences the effectiveness of language strategy use, but also decides learners' status. However, the findings of the metacognitive control and environment control in this study partly conflict with this conclusion.

7.3.2 Metacognitive control is problematic for all learners

All of the participants in the case study reported problems regarding metacognitive control during the study. During the survey, the mean score of all the learners in Ireland was the lowest in the self-regulation section ($M=3.91$), which suggests that the findings of the case study were common among Chinese learners in Irish higher education. Similar infrequent use of attention strategies was also found in a previous literature based on a survey of USA students (Shen, 2005). Although the strategy of paying attention became the tenth popular strategy in a more recent survey in America, Sung (2012) also found that the importance of metacognitive strategies was ignored by learners.

The data revealed that the reasons for this difficulty varied to a great degree and can be divided into four aspects: 1. Distractions by digital devices, such as phones,

laptops, instant communication software, etc.; 2. Boredom of Chinese character learning; 3. Breakdown in emotional control, for instance, pressure from the increasing difficulty of Chinese characters; 4. External factors, including learning tasks of the participants' other majors, part-time jobs, tiredness caused by long travel distance to the campus, etc. Among these reasons, the first and fourth were reported more frequently by the participants. Different to the other participants, the higher-proficiency learners showed their ability to rapidly identify this situation and adopt an effective solution.

7.3.3 Environmental control and time control

Similar to previous studies in Kanji learning (Rose, 2017), the results of the case study revealed that environmental control was often applied to regulate other self-regulated strategies, such as metacognitive, emotional and satiation control. The students, for instance, reported regulating their study environment in order to control tiredness or boredom, or factors that may lead to distraction. During the case study, no examples of environmental control were reported as used to regulate the Chinese character learning without regulating another form of self-regulated control. This indicates that environmental control “may not be a separate category of control in itself, but a self-regulatory mechanism or strategy to control other forms of motivation” (Rose, 2012a, p. 95). However, data from the case study showed that the participants chose the learning time for more productive learning. Similar to environmental control, the control over learning time sometimes regulated other self-regulated strategies, although, sometimes, the participants' control over learning time was based on the cognition of their biological clocks and directly affected their learning.

7.3.4 Changes in self-regulation

During the one-year case study, it was noticed that the level of every learner's self-regulation did not experience any dramatic change. In other words, for all learners, despite a small fluctuation, the level of each part of self-regulation stayed stable during this long period. This conclusion supports Dörnyei's (2006) assumption that self-regulation is an underlying ability that can be measured

more reliably than strategy use in each individual learner. The same condition was also noticed in the process of Kanji learning (Rose, 2017).

Even though the general trend of the students' self-regulation remained stable during the whole investigation, a small fluctuation can be noticed, due to two main reasons. Furthermore, more fluctuations can be noticed in the medium-proficiency and low-proficiency groups. The first cause was assessments, including dictations, HSKs and exams. These mainly helped some participants to plan their commitment control strategies by establishing regular goals and increasing their willpower. The second reason is the learning content. Some participants viewed the worth of each chapter of the workbook differently, which could affect the participants' emotional control. In addition, the students' different personal interests in the various course contents also influenced the satiation control level.

7.4 Research question 3. Within this setting, which strategies positively affects students' learning outcome in terms of Chinese character acquisition?

This section will focus on the strategies that affects students' learning outcome in terms of Chinese character acquisition. In section 7.3.2, two examples from the case study was presented in order to show how language learning strategies and self-regulation control affect learner's learning experience and achievement in a long time. Finally, the situation that learners are lack of related support and guide in Irish higher education will be presented and discussed.

7.4.1 Which strategies affects students' learning outcome in terms of Chinese character acquisition?

In considering that the learners' grades affected their strategy use, which was discussed in section 6.2, the data was separated by learners' year-level, in order to obtain a more accurate result in the survey. Regarding the first-year learners, their Chinese character proficiency was positively influenced by planning strategy use and metacognitive control strategy use. For the second-year students, their Chinese character learning achievement was positively correlated with the use of application strategies, commitment control strategies and emotional control

strategies, which was also supported by data from the interviews and stimulated recall tasks. In terms of the final-year participants, their use of story strategies, application strategies and emotional control strategies may affect their Chinese character learning outcomes. Among these strategies that could affect Chinese character learning outcome, the application strategy and the induction strategy were found to be positively related to Thai learners' Chinese character proficiency (Han 2009, Wang, 2017). In addition, such a correlation between application strategies and learners' achievement was also reported in a study of Central Asian learners (Fan and Hu, 2010).

Furthermore, previous research into language learning (O'Malley and Chamot, 1990; Grenfell and Macaro, 2007) made an assumption that the better language learners utilize a wider range of language learning strategies than the less advanced learners, which has not been supported by studies on Chinese character learning before this study. In other words, language learning strategy theory suggests that the more efficient learners use a greater number and wider range of strategies. Data from the case study part also concurs with this assumption in the area of Chinese character learning strategy to some extent. In terms of language learning strategies, this research also suggests a connection between strategy use and language achievement by concluding that the more proficient Chinese character learners employ a greater number and wider range of Chinese character learning strategies. This can be more obviously noticed in the case study. This data shows that, compared with the other participants, the low-proficiency learners used fewer strategies in the case study.

However, when only comparing the high-proficiency learners' language learning strategy use with the medium-proficiency learners', no sound evidence was drawn from the case study to support the above assumption, which was also noticed by other researchers (Yamamori et al., 2003) in their longitudinal study of Japanese students of English as a second language. In this case study, the key factor resulting in either high or medium language proficiency can be explained by their self-regulatory level. To be more specific, it can be generally concluded from data from the interviews that the students' Chinese character proficiency level is highly

correlated with their self-regulation control level, except the metacognitive and environmental control condition (Dörnyei, 2005; Oxford, 2017). From the case study, it can generally be concluded that the students' Chinese characters proficiency levels are highly correlated with their self-regulation control level, except the environmental control and metacognitive control.

7.4.2 Virtuous circle and vicious circle

7.4.2.1 The case of TD – an example of a virtuous circle

Firstly, TD had a very high level of commitment control. He would set goals in different terms. For example, he set a long-term goal of achieving HSK 6 at the end of his undergraduate studies, while he had a medium-term goal (to master 1,000 characters within three months) and short-term goal (to preview 2 chapters ahead of the process). Then, TD would use his planning strategies to organize a quantifiable and feasible weekly routine of study, containing the stages of previewing and reviewing. During the process to achieve his goals, he displayed great control over his self-regulation. TD did not suffer from inability to control the environment, nor did he have any negative feelings towards the study process. At the end of the case study, he reported distraction due to social networks, but he could quickly become aware of the distraction and adjust his learning strategies. He was fascinated by Chinese characters, both in culture and in application, meaning that his satiation control remained at a high level during his study of Chinese characters. With a high capacity to regulate his learning of Chinese characters, TD used a wide range of language learning strategies and noted the importance of application strategies. As a result, he could always finish the Chinese character learning tasks before their due time.

When these successful experiences accumulated, TD certainly realized the effective approach and embedded consistent confidence and interest. This resulted in less effort in controlling negative feelings and feelings of boredom. Therefore, although his learning time per week was the shortest of the participants in the case study (3 hours per week), the results of TD's stimulated recall tasks were better than the other participants'. He made no mistakes in any

of the stimulated recall tasks. According to his teacher, his exam results during the whole year were the best in the whole class.

The results of this case study refute evidence from case studies in Japan (e.g. Rose and Harbon, 2013; Rose 2107) that has shown that high-level students sometimes suffer from the magnitude of character learning, in that students are required to memorise increasingly difficult characters. The case study of TD shows how a highly self-regulated learner is able to handle the study of thousands of characters with a disciplined routine of study.

