Investigating the Effectiveness of Game-Based Teaching and Learning in Enhancing Student Engagement in Mandarin Class

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Dedication

To Mum,

the best parent I could wish for,

and the most important educator in my life

and Dad,

how I wish you were still around.

给妈妈，

最好的母亲

我人生中最重要的老师

给爸爸，

如果您还在就好了

Acknowledgements

Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

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(Signature)

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Declarations

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List of Abbreviations

ANCOVA   analysis of covariance

GBTL   game-based teaching and learning

HREA   Human Research Ethics Application

HREC   Human Research Ethics Committee

ICSEA   Index of Community Socio–Educational Advantage

MCEETYA   Ministerial Council on Education, Employment, Training and Youth Affairs

NALSAS   National Asian Languages and Studies in Australian Schools

NAPLAN   National Assessment Program—Literacy and Numeracy

NESA   NSW Education Standards Authority

NSW   New South Wales

PIS   participant information sheet

RHS   Rosette High School

ROSETE   Research-Oriented School-Engaged Teacher Education

SERAP   State Education Research Application Process

SES   socioeconomic status

UK   United Kingdom

Abstract

In the past decade, the Australian government has been emphasising the importance for all Australians to become Asia literate by promoting the learning of Asian languages in schools. However, in spite of the unremitting efforts made by the government, researchers, and educators, the retention rate of students who study Chinese as a second language in school remains strikingly low. Previous studies have attributed this issue partly to the failure to engage students in class. Therefore, this study aimed to investigate whether a game-based teaching and learning (GBTL) approach is effective in engaging students studying Mandarin. It addressed the research question: *Does GBTL impact the engagement of secondary school students studying Mandarin in the Western Sydney region?*

This study is a mixed methods action research that adopts a quasi-experimental pre-test post-test design. The research site was a high school located in the Western Sydney region. Seventy-four students from four Year 7 classes and a school mentor teacher participated in this study. Data collection involved student surveys, quantitative and qualitative in-class observations of the students, semistructured interviews with student participants and the mentor teacher, and the teacher–researcher's self-reflection journal. The data were analysed using both quantitative and qualitative research techniques of statistical tests, coding, and thematic categorisation.

Four key findings were revealed by the study:

Key Finding 1: GBTL was effective in enhancing both high-achieving and low-achieving classes' engagement level in Mandarin class.

Key Finding 2: Quantitatively, there was no significant difference between the extent of changes in students' engagement level of the high-achieving class and the low-achieving class, but qualitatively, the engagement level of the low-achieving class was found to be more enhanced than that of the high-achieving class.

Key finding 3: The effectiveness of GBTL was heavily dependent on the teacher's choice of game, the teacher's practical knowledge, and students' social skills.

Key finding 4: The effectiveness of GBTL was achieved through the opportunity for students to interact with the target language, turning them into active learners and improving peer and teacher–student relationships.

The findings support the effectiveness of GBTL in foreign language teaching in terms of enhancing students' in-class engagement, and provide a series of recommendations to guide teachers and future research.

Chapter 1. Introduction

1.1 Introduction

The current study investigated the effectiveness of game-based teaching and learning (GBTL) in enhancing secondary school student engagement in Mandarin class. Chapter 1 starts by detailing the research background, including the contextual information and the teacher–researcher's personal experience, to explain the teacher–researcher's interest in this topic. The author then introduces the overarching research question and three contributory questions, followed by the significance of the study and research approach. This chapter concludes with an outline of the thesis structure as a road map for the reader.

1.2 Research Background

1.2.1 Global and Australian Context

China is considered a growing economic and political power, which has greatly stimulated people's interest in learning Chinese worldwide (Scrimgeour, 2014). In 2017, reportedly 489,200 international students from 204 countries and regions came to China for language study or higher degree education (Ministry of Education of the People's Republic of China, 2018). This figure had increased by more than 10% compared with the number in 2016. In the meantime, the Chinese government is putting enormous effort into promoting overseas Chinese language education. The official institution of Chinese language teaching globally—the Office of Chinese Language Council International, which is commonly known as Hanban (汉办)—announced that it had successfully established 548 Confucius Institutes and 1,193 Confucius Classrooms in 154 countries and regions by the end of 2018 (Hanban, 2019). In some media reports, this phenomenon has been referred to as 'Chinese fever' (中文热/ zhōngwénrè) (Scrimgeour, 2014).

Even more remarkable is government-level appreciation of Chinese language education among English-speaking countries. The United Kingdom's (UK's) Department of Education, for example, regards learning Chinese of vital importance for the UK's economic development as well as beneficial for its youth's individual development (Zhu & Li, 2014). According to *People's Daily*, the U.K. government projected the number of people who choose to learn Chinese as a foreign language will reach 400,000 by the end of 2020 (Li, 2017).

According to the Australian Bureau of Statistics, since 2011, due to the upsurge of immigrants from China, Chinese (including Mandarin, Cantonese, and other regional languages) has been confirmed the most commonly spoken second language in Australia (Scrimgeour, 2014). The Australian government has gradually realised the increasing need for Australia to 'communicate, cooperate, collaborate and compete in a globalised, China-engaged world' (Orton, 2016b, p. 36), and thus has published certain policies to promote the learning of Asian languages, Chinese in particular. For instance, the *Australia in the Asian Century White Paper* (Australian Government, 2012) declared that 'relying on the language capabilities of Asian–Australians for all Australia's relationships and engagement will not be adequate. Proficiency in more than one language is a basic skill of the 21st century' (p. 170). In the same vein, the *Melbourne Declaration on Educational Goals for Young Australians* (Ministerial Council on Education, Employment, Training and Youth Affairs [MCEETYA], 2008) emphasised the necessity for all Australians to become 'Asia literate' due to the major power shift in Asia–Pacific regions in recent years. As a result, the Chinese language is taught in all states and territories in Australia regardless of education system, and Chinese language programs in schools are developing steadily (Orton, 2016a).

1.2.2 Problems in Chinese Language Education in Australian Schools

In spite of Chinese fever's advent on a global scale and the Australian government's great attention to it, there are serious problems in Chinese language education that should not be overlooked. These difficulties can be summarised into the following three aspects: the low learnability of the Chinese language, the lack of need and opportunities to use Chinese in students' daily life, and the shortage of meaningful activities in Mandarin class.

The first obstacle to Chinese language education lies in the reportedly low learnability of the language for speakers of English (Singh & Ballantyne, 2014). Challenged by tones, characters, and a lexicon with no cognates, it takes an English speaker about three-and-a-half times longer to achieve the same level of proficiency in Chinese as in a European language (Orton, 2016a). This slow progress of language acquisition fails to 'address [beginning second language (L2) learners'] needs for rewarding or successful learning experiences', and neither does it 'sustain their desire for learning Chinese' (Singh & Ballantyne, 2014, p. 201). In other words, it is vitally important to create a sense of 'I have learnt something' for beginning L2 learners or the frustration caused by the failure in language acquisition will result in the gradual collapse of the learner's self-confidence. Under these circumstances, learners would rather not waste time learning a language that seems impossible to master.

Another significant problem is students' general lack of need and opportunity to use the Chinese language in their daily lives. Orton and Cui (2016) considered need and opportunity two potent drivers of successful language learning. However, there seems to be no need or opportunity for students of non-Chinese backgrounds to communicate with the language in their everyday lives. On the one hand, Australian students rely on the status of English as the official and international language, while Chinese remains a minority language for them. This is also described as the 'monolingual mindset' or the 'Anglobubble', which means monolingual English speakers living in an English-majority country may believe this is the

case for the rest of the world (Moloney & Xu, 2018, p. 9). Therefore, most students are unlikely to feel motivated to learn Chinese, especially when they cannot see the advantage of mastering the language for their future individual development (Orton, 2016a). Regrettably, it may take considerable time for changes to take place in the public's mind.

On the other hand, the dominant use of English as the everyday instructional and communicative language also means limited opportunity for engaging and interacting with the Chinese language (Scrimgeour, 2014; Singh & Han, 2014). There is nowhere appropriate outside school for non-Chinese-background learners to speak Chinese instead of using English or their own language (Z. Chen, 2015). Without the support of a Chinese-speaking environment, students do not have the opportunity to review and test out what they have learnt in school (Z. Chen, 2015). In turn, learning a language that cannot be used anywhere in students' everyday lives has a negative influence on their motivation.

A third weakness in Chinese language education is the shortage of meaningful activities in Mandarin class (Orton & Cui, 2016). Orton and Cui (2016) stated that students rarely have the opportunity to write or speak about things that matter to them. Sometimes, even, they feel the need to make up stories that never happened in their real lives (Orton & Cui, 2016). 'Students listen, they speak, they read, they write—but for no clear purpose and with no particular audience in mind' (Scrimgeour, 2014, p. 160). In this case, learners neglect their own communicative needs and interests, and gradually, their enthusiasm for learning Chinese fades. Singh and Ballantyne (2014) generalised this as the failure to mobilise the educational interests of beginning L2 learners.

For these reasons, the past decade has witnessed a strikingly low retention rate of students who study Chinese as a second language in Australian schools. Statistics show that although the number of students learning Chinese has reached 172,000 nationally, only 2.4% continue their study through to Year 12, and of those, about 90% are of Chinese background

(Orton, 2016b). This provided a key reason for conducting the current research, that is, to engage secondary school beginning Chinese language learners with game-based class activities and provide the need and opportunities for them to use Chinese both in class and in their everyday lives.

1.2.3 Personal Experience

The research topic is closely related to the researcher's personal experience as a volunteer Mandarin teacher in Australian schools. The researcher was a member of the Research-Oriented School-Engaged Teacher Education (ROSETE) program and since October 2017 had been assigned to a secondary school in the Western Sydney region to work as a volunteer teacher. Before the teacher–researcher undertook her teaching activities, she had observed the former volunteer teacher's Mandarin class over a school term. It was the students' first year of learning Mandarin, and the teacher had introduced them to topics including greetings, numbers, animals, shopping, colours, and fruits. The majority of students showed enthusiasm in learning Mandarin and were willing to develop an amicable relationship with their Mandarin teachers.

As beginning learners, the students' Mandarin lexical knowledge was extremely limited; therefore, the teacher largely delivered the classes in English. This had led to a further reduction of students' opportunity to practise Mandarin in school. After studying Mandarin for a year, the vocabulary that students could use initiatively and proficiently were frequently used greeting words such as 你好 (nǐhǎo/hello), 再见 (zàijiàn/goodbye), and 谢谢 (xièxie/thanks). Other Mandarin vocabulary introduced to the students tended to be learnt and then forgotten quickly. Though it was fair to say that a 50-minute class per week was far from enough for successful foreign language acquisition, I expected students to make full use of the Mandarin class and to practise speaking Mandarin as much as possible.

During the researcher's observation, she also noticed that one could tell distinctly whether the students were engaged in a class through their behaviour. That is, if the students were engaged in a lesson, they tended to pay full attention to the teacher and the tasks assigned to them. On the contrary, if the teacher failed to intrigue the students, they would look down and do their own business, or even worse, they would start to 'muck up' and disturb the class. Among the classroom activities, the teacher–researcher observed that educational games had the best effect in engaging the students and promoting the learning of Mandarin. Children loved games. In class, they eagerly asked the teacher–researcher the meanings of the Mandarin words they encountered in the games. They practised these words again and again voluntarily and immersed themselves in playing these games. Moreover, they always asked the researcher after class, 'Miss, can we play this game again next time?' Collectively, these incidences led the researcher to consider the possibility of using games as a technique to enhance students' engagement in class and improve their Mandarin level. As a result, the researcher set out to investigate the effectiveness of a GBTL approach in engaging secondary school students in their Mandarin class in this research.

1.3 Research Purpose and Research Questions

This study was fuelled by the apparent failure of Mandarin language education in Australia in terms of mobilising students' educational interests and engaging them in class. The purpose of this study was to investigate the effect of GBTL on students' engagement level in Mandarin class in a public high school in the Western Sydney region. In particular, it attempted to examine whether GBTL impacts high-achieving and low-achieving classes differently, explore the prerequisites for its effectiveness, and illustrate how the effectiveness was achieved.

Grounded in previous research on problems existing in Chinese language education in the Australian context, in combination with the teacher–researcher's preliminary

observations, this research proposed to address the following overarching research question: *Does GBTL impact the engagement of secondary school students studying Mandarin in the Western Sydney region?*

Specifically, the main research question was answered through three contributory subquestions:

Research Subquestion 1: *Is there an effect of GBTL on student engagement in high-achieving and low-achieving classes?*

Research Subquestion 2: *Does the impact of GBTL on engagement affect students of the high-achieving class and low-achieving class differently?*

Research Subquestion 3: *If GBTL is effective in enhancing student engagement, what are the prerequisites for its effectiveness and how is its effectiveness achieved? If not, what are the reasons for its failure?*

1.4 Significance of Study

This study and the teacher–researcher constitute part of the ROSETE program, which

> has been designed to support the research, teaching and learning of the Chinese language and culture in schools in Western Sydney; to build the capacity of the teaching service in Ningbo, People's Republic of China, for teacher-research and second language education, and to do so by generating evidence and knowledge that is to be made public. (Western Sydney University & New South Wales [NSW] Department of Education, 2017).

As can be seen from the value of the program, the significance of this study is at least threefold. First, this study responds to the Australian government's Asia Literacy policy. The Australian government's attention to Asian languages can be dated back to 1994 when the National Asian Languages and Studies in Australian Schools (NALSAS) program was

launched. For over 20 years, the Australian government's emphasis on Asia literacy, especially Mandarin, has been on the rise, considering China's rise as a great power in the world. However, as mentioned in Section 1.2.2, despite the government's great effort to promote Mandarin learning among school students, the high dropout rate continues to frustrate the government, schools, and teachers (Orton, 2016a).

This research responds to the Australian government's policy and has tried to provide a solution to this dilemma by focusing on finding ways to make Chinese learnable for Australian school students. First, the student participants of this action research benefited from it as the teacher–researcher developed a customised pedagogy for them in the learning of the Chinese language and culture in accordance with their needs and learning styles.

Second, the study has significance for the educational research field with regard to the teaching and learning of the Chinese language. Chinese is a language that distinguishes itself from European languages in many ways. Therefore, research achievements on the teaching and learning of European languages cannot be generalised to the Chinese language. Moreover, learners' language background differs from country to country. As a result, the impact of a first language on second/foreign language acquisition differs from one to another. Singh and Ballantyne (2014) explicitly pointed out the lack of research and debate concerning appropriate Chinese language content and methods for teaching and learning in Australia. Under this circumstance, research on Chinese language education, particularly in the Australian context, is necessary.

Student engagement has attracted a tremendous amount of scholars' attention, and numerous research projects have been conducted in recent decades. However, as Fredricks, Wang, et al. (2016) elaborated, most of this research has measured students' general engagement in school rather than in specific subject areas. This study adopted certain measurement instruments from previous studies and adjusted them to meet the needs of the

Mandarin class. In the meantime, GBTL remains a controversial but increasingly popular approach in the education field. A large amount of research has shown GBTL to be effective in assisting second/foreign language acquisition and enhancing student engagement in class (which I review in Chapter 2). However, there is limited investigation into its effectiveness on Mandarin learning. Nor have scholars examined its impacts on students of different academic achievement levels (high achieving/low achieving). This study intended to fill these research gaps in the literature.

1.5 Research Approach

The study was a mixed methods action research that adopted a quasi-experimental design. Four Year 7 classes—two high-achieving classes and two low-achieving classes— were randomly assigned as experimental groups and control groups. The two control groups were taught by traditional instruction previously used by the teacher–researcher, while the two experimental groups were distinguished from the control groups by employing a game-based approach. The teacher–researcher collected and compared pre- and post-survey data to determine the change in students' engagement level in Mandarin class following intervention by GBTL. The researcher and school mentor teacher observed the student participants and interviewed them in focus groups for data triangulation. The teacher–researcher analysed her self-reflection journal and interview with the mentor teacher. A combination of multiple methods and data collected from multiple perspectives ensured a more comprehensive understanding of students' engagement level in class and enabled the researcher to measure the differences in student engagement before and after the intervention, thereby determining the effectiveness of GBTL in engaging students studying Mandarin and identifying the prerequisites for its effectiveness and how the effectiveness was achieved.

1.6 Organisation of Thesis

This thesis comprises eight chapters. Chapter 1 details the background of Chinese language education, especially in the Australian context. It identifies existing educational problems and defines this study's research questions. The study's significance is addressed and the research approach introduced.

Chapter 2 reviews the literature associated with the research topic. After introducing the dimensions of student engagement and the assessment of it, the chapter discusses factors that influence student engagement. GBTL, a pedagogy that various studies have shown to be effective in enhancing student engagement in class, was chosen as this study's intervention and is explained in the chapter. The chapter then illustrates the outcomes of research that have applied this approach to second/foreign language teaching and learning.

Chapter 3 presents the methodology of this study. The chapter indicates the mixed methods action research methodology this study undertook. Details of the research design, which encompasses the research site, participants, the quasi-experimental design, level of learning, games used as intervention, and data collection instruments, are expatiated. The chapter also provides an overview of the data analysis process followed for surveys, observations, interviews, and the teacher–researcher's self-reflection journals. It ends with a discussion of the principles guiding the research procedures, including ethical considerations, validity, and reliability.

Chapters 4 to 6 are evidentiary chapters, focusing on data analysis and discussion. Each chapter corresponds to one research subquestion, providing evidence and answers to it. Chapter 4 analyses the statistical test results for the effectiveness of GBTL on student engagement in general, and Chapter 5 further examines group differences between the high-achieving class and the low-achieving class. Chapter 6, on the other hand, employs

qualitative data to identify the prerequisites for the effectiveness of GBTL and the ways it achieves its effectiveness.

In Chapter 7, the findings of this study are combined and summarised to shed light on the main research question.

Finally, Chapter 8 includes the key contributions, limitations, implications, and recommendations for further study in GBTL in Mandarin language education.

Chapter 2. Literature Review

2.1 Introduction

This chapter is composed of two parts. The first part reviews student engagement with regard to its definition, conceptualisation, assessment of it, and factors that influence it, while the second part focuses on GBTL. The definition of a game, GBTL, and the application of GBTL in previous studies are also included in this chapter.

2.2 Student Engagement

In recent years, we have witnessed students' continuous low levels of academic achievement, high levels of boredom, and high dropout rates (Fredricks, Blumenfeld, & Paris, 2004). Along with a general decline in motivation and respect for authority and institutions, such signs of student alienation have led to widespread dissatisfaction among parents, educators, and authorities (Fredricks et al., 2004). Under this circumstance, student engagement increasingly has become a popular topic and considered by researchers a possible solution to student alienation. This section reviews the literature related to student engagement to provide insights for the current study.

2.2.1 Defining Student Engagement

As with many other concepts that various scholars have studied, there is no unitary definition of student engagement. According to Payne (2017), attention to student engagement started with a concern for the barely satisfactory achievement of some students, and then the concept evolved into a way of understanding this problem and improving students' performance. Similarly, Finn and Zimmer (2012) stated the initial focus of student engagement was simply on enhancing students' attendance, but later it shifted to students' involvement in classroom activities. The latest emphasis of student engagement is on the process of finding out how to involve and motivate students in every lesson through various

pedagogies and classroom activities, rather than simply pursue superficial results such as high levels of academic achievement and increased attendance. Thus, it is not difficult to see that people's understanding of student engagement has been deepening as educators and scholars conduct more research about this concept.

The current research took a psychological perspective, viewing 'engagement as an internal psycho-social process that evolves over time and varies in intensity' (Kahu, 2013, p. 761). This viewpoint has become one of the three primary assumptions of engagement, namely, engagement is *malleable*, and various pedagogies and interventions can enhance it (Fredricks, Filsecker, et al., 2016; Lawson & Lawson, 2013). The other two assumptions are that the presence of engagement is positively related to students' learning outcomes, and students' engagement is theoretically different from motivations (Fredricks, Filsecker, et al., 2016; Lawson & Lawson, 2013). Motivation is conceptualised as 'the direction, intensity, and quality of one's energies', and it helps to explain the reason for an individual's given behaviours (Appleton, Christenson, & Furlong, 2008, p. 379). Though motivation could mean that students direct their energy towards school and/or the classroom, engagement is considered the embodiment of the behavioural, emotional, and cognitive activation of that energy and direction (Lawson & Lawson, 2013). As Dean and Jolly (2012) suggested,

> student engagement [is when] . . . not only students' time and physical energy [are] directed toward learning opportunities, but also the emotional energy required to enter into the adaptive learning process. Engagement occurs when students accept a level of identity-based risk and are willing to experience potentially emotional outcomes associated with learning, both positive and negative. (p. 235)

Due to this, some researchers have defined engagement as 'energy in action, the connection between person and activity' (Russell, Ainley, & Frydenberg, 2005, p. 1). In addition, Appleton, Christenson, Kim, and Reschly (2006) stated that one could be motivated

but not necessarily actively engaged in a task; therefore, motivation and engagement are separate but not orthogonal.

The psychological perspective is that feeling and thinking are 'inseparable, interwoven dimensions of human social life' (Forgas, 2000, cited in Kahu, 2013, p. 762); therefore, student engagement is regarded as *a multidimensional construct,* which enables a rich understanding of the individual's experience. Though the definition of engagement varies, the majority of the literature agrees on the multifaceted nature of engagement. For example, Munns and Woodward (2006) described engaged students as those who are emotionally satisfied with working on the tasks assigned in class and refrain from disruptive behaviours. Fredricks et al. (2004) proposed engagement is a multidimensional construct that occurs in a learning situation when *behavioural*, *emotional,* and *cognitive* components are strongly presented simultaneously. Finn and Zimmer (2012) went a step further to identify four dimensions of engagement that repeatedly appear, namely, academic engagement, social engagement, cognitive engagement, and affective engagement. Academic engagement focuses on the behaviours that have direct relations with the learning process, whereas social engagement emphasises the extent to which a student follows the classroom rules of behaviour (Finn & Zimmer, 2012). Though it is doubtful this classification approach provides a more detailed guide for observation, both these terms can largely be considered subcategories of behavioural engagement.

Unlike others, Appleton et al. (2006) added *psychological engagement* in their research taxonomy to examine a student's feelings of identification or belonging, and relationships with teachers and peers. Other dimensions that have been identified include *a will to succeed* (Kahu, 2013) and *agentic engagement* (Sinatra, Heddy, & Lombardi, 2015) which happens when a student takes proactive action to enrich, personalise, modify, or request instruction in class. These dimensions are used to predict students' achievement and motivation. However,

the validity of agentic engagement is inconclusive, and as a new idea, it requires more research.

2.2.2 Conceptualising Student Engagement

The current research adopted the universally agreed-upon three dimensions of engagement, which are behavioural engagement, emotional engagement, and cognitive engagement. The following section illustrates each dimension and its relationship. The section also introduces an evolved engagement framework, which comprises two levels of engagement: small 'e' engagement and big 'E' Engagement.

2.2.2.1 Behavioural engagement. Behavioural engagement 'draws on the idea of participation; it includes involvement in academic and social or extracurricular activities and is considered crucial for achieving positive academic outcomes and preventing dropping out' (Fredricks et al., 2004, p. 60). This means when a student is engaged in the classroom, they should display positive behaviours that demonstrate involvement in learning, such as effort, attention, and concentration, whereas disruptive behaviours are supposed to be absent. Similarly, Sinatra et al. (2015) defined behavioural engagement as positive conduct, involvement in one's own learning and academic tasks, and participation in school-related activities. Also in this camp, Kahu (2013) added to the previous definition of rule following, including attendance. Munns and Sawyer (2013) suggested the term 'behavioural' should be changed to 'operative' due to the fact that it 'provides a stronger pedagogical and outcome focus for both students and teachers' (p. 21). But regardless of the subtle differences among these terms, behaviour has always been an indispensable and noticeable component of engagement.

This begs the question as to how researchers judge whether a student is engaged behaviourally. Sinatra et al. (2015) provided some indicators of referential significance; for example, is the student making effort and being persistent? Do they show evidence of paying

attention in class, such as making eye contact or leaning forward during discussions? Other indicators include autonomous academic behaviours such as exhibiting resiliency when facing challenges and seeking out information without prompting or assistance. Student conduct is generally seen as a key predictor of students' learning outcomes (Lawson & Lawson, 2013). Students who are more behaviourally engaged in school, that is, whose behaviour better fits the criterion and expectations of school, tend to experience better educational and social outcomes than students with conduct problems. Moreover, Axelson and Flick (2010) suggested that behavioural engagement is often regarded as an implicit representation of emotional and cognitive engagement since it is more evident in observation. However, Sinatra et al. (2015) argued that being behaviourally engaged does not necessarily mean strong cognitive/metacognitive engagement is also present; therefore, nor can behavioural engagement be used as an accurate predictor of students' achievement in exams.

2.2.2.2 Emotional engagement. Existing studies about emotional engagement can be divided into two categories. The first category examines the relations between students' emotional engagement and their academic pursuits through assessing their levels of interest—enjoyment, happiness, boredom, and anxiety—during academic activity (Lawson & Lawson, 2013). In this context, emotional engagement 'encompasses [a student's] positive and negative reactions to teachers, classmates, academics, and school, and is presumed to create ties to an institution and influence willingness to do the work' (Fredricks et al., 2004, p. 60). As Kahu (2013) stated, these studies have focused more on immediate emotions in the learning task. Studies have associated activating emotions with engagement, whereas deactivating emotions, such as relief, are considered causes that lead to the loss of focus and disengagement with the material or context (Sinatra et al., 2015). In addition, compared with negative emotions, positive emotions generally have more advantage in enhancing engagement (Sinatra et al., 2015).

The second category attends to students' broader and prolonged emotions, such as their feelings of belonging, identification, and relatedness to their school peers, teachers, and the school overall (Lawson & Lawson, 2013). In these studies, emotional engagement is employed to describe a student's 'level of emotional response characterized by feelings of involvement in school as a place and a set of activities worth pursuing' (Finn & Zimmer, 2012, p. 103). Kahu (2013) claimed that in this case, engagement and attachment are much alike. Lawson and Lawson (2013) reported the significance of students' feelings and emotional attachments. That is, students who are attached to their school peers and teachers are more motivated to pursue and complete academic tasks. Conversely, students who lack such emotional attachments tend to be less engaged in school.

Since emotional engagement refers to students' affective reactions, some articles have addressed this as *affective engagement* (e.g., Lawson & Lawson, 2013; Munns & Sawyer, 2013). But again, despite the use of different terms, this dimension of engagement emphasises students' emotional reactions. Regardless of the various studies' focus on emotional engagement, most have found it to be positively related to students' achievement (Sinatra et al., 2015). A student's motivation to engage with a certain task is based on their expectancy of the success, interest, attainment value, utility value, and relative cost of that task, while positive emotions and emotional attachments are able to bring such perceptions of value and interest (Sinatra et al., 2015). This type of motivation is often referred to as intrinsic motivation, which means a student is motivated by interest and pleasure gained in the learning process (Kahu, 2013). Intrinsic motivation is often considered privileged to its counterpart—instrumental motivation. If a student is motivated instrumentally, it means they only engage behaviourally and cognitively to serve an end, such as high grades or a qualification (Kahu, 2013).

2.2.2.3 Cognitive engagement. Since being engaged is different from being entertained, emotional pleasure is not the only element under consideration; critical thinking related to the learning task should also be promoted during the engaging process (Lynch, Patten, & Hennessy, 2013). Cognitive engagement is widely defined as psychological engagement (Sinatra et al., 2015). It incorporates the idea of a student's level of psychological investment in learning, which is embodied when a student is self-regulated, thoughtful, strategic, and willing to go beyond the minimal requirements and expend the necessary cognitive effort to understand complicated ideas or master challenging skills (Finn & Zimmer, 2012; Fredricks et al., 2004; Fredricks, Filsecker, et al., 2016; Fredricks, Wang, et al., 2016; Kahu, 2013; Sinatra et al., 2015). This psychological trait makes cognitive engagement rather difficult to be observed and measured.

The studies of students' cognitive engagement can be separated into two categories. Studies in the first category examine students' dispositions towards schoolwork, such as the effort students put into homework and their level of persistence when facing difficult academic work (Lawson & Lawson, 2013). Studies in the other category, by contrast, focus on students' 'in-the-moment' cognitive engagement in learning tasks and aim to describe students' way of thinking deeply about ideas and concepts, their meaning-making process of the learning material, and their use of self-regulating and metacognitive strategies to master content (Lawson & Lawson, 2013).

Despite the different focuses, researchers have generally agreed that cognitive engagement can directly predict student achievement (Sinatra et al., 2015). Sinatra et al. (2015) also recognised increased motivation as a result of high levels of cognitive engagement. Students who are highly engaged and intrinsically motivated are particularly self-disciplined towards learning, which prompts them to go beyond simply understanding class content and/or receiving a better grade (Lawson & Lawson, 2013). Newman and

Wehlage (1993, cited in Lawson & Lawson, 2013) referred to this as 'authentic achievement' (p. 436). Moreover, cognitive engagement is reciprocally related to self-regulation (Cleary & Zimmerman, 2012) and self-efficacy towards a task (Schunk & Mullen, 2012).

2.2.2.4 Interrelationship of the three dimensions. Though studies often discuss separately these three dimensions of engagement, in reality, they are dynamically interrelated within the individual, rather than isolated processes (Fredricks et al., 2004). As Sinatra et al. (2015) stated, differentiating the dimensions can be difficult since emotional engagement seems to include cognitive and behavioural elements, while cognitive engagement intersects with emotional and behavioural engagement. More importantly, only when all three components are strongly interconnected can the term *engagement* be used (Munns & Sawyer, 2013).

2.2.2.5 Small 'e' engagement and big 'E' Engagement. In recent years, Munns and Sawyer (2013) elucidated an engagement framework that had evolved from the dimensions mentioned previously in this section. Their framework consists of two levels of engagement: the small 'e' engagement and the big 'E' Engagement. As illustrated in Figure 2.1, small 'e' engagement is when students 'think hard (high cognitive), feel good (high affective) and work towards being more productive learners (high operative)' (Munns & Sawyer, 2013, p. 21). Small 'e' engagement is the multifaceted construct discussed earlier in this chapter. Munns and Sawyer (2013) suggested teachers adopt the four components in the outer circle of small 'e' engagement to create an 'insider classroom' in which learners become valuable members of the learning community and contribute to all learners (Munns & Sawyer, 2013). In short, small 'e' engagement refers to student engagement in the classroom.

Figure 2.1. Small 'e' engagement.

Big 'E' Engagement, on the other hand, is

the more enduring relationship with education and school, a sense that education [is]

a resource that students [can] use productively in their present and future lives, and

that school [is] a place that work[s] educationally, socially and culturally for them.

(Munns & Sawyer, 2013, p. 19)

The connection between students and their institutions is an important part of student

engagement (Axelson & Flick, 2010). Big 'E' Engaged students are convinced that school

education is not a waste of time and what they have learnt at school is useful not only in the

present but also for their future. In general, big 'E' Engagement highlights students'

relationship with education and school outside the classroom, and seeks to develop their

abilities with an eye to the future for the bigger picture. With regard to the relationship

between small 'e' engagement and big 'E' Engagement, Munns and Woodward (2006) stated

that small 'e' is embedded within big 'E' (see Figure 2.2). Consequently, immediate

educational experiences in classrooms have the potential to forge a future-oriented

consciousness that education is a resource students can profit from in their long-term

development (Munns & Woodward, 2006).

Figure 2.2. Link between 'e' and 'E': 'future in the present'.

Note. From 'Student Engagement: The Research Methodology and the Theory', by G. Munns and W. Sawyer, in G. Munns, W. Sawyer, and B. Cole (Eds.), *Exemplary Teachers of Students in Poverty* (p. 23), 2013. Abingdon, England and New York, NY: Routledge. Copyright 2013 by G. Munns, W. Sawyer, and B. Cole.

2.2.3 Assessment of Student Engagement

Before the selection of a method of measurement, the first task is to construct a

definition of engagement and use it as a guide for the selection of measures (Sinatra et al.,

2015). A lack of definition and differentiation between the dimensions of engagement is

regarded as the reason for inconsistencies in measurement (Kahu, 2013). Consequently,

inconsistent use of items in the instruments across behavioural, emotional/affective, and

cognitive engagement scales has made it almost impossible to compare findings across

studies (Fredricks, Filsecker, et al., 2016). From the literature review, it was evident that

researchers consider engagement a multidimensional construct. Unfortunately, only a limited

number of studies on student engagement have employed valid and psychometrically sound measures that incorporate this multidimensionality.

Next, depending on the researcher's choice of theoretical framework and research questions, the 'grain size' of the context—that is, 'the level at which engagement is conceptualized, observed, and measured' (Sinatra et al., 2015, p. 2)—is determined. The grain size of research is crucial for the selection of measurement approaches. For instance, if a research study's focus is an individual's engagement in the moment or in a learning activity, the grain size for measurement would be at the micro level. In this case, physiological and psychological indices of engagement, such as brain imaging, eye tracking, response time, or attention allocation, would be extremely useful (Sinatra et al., 2015). On the contrary, if a research study intends to study a group of students in a class or school, macro-level indicators of engagement, including discourse analysis, observations, or ratings, would be more practical (Sinatra et al., 2015).

Student engagement was once measured by students' academic achievement. Empirical research has confirmed students' engagement behaviour is positively related to their academic performance (e.g., Finn & Zimmer, 2012; Fredricks et al., 2004; Skinner, Kindermann, & Furrer, 2009). However, other researchers have argued that the link between achievement and engagement may not always be present, or it may be weak (Payne, 2017). Therefore, students' academic achievement as a consequence of their engagement in class may only be considered as one indicator of student engagement. More recently, researchers have employed various methods for studying engagement that differ according to their research focuses, suggesting that a combination of multiple methods prevails over the use of a single instrument (Sinatra et al., 2015). I illustrate five commonly used methods for the assessment of student engagement and their limitations in the following paragraphs.

2.2.3.1 Student self-report. Self-report is considered the most common method of measuring engagement (Fredricks, Filsecker, et al., 2016). During the assessment, students are provided items that reflect different aspects of engagement, and they are asked to choose the responses that best describe them. Fredricks and McColskey (2012) pointed out that, other than objective data collected from behavioural indicators, self-reports provide data on students' subjective perceptions. It is therefore helpful in assessing emotional and cognitive engagement, which is not directly observable (Fortney, 2016). As a research method, self-reporting is practical and easily carried out in classroom settings (Fredricks & McColskey, 2012).

However, self-reports also have their limitations. First, researchers are concerned about the validity of students' responses (Kahu, 2013). Fredricks and McColskey (2012) deemed that, in some cases, students might not answer as honestly as researchers wish them to. Second, predefined questions in self-report techniques, such as surveys, provide no room for other perspectives, which can result in limiting student participants' voices (Kahu, 2013). Third, the ambiguity of self-report measures, for instance, broadly worded items, unspecified engagement context (school, peer, or classroom), and the aspects of engagement being measured (single dimension or a general measure of engagement), can negatively influence the validity of responses (Fredricks & McColskey, 2012; Kahu, 2013). Last, by capturing only a single snapshot of students' in-the-moment engagement, self-reporting ignores the dynamic and situational nature of it (Kahu, 2013).

2.2.3.2 Experience sampling. Experience sampling is an innovative methodological technique that provides an alternative for assessing engagement from a moment-to-moment perspective. Experience sampling asks student participants to report their location, activity, and emotional and cognitive experiences when a signal, typically from an electronic pager or alarm watch, is sent at random moments (Shernoff, Csikszentmihalyi, Schneider, & Shernoff

2003). Shernoff et al. (2003) affirmed the effect of experience sampling in gathering an individual's subjective experiences when interacting in natural environments. Importantly, rather than collecting data retrospectively, experience sampling enables in-the-moment data collection on engagement, which is significantly conducive to the avoidance of recall failure and the manipulation of responses in socially desirable ways (Fredricks & McColskey, 2012). However, the nature of experience sampling means it is time consuming for respondents, and the large investment of time can only yield answers to a small number of items; the quality of the data collected is also dependent on student participants' ability and willingness to cooperate (Fredricks & McColskey, 2012).

2.2.3.3 Teacher checklist/rating of students. Teacher checklists or rating scales offer another perspective on measuring student engagement different from students' self-reports. Various studies have used such checklists and rating scales to examine single or multiple dimensions of engagement, and they are extremely popular among studies that involve younger children who may have trouble completing self-report instruments (Fredricks & McColskey, 2012). It is notable, however, that teacher reports fit students' own perceptions better in behavioural engagement than in emotional engagement (Fredricks & McColskey, 2012).

2.2.3.4 Interview. In general, student participants are able to talk about their experiences in a more open-ended and unstructured way during interview. Interviews provide researchers with insight to understand the reasons for differences among individuals in their level of engagement (Fredricks & McColskey, 2012), that is, in the same classroom, why some students withdraw from the class while other students engage. With respect to this, interviews allow researchers to glimpse students' meaning-construction process about their school experiences that influence engagement (Fredricks & McColskey, 2012). However, the interviewer's knowledge, skills, and biases, and the reliability and validity of interview

findings, are a concern to researchers as they can deeply influence students' responses (Fredricks & McColskey, 2012).

2.2.3.5 Observation. Although student self-reports are advantageous in measuring emotional and cognitive engagement, observational methods work better in the assessment of behavioural engagement (Fortney, 2016). Skinner et al. (2009) believe that students' behavioural and emotional participation in the classroom can reveal engagement. Likewise, disengagement is observable since it is typically operationalised as passivity, lack of initiation, giving up, and occasionally, the emotions of dejection, discouragement, and apathy may be presented (Skinner et al., 2009).

Observational methods can operate at both individual and classroom levels to assess engagement. At the individual level, they can be adopted to record individual students' on- and off-task behaviour, using a form of momentary time sampling with predetermined coding categories (Fredricks & McColskey, 2012). For example, Skinner et al. (2009) developed a coding system composed of seven categories in their study of children's behavioural and emotional engagement in academic activities in the classroom. Among these, three categories captured students' on-task behaviour, three captured students' off-task behaviour, and one was for other unspecified events (see Table 2.1). However, this type of observation can be time consuming, as the data collection process involves various types of academic settings, and students' behaviours can be misjudged since observational methods provide only limited information on a student's quality of effort, participation, or thinking (Fredricks & McColskey, 2012).