7.4.2.2 The case of OK – an example of a vicious circle

Firstly, OK lacked commitment control for the task of Chinese character learning. He only had specific short-term goals related to obtaining a good result in his corresponding exams, but had no goals regarding Chinese character learning tasks. Therefore, he lacked clear organization for studying the new Chinese characters introduced in every new chapter during the course. Moreover, OK also lacked metacognitive control, procrastinating severely throughout the duration of the study with serious distractions. However, although he understood clearly that he did have problematic metacognitive control, he believed that this situation could be resolved naturally when necessary, especially before exams. Therefore, it seemed that he did not contribute to trying various strategies to determine the most effective ones. Instead, he insisted on using two or three learning strategies without evaluating their effectiveness. All of these factors resulted in him not keeping up with the progression of the course. In addition, the result of his stimulated recall task (1 out of 10) conducted before the exam could not support his belief that all difficulties would be resolved naturally when necessary.

Because of that, he not only always felt tired and intimidated, but was also bored with Chinese character study, due to his contributing inability to remember them. Furthermore, OK also reported worry and stress before exams during the interviews. Consequently, the review of Chinese characters seemed like a time-consuming and laborious task for OK. During the last interview, he reported that

he spent over 8 hours per week trying to catch up with the characters and prepare for exams. However, according to the stimulated recall tasks, he was suffering in mastering the Chinese characters. The results of this case study support evidence from case studies in Japan (Rose, 2017) that showed that students who suffer a breakdown in self-regulation find it difficult to reach their learning goals, as well as the learning outcomes of their studies.

7.4.3 Lack of Instructions

In terms of the medium-proficiency and low-proficiency learners, their usage of this strategy placed heavy reliance on previous knowledge and teachers' explanation. If they encountered one learning task for which the strategic learning process was not firstly introduced or analysed by the teacher, it would be easy for them to give up exploring other effective strategies and use only the repeating strategy. In contrast, the high-proficiency learners also presented their thoughts based on teachers' explanation and the knowledge they had absorbed from other sources.

However, in the case study, strategy instructions from teachers were mainly presented when teaching Chinese characters. Therefore, most instructions were presented as an explanation based on some particular character rather than learning strategy instruction. For example, the teacher would break a Chinese character into small components and reveal the special links of the components with a pronunciation and meaning of the character. However, during this process, she would not provide further explanation of this strategy, such as how this strategy works or when this strategy can be used. Furthermore, the interview data did not indicate any evidence that their teachers offered any guidance of self-regulation control. When the participants encountered difficulties in controlling their self-regulation, no support from teachers was reported in the interview data. All these indicate that teachers may not be aware of, or understand, the importance of self-regulation in Chinese learning.

However, strategy instruction, or styles- and strategies-based instruction (Cohen & Weaver, 2006), optimally improve learners' consciousness of their strategy use and make them more able to use relevant strategies (Oxford, 1990). "It should never aim to make all learners use all the same strategies, but it should open the door to new possibilities" (Oxford, 2017, p. 46). Strategy instruction can assist learners in choosing strategies that are appropriate to specific tasks and to the learners' cognitive style (an individual's preferred or habitual way of "perceiving, remembering, organizing, processing, and representing information" (Dörnyei & Ryan, 2015, p. 112). In this sense, the strategy instruction that the participants received was not enough and not supportive. This finding may explain the low use of other strategies that are not directly related to Chinese characters, as well as the lower-proficiency learners' disillusionment of losing self-regulatory.

7.5 Limitations

Although the results from the survey confirmed the findings from the case study and the survey, the major explanations of these findings were concluded based on the data from the case study, which included only a small number of participants within the same learning context. As Chapter 3 presented, the purpose of designing the case study was to obtain a deep description and understanding of the phenomenon. However, the small sample size of the current study does limit the generalizability of these explanations. In addition, this study aimed to include students with similar language learning backgrounds, in order to control the confounding variables associated with a difference in L1 background, in order to isolate the effective strategies for Chinese character learning. Therefore, after the initial interviews, this study settled on eight participants from the same class, which offered the most diverse range of gender, proficiency and strategy use, but a similar language learning background. This class was in their second year when participating in this study. As a result, this study did not explore other learners of different language-proficiency levels. The study, instead, used a questionnaire only to explore the strategy use of other learners within the Irish context.

As Chapter 3 presented, the first part of the questionnaire was mainly based on Jiang and Zhao's questionnaire (2001) on Chinese character learning and the Questionnaire for the Strategic Learning of Kanji (Bourke, 1996; Rose, 2017). The second part of the questionnaire was designed to measure the self-regulatory capacity of Chinese character acquisition, and was based on the template of the questionnaire SRCkanji (Rose, 2017). Despite the reliability and validity of all these questionnaires being confirmed in previous corresponding literature, this new questionnaire, based on them, was firstly put into use in this current study after several pilot surveys. Nevertheless, the construct validity of this questionnaire can be supported by the emergence of parallel findings to the case study. However, there is still room to improve this questionnaire. Similar to previous studies in Kanji learning (Rose, 2017), the results of the case study revealed that environmental control was often used to regulate other self-regulated strategies, such as metacognitive, emotional and satiation control. The students, for instance, reported regulating their study environment to control tiredness or boredom, or factors that may lead to distraction. During the case study, no examples of environmental control were reported as being used to regulate the Chinese characters learning without regulating another form of self-regulated control. Therefore, it should be questioned whether items regarding environmental control do still need to be kept in this questionnaire. To sum up, it requires further applications or development, in order to facilitate wide-ranging research on strategic Chinese character learning, where the task undertaken by students is very different in various settings.

7.6 Recommendations for future research and education

This study is one of the first research projects to explore Chinese character learning within a new theoretical framework of strategic learning, which incorporated new concepts of self-regulation control. It is also one of the first to introduce a mixed research approach to the field of Chinese character strategic learning, by including a questionnaire, interview, stimulated recall tasks and eye-tracking technology to assist in the stimulated recall. As a result, this section will highlight a number of issues for future research.

Firstly, a number of areas for future research can be explored. A number of previous studies explored and discussed the concept of language learning strategies in terms of Chinese character learning (see for example Jiang and Zhao, 2001; Shen, 2005; Ma, 2007). However, most of these studies presented, or described, what strategies a certain group of students, normally from the same country or area, used in the process of learning Chinese characters (see for example Sung, 2012; Zahradníková, 2016). Therefore, there remains a lack of research that compares the effectiveness of certain strategies. In other words, future studies could explore further into which strategy could help learners with Chinese character learning tasks more effectively, based on an understanding of learners' strategy use. Moreover, this exploration could be set as experimental research in contexts created for research purposes, while most studies were conducted in actual learning contexts.

Furthermore, in considering few researchers (Ma, 2007; Zahradníková, 2016) have conducted longitudinal research to examine how Chinese character learning changed during the improvement of Chinese character knowledge and Chinese proficiency, more studies are needed to reveal the differences in Chinese character learning according to the improvement of learners' proficiency level, which were also addressed by this study. To understand this field further, an examination of studies over a longer duration and wider proficiency level are encouraged.

In addition, there is no past research literature that focused on Chinese character learning in actual learning contexts in Ireland prior to this study. As Chinese will be added to the Irish Leaving Certificate Examination by 2020, which is the college admission exam system of Ireland, an increasing number of Chinese learners can be foreseen in the future. There is a need to conduct research on Chinese character learning with the background of all levels of Irish education, such as high schools.

Finally, a unique characteristic of Chinese is that one word may contain two or more characters. In other words, one character is not equal to a word in most cases in modern standard Chinese. Therefore, comparative studies of strategic

learning between vocabulary learning and character acquisition are a new topic in TCFL.

The current study adopted a new theoretical framework for research into the strategic learning of Chinese characters, by incorporating theories on Chinese character strategic learning (Jiang and Zhao, 2001) and self-regulation (Dörnyei, 2006; Dörnyei & Schmitt, 2006). From the findings of this study, one potential improvement to the framework could be considered for further research. Firstly, as Rose (2017) claimed, “the current categories of self-regulation in Dörnyei’s model may not be the most appropriate, arguing that environmental control did not appear to be a valid construct” (p. 163). According to section 7.2.3, this claim is also partly supported by the finding in the Chinese character learning of this study. In other words, most of the time, environmental control was often used to regulate other self-regulated strategies, such as metacognitive, emotional and satiation control. However, based on the participants’ reports in the case study, the time control deriving from the environment control was sometimes based on the cognition of their biological clocks and directly affected the Chinese character learning. This indicates that, in future theoretical frameworks of self-regulation control in Chinese character learning, the environmental control needs to be re-considered.