Table 2.1

Engagement Assessment Coding Categories

Behaviour	Category	Example
On-task behaviour	On-task active initiative	Student raises hand or volunteers to go to the board
	On-task working	Reading, working on a problem, continuing an activity, or answering a question
	On-task passive	Listening to the teacher or a classmate making an on-task contribution
Off-task behaviour	Off-task initiative	Disrupting a classmate or interrupting the teacher with a non-academic issue
	Off-task working	Building paper airplanes, participating in a classmate's active off-task behaviour
	Off-task passive	Daydreaming or listening to a classmate's off-task contribution
Other	Other	All other events

Note. Adapted from 'A Motivational Perspective on Engagement and Disaffection: Conceptualization and Assessment of Children's Behaviour and Emotional Participation in Academic Activities in the Classroom', by E. A., Skinner, T. A. Kindermann, and C. J. Furrer, 2009, *Educational and Psychological Measurement, 69*(3), p. 503. Copyright 2009 by SAGE Publications.

Other than prespecified coding categories, observational methods also incorporate narrative and descriptive techniques, which can provide detailed information on the contextual factors when different engagement levels occur, to improve our understanding of the processes (Fredricks & McColskey, 2012). Researchers have also employed observational methods to verify the information collected from survey and interview techniques (Fredricks & McColskey, 2012). However, observations can be labour intensive and require proper training of the observer to capture and make sense of what has been observed for the sake of research reliability (Fredricks & McColskey, 2012).

2.2.4 Factors That Influence Student Engagement

As mentioned in Section 2.2.1, student engagement is malleable. This is of vital importance since if engagement were a nonmalleable trait of students, it would be pointless to make any intervention intended to influence it (Lam, Wong, Yang, & Liu, 2012). Because

engagement can be influenced by various factors, numerous studies, including the current one, are considered valuable in terms of bringing changes to a student's level of engagement. Factors that influence student engagement can be divided into two groups, namely, contextual factors and personal factors. Each factor is discussed in this section.

2.2.4.1 Contextual factors. Lam et al. (2012) reported that teachers' motivating instructional practices and the social–emotional support from teachers, parents, and peers significantly improved students' engagement in school. Therefore, contextual factors comprise two subcategories: instructional context and social relatedness (Lam et al., 2012). There are six important components of motivating instructional contexts: (1) challenge, (2) real-life significance, (3) curiosity, (4) autonomy, (5) recognition, and (6) evaluation (Lam et al., 2012). Shernoff et al. (2003) discovered that students were more engaged with authentic academic work, meaningful inquiry, and real-life problems, while a lack of challenge or meaning led to student disengagement. However, learning activities that gave students perceived control, such as individual and group work, engaged students better than listening to a lecture, watching a video, or taking a test (Shernoff et al., 2003). Therefore, Shernoff et al. (2003) suggested that teachers need to support students' sense of competency and autonomy by providing tasks that offer choice, relate to students' learning goals, and offer opportunities for the recognition of achievement. Activities perceived as challenging but still allowing students to feel in control of their learning environment and boost their confidence were also welcomed (Shernoff et al., 2003).

Social relatedness that affects student engagement in school is composed of five components: (1) teacher support, (2) parent support, (3) peer support, (4) aggression to peers, and (5) aggression from peers (Lim et al., 2012). Pianta, Hamre, and Allen (2012) proposed that, regardless of age or grade, positive relationships with teachers are fundamental to support student development. The more teachers care about students personally, the more

students would like to learn (Pianta et al., 2012). A teacher's depth of pedagogical content knowledge is also crucial in terms of supporting students' understanding of the connection between academic skills and their real-life experiences, as well as providing them a sense of control, autonomy, choice, and mastery during the learning process in order for children or youth to advance development and learning outcomes (Fortney, 2016; Pianta et al., 2012).

Bempechat and Shernoff (2012) stated that parents' behaviours and beliefs related to academic achievement could profoundly influence children's perceptions of their intellectual abilities and the value of learning and education. Peers, as another major part of students' social relationships, have also been shown to influence academic engagement. Juvonen, Espinoza, and Knifsend (2012) found that friends' behaviours, values, and social–emotional well-being, as well as children's perceptions of their friends' behaviours, were related to students' academic engagement and performance. Peer support can be divided into social support, which concerns an individual's emotions, and academic support, which focuses on an individual's learning (Juvonen et al., 2012). Both types of peer support can enhance a student's willingness to follow classroom rules, while academic support can further relate to students' academic social responsibility goals, active participation in class, and the reduction of discipline problems (Juvonen et al., 2012). On the contrary, students who experience peer rejection and bullying in school show lower levels of academic achievement and academic performance (Juvonen et al., 2012), and severe, negative social experiences with peers may lead to academic disengagement or even dropping out of school (Juvonen et al., 2012).

2.2.4.2 Personal factors. Ainley (2012) proposed that interest energises and directs students' interaction with classroom activities, the result of this process being situational engagement. Taking interest to a more complex level, individual/personal interest is facilitated by both the immediate situation and relevant past experience (Ainley, 2012). Students' engagement with classroom activities is not only impacted by their interests, in

particular, content of the immediate task, but also the more enduring individual interests are affected by their past experiences and play an important role (Ainley, 2012). For instance, Fortney (2016) concluded that, compared to other factors, students' past success in science had the most significant impact on students' engagement level in their science class. Additionally, Shernoff et al. (2003) recognised that the degree to which on-task behaviours had been rewarded or praised in the past was a positive influencer of students' engagement.

Other personal factors that may influence student engagement directly are students' motivational beliefs, namely, self-efficacy, goal orientation, and attribution (Lim et al., 2012). Self-efficacy refers to the level at which an individual believes their capability for learning and performing actions lies (Schunk & Mullen, 2012). Fortney (2016) pointed out students' perceived level of competence may have an enormous effect on their ability to learn and become engaged in school. Students with high self-efficacy tend to attempt more challenging tasks and do not quit easily; therefore, they are expected to be engaged in school (Lim et al., 2012). Moreover, compared to students with performance goals, students with learning goals are more persistent after failure (Lim et al., 2012). However, students who attribute their success and failure to effort will apparently put more effort into learning activities (Lim et al., 2012).

2.3 Game-Based Language Teaching and Learning

When traditional pedagogies fail to arouse students' interest and engage them in class, new ones are developed to make up this deficiency. Ainley (2012) suggested teachers could employ activities that attract students by their colour, sound, and movement, or by their novelty, complexity, and uncertainty, to trigger students' interest and capture their attention. Playing games, which are designed to be fun and engaging, is one activity that cannot be neglected (Benoit, 2017). This section focuses on GBTL, an approach that has commonly been used in language teaching and learning (see, e.g., H. Chen & Lin, 2016; Dwiaryanti,

2014; Franciosi, 2017; Liu & Chu, 2010). It starts with a definition of games and then enumerates elements that make a game engaging. I then explain GBTL, and the section concludes with a review of the application of the game-based approach in language teaching and learning.

2.3.1 Defining Games

Everybody loves games (Holmes & Gee, 2016). From the classic 'paper, scissors, rock' to the currently popular digital game*s*, games have always been a part of people's lives. A game is defined as 'a physical or mental competition conducted according to rules with the participants in direct opposition to each other' (Game, n.d.). The definition of game in a learning context, however, is slightly different. According to Koster (2005, cited in Kapp, 2012), 'a game is a system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction' (p. 7). From this definition, a learning game should comprise the following elements. First, a game is a *system*, which means each part of a game influences and is integrated with other parts of the game. Second, a game is an *abstraction* of reality that is based on certain elements of a realistic situation, but it does not have to be identical. Third, a game requires a person (*player*) who *interacts* with the game system, game content, or other players. Fourth, a game needs to be *challenging* to prevent players from losing interest. Fifth, a game should have *rules* that define the structure of the game, such as the sequence of play and the state of winning. Sixth, a game needs to provide players with *feedback* in the middle and a *quantifiable outcome* at the end. The outcome can be a score, level, or winning state as long as it is clear to the players. Finally, games are able to evoke strong *emotions*, both positive and negative.

Considering the extensive definition of a game, it is not hard to imagine the difficulty of classifying games into categories. Therefore, the current study focused on games

commonly used in the context of language teaching and learning. Hadfield (1999, cited in Dwiaryanti, 2014) suggested two ways to classify language games. With regard to the first classification, there are two types of games: *linguistic* games emphasise the accurate use of the target language and *communicative* games examine a learner's ability to exchange information and ideas successfully (Dwiaryanti, 2014). In the latter type, correct language usage is important but subordinate to the communicative goal.

The second taxonomy proposed by Hadfield (1999, cited in Dwiaryanti, 2014) to classify games is more elaborative and comprises the following eight categories: 'sorting, ordering, or arranging games; information-gap games; guessing games; search games; matching games; labelling games; exchanging games; and role play games' (pp. 141–142).

Each category has representative and famous games that have been shown to be effective in the teaching and learning of various languages. Examples are provided in Section 2.3.4.

2.3.2 Game Elements: What Makes a Game Engaging?

An estimated 99% of boys and 94% of girls engage in interactive gameplay (Benoit, 2017). After discussing what constitutes a game, this section attempts to understand what makes a game exciting, motivating, and irresistible. Kapp (2012) extracted 12 game elements that interrelate to make a game engaging: abstractions of concepts and reality; goals; rules; conflict, competition, or cooperation; time; reward structures; feedback; levels; storytelling; curve of interest; aesthetics; and replay or do over. Table 2.2 summarises Kapp's (2012) book to provide an explanation of each game element and its effects.

Table 2.2
Game Elements: Explanations and Effects

Game Element	Explanation and Effect
Abstractions of concepts and reality	These help players – manage the conceptual space being experienced; – identify cause and effect more clearly; – remove extraneous factors; – reduce the time required to grasp the concepts.
Goals	These add 'purpose, focus, and measurable outcomes' to a game (p. 28). Goals need to be – challenging, so they can keep motivating players and ensure sustained play; – achievable, so the players will not be too frustrated and quit playing the game. This requires building necessary prerequisite skills through scaffolding in previous game goals.
Rules	These 'are designed specifically to limit player actions and keep the game manageable' (p. 30). Different types of rules: – 'Operational rules' that 'describe how the game is played' (p. 30); – 'Implicit rules or behaviour rules' that 'govern the social contract between two or more players' (p. 30); – 'Instructional rules' that 'govern the learning within the process of the game' (p. 31); – 'Constitutive rules or foundational rules' that 'need only be understood by the designer of the game' (p. 30).
Conflict, competition, or cooperation	'A conflict is a challenge provided by a meaningful opponent. . . . The meaning of the play in the context of conflict is to become a winner while avoiding a loss at the hands of an opponent' (p. 31). The meaning of the play in the context of competition is 'to achieve the best possible accomplishment against the environment, obstacles, and the opponent. Winning is accomplished by being faster, cleverer, or more skilled than the opponents' (p. 32). 'Cooperation is the act of working with others to achieve a mutually desirable and beneficial outcome. This is the social aspect of games that many players enjoy. In these types of games, the more individuals work together, the more they are able to achieve' (p. 32).
Time	Time works as 'a motivator for player activity and action' (p. 32). The allocation of time during a game is critical to success.
Reward structures	These refer to badges, points, and rewards that are used to symbolise the achievement of a player in the game.
Feedback	Feedback 'is designed to evoke correct behaviour, thoughts, or actions' (p. 36). Two forms of informational feedback: – 'to indicate the degree of "rightness" or "wrongness" of a response, action, or activity' (p. 36);

	– 'to provide information' that guides the learner towards 'the correct outcome' (p. 36).
Levels	There are three types of levels in the game context: – Game levels: 'mission-based levels' to 'keep the game space manageable' (p. 38). Game levels help the story narrative progress, motivate players, and build and reinforce a player's skills; – Playing levels: to create a game that is both easy and hard through the use of different levels of entry into the game so players of all levels can participate; – Player levels: a player gains more and more experience as their level is upgraded.
Storytelling	Storytelling 'provides relevance and meaning to the experience' (p. 41). It provides the player with a context and helps them to learn the desired behaviours, actions, and thinking patterns that support the desired outcome within this context.
Curve of interest	'The interest curve within a game is the flow and sequence of events that occur over time that maintains the player's interest. The idea is to purposely sequence events within the flow to grab and hold the player's attention' (p. 45). Curve of Interest interest time 'The first part of the curve of interest is an entry point' (p. 45). 'Once the initial hook is "set", the next step is to settle down to business. If the learning experience is well crafted, the learner's interest will continually rise, temporarily peaking at different points. Finally, there is the 'climax', and the learning is then over. Hopefully, the learner leaves the instruction with some interest left over and with knowledge gained by the carefully sequenced instruction' (p. 45).
Aesthetics	'The aesthetics help the players become caught up in the game experience' (p. 46).
Replay or do over	This allows 'a player to fail with minimal consequences' and 'encourages exploration, curiosity, and discovery-based learning'. . . . 'Exploring failure and what it means is a valued approach' since it makes the player reconsider his or her approach to a game (p. 48). It also adds a sense that something was accomplished and achieved.
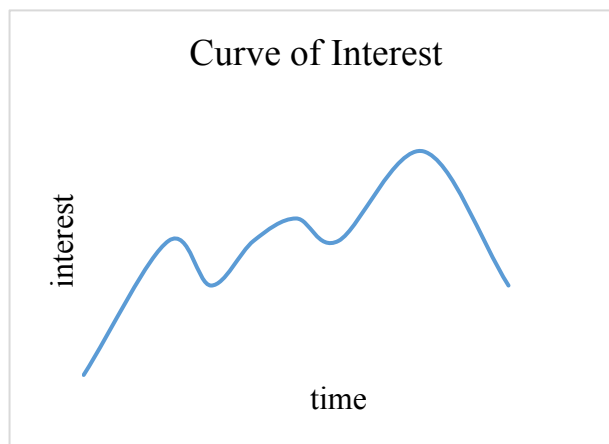
Note. From Kapp, 2012, pp. 26–48.

Understanding the effects of each game element gives researchers and teachers a better idea of not only why learners are engaged in a game, but also what kind of adjustments can be made so that a game will become more engaging and thus promote learning outcomes. Vandercruysse, Vandewaetere, Cornillie, and Clarebout (2013), for example, scrutinised the impact of adding the game element *competition* to a game-based language learning environment, and the results demonstrated that competition can be effective in improving students' performance during the interaction with the environment. Though they found only a weak relationship between competition and students' motivation, learning in a competitive environment indeed led to a higher level of perceived competence, invested effort, and task value (Vandercruysse et al., 2013). Additionally, Kapp (2012) looked into the influence of gaming uncertainty in reward structures and reported its ability in transforming the emotional experience of learning, therefore improving engagement, encoding, and later recall.

2.3.3 Game-Based Teaching and Learning

Children play with their peers, parents, and teachers every day, and learning occurs simultaneously in this process (Dwiana & Singh, 2011). For this reason, games are considered appropriate in learning environments, especially for younger students (Holmes & Gee, 2016). According to Holmes and Gee (2016), the last decade has witnessed a tremendous growth of GBTL in K–12 settings. This indicates that an increasing number of educators and researchers are accepting a game-based approach and admitting its effectiveness in improving students' learning. Hamari et al. (2016) provided evidence that engagement in the game is effective in enhancing learning. Despite the widespread use of GBTL in many subjects, however, this review focused on its application in second/foreign language education.

Reinhardt and Sykes (2012) defined GBTL in the context of language education as 'the use of games and game-inclusive synthetic immersive environments that are designed

intentionally for L2 learning and pedagogy' (p. 39). Franciosi (2017) proposed that most mainstream foreign language education models are comprised of three parts: 'meaning-focused' activities for applying the target language, 'form-focused' activities for practising linguistic form, and 'a post-activity phase' for reflecting and constructing knowledge (p. 123). GBTL here precisely refers to the use of games as a meaning-focused activity (Franciosi, 2017). A game-based approach is designed to combine learning with game playing (Liu & Chu, 2010), which happens to coincide with a Chinese idiom, 寓教于乐 (yùjiàoyúlè/make entertainment a medium of education), that reflects ancient Chinese educational philosophy. As Kapp (2012) stated, 'well designed games help learners acquire skills, knowledge, and abilities in short, concentrated periods of time with high retention rates and effective recall' (p. 13). Yet how to maintain the enjoyment of games without compromising the intended learning outcomes remains a major challenge for educators (Stanley, 2014).

2.3.4 Application of GBTL in Language Education

Amid the prevalence of the game-based approach in classrooms, a large amount of research has been conducted to examine the effectiveness of this approach in language teaching and learning, involving various languages and students from multiple age groups. Dwiaryanti (2014), for example, focused on the impact of colourful puzzle games on assisting junior high school students in Indonesia to understand and memorise the meaning of English vocabulary. The results indicated that a game-based approach creates an enjoyable atmosphere in the teaching and learning process and makes it easier to memorise and apply the vocabulary to daily conversations. Students' various kinds of intelligence, including visual/spatial intelligence, bodily/kinaesthetic intelligence, and interpersonal intelligence, are also developed through playing games (Dwiaryanti, 2014). Similarly, Liu and Chu (2010) incorporated games into high school juniors' English learning process. Through comparative

research involving pre- and post-tests, survey, and interview, they discovered that students who learn with a game-based method are more motivated and achieve better learning outcomes than those learning with a nongaming method (Liu & Chu, 2010).

Griva and Semoglou (2012) discussed a wide range of creative classroom activities such as memory and word games, role-playing games, and songs, as well as physical activities such as races, chases, and hopscotch, and their effectiveness in improving Grade 2 students' oral communicative skills in Greek English classrooms. They argued that games created a low-anxiety environment in which children tended to feel less stressed, which was beneficial for them to learn languages. Results of a pre- and post-test showed developed language skills among children and an increase in their motivation to participate. Moreover, playing games provided a variety of opportunities and a real reason for children to use a foreign language that satisfied their need to communicate for meaningful purposes.

Bao and Du (2015) applied three types of games, namely, information-gap games, dictogloss games, and role-playing games, to two Danish adult classes that were learning Chinese as a foreign language. The first thing they observed was an increased participation in classroom interaction since learners needed to give each other feedback (Bao & Du, 2015). Second, learners' oral, listening, and vocabulary-building skills significantly improved. Third, playing games encouraged learners to use the target language, further improving their ability to transfer what they had learnt in the classroom to the real world. Finally, a positive learning environment was created since the games eased learners' anxiety, boosted their confidence, and enhanced their motivation.

Further, Reinders (2012) explored the benefits of GBTL for language acquisition in general, and found that during game play, students were forced to participate actively in the learning process as they interacted with peers, content, and the target language. Fortney

(2016) pointed out that academic games can prompt students to pay more attention to learning tasks and improve their engagement and memory by eliciting an emotional response.