In terms of future methodological design, several revisions and advices can be generated from this study. The emotional control is currently defined as “emotion control strategies for managing disruptive emotional states or moods, and for generating emotions that are conducive to implementing one’s intentions”(Dörnyei, 2005). Based on this, the data from the interviews found that, in the Chinese character learning, emotional control means dealing with a number of other negative feelings, such as tiredness, frustration and intimidation. Despite stress being frequently reported, other negative feelings were easily identified by learners, which did not always accompany stress. However, the current questionnaire design of emotional control was centred on the control of stress in learning. As a result, the questionnaire of this part should be reworded in order to incorporate such ideas.

In addition, in the part of the case study, the results of the questionnaire cannot, sometimes, match the interview data, in terms of self-regulation, especially for the high-proficiency learners. It was found that the main reason was the wording of these items. Several items were set with an assumption that all of the participants had corresponding problems, such as this item to explore the metacognitive control: “7. When it comes to learning characters, I think my methods of controlling procrastination are effective.” However, high-proficiency would assign low scores to these items, because they never faced such problems. As a result, they did not need methods to control it. As a result, changes should be made to this questionnaire to ensure proper guidance is given to students regarding how to answer this question, in order to increase the validity of the questionnaire. This situation also adds evidence to Ranalli’s (2012) argument that Dörnyei’s model of self-regulation takes a volitional view of self-regulation, but only focuses on how learners regulate the negative aspects of learning. Such results could indicate that future self-regulation research should explore other models of self-regulation.

In addition, in terms of the eye-tracking use, this study starts an exploratory trail to utilize the eye-tracker to assist understanding the cognitive pattern when learners are recalling characters. In the future, more various uses of this technology is encouraged in this study. In addition, in this study, the eye-tracking data regarding the combination use of strategies was not analysed, which also can be a focus for further exploration.

Fourthly, more instructions regarding strategies for effective learning and self-regulation are urgently required based on the fact that participants’ lack of such kind of instructions were affecting their learning negatively. In section 7.3, the lack of strategy-based instruction was noticed to have already influenced students’ learning outcome of Chinese characters, according to the interview data. This suggests that learners should be systematically taught those strategies in the current pedagogical practices in Chinese language courses in Irish higher education. For teachers, an introduction to all language learning strategies is encouraged to be thoroughly explained to students, in order to allow them to understand and choose the most suitable ones. In addition, strategy instruction

could be developed in a deeper way, with an aim towards developing learners' self-regulation by a number of approaches, such as encouraging students to measure progress with feasible goals, and increasing students' autonomy. Outside the classroom, various approaches are suggested to be conducted to enhance communication and share effective strategies among students or between students and teachers. Such methods include creating a dialogue to discuss problems related to learning difficulties, in order to minimize negative emotional and satiation caveats, as well as holding regular sharing events to explore effective strategies.

7.7 Significance of this study

In English-speaking nations during recent years Chinese language studies have been spreading at a rapid speed, indicating the possible emergence of a boom period of Chinese language learning around the globe. However, despite this surge of Chinese language education, Chinese is still described as one of the most difficult languages to acquire by a number of studies as concluded in Chapter 1. In the research field of Chinese language learning as a foreign language, as mentioned in Chapter 3, the majority of researchers have focussed mainly on the teaching of Chinese as a foreign language and the teaching strategies employed by Chinese language instructors. Few studies have investigated how learners overcome the barriers to acquiring this difficult language and its unfamiliar writing system. Although a few key studies have examined the language learning strategies applied to written Chinese acquisition, little research has examined Chinese characters learning through the lens of the latest self-regulation theory, which is an element that has been added to strategy research in recent years. Furthermore, there remains a severe lack of research on this aspect, especially with regard to Irish students.

Consequently, this current study firstly discusses the Chinese characters learning strategies and self-regulatory learning of Irish students and analyses the relationship between learning outcomes and learning strategy use with the latest theories strategy research. During this process, a lack of related instructions

during the Chinese learners' study was also noticed in this study and, as a result, the findings of this study may assist teachers to change their teaching strategies to better meet the learning needs of their students. In addition, by a comparison with studies of Chinese learners from other learning backgrounds, as well as learners of foreign languages other than Chinese, it is hoped that the results of this research will provide a richer understanding of the influence of different backgrounds on learning strategy use.

In terms of methodology, this study explored the practices of four research instruments (semi-structured interviews; stimulated recall tasks; eye-tracking; questionnaire) in the investigation regarding language learning strategies. Among these four research instruments, stimulate recall tasks and eye-tracking were firstly used in researching Chinese character learning in the field of foreign language acquisition. From the case study, the pattern of this research approach, which used four research instruments, confirmed that different dimensions of the language learning strategies can be approached by this design. In addition, one questionnaire, which contains scales of language learning strategies and self-regulatory learning, was developed by this study. From the result of the survey and triangulation between the case study and the survey, this questionnaire was in a good quality in terms of the reliability and validity.

7.8 Conclusion

This study explored alphabet-based learners' language learning strategies and self-regulatory learning in the context of Irish higher education with a mixed method combined a case study and a survey. In terms of language learning strategies, Irish undergraduate students preferred using repeating strategies and evaluating strategies, while showed a least preference of making stories and collaborative learning in their Chinese character learning. From the longitudinal case study, evidence was found that students tended not to change their language strategies during the course of one academic year. In addition, Irish undergraduate students with alphabetic language background combined strategies to recognized single Chinese characters.

In terms of self-regulation, the results from the investigation indicated that metacognitive control seems a problem for all Irish undergraduate students who learned Chinese languages. In addition, the case study revealed that participants didn't figure out many effective strategies to control the metacognition. Furthermore, from the results from the case study higher-proficiency learners maintain a high-level of commitment control, emotional control and satiation control with effective strategies compared with lower-proficiency learners. Even though some fluctuations were observed in the case study during the period of one academic year, each participants' self-regulatory level stayed stable in this long term. Finally, environmental control was often applied to regulate other self-regulated strategies, such as metacognitive, emotional and satiation control. As a result, in future theoretical frameworks of self-regulation control in Chinese character learning, the environmental control needs to be re-considered.

Finally, this study discussed the effectiveness of each strategy for Chinese character learning. The survey found that the learners' grades affected their strategy use. As a result, the data was separated by learners' year-level, in order to obtain a more accurate result in the survey. Regarding the first-year learners, their Chinese character proficiency was positively influenced by planning strategy use and metacognitive control strategy use. For the second-year students, their Chinese character learning achievement was positively correlated with the use of application strategies, commitment control strategies and emotional control strategies, which was also supported by data from the interviews and stimulated recall tasks. This was supported by triangulation with results from the case study. In terms of the final-year participants, their use of story strategies, application strategies and emotional control strategies may affect their Chinese character learning outcomes. The case study also revealed that compared with the other participants, the low-proficiency learners used fewer strategies in the case study. Language strategies, functioned with self-regulatory learning, can form a virtuous circle and vicious circle in long term. Last, the lack of instruction regarding strategies to learn Chinese characters and control self-regulation was also observed in the case study, which strongly affected students' acquisition of Chinese characters.

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Appendix A: Outline of interview schedule

Opening: Thank you for being willing to take part in this series of interviews about Chinese character learning. I first wish to assure you anonymity and confidentiality.

Part One (For Initial Interview only) These questions concern your past experiences of studying Chinese characters	
Question	Follow-ups/Probes
Can I first ask you about your Chinese learning background?	How long have you studied Chinese? If you learnt before you chose this major, where have you studied? What kinds of learning have you taken part in?
How do you feel about learning Chinese characters in your Chinese learning so far?	Do you find it difficult/fun/challenging/overwhelming? How do you feel about studying Chinese characters in the future?
Why do you want to learn Chinese?	Are you interested in Chinese? Do you think that it is helpful for your future career?
Part Two: General Learning	
Remember back to your classes in this month. What did you learn?	How were these new characters introduced by the teacher? Did the teacher shown you ways to remember any of the Chinese characters more easily? If yes, what are they?
How have you been studying Chinese characters in the last week?	How have you studied them? How long did you spend in each study session?
Part Three: Self-regulatory strategies	
What are your Chinese character learning goals? Did you set for yourself weekly/monthly? What do you think of your willpower this week in achieving these goals?	Did you feel satisfied/confident about your will power? Did you feel the methods to control your willpower were effective/useful? And other reflections on the methods used?
Think back to your previous Chinese lesson or study period relating to learning Chinese characters. How did you feel during this period?	Did you feel bored/afraid/impatient about this situation? If so, what did you do about this feeling? Did you feel satisfied/confident about your methods to control this negative feeling? How effective/useful were these methods?
Think about the last dictation you had to take. How did you prepare for it?	Did you procrastinate in reviewing the words? If so, what made you procrastinate? Comment on the methods used to stop procrastination. Did you feel easily distracted? If so, why did you feel easily distracted? Comment on the methods used to enhance concentration.
How did you feel when learning a new group of Chinese characters this month? Did you feel easily bored?	If so, why did you feel easily bored? Comment on the methods used to get rid of the feeling of boredom. If not, how do you maintain your motivation?
Where and when did you study Chinese characters in the previous month?	How did you select a productive time and place for your learning? (e.g. waiting for a bus, during a classroom break, your own room.) Which environments were best/worst for you? What time was best/worst for you? Comment on the methods used to control the learning time and environment.
Part Four: Learning Strategies	
Stimulated Recall I am going to let you wear the eye-tracking equipment. Then you will see a list of Chinese characters (about ten), which you have studied. I want you to tell me the reading and meaning of the Chinese characters and any information on how you remember it.	Probe for cognitive and mnemonic strategies used. How did you remember it? How do you know that is the answer? Did you remember it in any special way?
Part Five: General Conclusions	
Reflecting on your Chinese character learning in the past month, how do you think you have performed?	Probe for reflections on strategy use, study habits, difficulties of learning and external factors that may have affected study – i.e. reasons for under or over performance.
Can I finally ask you if there is any aspect of your experience of learning Chinese characters that has not been covered in this interview?	

Appendix B: Post-course learner questionnaire

Questionnaire for the Strategic Learning of Chinese Characters

This questionnaire is designed to gather information about how you, as a student of Chinese Studies, go about learning Chinese characters. On the following pages, you will find statements describing possible approaches to the Chinese character learning task. Please read each statement and mark the response that best describes your Chinese character learning practices.

Possible Responses: 1= Not true at all (of me)
 7= Always true (of me)
 X: I either do not understand or do not want to
 answer

Please note that there are no right or wrong answers. Each individual will approach the task in his/ her own unique way. The instrument is designed to give a profile which summarises the way you are approaching the task of learning Chinese characters.

Language Learning Strategies		
1. When I learn a new character, I learn the strokes in this character.	1 2 3 4 5 6 7	X
2. When I learn a new character, I learn the stroke order of this character.	1 2 3 4 5 6 7	X
3. I write the characters by stroke order.	1 2 3 4 5 6 7	X
4. I distinguish similar strokes when I am writing	1 2 3 4 5 6 7	X
5. When I learn a new character, I remember the pronunciation from Pinyin.	1 2 3 4 5 6 7	X
6. I use phonetic component to remember the pronunciation of a new character.	1 2 3 4 5 6 7	X
7. When I learn a new character, I remember the meaning from English explanation.	1 2 3 4 5 6 7	X
8. I use semantic component to remember the meaning of a new character.	1 2 3 4 5 6 7	X
9. When I learn a new character, I practice to write this character over and over.	1 2 3 4 5 6 7	X
10. I make up my own stories according to what the character looks like to me.	1 2 3 4 5 6 7	X
11. I make up my own stories according to the component element of the character.	1 2 3 4 5 6 7	X
12. I use stories told to me by my teacher or in reference books.	1 2 3 4 5 6 7	X
13. I group the characters containing the same phonetic components.	1 2 3 4 5 6 7	X
14. I group the characters containing the same semantic components.	1 2 3 4 5 6 7	X
15. I compare and contrast characters that look similar so as not to confuse them.	1 2 3 4 5 6 7	X
16. I compare and contrast characters that hear similar so as not to confuse them.	1 2 3 4 5 6 7	X

17. I create associations between the new character and other characters I already know.	1 2 3 4 5 6 7	X
18. I create associations between the new character and other known symbols	1 2 3 4 5 6 7	X
19. I create associations between the new character and letters of the alphabet.	1 2 3 4 5 6 7	X
20. I associate the new character with other characters from the same meaning group.	1 2 3 4 5 6 7	X
21. I associate the new character with characters that mean the opposite.	1 2 3 4 5 6 7	X
22. I associate the new character with other characters that look different but have the same reading.	1 2 3 4 5 6 7	X
23. I associate the new character the other characters that look the same but have a different reading.	1 2 3 4 5 6 7	X
24. I associate the new character with other characters that look different but have the same meaning.	1 2 3 4 5 6 7	X
25. I associate the new character the other characters that look the same but have a different meaning.	1 2 3 4 5 6 7	X
26. I associate the new character with the Chinese reading then the meaning.	1 2 3 4 5 6 7	X
27. I associate the new character with the meaning in English then the Chinese reading.	1 2 3 4 5 6 7	X
28. I visualise the new character in my head and transfer the image to paper.	1 2 3 4 5 6 7	X
29. I remember what it looked like on the page where I learned it.	1 2 3 4 5 6 7	X
30. I associate the new character with other characters in the sequence or list I first learned it in.	1 2 3 4 5 6 7	X
31. I place the new character in a sentence and remember it in that context.	1 2 3 4 5 6 7	X
32. I remember the character by the way it feels to write it.	1 2 3 4 5 6 7	X
33. I have a set time each day/week which I spend learning characters.	1 2 3 4 5 6 7	X
34. I use flashcards to repeatedly practice characters.	1 2 3 4 5 6 7	X
35. I write our characters many times until I know them.	1 2 3 4 5 6 7	X
36. I use a computer program to practice characters.	1 2 3 4 5 6 7	X
37. I use an app in electronic devices to practice characters.	1 2 3 4 5 6 7	X
38. I use characters as often as I can (e.g. in class notes, homework assignments etc.)	1 2 3 4 5 6 7	X
39. I try to find better ways of learning characters from books or by talking to others.	1 2 3 4 5 6 7	X
40. I use other characters resources additional to those required in my course.	1 2 3 4 5 6 7	X
41. I set myself goals and objectives for what I wish to achieve each week.	1 2 3 4 5 6 7	X
42. I set myself a long-term goal for how many characters I want to learn.	1 2 3 4 5 6 7	X
43. I try to learn characters in daily life (e.g. watching Chinese movies, etc.)	1 2 3 4 5 6 7	X
44. I test myself.	1 2 3 4 5 6 7	X
45. I relearn or focus on characters I have trouble with.	1 2 3 4 5 6 7	X
46. I keep a separate list of characters I have trouble remembering for easy reference.	1 2 3 4 5 6 7	X
47. I focus on characters that are likely to come up in an exam.	1 2 3 4 5 6 7	X
48. I test myself regularly on old characters so I don't forget them.	1 2 3 4 5 6 7	X
49. I correct myself regularly with wrong pronunciation or writing mistakes so I don't make the same mistake.	1 2 3 4 5 6 7	X
50. I study with others, practising together.	1 2 3 4 5 6 7	X
51. I discuss my feelings about characters learning with others.	1 2 3 4 5 6 7	X
52. I ask another person to test me.	1 2 3 4 5 6 7	X