With the development of digital technology in recent decades, many researchers are turning their focus to digital game-based learning of languages. For instance, Dwiana and Singh (2011) tested the effectiveness of computer games in assisting 4- to 8-year-old children in Malaysia to learn Mandarin as a second language. Hu, Su, and He (2016) utilised educational games based on virtual reality to teach Chinese idioms to non-native speakers. Similarly, H. Chen and Lin (2016) adopted digital games to support the learning of Chinese language poetry in junior high schools in Taiwan. All three studies reported better learning achievements and improved learning experience among the learners.

Combining all the research findings discussed above, a game-based approach has multiple advantages; in particular, it

- integrates learning objectives to game tasks (Cai, Liu & Liang, 2010);
- aids students to acquire the target language knowledge and improves learning achievement;
- creates an immersive, interactive, and low-anxiety learning environment;
- enhances student engagement, learning motivation, and attention;
- provides learners with a context for meaningful communication to apply what they have learnt to the real world;
- simplifies the link between study and practice (Cai et al., 2010);
- improves different kinds of student intelligence.

2.4 Research Gaps

Student engagement can be examined in any discipline, task, or content area, and it is undeniable that there are certain domain-general aspects of engagement (Sinatra et al., 2015). Yet domain-specific aspects are worth considering since different types of instructions and

tasks shape and interact with student engagement in different ways (Fredricks, Wang, et al., 2016b; Sinatra et al., 2015). A review of the literature on student engagement revealed only a limited number of research studies on the conceptualisation and instrumentation of engagement in Mandarin classes. Moreover, Kahu (2013) pointed out that certain research studies have failed to differentiate the dimensions of engagement, and that the use of a single assessment method has led to questions about the reliability of the results.

GBTL is a controversial but increasingly popular approach in the field of education. A large amount of research has shown GBTL to be effective in facilitating second/foreign language acquisition. However, there has been only limited investigation into the impact of games on Mandarin learning. Is GBTL effective in enhancing secondary school students' engagement in the Mandarin class? Does it work differently for students of different academic achievement groups? What are the prerequisites for the effectiveness of GBTL, and how is the effectiveness achieved? As far as this research is concerned, previous research has provided extremely limited answers, especially to the last two questions.

To fill the gaps, the current study adopted multiple methods to assess student engagement and attempted to distinguish each component of engagement from another by defining it properly. The present research also incorporated Munn and Sawyer's (2013) idea of big 'E' Engagement with the commonly used three dimensions of engagement. Importantly, a set of self-reporting instruments specifically developed for Mandarin learning was employed to assess student engagement. The current research sheds light on the effectiveness of GBTL in enhancing various types of student engagement in the Mandarin class by accurately measuring variation in students' engagement levels.

2.5 Conclusion

This chapter reviewed an extensive literature on engagement and GBTL. Engagement is a multidimensional construct that comprises behavioural, emotional, and cognitive

components. Various instruments, such as student self-report, observation, and interview, can assess each of these components. Engagement is also malleable. It is influenced by a wide range of factors and can be enhanced using different pedagogies and interventions. Because of this, GBTL, a pedagogy shown to be effective in promoting student engagement in previous research, was examined in the current study for its effects in enhancing student engagement in Mandarin class.

Chapter 3. Methodology

3.1 Introduction

In this chapter, I introduce the mixed methods action research approach adopted by this study. I then elaborate the research site, participants, level of learning, games used in the intervention, and the complete research design. Following the research design, this chapter details what instruments for data collection were used and why they were chosen for this study. The next section demonstrates how the collected data were analysed and ends with the principles guiding the research procedure, including validity, reliability, and ethical considerations.

3.2 Methodology

The decision on which kind of research methodology to undertake directly determines instrument usage in a particular research study (Cohen, Manion, & Morrison, 2011). This study was a mixed methods action research study involving the collection and analysis of both quantitative and qualitative data.

3.2.1 Mixed Methods Research Approach

Mixed methods research integrates specific strengths of particular methods to reduce the weaknesses and biases of a single approach (Denscombe, 2008). The advantages of adopting a mixed methods approach are manifold, including enhancing the accuracy of data, providing a more complete picture of the question under study by using complementary kinds of data or sources, developing analysis and initial findings with contrasting kinds of data or methods, and assisting in sampling (Creswell, 2014; Denscombe, 2008). Given the increasing popularity of the mixed methods approach, Denscombe (2008) considered it 'the third major research approach or research paradigm' (p. 270) that coexists with quantitative and qualitative methods. Due to these factors, the current study employed four data collection

methods to collect both quantitative survey data and qualitative observation, interview, and self-reflection journal data.

Specifically, in adopting a mixed methods approach, this study followed the 'parallel mixed designs' method (Cohen et al., 2011, p. 25) in which both qualitative and quantitative approaches proceed simultaneously yet independently in addressing the research questions. The detailed research design is elucidated in the following section.

3.2.2 Action Research

Action research is defined as 'an inquiry conducted by educators in their own setting in order to advance their practice and improve their students' learning' (Efron & Ravid, 2013, p. 2). It is a form of participatory research employed to understand, improve, and reform a teacher's practice (Cohen et al., 2011). Action research is distinguished from traditional educational research in many ways. As Efron and Ravid (2013) stated, 'It is *constructivist, situational, practical, systematic, and cyclical*' (p. 7, emphasis in original), which means teachers are now researchers who investigate questions generated from local events, problems, and needs using a thoughtful plan of action to improve their own practices. These characteristics make action research perfectly suitable when there is a challenging pedagogical problem to solve. The teacher–researcher chose action research for this study because she had identified the lack of student engagement in her own Mandarin class as an educational problem, and aimed to enhance students' engagement in class by adopting innovative teaching practices. Thus, action research as a methodology suited the situation and needs of this study and was capable of providing answers to the research questions.

The procedures for action research are straightforward. Figure 3.1 illustrates an eight-stage action research model that includes a full cycle of reconnaissance, planning, acting, researching action, and evaluating action (Cohen et al., 2011).

Then plan
research

Implement
action

and

Plan
action

Act
thoughtfully

First plan
action

Monitor
action

(*together*)

Reconnaissance
(first cycle)

Reflect
(on action)

Evaluate
action

Research
action

First
produce
data

and

Review
(research)
process

Then
analyse
data

(*separately
and together*)
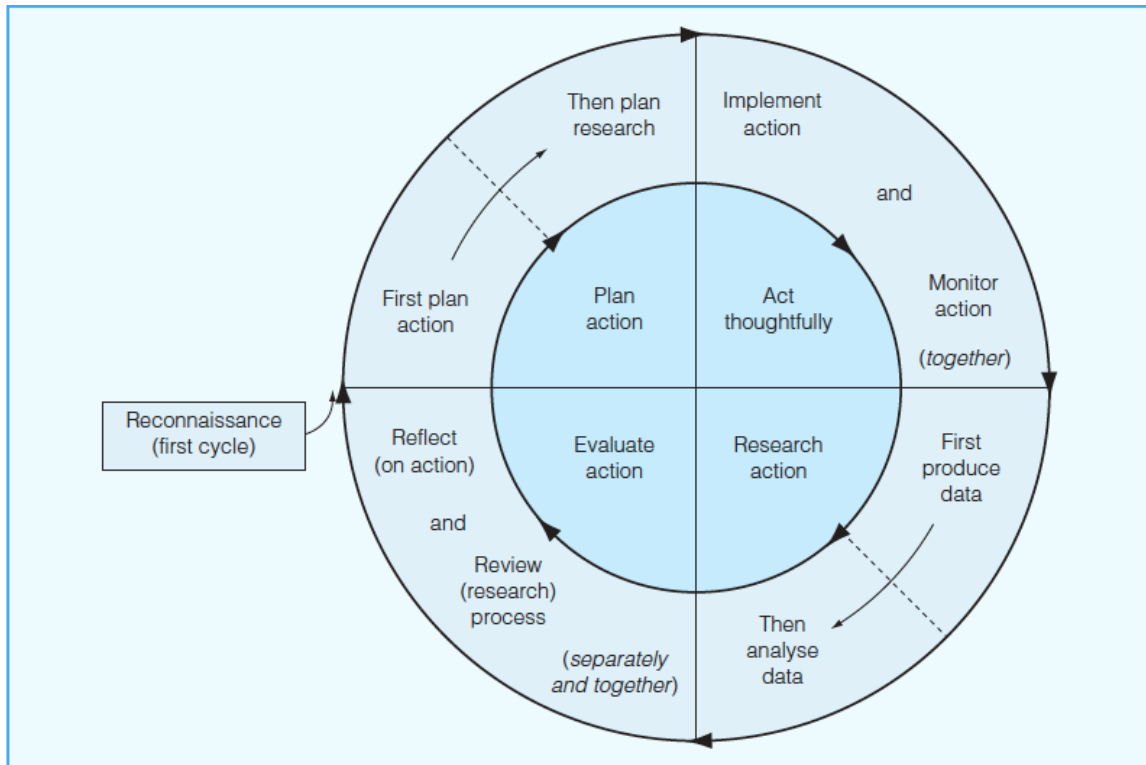
Figure 3.1. The full action research cycle.

Due to its cyclical character, action research usually starts with a question and ends with applying the research findings to a particular educational setting, which leads to new questions and a new cycle of research (Efron & Ravid, 2013).

Regarding the selection of research procedures, action research may incorporate various research designs that employ different methods of collecting data (Baumfield, Hall, & Wall, 2013). For example, a piece of action research might adopt

- an initial and end-of-intervention survey (a pre- and post-survey);
- an experimental or quasi-experimental design;
- a longitudinal study;
- participant and non-participant observation;
- interviews and field notes;

- one or more case studies;

- documentation from, and about, participants;

- questionnaire data. (Cohen et al., 2011, p. 355)

The current study employed a quasi-experimental design that compared pre- and post-survey results. A quasi-experimental design can assist in identifying causality, that is, whether a change is caused by a specific intervention, through a controlled intervention by means of control and experimental groups (Cohen et al., 2011). It also incorporated observation, interview, and the teacher–researcher's self-reflection journal as complementary qualitative data. Detailed research design and data collection methods are described, respectively, in Sections 3.3 and 3.4.

3.3 Research Design

Research sites and participants should be purposefully and intentionally selected to best understand a central phenomenon that an inquiry explores (Creswell, 2012). This section provides a detailed introduction of the research site and participants, and explains the reason they were chosen for this study. It defines the level of learning and explains the games used as an intervention in terms of game rules and reasons for selection. Finally, it demonstrates the design of the research and how it can draw conclusions to answer the research questions.

3.3.1 Research Site

The researcher was a volunteer teacher of Chinese language affiliated with the ROSETE program that was designed to support the research, teaching, and learning of the Chinese language and culture in schools in Western Sydney. As a member of the ROSETE program, the researcher was allocated to a secondary school, referred to hereafter by the pseudonym Rosette High School (RHS), to provide voluntary classroom support in teaching Mandarin language and Chinese culture.

RHS was a well-established and dynamic school located in Western Sydney, which had a total enrolment of 620 students ranging from Year 7 to Year 12. Only 8% of students were from families with a language background other than English. This meant the school was located in a relatively monolingual community. The Index of Community Socio–Educational Advantage (ICSEA) value of the school was 939, which was lower than the set average value of 1,000. This indicates a lower level of educational advantage of students who went to this school. Indeed, the majority of students were from the bottom and middle quarters, which corresponded respectively to 51% and 44% of the student population, leaving only 5% top quarter students. The numbers reveal the general deficiency of students' academic achievement. Considering these figures, GBTL was a method worth trying over other traditional teaching methods since it has been shown to be more attractive and interesting to students in lower socioeconomic status (SES) locales (Munns & Sawyer, 2013).

The school staff and students demonstrated their great support and enthusiasm for both the teaching and learning of the Mandarin language. Before becoming a member of the ROSETE program, RHS was in a program called Connect with China. The school principal and mentor teacher had undertaken quite positive roles in cooperating with Mandarin teachers and promoting the learning of Mandarin in the previous few years. The students had also expressed their interest in learning Mandarin and communicating with people from China in chats with the teacher–researcher.

3.3.2 Participants

Participants came from two parties: The first party was composed of Year 7 students enrolled at RHS, while the second party was the Year 7 French teacher. Based on school arrangements, four Year 7 classes could take a 50-minute Mandarin lesson alternately every fortnight during term time. That is, two classes had their Mandarin class during Week A and the other two classes during Week B. Based on the researcher's preliminary observations,

nearly all the students were beginner learners with no previous background in Mandarin Chinese, except for a handful of students who had been exposed to the target language in primary school. This largely eliminated the influence of past learning experience on the results of the current research. In addition, the method and materials being studied were appropriate for young students of the targeted age range and involved activities they would naturally encounter in their classroom.

Due to NSW's policy, a registered teacher was obligated to supervise the class while the researcher conducted teaching activities. The Year 7 French teacher who supervised the Mandarin class at RHS had already been a part of the ROSETE program. The teacher also served as mentor to the researcher. The French teacher therefore observed all the researcher's classes and was expected to provide feedback on the researcher's teaching practice, which would inform the researcher's investigations. The mentor teacher was a critical source of information as she was familiar with the school students who participated in this study, had experience in teaching in NSW schools, and was a firsthand observer of both the researcher's teaching practice and the school students' behaviours in class.

3.3.3 Level of Learning

The participants in this investigation were Year 7 high school students aged 12 to 13 years. The learning content for students in this study was designed based on the NSW Chinese K–10 Syllabus (2017) to satisfy the needs of students of this particular age. Ideally, the students would have been able to achieve the basic outcomes of Stage 4 in terms of communicating (interacting, accessing and responding, and composing), understanding (systems of language and the role of language and culture), values, and attitudes at the end of the academic year (2018) (NSW Education Standards Authority, 2017). However, given the students' lack of any previous Mandarin knowledge and the limited curricular hours, the teaching content and students' anticipated achievement were modified in accordance with

Stage 1, which mainly focused on vocabulary development and short, fixed expressions and sentences such as 你几岁? (nǐ jǐ suì/How old are you?), 我有. . . (wǒ yǒu . . ./I have . . .), and 你喜欢 . . . 吗? (nǐ xǐ huān . . . ma?/Do you like . . .?). However, the teacher–researcher also bore in mind that compared to younger children, older children progress more quickly through the initial stages of proficiency development in a second language (Lambelet & Berthele, 2015). Therefore, the process of the lessons and in-class activities and tasks were designed, fully considering the students' age and developmental level and introducing the students to a pace that was manageable for them.

3.3.4 Games Used As Intervention

Four games were employed in this study with the hope of enhancing student engagement in Mandarin class. Each game belonged to a different type and had various rules of play to ensure the students would enjoy themselves in at least one game. This section introduces the games used in the study as an intervention in the classroom.

3.3.4.1 Game 1: Matching game/Memory game. In the Matching game, students were provided a set of cards that contained Chinese and English words, and they had to match the Chinese character and its Romanisation (pīnyīn) with its English counterpart. For example, students needed to match 红色 (hóng sè) with red, 蓝色 (lán sè) with blue, and 灰色 (huī sè) with grey. During the activity, the class was divided into pairs, and each group was provided their own set of cards. In the first round, students were simply required to take turns and match the cards. Those who had successfully matched the cards could take the cards with them. Students with more cards in their hands at the end won the game.

In the second round, students were asked to turn the cards over, and the game was upgraded to the Memory game. They still needed to take turns and turn two cards back over at a time. If the cards were a match, students could take the cards with them; otherwise, they needed to turn the cards over again and wait for their next turn. Likewise, the student who

had more cards by the end of the game was the winner of their group. In this round, students not only needed to understand the meaning of the Chinese words, but also had to remember their positions as well, which added a challenge to the original Matching game.

3.3.4.2 Game 2: Physical game: Jiànzi (Chinese Shuttlecock). Jiànzi is a traditional Chinese national sport. Players aim to keep a heavily weighted shuttlecock in the air with their bodies, apart from the hands. When playing the game, students were divided into three or four groups. Then, they were asked to stand in a circle and pass the Jiànzi to other group members by kicking it with their feet or other body parts. While passing it, they needed to count aloud how many times they had kicked it, using numbers in Chinese. If the Jiànzi fell to the ground, they would need to start counting all over again. The group that achieved the highest count won.

3.3.4.3 Game 3: Luóbo Dūn (Carrot Squats). This game involved a certain amount of physical activity and engaged students' speaking capability. Before the game started, players were given a code name such as 一萝卜(carrot 1) or 二萝卜(carrot 2) if the purpose was to practise numbers, 红色 (red) or 黑色 (black) if the learning target was colours, or 苹果 (apple) or 葡萄 (grape) if the vocabulary taught that lesson was about types of fruit. Take fruits as an example. During the game, players stood in a line in front of the classroom. The first player started by saying '苹果蹲 (apple squats), 苹果蹲 (apple squats), 苹果蹲完 (after apple squats), 葡萄蹲 (grape squats)'. Then, the player whose code name was 葡萄 (grape) needed to react immediately, squat, and say '葡萄蹲 (grape squats), 葡萄蹲 (grape squats), 葡萄蹲完 (after grape squats), 草莓蹲 (strawberry squats)'. The player whose code name was 草莓 (strawberry) had to answer with the same sentence and then name another player. The speed would become increasingly fast. If a player failed to react when he was called by another player, made any movement when his code name was not the one being called, or

forgot the code names of other players, he would be eliminated from the game. The last player left would be the winner. The game required students to remember all the vocabulary learnt in class and tested their reaction capacity.

3.3.4.4 Game 4: Digital game: Kahoot! Traditional education games sometimes might not be attractive enough for today's tech-savvy students. Considering this, the current study incorporated a digital game that is frequently used in classrooms all over the world. Kahoot! is a game-based online learning platform that allows teachers to create quizzes and game-type activities for students. It enables the lessons and classroom to become more interactive and engaging. When a teacher creates a game, it produces a code that can be shared with students. The students in the present study simply went to www.kahoot.it, entered the code, and joined in the game. During the game, students needed to choose the correct answers to the questions as quickly as possible, and the system would reward them with scores according to whether their answers were right or wrong and the speed of answering questions. At the end of a game, the system would display the top three players.

3.3.5 Research Design

The current study followed the pre-test/post-test nonequivalent group design, which can be represented as follows:

$$
\begin{array}{lll}
\textit{Experimental} & \underline{O_1}\_ \_ \_ \underline{X}\_ \_ \_ \_ \underline{O_2} \\
\textit{Control} & O_3 & O_4
\end{array}
$$

Note. From *Research Methods in Education* (p. 323), by L. Cohen, L. Manion, and K. Morrison, 2011, Oxon, England and New York, NY: Routledge. Copyright 2011 by L. Cohen, L. Manion, and K. Morrison.

O_1 here refers to a dependent variable of the experimental group measured in its initial condition. X is the experimental manipulation of the research, while O_2 refers to the results of the dependent variable measured after the intervention. Similarly, O_3 and O_4, respectively, refer to the pre- and post-test results of the dependent variable of the control group. The

dashed line separating the parallel rows in the diagram points to the fact that the experimental and control groups have not been equated by randomisation, which explains the use of the term *nonequivalent*. However, according to Cohen et al. (2011), the equivalence of groups can be enhanced by matching, followed by randomly assigning the groups experimental and control treatments.