Self-regulation capacity in character learning		
1. When learning characters, I have special techniques to achieve my learning goals.	1 2 3 4 5 6 7	X
2. When learning characters, I believe I can achieve my goals more quickly than expected.	1 2 3 4 5 6 7	X
3. When learning characters, I persist until I reach the goals that I make for myself.	1 2 3 4 5 6 7	X
4. I believe I can overcome all the difficulties related to achieving my character learning goals.	1 2 3 4 5 6 7	X
5. When learning characters, I have special techniques to keep my concentration focused.	1 2 3 4 5 6 7	X
6. When learning characters, I think my methods of controlling my concentration are effective.	1 2 3 4 5 6 7	X
7. When it comes to learning characters, I think my methods of controlling procrastination are effective.	1 2 3 4 5 6 7	X
8. When it comes to learning characters, I have my special techniques to prevent procrastination.	1 2 3 4 5 6 7	X
9. Once the novelty of learning characters is gone, I easily become impatient with it.	1 2 3 4 5 6 7	X
10. During the process of learning characters, I am confident that I can overcome any sense of boredom.	1 2 3 4 5 6 7	X
11. During the process of learning characters, I feel satisfied with the ways I eliminate boredom.	1 2 3 4 5 6 7	X
12. When feeling bored with learning characters, I know how to regulate my mood in order to invigorate the learning process.	1 2 3 4 5 6 7	X
13. When I feel stressed about character learning, I know how to reduce this stress.	1 2 3 4 5 6 7	X
14. I feel satisfied with the methods I use to reduce the stress of character learning.	1 2 3 4 5 6 7	X
15. When I feel stressed about character learning, I simply want to give up.	1 2 3 4 5 6 7	X
16. When I feel stressed about my character learning, I cope with this problem immediately.	1 2 3 4 5 6 7	X
17. When I am studying characters and the learning environment becomes unsuitable, I try to sort out the problem.	1 2 3 4 5 6 7	X
18. When learning characters, I know how to arrange the environment to make learning more efficient.	1 2 3 4 5 6 7	X
19. When learning characters, I am aware that the learning environment affects my learning.	1 2 3 4 5 6 7	X
20. When I study characters, I look for a good learning environment.	1 2 3 4 5 6 7	X

Appendix C: National survey

This questionnaire is designed to gather information about how you, as a student of Chinese Studies, go about learning Chinese characters. Your participation in this research project is voluntary. Your responses will remain confidential and anonymous.

If you agree to participate in this project, please answer the questions on the questionnaire as best you can. On this page, you will find some questions in terms of your learning background. Please read each question and mark the result that best describes your Chinese learning background.

Chinese learning background

- Which year of university are you in?
☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- Have you learned Chinese before university?
☐ Yes ☐ No (if no, please skip Question 3 and 4)
- Before university, what kind of Chinese learning have you taken part in?
☐ Kindergarten ☐ Primary School ☐ Middle school (class for interests)
☐ Middle school (class for YCT) ☐ Chinese institution
☐ Other (Please specify: _____)
- Before university, how long have you learned Chinese?
☐ Less than 1 year ☐ 1-2 years ☐ 2-3 years
☐ 3-4 years ☐ more than 4 years
- Have you been to China before?
☐ Yes ☐ No (if no, please skip Question 6, 7 and 8)
- How long have you stayed in China?
☐ Less than 1 year ☐ 1-2 years ☐ 2-3 years
☐ 3-4 years ☐ more than 4 years
- When you were in China, were you involved in Chinese courses?
☐ Yes ☐ No (if no, please skip Question 8)
- When you were in China, what kind of Chinese learning have you taken part in?
☐ Kindergarten ☐ Primary School ☐ Middle school (class for interests)
☐ Middle school (class for YCT) ☐ Chinese institution
☐ University course (as exchange student) ☐ University course (as understand in Chinese universities)
☐ Other (Please specify: _____)
- How many Chinese characters do you know?
☐ Less than 150 (HSK 1) ☐ 150-300 (HSK 2) ☐ 300-600 (HSK 3)
☐ 600-1000 (HSK 4) ☐ 1000-1800 (HSK 5) ☐ 1800-2800 (HSK 6)
- Your native language is: _____

On the following pages, you will find statements describing possible approaches to the Chinese character learning task. Please read each statement and mark the response that best describes your Chinese character learning practices.

Possible Responses: 1= Not true at all (of me)
 7= Always true (of me)
 X: I either do not understand or do not want to answer

Please note that there are no right or wrong answers. Each individual will approach the task in his/ her own unique way. The instrument is designed to give a profile which summarises the way you are approaching the task of learning Chinese characters.

Language Learning Strategies		
1. When I learn a new character, I learn the strokes in this character.	1 2 3 4 5 6 7	X
2. When I learn a new character, I learn the stroke order of this character.	1 2 3 4 5 6 7	X
3. I write the characters by stroke order.	1 2 3 4 5 6 7	X
4. I distinguish similar strokes when I am writing	1 2 3 4 5 6 7	X
5. When I learn a new character, I remember the pronunciation from Pinyin.	1 2 3 4 5 6 7	X
6. I use phonetic component to remember the pronunciation of a new character.	1 2 3 4 5 6 7	X
7. When I learn a new character, I remember the meaning from English explanation.	1 2 3 4 5 6 7	X
8. I use semantic component to remember the meaning of a new character.	1 2 3 4 5 6 7	X
9. When I learn a new character, I practice to write this character over and over.	1 2 3 4 5 6 7	X
10. I make up my own stories according to what the character looks like to me.	1 2 3 4 5 6 7	X
11. I make up my own stories according to the component element of the character.	1 2 3 4 5 6 7	X
12. I use stories told to me by my teacher or in reference books.	1 2 3 4 5 6 7	X
13. I group the characters containing the same phonetic components.	1 2 3 4 5 6 7	X
14. I group the characters containing the same semantic components.	1 2 3 4 5 6 7	X
15. I compare and contrast characters that look similar so as not to confuse them.	1 2 3 4 5 6 7	X
16. I compare and contrast characters that hear similar so as not to confuse them.	1 2 3 4 5 6 7	X

17. I create associations between the new character and other characters I already know.	1 2 3 4 5 6 7	X
18. I create associations between the new character and other known symbols	1 2 3 4 5 6 7	X
19. I create associations between the new character and letters of the alphabet.	1 2 3 4 5 6 7	X
20. I associate the new character with other characters from the same meaning group.	1 2 3 4 5 6 7	X
21. I associate the new character with characters that mean the opposite.	1 2 3 4 5 6 7	X
22. I associate the new character with other characters that look different but have the same reading.	1 2 3 4 5 6 7	X
23. I associate the new character the other characters that look the same but have a different reading.	1 2 3 4 5 6 7	X
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30. I associate the new character with other characters in the sequence or list I first learned it in.	1 2 3 4 5 6 7	X
31. I place the new character in a sentence and remember it in that context.	1 2 3 4 5 6 7	X
32. I remember the character by the way it feels to write it.	1 2 3 4 5 6 7	X
33. I have a set time each day/week which I spend learning characters.	1 2 3 4 5 6 7	X
34. I use flashcards to repeatedly practice characters.	1 2 3 4 5 6 7	X
35. I write our characters many times until I know them.	1 2 3 4 5 6 7	X
36. I use a computer program to practice characters.	1 2 3 4 5 6 7	X
37. I use an app in electronic devices to practice characters.	1 2 3 4 5 6 7	X
38. I use characters as often as I can (e.g. in class notes, homework assignments etc.)	1 2 3 4 5 6 7	X
39. I try to find better ways of learning characters from books or by talking to others.	1 2 3 4 5 6 7	X
40. I use other characters resources additional to those required in my course.	1 2 3 4 5 6 7	X
41. I set myself goals and objectives for what I wish to achieve each week.	1 2 3 4 5 6 7	X
42. I set myself a long-term goal for how many characters I want to learn.	1 2 3 4 5 6 7	X
43. I try to learn characters in daily life (e.g. watching Chinese movies, etc.)	1 2 3 4 5 6 7	X
44. I test myself.	1 2 3 4 5 6 7	X
45. I relearn or focus on characters I have trouble with.	1 2 3 4 5 6 7	X
46. I keep a separate list of characters I have trouble remembering for easy reference.	1 2 3 4 5 6 7	X
47. I focus on characters that are likely to come up in an exam.	1 2 3 4 5 6 7	X
48. I test myself regularly on old characters so I don't forget them.	1 2 3 4 5 6 7	X
49. I correct myself regularly with wrong pronunciation or writing mistakes so I don't make the same mistake.	1 2 3 4 5 6 7	X
50. I study with others, practising together.	1 2 3 4 5 6 7	X
51. I discuss my feelings about characters learning with others.	1 2 3 4 5 6 7	X
52. I ask another person to test me.	1 2 3 4 5 6 7	X

Self-regulation capacity in character learning		
1. When learning characters, I have special techniques to achieve my learning goals.	1 2 3 4 5 6 7	X
2. When learning characters, I believe I can achieve my goals more quickly than expected.	1 2 3 4 5 6 7	X
3. When learning characters, I persist until I reach the goals that I make for myself.	1 2 3 4 5 6 7	X
4. I believe I can overcome all the difficulties related to achieving my character learning goals.	1 2 3 4 5 6 7	X
5. When learning characters, I have special techniques to keep my concentration focused.	1 2 3 4 5 6 7	X
6. When learning characters, I think my methods of controlling my concentration are effective.	1 2 3 4 5 6 7	X
7. When it comes to learning characters, I think my methods of controlling procrastination are effective.	1 2 3 4 5 6 7	X
8. When it comes to learning characters, I have my special techniques to prevent procrastination.	1 2 3 4 5 6 7	X
9. Once the novelty of learning characters is gone, I easily become impatient with it.	1 2 3 4 5 6 7	X
10. During the process of learning characters, I am confident that I can overcome any sense of boredom.	1 2 3 4 5 6 7	X
11. During the process of learning characters, I feel satisfied with the ways I eliminate boredom.	1 2 3 4 5 6 7	X
12. When feeling bored with learning characters, I know how to regulate my mood in order to invigorate the learning process.	1 2 3 4 5 6 7	X
13. When I feel stressed about character learning, I know how to reduce this stress.	1 2 3 4 5 6 7	X
14. I feel satisfied with the methods I use to reduce the stress of character learning.	1 2 3 4 5 6 7	X
15. When I feel stressed about character learning, I simply want to give up.	1 2 3 4 5 6 7	X
16. When I feel stressed about my character learning, I cope with this problem immediately.	1 2 3 4 5 6 7	X
17. When I am studying characters and the learning environment becomes unsuitable, I try to sort out the problem.	1 2 3 4 5 6 7	X
18. When learning characters, I know how to arrange the environment to make learning more efficient.	1 2 3 4 5 6 7	X
19. When learning characters, I am aware that the learning environment affects my learning.	1 2 3 4 5 6 7	X
20. When I study characters, I look for a good learning environment.	1 2 3 4 5 6 7	X

Appendix D: Example of transcripts of audio interviews and stimulated recall tasks

Keys for Jefferson style symbols used in the study

(.)	short pause
()	inaudible or unclear speech
(gestures)	additional descriptions for movements, laughter etc.
(information)	guess at unclear speech
_____	stressed syllable
[	overlapping talk
><	the talk between the arrows is noticeably speeded up
<>	the talk between the arrows is noticeably slowed down
...	prolongation of the sound
=	no break within turns
↑	the sentence shifts into higher pitch
↓	the sentence shifts into lower pitch

Example of transcripts of audio interview and stimulated recall session

Date: 02 May 2017
Interviewee: KX
Interviewer: Ning
Duration: 38 mins

Ning: So recall your classes since we last met.

KX: [OK.

Ning: How would you like to see introduced by a teacher?

KX: They usually introduce the same way. But these ones are gotten so complicated now. (laugh) So you've gotten a lot of character to recognize them. Especially now because there's like more measured words. So we can't just always like 一个. Now we have to use actually use the proper measure words.

Ning: OK.

KX: But the measure words are kind of hard to learn now because they're so different. Because there's no English equivalent. Then the characters aren't as easy as 一个. So I always kind of want to use 一个.

Ning: So did the teacher show you easier ways of remembering any of the Chinese characters more easily?

KX: They are trying to break them up into components more because they're getting so complicated to make sure we're doing all the right strokes and stuff.

Ning: [Yes.

KX: But I don't think it's any easier way to show us.

Ning: You don't think they.

KX: I think that's kind of the only way to show us the really complicated ones because unless there's like parts of characters 〇 learn them. Because a lot of them are just so new and we only have like such a small, there is such a small range of radicals and stuff. So pretty much all characters now we are learning are completely new.

Ning: So you mean since the teacher split the characters into different components, it didn't work out because you still need to remember these new components.

KX: Yeah it doesn't work for me but I don't learn the characters by their components. But I know Gan Yifei does, so it helps her more. So I think it's more just personal learning with that.

Ning: Okay. So what are your Chinese character learning goals?

- KX: I want to catch up on the chapters for the exam in two weeks I think. But I'm going I'm plan on getting the final year book then. I try to learn some of them characters over the summer. So I have more vocab for when I do go to China. Because based on just the two books that we have now I don't think I'll survive more in a day. (laugh)
- Ning: OK. So you have some plan for the summer.
- KX: Yeah. I am going to learn more during the summer show try to make it easier.
- Ning: Did you set this for yourself weekly or monthly or?
- KX: I think for character's for the the exam. I am going set from next week and I'm going to set them daily so like 10 characters a day to try get them learn that way.
- Ning: How about like previously since we last met? Did you set your goal weekly or monthly?
- KX: I will set more weekly because it worked out better when I had lectures to do a weekly. Cause then I can just in trying to say Oh I learned 10 characters today but I have six lectures that day. I didn't really have time to. So that I set it weekly. But I think now that my lectures are finished I'm gonna say I kind of more daily or every two days because I have more time to actually study and it will help for the final exam.
- Ning: So what do you think of your willpower since we last met in achieving your goal?
- KX: I think it's improved a bit because now I'm getting scared (laugh) for the exam. So I want to do well. So it's make me focus a lot more on learning characters.
- Ning: Okay. So are you satisfied or confident about your willpower since we last met?
- KX: I think I'm going to be because the last see. I I found a lot difficult compared to the older ones. So I think when we put more effort into what's up the final exam doesn't seem as difficult.
- Ning: So do you have any measures to control your willpower?
- KX: (.) Not really. I know my mom a certain, like at my home and I'm playing games on a computer stuff. so it's kind of like oh you could be studying or you could be doing an essay or something. So she's kind of getting more onto me now I remember. because I'm like an

essay to due next week and a half. But other than that, I think I'm usually okay like, just doing things by myself anyway so I think I'll be okay for the exam.

Ning: So any other reflections on your methods?

KX: Yeah. It's more just put pressure to do some work and not some work like specifically characters or anything. Cause I think she knows more on myself if I don't do well and then like "Oh well I spent so like X amount of time playing games" like "spend so much time doing characters and stuff". But some of them old methods I used aren't working as well like posted notes because like I can't walk up to like a post office write character for the post office and put on the door. So it worked OK when I was like () things around the house but it's not working as well now. so I'll have to try. Think of how to do that but in a different way now.

Ning: So you mean your previous methods, just to put the Chinese characters on the corresponding thing.

KX: [Yes.

Ning: It doesn't work now.

KX: Because I can't like, for a character like apartments like 房子 I can't like write on a post and put it on an apartment. I think I start to do a little drawings on an apartment then do it that way so I can still visually see it because I learned more from scene things than speaking.

Ning: You mean that you are learning faster when reading instead of speaking?

KX: [Yeah. Yeah. Yeah I learned things more from just looking at them.

Ning: Think back to your previous Chinese lesson or study period relating to Chinese characters since we last met, so how did you feel during this period?

KX: I'm feeling okay with the class of Chinese characters because I'm not that stressed. Because I know I've put in the work. So I'm calm enough cause I know I have to learn. So it's not stress me that much. I think it's more kind come to me as the grammar aspects that have me more stress than the actual characters.

Ning: You just mentioned that you feel a little bit stressful. So what did you do about your stressful feeling?