Year 7 students at RHS were grouped into five classes based on their National Assessment Program—Literacy and Numeracy (NAPLAN) tests results. Of the four Year 7 classes that took Mandarin, two were high-achieving classes composed of students with high literacy and numeracy skills. In this study, these two classes are referred to as 7A and 7B. The other two were low-achieving classes in which students' academic achievement in literacy and numeracy was less satisfactory. These two classes are referred to in this study as 7C and 7D. These four classes were chosen in terms of their similarities in the stage of development and previous experience in Mandarin learning. Then, they were matched as pairs: a high-achieving class pair (7A, 7B) and a low-achieving class pair (7C, 7D).

The intervention involved an experimental class in each pair that adopted a game-based approach to the teaching and learning of the Mandarin language, and a control class that was taught the same content but employed more traditional instruction. The experimental class and control class in each pair were selected randomly using the random number generator in Excel. As a result, 7A and 7C were chosen as the experimental group of each pair, leaving 7B and 7D as the control groups.

High achieving	*Experimental 7A*	O_1	*GBTL*	O_2
	Control 7B	O_3		O_4
Low achieving	*Experimental 7C*	O_1	*GBTL*	O_2
	Control 7D	O_3		O_4

 Note. Based on *Research Methods in Education* (p. 354), by L. Cohen, L. Manion, and K. Morrison, 2011, Abingdon, England and New York, NY: Routledge. Copyright 2011 L. Cohen, L. Manion, and K. Morrison.

The data collection process for this study lasted for a school term (10 weeks). Based on the school's arrangement, the two high-achieving classes 7A and 7B took their Mandarin class in Week A (odd weeks), while the low-achieving classes 7C and 7D did so in Week B (even weeks). The pre-test, which was formed as an internet-based survey, was conducted in Week 1 (for 7A and 7B) and Week 2 (for 7C and 7D), before the start of the intervention. Following Cohen et al. (2011), this was to avoid as much as possible the impact of confounding effects between the pre-test and the start of the intervention.

Then, the pre-test results were used to assist in the sampling. Denscombe (2008) provided examples of research in which researchers had employed questionnaires to screen potential participants to include in an interview program. Similarly, in the current research, six students from each experimental class were selected based on their pre-test results to establish two focus groups: a high-achieving class focus group and a low-achieving class focus group. Of the 12 participants of the two focus groups, half scored as 'highly engaged' in the pre-test, while the other half scored as 'lowly engaged'. These 12 students were given great emphasis during the observation and were invited to the focus group interviews conducted at the end of the intervention in Week 9 and Week 10.

Following the eight-week-long intervention, during which the experimental classes were taught with GBTL while the control classes continued learning from worksheets, a post-test was conducted in Week 9 (for 7A and 7B) and Week 10 (for 7C and 7D). The ideal timing of the post-test remains controversial. Some believe that the post-test should be as close as possible to the end of the intervention to reduce the influence of confounding effects; however, others argue that the effects of a particular intervention may require some time to reveal themselves (Cohen et al., 2011). In other cases, although an effect can easily be discovered from an immediate post-test, the effect may not be sustainable, and students could reconvert over time (Cohen et al., 2011). Despite this, the post-test was conducted at the end

of the intervention in the current study to examine the change in students' engagement level. The data collection instruments and approaches to data analysis are discussed next in Sections 3.4 and 3.5.

3.4 Data Collection

The data collection process is an essential and fundamental part of all research projects. Researchers need to identify the most appropriate methods for collecting data from the research purposes and questions (Creswell, 2012). As reviewed in Section 2.2.3, researchers recommend a combination of multiple methods to remedy the limitations of a single instrument in assessing student engagement. The current research was a mixed methods study, and data were collected through four methods, namely, survey, observation (field notes and checklists), interview (one-on-one and focus group), and the teacher–researcher's self-reflection journal. The study started with a quantitative survey, and then the second phase used observation and open-ended interviews to collect detailed perspectives from participants to help elaborate on the results of the survey. The teacher–researcher recorded journal entries immediately after each Mandarin class. The data collection process ended with a post-survey. Each method and type of data are elucidated in this section.

3.4.1 Survey

Efron and Ravid (2013) indicated that a broader spectrum of participants is preferable if an inquiry's focus is a new approach, so the representation of diverse perspectives can be assured. Therefore, survey was chosen for data collection since it can provide large-scale responses quickly, and the analysis can be relatively straightforward. This study incorporated two surveys—a pre-survey conducted before the intervention and a post-survey conducted at the end of the intervention—to test the influence of the independent variable (the pedagogy, i.e., GBTL) on the dependent variable (student engagement) by comparing the results of the

two surveys. Both surveys were administered through the web-based platform Qualtrics. The benefits of using an online survey include preventing students from skipping important items and simplifying the tabulation and analysis process (Efron & Ravid, 2013). The teacher–researcher booked the school lab where students had access to computers, where they were asked to complete each survey as a part of their class. Since the surveys were conducted online, once the responses were submitted, they could not be modified.

Survey items should be constructed based partially on a literature review and the instruments employed in other studies. Other factors such as research questions, the type of data required, schedule and timetable, and access to participants also contribute to its construction (Tuckman & Harper, 2012). Chapter 2 illustrated that researchers generally agree on the multifaceted features of student engagement. Embracing this viewpoint, four dimensions in the surveys sought to examine student engagement, namely, behavioural engagement, emotional engagement, cognitive engagement, and big 'E' Engagement. Each dimension was embodied in four survey questions (for full survey questions, see Appendix A). The survey items of both the pre- and post-survey were identical. Taking into consideration the age and developmental stage of the participants, the study adopted structured items, in which respondents had to circle, check off, rate, or rank order their response choices (Tuckman & Harper, 2012). Surveys using structured items usually receive a higher response rate since such items are easier for respondents to complete and require less time (Efron & Ravid, 2013).

Of the various response choices to structured items, rating response was chosen for this study. The most commonly used Likert scale was adopted with minor changes. That is, the extreme response choices were changed from *strongly agree* to *very strongly agree* and from *strongly disagree* to *not at all* to assist students' comprehension of their meanings. However, sliding bars that were ultimately mapped to a numerical scale from 0-100 were selected

instead so that the surveys' function as *test* could be reflected more intuitively, and the results of both surveys could be compared (see Figure 3.2). The minimum value was set at 0, and the maximum value was set at 100. Additionally, the survey statements were worded in an affirmative, positive way; for example, *I'm excited about learning Mandarin*. In such items, a positive attitude is represented by sliding the bars towards *strongly agree*. In the case of this study, the closer the students slid the bar to *strongly agree,* the higher they scored; the higher the students scored in the survey, the more engaged they were in Mandarin class.
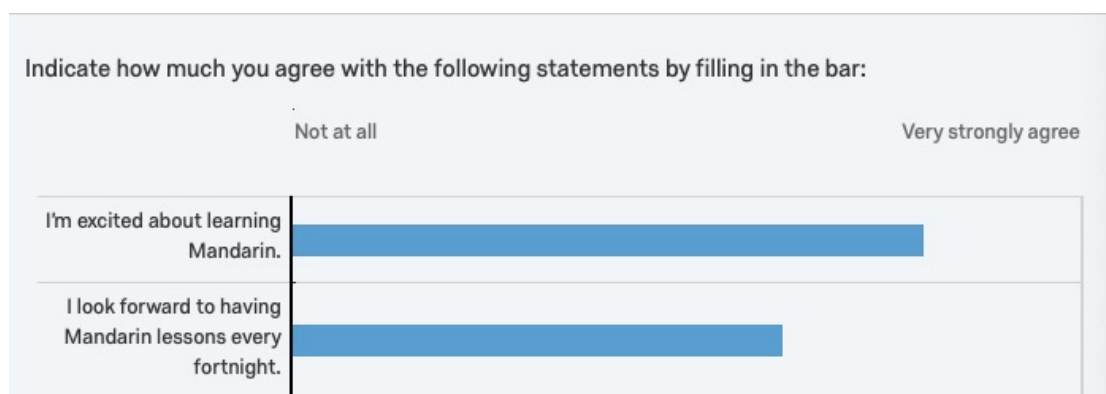
Figure 3.2. Sample survey statements and response choices.

As mentioned, the pre-survey was administered before the implementation of the intervention. The researcher then calculated each student's mean value for the 16 survey items and regarded this as their final score. The three highest scoring students and the three lowest scoring students were selected from each experimental group (7A and 7C) due to the polarity of their engagement level in class. They were labelled respectively as highly engaged students and lowly engaged students and then observed closely in class and interviewed by the researcher at the end of the intervention.

3.4.2 Observation

Observation refers to 'the process of gathering open-ended, firsthand information by observing people and places at a research site' (Creswell, 2012, p. 213). As a method of data collection in educational research, one of its most prominent advantages is that it provides the

opportunity to record what is actually happening in the authentic life of schools and classrooms (Efron & Ravid, 2013). Observation also assists researchers in understanding context and seeing things that they might otherwise unconsciously neglect as it can move beyond perception-based data to discover things that participants might not feel free to talk about during interviews (Cohen et al., 2011). Observation requires the researcher to focus on the participants' nonverbal behaviours, gestures, and body language; however, this also means only observable behaviours can be recorded, and other research tools are necessary to determine the intentions of those being observed (Tuckman & Harper, 2012).

Semistructured observation was adopted in this study. The researcher took a *participant observer* position and engaged in activities in the classroom she observed. Participant observational studies require the researcher to spend substantial time with the participants to reduce reactivity effects, record what is happening, and take a role in the situation (Cohen et al., 2011). In this study, the researcher stayed with the student participants for an academic year and in the role of their Mandarin teacher as a part of the ROSETE program, during which the research was undertaken. By being immersed in the classroom over a long period, the researcher was able to identify the prominent features of Mandarin teaching and learning and develop a more holistic view of the interrelationships of the factors.

The researcher's participant observation was intended to generate 'thick descriptions', which involved recording 'speech acts; non-verbal communication; descriptions in low inference vocabulary; careful and frequent recording of the time and timing of events; the observer's comments that are placed into categories; detailed contextual data' (Cohen et al., 2011, p. 466). The observation protocol mainly used in this study was field notes, including descriptive notes that recorded what occurred during the observation without inferring feelings or responses and reflective notes that contained reflections and insights about what

happened in the setting. The observation protocol used in this study was adapted from Efron and Ravid (2013); see Appendix B.

In addition, the researcher invited the school's mentor teacher to assist in observing the students selected by pre-survey since the researcher was not capable of conducting systemic structured observation of six individual students while delivering the class. The mentor teacher was already obligated to supervise the class as a part of her role, which made the observation an additional task she was willing to help with. Different from the researcher, the mentor teacher adopted a passive, nonintrusive role. The researcher provided a checklist with predefined categories to the mentor teacher. The categories were adapted from Skinner et al.'s (2009) study of student engagement (reviewed in Section 2.2.3) and mainly concerned students' observable on- and off-task behaviours. The observational checklist is shown partially in Figure 3.3 (for the complete version, see Appendix C).

	1	2	3	4	5	6
Student asked a question					/	
Student answered a question				/		
Student interrupted the teacher	//					

Figure 3.3. Partial observational checklist.

Each session lasted 30 minutes. The sampling took place every five minutes, and numbers 1 to 6 represented each five-minute interval. A forward slash was used as the entry, and it indicated the presence of a certain on- or off-task behaviour. The number of forward slashes indicated the frequency of observed behaviours. For example, Figure 3.3 shows the student was observed interrupting the teacher twice during the first five minutes of the session, and in the next 10 minutes, no specific behaviour in the checklist occurred. During 15 to 20 minutes in this session, the student answered a question, and then in the following

five minutes asked the teacher a question. This shows that structured observation preserved the chronology of events and, more importantly, generated numerical data, which facilitated comparisons between settings and situations, and frequencies, patterns, and trends (Cohen et al., 2011).

Observations took place in a natural setting: students' Mandarin classroom. To address their reliability and verify emergent categories, semistructured observations were conducted once a week in both experimental groups' Mandarin class for 10 weeks, including the whole process of intervention and two weeks of preliminary observation. Therefore, a total of 10 semistructured observations were undertaken, half with experimental class 7A and the other half with experimental class 7C. Structured observations were scheduled to proceed simultaneously with the semistructured observations. That is, 10 structured observations were conducted. Among them, half were with the six students selected from 7A, and the other half were with the six students selected from 7C.

3.4.3 Interview

Because observation is confined to participants' observable behaviours, and survey lacks a relationship of trust between the researcher and the participants, it is difficult to find out how participants feel about the issue being investigated; therefore, a follow-up interview with selected participants is necessary. Interviews allow participants to voice their ideas, opinions, values, and knowledge on issues related to the investigation so that the researcher can get a better understanding of their experiences from their own perspectives (Efron & Ravid, 2013). The researcher also has better control over the types of information received as interview permits a detailed inquiry about the research interest (Creswell, 2012). The current research employed two methods of interviewing: a semistructured one-on-one interview with the mentor teacher and semistructured focus groups with students.

3.4.3.1 Semistructured one-on-one interview. A semistructured one-on-one interview was conducted with the researcher's mentor teacher at the end of the intervention. The mentor teacher was considered ideal for one-on-one interviewing since she observed all the researcher's Mandarin classes and was able to articulate and share her ideas with the researcher. During the interview, the mentor teacher was asked open-ended questions about the impacts of GBTL and students' engagement in Mandarin class; these questions had been prepared prior to the interview (for the interview questions, see Appendix D). The teacher was also invited to co-construct the narrative and raise and pursue emergent issues related to the study but which were not included in the initially planned questions. The one-on-one interview allowed the researcher to gain access to the mentor teacher's perspective, which could reduce the subjectivity of the researcher's interpretation of students' behaviours in class. The interview was audio-recorded by the researcher for later analysis after permission was gained (for ethical reasons; see Section 3.6).

3.4.3.2 Focus groups. Children are the best sources for gathering information about themselves; however, they differ from adults in many ways (Cohen et al., 2011). It is of vital importance to establish trust with children, make the interviews nonthreatening and enjoyable, and ask age-appropriate questions with straightforward, child-friendly language (Cohen et al., 2011). Efron and Ravid (2013) claimed focus groups are particularly beneficial for interviewing children as the company of their friends emboldens them to talk and express their views. Since these opinions are the views of the participants rather than the researcher's, the participants' agenda can predominate (Cohen et al., 2011).

Students selected from the pre-survey who were closely observed in class were also invited to participate in the focus groups. There were two focus groups, with six students selected from 7A in one group and six students selected from 7C in the other. The focus groups took place at the end of the intervention, during lunchtime in the students' language

classroom on the day they had taken their last Mandarin lesson (7A in Week 9 and 7C in Week 10). The mentor teacher was present to supervise the whole interviewing process. The duration of each interview was limited to a maximum of 15 minutes to ensure minimum distraction of participants. Student participants were asked questions about their experience in Mandarin class mainly surrounding the use of GBTL. To avoid a single answer type response, semistructured open-ended questions were employed in this study (for focus group questions, see Appendix E). The predefined interview questions prepared for both focus groups were identical. The focus groups were audio-recorded by the researcher for later analysis after consent was given by the participants and their parents/carers (for ethical reasons; see Section 3.6).

3.4.4 Teacher–Researcher's Self-Reflection Journal

Personal documents provide researchers with a rich source of information to understand central phenomena in qualitative studies, and a teacher's self-reflection journal is one such type of document (Creswell, 2012). In this study, the teacher–researcher used this journal to document her perceptions of students' behaviours in Mandarin class. Efron and Ravid (2013) indicated a list of advantages of keeping a self-reflection journal, including revealing classroom interaction patterns, illuminating unnoticed constraints and possibilities in the classroom, and allowing the teacher–researcher to monitor their subjectivity and be mindful of the different roles they take in the study. An unstructured journal, which records whatever happens in class that seems valuable and important to the teacher–researcher, was used in this study (for details, see Appendix F). The teacher–researcher logged observations in her self-reflection journal weekly following teaching and documented as soon as practically possible to preserve the accuracy of the details pertaining to the events recorded.

3.4.5 Timeline

Table 3.1 demonstrates the timeline for the study's data collection process. In the top row, the H and L in brackets following class names refer to the high-achieving class and low-achieving class, respectively. The E and C represent whether the class was an experimental group or a control group. The first column indicates school weeks and the topic of the Mandarin class each week. Table 3.1 also exhibits when and what kind of data collection activity took place in the process.

Table 3.1
Timeline for the Data Collection Process

	7A (H; E)	7B (H; C)	7C (L; E)	7D (L; C)
Week 1	Pre-survey	Pre-survey		
Week 2			Pre-survey	Pre-survey
Week 3 (Numbers)	Physical game: Jiànzi + observation	Worksheet		
Week 4 (Numbers)			Physical game: Jiànzi + observation	Worksheet
Week 5 (Colours)	Matching and Memory game + observation	Worksheet		
Week 6 (Colours)			Matching and Memory game + observation	Worksheet
Week 7 (Fruits)	Luóbo Dūn (Carrot Squats) + observation	Worksheet		
Week 8 (Fruits)			Luóbo Dūn (Carrot Squats) + observation	Worksheet
Week 9 (Revision)	Kahoot! + observation + post-survey + focus group	Worksheet + post-survey		
Week 10 (Revision)			Kahoot! + observation + post-survey + focus group	Worksheet + post-survey
	Interview with mentor teacher			

3.5 Data Analysis

The collected data was analysed to test the hypotheses and answer the research

questions this project proposed. H_0 represented the null hypothesis, while the

alternative/research hypothesis was written as H_R. The procedures of data analysis followed a *triangulation design*, in which qualitative and quantitative data were analysed concurrently but separately. Then, the findings of both forms of data were compared and contrasted to ascertain whether they produced similar results.

Research Subquestion 1: Is there a positive effect of GBTL on student engagement in high-achieving and low-achieving classes?

H_{01}: There is no statistically significant difference between the pre-survey and post-survey means of both the high-achieving classes (7A vs. 7B) and the low-achieving classes (7C vs. 7D).

H_{R1}: There is a statistically significant difference between the pre-survey and post-survey means of both the high-achieving classes (7A vs. 7B) and the low-achieving classes (7C vs. 7D).

H_{R2}: There is a statistically significant difference between the pre-survey and post-survey means of the high-achieving classes (7A vs. 7B), but no statistically significant difference in the pre-survey and post-survey means of the low-achieving classes (7C vs. 7D).

H_{R3}: There is a statistically significant difference between the pre-survey and post-survey means of the low-achieving classes (7C vs. 7D), but no statistically significant difference in the pre-survey and post-survey means of the high-achieving classes (7A vs. 7B).

The quantitative pre- and post-survey data collected from the high-achieving classes (7A and 7B) and low-achieving classes (7C and 7D) were compared, respectively, to determine if there was a significant interaction between Survey Time (pre vs. post) and Lesson Type (GBTL vs. traditional); if yes, then the difference in engagement over time was greater for either the experimental group or the control group.

Research Subquestion 2: Does the impact of GBTL on engagement affect high-achieving students and low-achieving students differently?

H₀₂: There is no statistically significant difference between the gain score of the high-achieving class 7A and that of the low-achieving class 7C in the post-survey.

H_{R4}: The gain score of the high-achieving class 7A is statistically significant greater than the gain score of the low-achieving class 7C in the post-survey.