- KX: I try to make a like little day to day plan of things of what I can do to try like make me less stressed. So like I'd say like I write 10 characters and one grammar topic this day, just to try slowly do the work. So it doesn't build up because I can't do it in the big chunks. Like I can't do a chapter a day because I just don't have the concentration for. So I just make it, like a little study plan.
- Ning: So setting goals is very important to you to relieve the stress.
- KX: [Yeah. Cause otherwise, because otherwise I'm like "Oh I'll do it tomorrow" and then "I'll do it tomorrow". And then I let it all build up. So I kind of, I have to have to have that structure and so that I can actually get it all done in time.
- Ning: So since we last met, you actually had a daily target.
- KX: Yeah. I am starting to put a day target in because I have so many exams and I want to make sure that I keep it up to learn. So I think for coming exams I need a daily. Otherwise I'm like "oh learn at the weekend" and then "Oh no, I have two days I learn them all" kind of thing. And by then I'll be panic. And I will actually even if I do learn I will be learning them for like a half an hour. And then I'll forget again when it comes to exams so it's been always a waste of time then.
- Ning: Do you feel satisfied or confident about your methods to control your stress?
- KX: Yeah. I think the methods, they work OK. I don't know what to do if they don't work. (laugh)
- Ning: So let's say they are effective?
- KX: Yeah. It was effective last year. So I'm consuming it's gonna work out okay this year as well.
- Ning: Oh you haven't started yet.
- KX: No, I am starting it from tomorrow afternoon for my Chinese. Cause I usually waiting after my Chinese classes and then concentrate on my Chinese characters.
- Ning: So since we last match previously since we last met. Do you have any methods to relieve your stress?
- KX: No. It was the same methods. But it sounds a day to day basis. It was a week to week because of lectures or stuff.
- Ning: So think about the last dictation, how did you learn characters?

- KX: I didn't prepare well enough because I usually don't find the assessments that tough. But I'm no good with directions even in English. So I talk I spend a lot of time on them. But I didn't when I see the exams. I've spent a lot more time on them now because I don't know the difference in my left and right. And then if getting all confused and then may be panic in the CA. so I am going to have to work a lot more on that sort of thing.
- Ning: So did you procrastinate in reviewing words?
- KX: Yeah. I procrastinate a lot. I wasn't expecting it to be as difficult as the other ones. I pretty shock.
- Ning: Any other reasons?
- KX: I think it was cause I had two essays due around the same time as well. So I think I was trying to get the essays due first.
- Ning: So did you feel easily distracted?
- KX: Once I actually start studying for I wasn't that distracted. But it was actually getting them to study in that I've only found harder because I had like essays and stuff to do as well. So it was actually find time to start studying the characters, just harder. But once usually once I get started studying characters I'm fine for like an hour and then I'll take a break come back to for another half an hour or whatever.
- Ning: So the essays will be the main thing.
- KX: Yeah. It's usually other work I have to do for college that will distract me from learning characters. Because I'm kind of like "OK I really can't focus everything on one subject". I still have to get good marks in the other subjects so it's trying to balance that all.
- Ning: So do you have any methods to enhance your concentration?
- KX: Usually just taking breaks. Like I might start off like an hour, take a ten-minute break. And then do a half hour, five-minute break. Because if I sit there for like two or three hours straight, I won't spend enough time learning to character because I just want to get through it as quick as possible. So then I can just put it away and go play computer games or watch TV something.
- Ning: How did you feel when learning a new group of Chinese characters since we last met?

- KX: Yeah they're getting harder. So I'm kind of, I'm spend more time learning one character whereas, like say last year I kind of learned two characters in that time. So it's annoying me a little bit that I can't learn them as quick. But I think I just have to get over, deal it, and just accept that it takes longer to learn some characters than others.
- Ning: Do you feel easily bored?
- KX: Sometimes I am easily bored but I think it's more to do with what the chapters about. So like learn about renting an apartment, I didn't find very interesting. So then characters just send to just bore me more. But It's more about the text and what characters actually mean.
- Ning: So do you have any methods to get rid of the bored feeling?
- KX: No not not usually like it's usually I'm kind of like Oh okay well I have homework to do on this. So I've learned characters for that. Or I guess a topic on the oral. So I just have to learn. I used to like more, "Oh you have to notice for the exam". Whereas the other chapters that I find interesting I'm like "okay I find it interesting. If I know this character, I can make this type sentence and that type of sentence". So I can like make it more interesting to learn because I know I'm like expanding, whereas chapters I guess or I am like "it's going for the exam". Just get over it and learn it.
- Ning: So Where and when did you study Chinese characters since we last met? Do you have any productive time and place for your learning?
- KX: It's it's kind of hard to know. That's coming up to no lectures. Because I don't have as much structure whereas the lectures. I knew it was a Wednesday afternoon. Because I finished early and I'd go over to the Phoenix to study. So it'll be I think I'll definitely keep on the Wednesday. But I will try to get other set times in and I think it'll be more difficult. But I'm kind of aim for like two hours a day. So it will be two hours in the morning, two hours in the evening I don't know but maybe for like two hours a day anyway.
- Ning: So except for Wednesday afternoon, you actually don't have any set time for your learning.
- KX: No, not for characters. Because like I have own actions and then I work Friday Saturday and Sunday. So I don't really have a lot of time to do a lot of study on the weekends. So I just try to do the bare like just the bare minimum homework and stuff.
- Ning: So how long did you spend for on Chinese character learning, every week per average?

KX: three or four? Because I've spent like two hours on Wednesday learning characters. And then on the Thursday depending on how complicated I found the characters. I can learn the grammar and stuff in an hour or could take me up to two hours. It depends on how difficult I find.

Ning: Does it include your homework?

KX: Not usually. Cause the homework once I have the characters learned, the homework usually takes like 10, 15 minutes. It doesn't take like, because once I have the characters and grammar learned in my head, I can make sense or block quicker. So it doesn't take me as long. Depending on the type of homework, it could take longer.

Ning: So what kind of environment is the best for your Chinese character learning?

KX: Usually places where a bit of noise. Cause I'm not because I can't deal quiet because then I get to distract when quiet. So places like the library aren't usually good because I was like "oh I wonder what she's learned". I'm wondering what they're doing. There is a place in the north campus. There is a bit of noise. So I am not distracted by it.

Stimulated recall session starts

Ning: OK, would you mind to sit here? I am going to let you wear the eye-tracking equipment. Then you will see a list of Chinese characters (about ten), which you have studied. I want you to tell me the reading and meaning of the Chinese characters and any information on how you remember it. Shall we start? Are you ready?

First character

KX: Yeah. I think this is some to do with the former chapter. I don't know.

Ning: No worries.

First word with first character

KX: Oh. It's Shaoxin Opera. Something 剧. I cannot remember the pronunciation. Because I know the character on the right is 京剧, Beijing Opera. I know it's not Beijing Opera. It's about the film, Farewell My Concubine. That's how I remember that one.

Ning: Next one.

Second character (second word was ignored as the participant named the word when seeing the character)

KX: 虽, for 虽然. Although.

- Ning: How do you know that?
- KX: I am pretty sure I remember from learning the grammar. Other than that, I don't know. I kind of just practice the grammar in sentences. So I just used to write the character for it.
- Ning: How can you remember the pronunciation?
- KX: Cause usually when I write out the sentences for grammar. I will say the sentence in my head as I am writing it.
- Ning: When you write the sentences, you will speak to yourself.
- KX: Yeah. It makes people crazy cause they don't understand me. But it's kind of how I learn the pronunciation as I am writing characters.

Third character

- KX: 请, I think that's please and to invite.
- Ning: No.
- KX: The component on the right, I remember it's 青.

Third word with the third character

- KX: 爱情. Is it lovers?
- Ning: No.
- KX: (.) No.

Fourth character (fourth word was ignored as the participant named the word when seeing the character)

- KX: I know it's in. But it's not 所. No. ↓
- Ning: No worries.
- KX: 故事? The story?
- Ning: Yes. How can you recognize this?
- KX: I think that's because I remember translating. Cause story about. I remember doing the class. It's about a story about a man and a women. They got married. And then he got sick. So the grandmother let him marry other women. But I think I just remember the translating from that class.

Fifth character (fifth word was ignored as the participant named the word when seeing the character)

KX: 座. I want to say it is seat.

Ning: Yes. How do you know that?

KX: Because the inside component, just have to say like “我坐公共汽车”.