H_{R5}: The gain score of the low-achieving class 7C is statistically significant greater than the gain score of the high-achieving class 7A in the post-survey.

The quantitative pre- and post-survey data from the two classes that received GBTL, 7A and 7C, were compared to determine if there was a significant interaction between Survey Time (pre vs. post) and Academic Achievement Classification (high vs. low); if yes, this indicates there was a bigger change in engagement for one of the groups, either high achieving or low achieving. This means that GBTL influenced one of the groups more so than the other. Qualitative observational field notes were also analysed and focus group responses to questions about the impact of GBTL on engagement compared.

Research Subquestion 3 focused on individual students and attempted to uncover the prerequisites for the effectiveness of GBTL, if GBTL was effective in enhancing student engagement, and in what ways it worked. Qualitative data collected from observational field notes, teacher's self-reflection journal, and interviews with the mentor teacher and students were analysed to identify the elements.

3.5.1 Quantitative Data

Quantitative data in this project constituted two parts: survey data and observational checklist data. With regard to quantitative data analysis, Efron and Ravid (2013) proposed the following steps:

1. Entering, organising, graphing, and tabulating data;
2. Computing measures of distribution centres;
3. Computing measures of distribution variability;

4.   Analysing the data;

5.   Evaluating the statistical findings;

6.   Presenting the findings. (p. 191)

The analysis process of each type of quantitative data is explained in this section.

3.5.1.1 Survey data. As mentioned in Section 3.4.1, although the surveys in this project adopted a Likert-type scale, they used sliding bars that were ultimately mapped to a numerical scale from 0-100 instead of response choices, which meant the data did not need to be assigned an additional numerical value. The surveys were conducted online using the survey platform Qualtrics; the data were downloadable to SPSS (IBM SPSS Statistics Version 25) once the responses were submitted. Means can describe sets of scores and make comparisons between two or more distributions of scores (Efron & Ravid, 2013). After the data were coded and entered, the mean value of 16 survey items of each student participant's response was calculated. The same procedure was undertaken for all four Year 7 classes for both the pre- and post-survey. Joint bar graphs displayed the comparison of the engagement score of experimental and control groups in the pre- and post-survey, and of the high-achieving and low-achieving experimental groups.

After the data were prepared for analysis, an analysis of covariance (ANCOVA) using the pre-test score as a covariate was employed to analyse differences between means and groups. The main purpose of adopting an ANCOVA in a nonrandomised design is to adjust the post-test means for differences among groups on the pre-test that are unlikely to be avoided (Miller & Chapman, 2001). The difference between the pre-survey and post-survey means revealed whether the student engagement level changed during the intervention.

Following the test statistic, the statistical significance was evaluated. A p value of .05 was employed as a cut-off point to determine if the test statistic was statistically significant or if it could have occurred by accident. The results were reported as statistically significant if the p value was equal to or less than .05 ($p < .05$), and the null hypothesis was rejected. On

the contrary, if the *p* value was more than .05 ($p > .05$), there was a more than 5% probability that the results were obtained entirely by chance; therefore, the research hypothesis was not supported, and the null hypothesis was retained. The effect sizes of the intervention were then calculated to evaluate practical significance of the intervention since statistical significance of the results does not necessarily mean they are important. The greater the effect sizes were, the larger the effects of the treatment (Efron & Ravid, 2013).

3.5.1.2 Observational checklist data. 'Quantitative observations allow a comparison among settings, individuals, and situations, and frequencies, patterns, and trends' (Efron & Ravid, 2013, p. 95). The items in the checklist were divided into two categories: on-task behaviours and off-task behaviours. Then, the frequency of each type of student behaviour with reference to the individuals in each observational session were counted and summarised in a table (see Table 3.2) and presented as line charts. The chart revealed visually the changes and trends of observed students' behavioural engagement during the intervention process.

Table 3.2
Sample Quantitative Observation Data Analysis

	On-Task Behaviours					Off-Task Behaviours				
Session	Pre	S1	S2	S3	S4	Pre	S1	S2	S3	S4
Student A										
Student B										

3.5.2 Qualitative Data

The aim of qualitative data analysis is 'to bring meaning and order to the mass of collected data by looking for recurring themes, categories, and patterns' (Efron & Ravid, 2013, p. 166). Tuckman and Harper (2012) suggested that qualitative data analysis is inductive in form since it concludes general codes and themes from particular or detailed data. There is no universally accepted approach to analysing qualitative data, but generally, qualitative data analysis follows a four-step procedure:

1.   Preparation for data analysis;

2.   Analysis of the data;

3.   Synthesis and interpretation of data;

4.   Presentation of data analysis and interpretation. (Efron & Ravid, 2013, p. 188)

Before starting data analysis, the audio-recordings and observational field notes were transcribed. The data were then organised according to data sources and participants in both computer and printed files. Preliminary exploratory analysis was conducted by going through the data as a whole and exploring the general sense of them.

The majority of qualitative data analysis consisted of coding the data, which is 'the process of segmenting and labelling text to form descriptions and broad themes in the data' (Creswell, 2012, p. 243). In essence, coding aims to make sense from the data. The coding process in qualitative research is illustrated in Figure 3.4. Predetermined categories were adopted from Skinner et al.'s (2009) coding system (reviewed in Section 2.2.3) for analysing qualitative observations. Analysis of qualitative data using predetermined categories generally constitutes five steps:

1.   Identifying the predetermined categories;

2.   Finding segments in the data that fit each category;

3.   Looking for themes within each category;

4.   Arranging the categories and themes in a logical order;

5.   Recording the categories and selecting quotes that illustrate their essence. (Efron & Ravid, 2013, p. 188)

Emerging categories were employed to analyse interview transcripts and the teacher's self-reflection journal data and complement the predetermined categories used for the observation data. Identifying emerging categories also consists of five steps:

1.   Generating topics from the data and assigning them codes;

2.   Organising quotes with similar content into categories;

3. Ensuring congruency between data and category;

4. Arranging topics logically within each category;

5. Recording the categories and selecting quotes that illustrate their essence. (Efron & Ravid, 2013, p. 188)
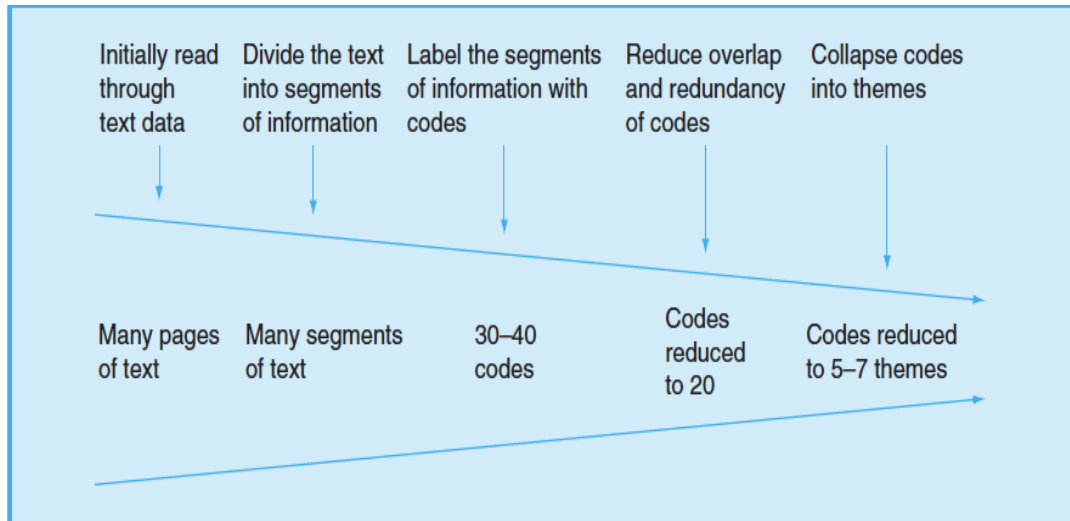
Figure 3.4. A visual model of the coding process in qualitative research.

Note. From *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (4th ed., p. 244), by J. W. Creswell, 2012, Boston, IL: Pearson. Copyright 2012 by Pearson Education, Inc.

The next step is synthesis and interpretation of data, which aims to develop a holistic story and interpret the data's meaning based on the patterns in them (Efron & Ravid, 2013). In the present study, this step started with identifying patterns through grouping similar or duplicated categories to form larger, more general categories; the relationship among these categories was then examined according to the following domains: context, frequency, sequence, cause and effect, and rationality. After that, the patterns and insights were used to formulate findings and to generate answers to the research questions. Finally, the interpretation was validated by checking for alternative interpretations, triangulating the findings, contextualising the findings within a theoretical framework, and practising self-reflexivity.

<center>**3.6 Principles Guiding Research Procedures**</center>

3.6.1 Ethical Considerations

To ensure the safety, confidentiality, and well-being of those being studied or those who could be affected by the research, ethical issues must be considered before any data collection procedure can be undertaken. Ethics approval for the current research was sought through a Human Research Ethics Application (HREA) submitted by the investigator. The application was approved by Western Sydney University's Human Research Ethics Committee (HREC) under the reference number H12935 (refer to Appendix G). Since the study involved school research conducted with young people under the age of 18 years, ethical approval was also sought from the NSW Department of Education by completing the State Education Research Application Process (SERAP) online. The NSW Department of Education approved the application under SERAP reference number 2018830 (refer to Appendix H). Next, the school principal was made aware of the study. The participant information sheet (PIS) and consent form were provided to and signed by the school principal before any research procedure took place (see Appendices I, J, and K). During the whole process, the researcher showed her respect for the needs, goals, and priorities of the school and classroom where she conducted the inquiry.

As mentioned in Section 3.3.2, the participants of this research comprised two parties, namely, the school mentor teacher and the Year 7 students. Participants and their parents or legal guardians were informed of the study's purpose without any deceptive practices with a letter of introduction, and the researcher shared information with them. The informed consent process for each party is described separately in this section.

School mentor teacher. The school mentor teacher involved in the research was over the age of 18. As with all mentor teachers who took up a role in the ROSETE program, she was expected to provide feedback to the teacher–researcher. Specifically, she was asked for

<center>67</center>

permission for her data to be included in the research. The mentor teacher was provided a PIS and consent form to complete, which elucidated the detailed information of the research and the data that would be collected from her (see Appendices L and M). She was also informed that she was free to withdraw from the research at any time with no consequence. The consent form was returned to the researcher immediately after being signed by the mentor teacher.

Year 7 students. The teacher–researcher invited the 89 students from the school's four Year 7 classes involved in Mandarin classes to participate in the study. She ensured that study participants were not put in harm's way or made to suffer in any way in the name of research. The research activities were designed to be a part of the students' regular Mandarin Chinese classroom activities; they involved activities such as playing games and singing songs. As such, the activities were age appropriate and generally enjoyable for young people.

Nevertheless, before any research procedures took place, the parents/caregivers, who would have to give consent for their children to participate, were provided with all the required information to make an informed decision regarding their child's participation in the study (see Appendices N and O). The teacher–researcher talked to the student participants about the research project during their regular Mandarin class (refer to Appendix P), while the mentor teacher helped distribute the recruitment documentation to the participants. The students were asked to take the consent forms home for their parents/caregivers to look over the information and give consent for their children to participate. Parents/caregivers generally returned the forms within a week. Only students whose parents/caregivers had signed the consent form were included in the research study. Children whose parents/caregivers did not provide consent still participated in regular Mandarin class activities, but no data were collected from them. Parents/caregivers were also informed they were free to withdraw their

child from the study at any time with no consequence. Any information that had been supplied by students who withdrew would be deleted.

The teacher–researcher also asked for verbal assent from students whose parents/caregivers had provided consent, by explaining what the research activity would be and asking whether the students were willing to continue. However, students' verbal assent must not override the parents/caregivers' consent: If parents/caregivers did not consent to their child's participation in the study, no research data would be collected from them. Moreover, the school mentor teacher was always in the classroom with the researcher. If a student did not give assent, data were not collected from them, but they were be able to continue in the class per the normal school routine. They were not disadvantaged in any way.

All data were collected from individual participants only after those participants (or their parents/caregivers) had given their written consent. The researcher ensured the confidentiality of data collected. The researcher protected the privacy of the participants and did not disclose any personal information related to those involved in this project to any third party.

3.6.2 Validity and Reliability

Validity refers to 'the degree to which the study, the data collection tools, and the interpretation of data accurately represent the issue being investigated' (Efron & Ravid, 2013, p. 70). With regard to the internal validity of the quantitative data, the experimental and control groups were tightly controlled to ensure that the changes observed were caused by the independent variable (planned intervention) rather than other possible extraneous variables. The external validity of quantitative data was enhanced through appropriate instrumentation and statistical treatment of the data. Ensuring the validity of qualitative data, however, is more complicated. Since the qualitative part of the study was essentially subjective and interpretive, the researcher was always self-reflective about her role in the research, the

interpretation of the findings, and the extent to which the data collected reflected participants' views of the issues being explored. The researcher's subjective views may have caused her to be overselective, unrepresentative, and unfair in choosing and interpreting data. Therefore, it was of vital importance to use a range of data that included the views of other participants to bring externality to the investigation and to focus on those things that happened that the participants could confirm (Cohen et al., 2011).

Efron and Ravid (2013) suggested some of the most common methods to improve the validity of qualitative data are triangulation, disciplined subjectivity, thick description, member checking, peer review, and data audit. To ensure research validity, this study considered methodological triangulation and adopted more than one method in the pursuit of the research objective. By collecting and analysing both quantitative and qualitative data, triangular techniques enable the researcher to study and explain the richness and complexity of human behaviour from multiple standpoints. As mentioned, the current study's data were gathered from multiple sources, including student participants, the mentor teacher, and the teacher–researcher herself. Multiple methods, including survey, observation, interview, and the teacher–researcher's self-reflection journal, were also utilised in the data collection process. Moreover, thick description was employed in the observation field notes and the teacher's self-reflection journal, and the interviewees were provided the opportunity to review and edit the interview transcripts.

Reliability refers to the 'dependability, consistency and replicability over time, over instruments and over groups of respondents' (Cohen et al., 2011, p. 199). However, since the goal of educational research is not to generalise the findings to other populations of participants, reliability in this instance usually refers to 'the consistency of the tools used to gather data' (Efron & Ravid, 2013, p. 73). The reliability of quantitative data was enhanced by minimising any external sources of variation, such as controlling data collection and

measurement conditions and excluding extreme responses from the data analysis. Regarding the qualitative portion of this study, reliability comprises 'fidelity to real life, context- and situation-specificity, authenticity, comprehensiveness, detail, honesty, depth of response and meaningfulness to the respondents' (Cohen et al., 2011, pp. 203–204). It emphasises the extent to which the recorded data represent what actually happened in the investigated setting, which could be improved by triangulation, prolonged engagement in the field, persistent observation, and reflexive journal. In summary, validity and reliability were two essential criteria that were considered in order to bolster the quality of this research.

3.7 Conclusion

This chapter introduced, explained, and justified the research methodology adopted in the current study. The research employed a quasi-experimental design with experimental and control groups to examine the effect of GBTL on student engagement in Mandarin class. Different groups of participants, including a school mentor teacher and four classes of Year 7 students, were invited to contribute to the research to ensure a less subjective result. Quantitative survey data were triangulated with data from qualitative observation, interview, and the teacher's self-reflection journal to improve the validity and reliability of the research. In the subsequent chapters of this thesis, data analysis is reported in accordance with the research questions.

Chapter 4. Findings: Game-Based Learning and Teaching as an Effective Way to Enhance Student Engagement in Mandarin Class

4.1 Introduction

To answer the main research question, this study first determined whether GBTL had a general impact on student engagement in Mandarin class. Chapter 4 presents the quantitative results and findings arising from data collected from the surveys to answer Research Subquestion 1. Survey data were categorised in accordance with class type (high-achieving class or low-achieving class) and test groups (experimental group or control group). Then, a variety of numerical analyses were conducted to test the reliability of the survey items and whether there were statistical and practical differences between the pre- and post-survey mean scores of the high-achieving classes and the low-achieving classes, respectively. A summary of the results is provided, followed by a discussion of the emergent findings of Research Subquestion 1.

4.2 Restatement of Research Questions and Hypotheses

The overarching research question guiding this study was *Does GBTL impact the engagement of secondary school students studying Mandarin in the Western Sydney region?* To address this question, three subquestions were proposed. Research Subquestion 1 asked if there was an effect of GBTL on student engagement in both high-achieving and low-achieving classes. The hypotheses regarding this question were as follows:

H_{01}: There is no statistically significant difference between the pre-survey and post-survey means of both the high-achieving classes (7A vs. 7B) and the low-achieving classes (7C vs. 7D).

H_{R1}: There is a statistically significant difference between the pre-survey and post-survey means of both the high-achieving classes (7A vs. 7B) and the low-achieving classes (7C vs. 7D).

H_{R2}: There is a statistically significant difference between the pre-survey and post-survey means of the high-achieving classes (7A vs. 7B), but no statistically significant difference was found in the pre-survey and post-survey means of the low-achieving classes (7C vs. 7D).

H_{R3}: There is a statistically significant difference between the pre-survey and post-survey means of the low-achieving classes (7C vs. 7D), but no statistically significant difference was found in the pre-survey and post-survey means of the high-achieving classes (7A v. 7B).

4.3 Survey Data

4.3.1 Demographics

A total of 89 students were invited to participate in this study, all of whom were Year 7 students enrolled in a public high school in the Western Sydney region. All students were participants of the school's Mandarin language program. Among them, nine students did not undertake the surveys as their parents/carers had not provided their consent. Another six students failed to complete either the pre-survey or the post-survey; therefore, their data were not used in this study. Hence, data from 74 students were analysed, with 23 (of 26) cases in the high-achieving experimental class 7A, 21 (of 26) in the high-achieving control class 7B, 18 (of 21) in the low-achieving experimental class 7C, and 12 (of 16) in the low-achieving control class 7D.

Of the 74 students whose data were analysed in this study, 35 were female and 39 were male. A chi-square analysis of independence determined that there was no statistical difference in sex distribution among the experimental and control classes, $\chi^2(7, N = 74) =$

4.49, $p = .72$. It thus can be seen that male students ($n = 11$ in the high-achieving experimental class, $n = 9$ in the low-achieving experimental class, $n = 12$ in the high-achieving control class, and $n = 7$ in the low-achieving control class) and female students ($n = 12$ in the high-achieving experimental class, $n = 9$ in the low-achieving experimental class, $n = 9$ in the high-achieving control class, and $n = 5$ in the low-achieving control class) were reasonably equally distributed among these four classes. Ethnicity was controlled using homogenous classes and the school's intentional even distribution system.

4.3.2 Reliability of Measurement

A multi-item survey was developed and given to the students ($N = 74$) to measure their engagement level in Mandarin class. The students were invited to complete the 16-item survey online prior to the intervention and again eight weeks later following completion of the game-based Mandarin language instruction. Cronbach's alpha was calculated on the 16 survey items to examine the internal consistency among them. The alpha coefficient for the pre-survey and post-survey was .957 and .945, respectively, which indicated the survey items were highly reliable. Survey data were then progressed to statistical tests to examine the hypotheses of Research Subquestion 1.

4.3.3 Analysis of Survey Data

Research Subquestion 1 concerned whether GBTL affected student engagement in Mandarin class in both the high-achieving experimental class and the low-achieving experimental class. To determine whether the post-survey score means of the experimental group and the control group were statistically different from one another, an ANCOVA was conducted. The main purpose of conducting an ANCOVA was to adjust the means of the post-survey score for differences among groups on the means of the pre-survey score, as the current study adopted a nonrandomised design (Dimitrov & Rumrill, 2003). The survey data

collected from the high-achieving classes and the low-achieving classes were compared, respectively, and the results are presented next.

Before performing an ANCOVA, tests were run to ensure the data met its assumptions: (a) the assumption of the independence of the covariate and treatment effect, and (b) the assumption of homogeneity of regression slopes (Miller & Chapman, 2001). A t test for independent samples was conducted to compare the pre-survey results of the high-achieving experimental and control groups. The results of Levene's test $F(1, 42) = 4.445$, $p = .041$ indicated that the variance of the two groups could not be assumed to be equal; therefore, an unequal variances t test was used. No statistically significant difference in student engagement level ($p = .892$) was found in the pre-survey between the two groups. Next, the homogeneity of regression effect was checked, $p = .822$, which indicated that the data met the homogeneity of regression assumption. Then, the data were proceeded to an ANCOVA since both assumptions were satisfied.

A one-way ANCOVA was then calculated to examine the effectiveness of GBTL on the high-achieving class students' engagement level in Mandarin class, controlling for the effect of pre-survey scores, and the results are displayed in Table 4.1. There was a significant effect of GBTL on the high-achieving class students' engagement level in Mandarin class $F(1, 42) = 33.374$, $p = .000$ after eliminating the effect of pre-survey scores. Pre-survey scores were significantly related to post-survey scores $F(1, 42) = 382.327$, $p = .000$. The effect size was 0.449, which is a very large effect. That is, there was a substantial difference between the scores of the two classes.

Table 4.1

ANCOVA Result: High-Achieving Classes, Pre- and Post-Survey

Tests of Between-Subjects Effects

Dependent Variable: post.score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected model	18862.802[a]	2	9431.401	210.365	.000	.911
Intercept	167.727	1	167.727	3.741	.060	.084
pre.score	17141.063	1	17141.063	382.327	.000	.903
test.group	1496.270	1	1496.270	33.374	.000	.449
Error	1838.175	41	44.834			
Total	179221.000	44				
Corrected total	20700.977	43				

[a] R squared = .911 (adjusted R squared = .907).

As there was a statistically significant difference in the high-achieving classes' engagement level between those who were taught with a game-based approach and those who were taught in a traditional class environment, the null hypothesis was rejected. GBTL was effective in enhancing the high-achieving classes' engagement level. The experimental group demonstrated an increase in engagement level from a mean score of 61.04 (of 100) to a mean score of 66.00 (of 100), while the engagement level of the control group was witnessed to experience a decline from a mean score of 60.10 (of 100) to a mean score of 53.48 (of 100) (see Figure 4.1).
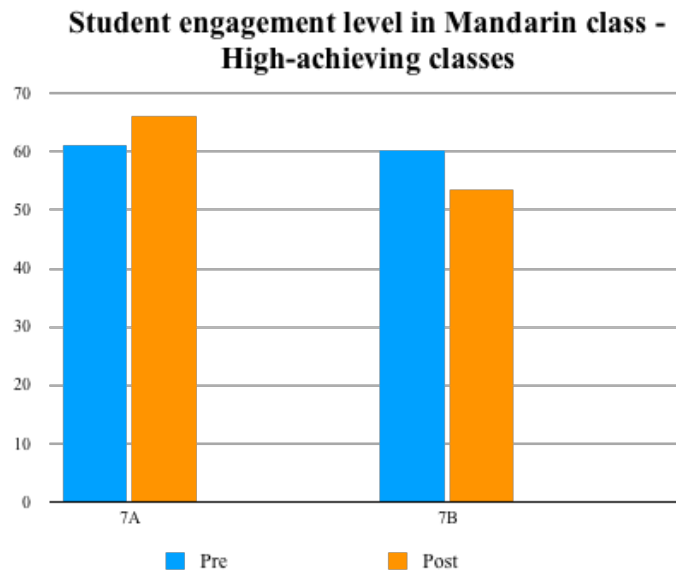
Figure 4.1. High-achieving classes' pre- and post-survey scores.

Pre- and post-survey mean scores of the low-achieving experimental class (7C) and control class (7D) were analysed through the same procedure. The results of Levene's test, $F(1, 28) = .001$, $p = .981$, showed no statistically significant difference between the variance of the experimental group and the control group. Thus, an independent samples t test was adopted, in which equal equivalence was assumed. No significant statistical difference ($p = .807$) was identified in the pre-survey scores between the two groups, which indicated that the two low-achieving classes were of a similar engagement level before the intervention. Meanwhile, the homogeneity of regression was checked, $p = .710$. Hence, both the assumptions of ANCOVA were sustained.

A one-way ANCOVA was then performed on the low-achieving classes' survey scores to evaluate the effect of GBTL on student engagement. The independent variable was the group status of control versus experimental. Covariate was the pre-survey scores measured prior to the intervention. The ANCOVA for experimental group versus control group on pre- versus post-survey scores controlling for pre-survey scores revealed statistically significant effects (see Table 4.2), $F(1, 27) = 12.285$, $p = .002$. Pre-survey scores were significantly lower than post-survey scores $F(1, 27) = 318.341$, $p = .000$. A numerical value of 0.313

indicated a large effect size. That is, there was a marked difference between the two groups in their engagement level.

Table 4.2
ANCOVA Result: Low-Achieving Classes, Pre- and Post-Survey

| | | | Tests of Between-Subjects Effects | | | |
| | | | Dependent Variable: post.score | | | |
Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected model	15510.655[a]	2	7755.327	168.592	.000	.926
Intercept	391.494	1	391.494	8.511	.007	.240
pre.score	14643.849	1	14643.849	318.341	.000	.922
test.group	565.137	1	565.137	12.285	.002	.313
Error	1242.012	27	46.000			
Total	87806.000	30				
Corrected total	16752.667	29				

[a] R Squared = .926 (Adjusted R Squared = .920).

Hence, the null hypothesis was rejected since there was a statistical significance in the low-achieving classes' engagement level between those who were introduced to GBTL and those who remained in a traditional learning environment. GBTL's effectiveness in enhancing the low-achieving classes' engagement level was confirmed. The mean score of the experimental class 7C was increased to 53.05 (of a possible 100) from 47.78 (of a possible 100). Meanwhile, there was a slight decrease in student engagement level for the control class 7D, decreasing from a mean pre-survey score of 45.33 (of a possible 100) to a mean post-survey score of 42.08 (of a possible 100) (see Figure 4.2).

Student engagement level in Mandarin class - Low-achieving classes
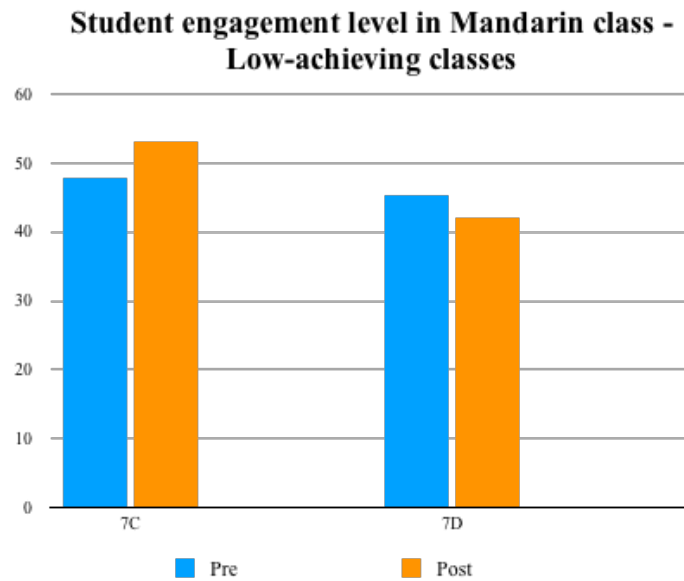
Figure 4.2. Low-achieving classes' pre- and post-survey scores.

4.4 Concluding Comments

Combining the analysis of the pre- and post-survey data of both the high-achieving classes and the low-achieving classes, it can be concluded that a statistically significant difference was found in the post-survey mean scores between the experimental class and the control class regardless of group difference (students' academic achievement level). That is, the null hypothesis was rejected and H_{R1} was substantiated, which indicated that GBTL had a general effect in enhancing students of both classes' engagement level. However, whether there is a difference between the impacts of GBTL on classes of different academic achievement levels is examined in Chapter 5.

Chapter 5. Findings: Different Impacts of Game-Based Teaching and Learning on a High-Achieving Class and a Low-Achieving Class

5.1 Introduction

After determining the general effectiveness of GBTL on enhancing student engagement in Mandarin class, Chapter 5 moves on to Research Subquestion 2: *Does the impact of GBTL on engagement affect students of a high-achieving class and low-achieving class differently?* It further examines whether the impacts of GBTL differed between groups of different achievement levels. Pre- and post-survey data of both experimental classes (7A and 7C) were analysed to determine whether a statistically significant difference could be found in the gain scores of these two classes. Then, the observational checklists were counted to see if the patterns of change in students' in-class behaviours differed between classes. Furthermore, data from observational field notes, one-on-one interview, and focus groups were triangulated with the quantitative data to ensure validity and reliability of the findings. This chapter is organised in accordance with the data collection instruments.

5.2 Analysis of Quantitative Data

5.2.1 Analysis of Survey Data

Research Subquestion 2 examined whether GBTL affected the engagement level of classes from different achievement backgrounds differently. That is, did students' engagement level in the high-achieving experimental class 7A change more than that of the low-achieving experimental class 7C at the end of the intervention? Conversely, did the change in students' engagement level of 7C outnumber that of 7A? Regarding the research question, the following hypotheses were proposed:

H_{02}: There is no statistically significant difference between the gain scores of the high-achieving class 7A and that of the low-achieving class 7C.

H_{R4}: The gain score of the high-achieving class 7A is greater than the gain score of the low-achieving class 7C.

H_{R5}: The gain score of the low-achieving class 7C is greater than the gain score of the high-achieving class 7A.

An ANCOVA was adopted to test if there were group differences (high achieving vs. low achieving) of the change between the pre-survey and the post-survey (gain score). Two assumptions of the ANCOVA were checked. To test the independence of the covariate, an independent samples *t* test, with pre-survey scores as the test variable and class achievement level as the grouping variable, was run. Levene's test, $F(1, 39) = 1.521, p = .225$, indicated that the variance of the two groups could be assumed to be equal. The results of the independent *t* test identified no statistically significant difference ($p = .07$) of pre-survey scores between the high-achieving class and the low-achieving class. Additionally, the homogeneity of regression effect was checked, $F(1, 39) = .002, p = .962$. Both assumptions of the ANCOVA were met.

Next, ANCOVA with pre-survey scores as the covariate, gain score as the dependent variable, and the class achievement level as the independent variable were performed. The results showed no statistically significant difference between the gain scores of the high-achieving and low-achieving classes after controlling for the effect of pre-survey scores, $F(1, 39) = .555, p = .461$, partial $\eta^2 = .014$ (see Table 5.1). This demonstrated that a class's previous academic achievement level did not significantly affect the gain score. The null hypothesis was not rejected, which means the effects of GBTL on increasing student engagement level were not different between the high-achieving class and the low-achieving class (see Figure 5.1).

Table 5.1

ANCOVA Results: Comparing Gain Scores of the High- and Low-Achieving Classes

| | | | Tests of Between-Subjects Effects | | | |
| | | | Dependent Variable: gain.score | | | |
Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected model	494.551[a]	2	247.275	4.762	.014	.200
Intercept	1080.623	1	1080.623	20.812	.000	.354
pre.score	493.509	1	493.509	9.505	.004	.200
score.group	28.807	1	28.807	.555	.461	.014
Error	1973.059	38	51.923			
Total	3533.000	41				
Corrected total	2467.610	40				

[a] R squared = .200 (adjusted R squared = .158).
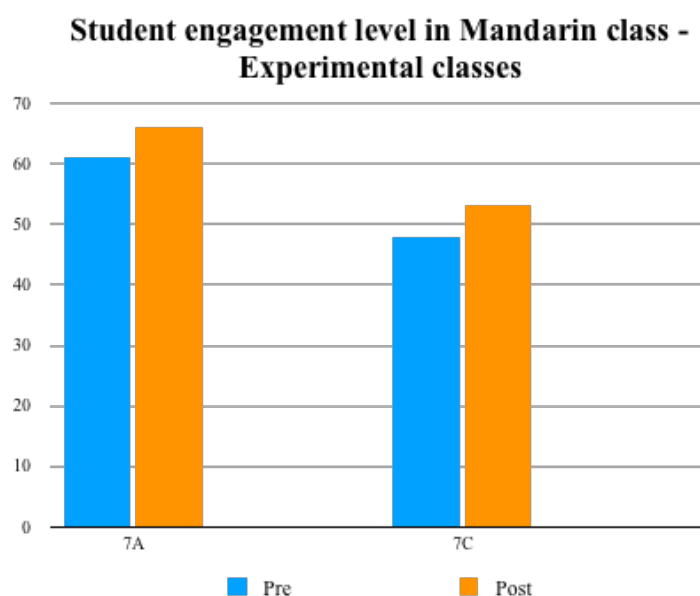
Figure 5.1. Pre- and post-survey results of the high-achieving experimental class 7A and the low-achieving experimental class 7C.

5.2.2 Qualitative Observational Checklists

Items in the observational checklists were divided equally into two categories, namely, on-task behaviours and off-task behaviours, with five items in each category. On-task behaviours were composed of raising one's hand, asking or answering a question,

participating actively in a classroom activity, listening attentively to the teacher or classmates, and working on a problem. Off-task behaviours, on the other hand, focused on students' interruptive behaviours, including disrupting a classmate or the teacher with a non-academic issue, participating in a classmate's active off-task behaviour, daydreaming or listening to a classmate's off-task behaviour, playing with a phone, and initiating a non-academic conversation with a classmate.

The frequency of occurrences of each student's on- and off-task behaviours in each observational session were summarised, respectively, and are reported in Table 5.2. The data are also presented in Figure 5.2 to better visualise the trends of students' on- and off-task behaviours under the influence of GBTL. Each student was assigned a pseudonym in the data reports to ensure the confidentiality of their identity. Students of 7A were named Anne, Amelia, Aliya, Arron, Adam, and Agnes, while students of 7C were referred to as Charlotte, Carla, Chelsea, Calvin, Cedric, and Chris. The 'pre' is short for preliminary observation, and S1, S2, S3, and S4 refer to the four observational sessions during the intervention. Numbers indicate the number of times the mentor teacher noted an on- or off-task behaviour.

Table 5.2

Summary of Observational Checklists Data

	On-Task Behaviours					Off-Task Behaviours				
Session	**Pre**	**S1**	**S2**	**S3**	**S4**	**Pre**	**S1**	**S2**	**S3**	**S4**
Anne	23	26	24	25	26	2	0	2	0	1
Amelia	26	28	27	26	27	1	0	1	0	0
Aliya	25	25	24	26	26	2	1	1	2	1
Arron	18	23	20	23	22	4	2	3	1	2
Adam	19	21	17	19	20	5	1	4	2	3
Agnes	22	25	23	24	23	3	1	2	0	1
Charlotte	22	26	24	26	25	1	0	2	0	0
Carla	24	25	23	23	24	3	1	0	1	0
Chelsea	21	23	22	24	23	1	1	2	1	0
Calvin	13	22	16	18	19	10	3	6	4	3
Cedric	11	19	17	18	19	6	2	5	3	5
Chris	14	20	15	19	18	9	3	7	4	5
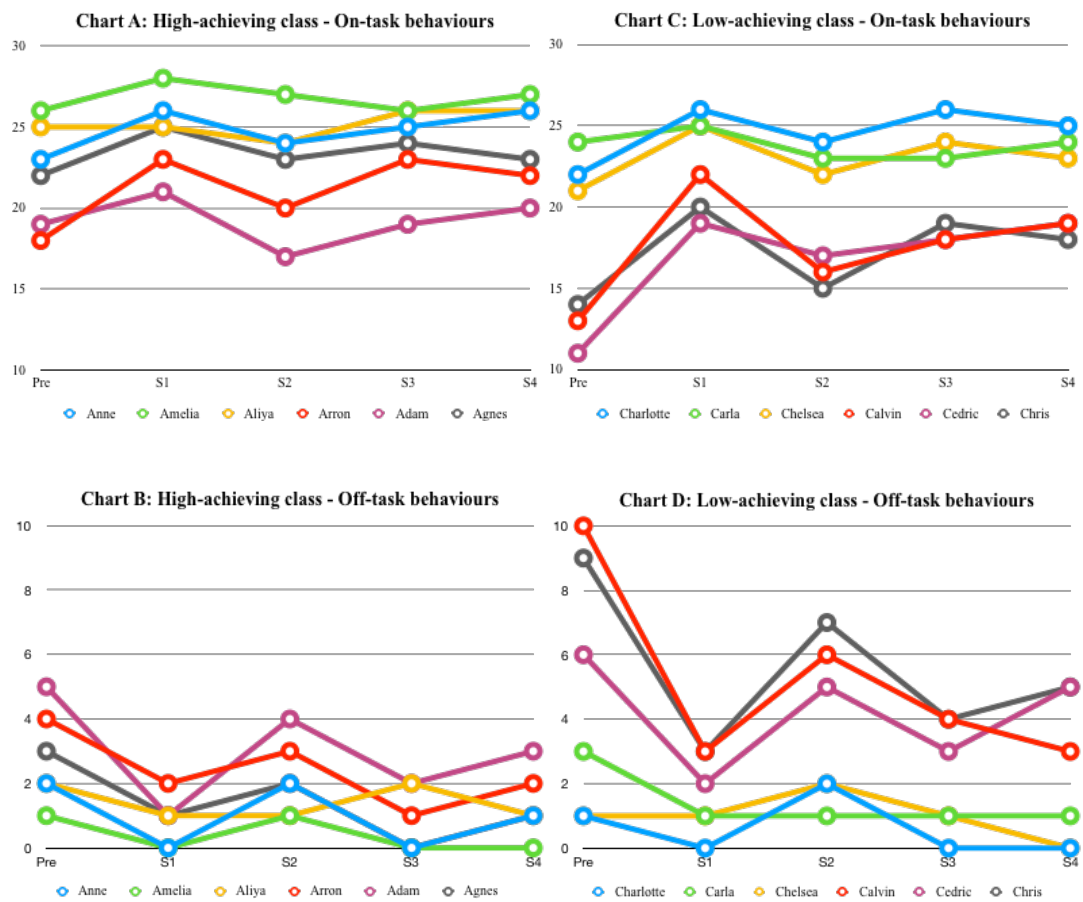
Figure 5.2. Trends of students' on- and off-task behaviours of both classes.