Fifth word with fifth character

KX: 座位. Seat.

Ning: Yes.

KX: I recognize the second character is the measure word for people.

Sixth character (sixth word was ignored as the participant named the word when seeing the character)

KX: 梦. Dream.

Ning: Yes. How do you know that?

KX: Cause I think it was 阳老师 said that some American said that I had a dream. I thinks it's Martin Luther King. Cause like “我有一个梦”.

Ning: Teacher Yang told you like that?

KX: Yeah. Sometimes I remember the characters like that sometimes. I don't actually remember using that character I think.

Ning: So you link this one with the sentence?

KX: I link the character to the class.

Seventh character

KX: No.

Seventh word with the seventh character

KX: No.

Eighth character

KX: No.

Eighth word with the eighth character

KX: No.

Ninth character

KX: No. I think I should know it.

Ning: No worries. Take it easy.

KX: I know the one on the right is 方. The left part is to do the language. But I don't know what's the meaning.

Ninth word with ninth character

KX: 访问? Like a survey? Questionnaire?

Ning: Not really.

KX: (.) OK. Then no.

Tenth character (Tenth word was ignored as the participant named the word when seeing the character)

KX: 难. Difficult. 很难.

Ning: How can you know that?

KX: Because the pronunciation is like man. (laugh). That's how I remember that one. I just remember purely just because that one is a little bit difficult to write when I firstly learned them. Cause I am always getting a lot of strokes in the right component. But It's mainly just to do the pronunciation. That's how I remember. Cause the way that I learned is 难 equals man. So man are difficult. (laugh).

Ning: We finished. Please move back.

End of stimulated recall session

Ning: So reflecting on your Chinese character learning since we last met, how do you think you have performed?

KX: Definitely could done better. But I think it's due to having the essays and stuff that I didn't have as much time to put into it. But I know I could have done better this time around with the characters.

Ning: So it's like of external facts to affect your learning?

KX: Yeah, I just need to make time to get essays and stuff done. I wasn in fact like "Okay I'll do characters as more". I just I have to get other things done as well.

Ning: Finally, is there any aspect of your experience of learning Chinese characters that has not been covered in the interview?

KX: No, I don't think so.

Appendix E: Participant information leaflet and consent form

TRINITY COLLEGE DUBLIN
SCHOOL OF LINGUISTIC SPEECH AND COMMUNICATION SCIENCES
RESEARCH ETHICS APPLICATION FORM

Participant Information Leaflet

TRINITY COLLEGE DUBLIN
SCHOOL OF LINGUISTIC SPEECH AND COMMUNICATION SCIENCES
Chinese character learning strategy in foreign language education
Principal Investigator Ning Jiang
Supervisor: Adrian Tien

You are invited to participate in this research project which is being carried out by Ning Jiang. Your participation is voluntary. Even if you agree to participate now, you can withdraw at any time without any consequences of any kind.

The study is designed to gain a detailed and overall understanding of the learning strategies deployed by university students in the process of Chinese character acquisition. The study aims to describe and evaluate the learning strategies of foreign students acquiring Chinese in different stages.

If you agree to participate, this will involve you finishing 10 questionnaires and 10 one-to-one discussions in 12 months.

These questionnaires and investigations will take you a few times over short sessions to complete them. You might feel uncomfortable when you failed to recognize characters in the stimulated tasks or discuss their learning outcomes in interviews or questionnaires. But any discomforts will be minimized by the researcher.

You will not benefit directly from participating in this research.

This research will be beneficial in terms of improving of teaching Chinese as a foreign language.

Any information or data which we obtain from you during this research which can be identified with you will be treated confidentially. This will be done by removing your name from the data and keep the data in my laptop. The data will be kept only by the researcher and the school of Linguistic, Speech and Communication Sciences.

Portions of the recording may be played in linguistics classes or during conference presentations, or written transcriptions may be made for teaching purposes or for linguistic analysis. Data from this research project may be published in future. The original recording and all copies will be available only to the present investigators or to investigators in other academic institutions engaged in similar work. The recordings will be kept in a secure location in the School which will be locked when the researchers are not present.

If you have any questions about this research you can ask me. You are also free, however, to contact any people involved in the research to seek further clarification and information.

TRINITY COLLEGE DUBLIN
SCHOOL OF LINGUISTIC SPEECH AND COMMUNICATION SCIENCES
Consent Form

Chinese character learning strategy in foreign language education
Principal Investigator Ning Jiang
Supervisor: Adrian Tien

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I will not benefit directly from participating in this research. I understand that this research will be beneficial in terms of improving of teaching Chinese as a foreign language.

Any information or data which is obtained from me during this research which can be identified with me will be treated confidentially. This will be done by removing my name from the data and keep the data in my laptop. The data will be kept only by the researcher and the school of Linguistic, Speech and Communication Sciences.

Portions of the recording may be played in linguistics classes or during conference presentations or written transcriptions may be made for teaching purposes or for linguistic analysis. Data from this research project may be published in future. The original recording and all copies will be available only to the present investigators.

Materials that are sensitive will be kept in a secure location in the School which will be locked when the researchers are not present. If copies are made available to researchers elsewhere, similar conditions regarding the storage and use of recordings will apply. At the time of this application, no sensitive material is expected to be part of data collection.

If I have any questions about this research I can ask Ning Jiang (0873865365). I am also free, however, to contact Adrian Tien (+353 1896 4035 or tiena@tcd.ie) involved in the research to seek further clarification and information.

Signature of research participant

I understand what is involved in this research and I agree to participate in the study. I have been given a copy of this consent form to keep.

Signature of participant

Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study.

Signature of researcher

Date

Appendix F: The list of the stimuli, classified according to the taxonomy adopted in the study (liùshū)

Test	Stimuli	Taxonomy	Words
Stimulated Recall Task 1	洲	Pictograph Ideographic Ideograph Phonosemantic	欧洲
	邮	Phonosemantic	邮局
	旅	Ideograph	旅行
	重	Phonosemantic	重复
	早	Ideograph	早上
	信	Ideograph	写信
	馆	Phonosemantic	图书馆
	正	Ideographic	正确
	忘	Ideograph	忘记
	翻	Phonosemantic	翻译
Stimulated Recall Task 2	记	Phonosemantic	记错
	裹	Phonosemantic	包裹
	典	Ideograph	词典
	费	Phonosemantic	邮费
	护	Phonosemantic	护照
	汽	Phonosemantic	汽车
	像	Phonosemantic	好像
	铁	Phonosemantic	地铁
	糟	Phonosemantic	糟糕
	旧	Phonosemantic	旧的
Stimulated Recall Task 3	因	Ideograph	因为
	热	Phonosemantic	天气热
	器	Pictograph	乐器
	惯	Phonosemantic	习惯
	花	Phonosemantic	花儿
	演	Phonosemantic	演奏
	相	Ideograph	照相
	章	Ideograph	文章
	恭	Phonosemantic	恭喜
	急	Phonosemantic	着急
Stimulated Recall Task 4	同	Ideograph	不同
	赛	Phonosemantic	比赛
	校	Phonosemantic	学校
	后	Ideograph	以后
	提	Phonosemantic	提高
	踢	Phonosemantic	踢球
	右	Ideograph	右边
	远	Phonosemantic	不远
	卫	Ideograph	卫生
	卧	Ideograph	卧室
Stimulated Recall Task 5	越	Phonosemantic	越剧
	虽	Phonosemantic	虽然
	情	Phonosemantic	爱情

	故	Phonosemantic	故事
	座	Phonosemantic	座位
	梦	Ideograph	做梦
	角	Pictograph	主角
	优	Phonosemantic	优美
	访	Phonosemantic	访问
	难	Phonosemantic	很难
Stimulated Recall Task 6	角	Pictograph	主角
	邮	Phonosemantic	邮局
	忘	Ideograph	忘记
	裹	Phonosemantic	包裹
	踢	Phonosemantic	踢球
	优	Phonosemantic	优美
	旅	Ideograph	旅行
	信	Ideograph	写信
	器	Pictograph	乐器
	后	Ideograph	后面
	梦	Ideograph	做梦