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As seen from line charts A and B (Figure 5.2), the frequency of the high-achieving class 7A's on-task behaviours being observed were generally higher than low-achieving class 7C's, which indicated that 7A was more behaviourally engaged than 7C before and after the intervention. However, while the number of 7A's students stayed relatively high during the preliminary observation and throughout the whole intervention process, half of 7C's students being observed who were initially lowly engaged showed an uptrend in their on-task behaviours, especially between the preliminary observation and the first observational session. This demonstrated qualitatively that (a) GBTL was effective in increasing students' on-task behaviours in both the high-achieving class and the low-achieving class, and (b) the effectiveness was more prominent for those students who were initially lowly engaged in the class.

Corresponding to this is the sharp decrease of students' off-task behaviours as seen in line charts C and D (Figure 5.2). Almost all the students under observation were witnessed to experience a slump in their off-task behaviours between the preliminary observation and the first observational session. Though there was a fluctuation in the following process, students' off-task behaviours generally displayed a downward trend from the beginning of the intervention. This description was evident especially for some students of the low-achieving class. That is, their off-task behaviours reduced by around half by the end of the intervention, which indicated that the behavioural engagement of students who were initially lowly engaged in class was enhanced by GBTL. Highly engaged students of both classes were rarely observed to involve in off-task behaviours even before the intervention, leaving less room for improvement compared to the low-achieving class. Nevertheless, from these two charts, it can be seen that (a) GBTL was effective in reducing students' off-task behaviours in both the high-achieving class and the low-achieving class, and (b) the impacts were more remarkable for those students who were initially lowly engaged in the class.

In summary, GBTL was effective in reducing the off-task behaviours and increasing the on-task behaviours for students of both high-achieving and low-achieving classes, therefore enhancing both classes' behavioural engagement in Mandarin class. The effects, however, were more obvious in the low-achieving class as it had a larger proportion of lowly engaged students. That is, an analysis of observational checklists data revealed that GBTL affected the low-achieving class's student engagement in Mandarin class more than it did the high-achieving class.

5.3 Analysis of Qualitative Data

Though the impacts of GBTL on student engagement of the high-achieving class and the low-achieving class were compared using data from quantitative survey and observational checklists, this section triangulates the findings from qualitative observational and interview data to determine whether the impacts differ between these two classes. That is, whether students' in-class behaviours, emotional reactions, and cognitive investments of one class changed more than the other during the intervention.

5.3.1 Observational Field Notes

The teacher–researcher documented her observations of both the high-achieving class 7A and the low-achieving class 7C during the implementation of GBTL. Table 5.3, which illustrates the effects of GBTL on student engagement in Mandarin class, was summarised from the teacher–researcher's observational field notes of these two classes. The impacts of GBTL are divided into three categories, namely, improved behavioural engagement, improved emotional engagement, and improved cognitive engagement. Each category is followed by its explanation and examples excerpted from the observational field notes. The last two rows are checkboxes that indicate whether this category was observed in 7A or 7C.

Table 5.3

Impacts of GBTL on Student Engagement: 7A vs. 7C

Effect of GBTL	Explanation	Example	Observed 7A	Observed 7C
Improved behavioural engagement	Visible increase in on-task behaviours and decrease in off-task behaviours	'It definitely attracted some lowly engaged students' attention'. 'There was no swearing words, no students talking on top of each other and teachers'.	Yes	Yes
Improved emotional engagement	Increase in positive reactions such as interest, enjoyment, and happiness, and decrease in negative reactions such as boredom and anxiety to teachers, classmates, and academics	'They were excited to know we were going to play a game today'. 'Students got more energetic'.	Yes	Yes
Improved cognitive engagement	Students being more self-regulated, thoughtful, strategic, and willing to go beyond the minimal requirements	'Some of them can play the game without referring to their worksheets and the clue I showed them on the board'. 'After playing the Shuttlecock game for a few rounds, a group of boys started to create their own game rules'.	Yes	Yes

Table 5.3 shows that improvements in students' behavioural, emotional, and cognitive engagement were observed in both 7A and 7C during the implementation of GBTL. Under this circumstance, it is evident that, regardless of the extent of changes, the impacts of GBTL on student engagement of the high-achieving class and the low-achieving class were embodied in the same aspects, which means there was no record indicating that one class demonstrated some particular changes under the influence of GBTL that were not possessed by the other class.

The extent to which changes in the engagement level were influenced by GBTL, however, was notably different among the two classes. The teacher–researcher's preliminary observations showed that 7A had been more engaged behaviourally, emotionally, and cognitively than 7C in Mandarin class before the intervention began. As the teacher–researcher noted,

> 7A was always ready to learn. They settled down very quickly and started to engage in learning activities. I could see them looking at the board, listening to me, and copying things down. Nobody was chitchatting. I noticed several boys sitting at back were not very interested in today's topic, but they kept it to themselves rather than disrupting their neighbours . . . They repeated after me confidently with a fuller voice, unlike students of 7D who barely responded to me. Many of them were enthusiastic in interacting with me by answering and asking questions . . . They did their worksheets fast and knew to move on to the following tasks without asking me what to do next. Those who finished quickly started practising writing Chinese characters on the back of the paper. (Preliminary Observational Field Notes, 7A, 18/09/2018)

Based on the preliminary observational field notes, students of 7A were mainly exhibiting on-task behaviours in class. Though it is inevitable that some students would not be as emotionally engaged as others, they were not involved in off-task initiatives or working behaviours that disrupted their classmates or interrupted the teacher, which further proved their good self-regulation skills. Moreover, being willing to go beyond the minimal requirements by challenging themselves with extra tasks could be regarded as an indicator of students being cognitively engaged.

The preliminary observational field notes of 7C, however, depicted a very different scene:

> Today 7C was very unsettled at the beginning of the class, just as usual. Several boys kept talking and reacting to each other in the first ten minutes of the lesson, even though their seats were purposefully arranged away from each other. They interrupted me from time to time and kept challenging the teachers' authority in the classroom. What made it worse was there was other students reacting to them because they thought these boys were funny. This has prevented me from conducting normal teaching activities. Then, things escalated when my mentor teacher and me tried to stop them. They kept arguing with us. It went back and forth and we wasted a lot of time until a girl couldn't stand it anymore and shouted at the boys, 'Can you shut up?'. (Preliminary Observational Field Notes, 7C, 25/09/2018)

First, it is not hard to notice that this level of chaos in class was not a one-time, rare situation for 7C. It happened in every Mandarin class to the extent that the teacher–researcher had considered it normal for that class. Some students in this class were observed to possess severe behavioural issues; they frequently initiated off-task behaviours that also dragged other students into off-task working behaviours, which finally led to significant deterioration of the classroom atmosphere and classroom discipline. Based on their behaviour in class, the teacher–researcher could only assume that Mandarin was not an enjoyable and interesting subject for these students, and their misconduct caused negative influences on those who used to be emotionally engaged in class. In this case, it was barely possible for the teacher–researcher to finish what was prepared for a lesson, not to mention providing the opportunity for students to go beyond minimal requirements.

By comparing the preliminary observational field notes of 7A and 7C, it can be argued that 7A used to be more engaged in Mandarin class behaviourally, emotionally, and

cognitively than 7C. However, such obvious disparities were gradually eliminated during the implementation of GBTL. Taking the teacher–researcher's observations of the Chinese Shuttlecock game as an example,

> 7A was just good as usual, though they were very excited to know we were going to play a game today . . . They formed their own groups and got into the game without further help or instruction . . . Students got really competitive, but in a good way. They were respectful to each other and waited for their turns . . . It [the game] definitely attracted some lowly engaged students' attention and turned them into active participants of the class. From my perspective, students were enjoying themselves when they were playing games. When the bell went, they were asking me, 'Can we play next time, Miss?' (Observational Field Notes, 7A, 30/10/2018)

In terms of behavioural engagement, there were no significant changes except for several relatively lowly engaged students, as classroom discipline of 7A was never a concern, leaving limited potential for improvement. With regard to emotional engagement, the teacher–researcher witnessed an increasingly energetic and enthusiastic 7A. If 7A used to behave themselves in Mandarin class due to their excellent self-regulation skills, that is, they understood they should not mess around in any class no matter whether it interested them or not, then it is evident that the students were genuinely attracted by this lesson and voluntarily invested their energy in it. Moreover, 7A was more initiative and aggressive, and they were willing to take the challenges embodied in the game without hesitation. The problem-solving process revealed independence, which implied that the students were more thoughtful and strategic, hence being more cognitively engaged. In summary, the teacher–researcher observed an upsurge in 7A's emotional and cognitive engagement level during the intervention of GBTL, accompanied by a slight increase in their behavioural engagement influenced by its high starting point.

7C, on the other hand, was witnessed to experience dramatic changes even within the first lesson of the intervention:

> This week was the best 7C I've ever seen. There was no swearing words, no students talking on top of each other and teachers. They listened carefully about how to play the game and the vocabs because I told them they were going to be used in the game . . . The students were so excited to go outside. They even moved faster than usual when they heard they could leave the classroom and play . . . Surprisingly, everybody voluntarily played a fair game, respected each other, and honoured their sportsmanship . . . They got more energetic and competitive . . . Already engaged students were good as usual, but it's evident that students who used to be disengaged in regular class were engaged in this lesson. Especially for Cedric and Chris who used to be two of the most disturbing kids in class. Today they devoted themselves in the game and I didn't notice much off-task behaviours especially during the game. (Observational Field Notes, 7C, 06/11/2018)

The first thing that drew the teacher–researcher's attention was the tremendous improvement in 7C's behavioural engagement, particularly for those who were initially lowly engaged in class. Off-task initiative and working behaviours were replaced by on-task behaviours, which contributed to the amelioration of classroom dynamics. Meanwhile, the reduction of negative emotions such as boredom, laziness, and irritation along with an increase in positive reactions led to enhanced emotional engagement. Though the effectiveness of GBTL on 7C's cognitive engagement was not as evident as it was in 7A, since 7A was indeed more initiative, strategic, and willing to challenge themselves, it enabled 7C to start to be cognitively engaged.

In summary, an analysis of observational field notes revealed that, regardless of group difference, the effectiveness of GBTL on enhancing student engagement was embodied in the

same aspects, namely, improved behavioural, emotional, and cognitive engagement. The extent of improvement, however, showed a marked difference between the high-achieving class and the low-achieving class. The low-achieving class exhibited greater improvement in behavioural and emotional engagement than the high-achieving class, as it started out from a comparatively low engagement level, which made improvement relatively easily achieved and the outcomes more evident. The high-achieving class, however, was observed to make greater progress in terms of cognitive engagement.

5.3.2 One-on-One Interview With the Mentor Teacher

The mentor teacher confirmed the general positive influence of a game-based approach on students' learning outcomes in Mandarin class in the first place. When being interviewed about whether the games worked for the students, the mentor teacher commented, 'Definitely. 100% yes. It's a great way to reinforce everything that you've done' (Mentor Teacher, Interview, 18/12/2018).

However, based on her observation, both the high-achieving class and the low-achieving class were affected by the new teaching strategy to a similar degree:

> I think it [GBTL] has the same effect. I don't really see any major differences. I feel
> like when they play games they're all equal. They're all in the same boat. The only
> difference is the type of game you play. You have to modify the game. But the
> outcomes are always the same. So they're always using their Chinese. (Mentor
> Teacher, Interview, 18/12/2018)

From the mentor teacher's perspective, GBTL affected the student participants of both classes in the same way. One difference mentioned by her was that the teacher–researcher had to modify the games in accordance with the ability of students from different classes. Yet once the games were adjusted to a mode suitable for the students' ability, the differences between these two classes were negligible. Students were merely displaying similar age-

specific features shared among their counterparts when they were playing games. In addition, the outcomes of the application of GBTL were identical, which means the games enabled the students to interact with the Chinese language more in class, and by doing so reinforced the new knowledge they learnt.

Another difference noticed by the mentor teacher was the motivation the students displayed at the beginning of game playing:

> Maybe motivation to get started, to start the game. 7C was a bit more hesitant. There were two groups in 7C that were not enthusiastic; whereas with 7A everybody was enthusiastic and everybody just followed instructions quite quickly. But with 7C there were two groups and I had to sort of tell them explicitly that they had to do the game, but once they get the hang of it and their confidence builds, they're fine. I think they started to get quite addicted. (Mentor Teacher, Interview, 18/12/2018)

Some students of the low-achieving class required more time to warm up, process the game rules, and build their confidence in handling the games, whereas students of the high-achieving class were generally more comfortable with new experiences and changes. Though this means normally it would take more time for students of the low-achieving class to learn to play the games, apply the new knowledge to the games, and be confident enough to enjoy the games, once they became acquainted with the game-playing process, they were just the same as students of the high-achieving class from behavioural, emotional, and cognitive perspectives.

A conclusion drawn from the one-on-one interview with the mentor teacher was that the effects of GBTL were the same on students of both high-achieving and low-achieving classes. Only certain students of the low-achieving class lacked enthusiasm and motivation at the beginning and therefore required more teacher support to get started. But no difference between groups was found in terms of the process and results of the intervention.

5.3.3 Focus Groups

The basis of the mentor teacher's and teacher–researcher's judgements were their observations and interpretations of students' observable behaviours. Consequently, their comments were mainly about students' behavioural and emotional engagement, as these two dimensions of engagement are more observable compared to cognitive engagement. However, behaviours can easily be misinterpreted due to the inescapability of subjectivity. To determine the effects of GBTL more accurately, especially on students' emotional and cognitive engagement, focus groups were conducted at the end of the intervention with students selected from both classes.

The focus group data are presented question by question. In the following tables, similar data collected from student interviewees are grouped into a single set of responses by row, whereas different responses are kept separate. The left-hand column in each table indicates the number of student interviewees (1–6) and the class to which the student interviewee belonged (7A or 7C). For example, '1 & 2: 7A' refers to the responses of Interviewees 1 and 2 of Class 7A. There were 12 student interviewees in all, six from the high-achieving class 7A and six from the low-achieving class 7C. The right-hand column lists all responses. An analysis and comment are provided after each table.

Table 5.4
Students' Attitudes Towards the Mandarin Class

Q1: Students' Attitudes Towards the Mandarin Class	
1 & 2: 7A 1: 7C	I enjoyed learning Chinese. It's definitely one of my favourite subjects as • I like learning about a country's language and everything; • I like Asian countries and I'm fascinated learning about their cultures; • I have a bit of Chinese in me; I was quite curious.
3–6: 7A 2–4: 7C	It wasn't my favourite subject but • it was nice learning some new words; • I did like the sport lesson; • I liked when we were playing games; • it was better than English. English is boring.
5–6: 7C	I wasn't so into it because • learning languages is boring; • I don't like the songs. They are catchy but annoying.

This question concerned students' emotional engagement in Mandarin class, and the interviewees' responses can be divided into three categories. Some students regarded Chinese as one of their favourite subjects; most of the others sometimes enjoyed themselves in learning the language, while several barely found any pleasure in it. Table 5.4 shows that, in the high-achieving class, students' attitudes towards the Mandarin class were generally more positive compared to students' attitudes in the low-achieving class. The majority of the students were emotionally engaged in the class to a certain extent due to various reasons, though several students of the low-achieving class still reported being lowly engaged in the class emotionally after the intervention.

It is also noticeable that those students who revealed fully positive attitudes towards the Mandarin class had already built their interests in language learning or Asian countries and cultures prior to the class because of their previous experience or backgrounds. Based on questions in the pre- and post-intervention surveys targeting emotional engagement, their emotional engagement level started high and ended high, being less susceptible to the change in pedagogy. For those who showed no interest in the language itself, a lesson's teaching

content and how it was delivered were of vital importance. As can be seen from the interview, students that sometimes enjoyed learning the subject were mainly attracted by certain game-based activities or the interestingness of the lesson, whereas those who left negative comments towards the subject did so due to their negative experiences in class such as boredom. Therefore, the interestingness of a lesson was a decisive factor for whether students lacking internal motivation in learning Mandarin would be emotionally engaged in the class, and GBTL was evidently effective in enhancing the interestingness of a lesson.

Table 5.5
Students' Opinions of the Introduction of Game Playing to the Classroom

Q2: Students' Opinions of the Introduction of Game Playing to the Classroom	
1 & 2: 7A 1–3: 7C	I got entertained more.
3 & 4: 7A 4: 7C	It's easier to concentrate on the class and I tend to listen more.
5: 7A 5: 7C	The new vocabularies were stuck in my brain more after playing the games.
6: 7A	Sometimes people got side-tracked with just playing the game rather than learning what they were meant to learn.
6: 7C	I don't really like physical activity that much because I'm a lazy person. I enjoyed the worksheets more because I like reading and writing a lot.

Table 5.5 shows that the introduction of GBTL to the Mandarin class contributed to an improvement in student engagement behaviourally, emotionally, and cognitively. About half the students stated that they were entertained by learning games, which represented an increase in their positive reactions towards the class. Several students also mentioned their improved on-task behaviours based on their self-perception, including enhanced concentration in class and attention to the teacher. The other two students confirmed the effectiveness of GBTL in terms of learning Mandarin by noting it helped with memorising the vocabulary through repeated practice.

Meanwhile, several students proposed different opinions on this issue. One of them noticed the potential side effects of game playing in class; that is, it could divert some students from learning the target language rather than promoting it. The other one failed to provide affirmative comments due to personal preference. But generally, students of the high-achieving class and the low-achieving class shared the majority of their opinions towards the introduction of GBTL to the Mandarin class. There was no difference between these two classes in terms of the effects of GBTL on them.

Table 5.6
Effectiveness of GBTL in Terms of the Learning of Mandarin

Q3: Effectiveness of GBTL in Terms of the Learning of Mandarin	
1 & 2: 7A 1: 7C	For people that didn't really understand the work and stuff, it would hit them with the realisation that it's a bit more easier.
3: 7A 2 & 3: 7C	It helped me remember the vocabularies. We had to check the words in the worksheets for so many times so it just stuck in my brain.
4: 7A	I learnt more because it's easier to concentrate on the class.
5 & 6: 7A	Sometimes it can be confusing because some of the words are similar to other words. Sometimes it's easier when you say it and we repeat, so then we get it imprinted in our minds more easily.
4: 7C	I could use the vocabularies in the games.
5 & 6: 7C	Respondents never thought about the question or didn't think there was an effect.

Table 5.6 indicates that the majority of students realised that games could be employed as a strategy for acquiring Mandarin; they thought games (a) made the new knowledge easier to learn, (b) helped them memorise new vocabulary, (c) directed their energy to the class and made them more devoted to learning, and (d) provided an opportunity for applying the new knowledge. At the same time, the responses of a group of students from both classes challenged the effectiveness of GBTL in terms of learning Mandarin. They argued that learning games was helpful but only in certain situations. In the most extreme case, a pair of

students claimed not to have not noticed or realised the impact of games on enhancing learning.

It would appear most of the students were constantly searching for strategies to help them with learning Mandarin, and they had been evaluating the effectiveness of learning games since they had been introduced to the classroom. By doing so, they were being engaged cognitively, not only when they were processing new knowledge, but also while they were strategically selecting how to learn it. There was a great variety of comments regarding this question. There were degrees of agreement among students of the high-achieving class and the low-achieving class, which indicated that the majority of them were being engaged cognitively, though students of the high-achieving class were generally more reflective than students of the low-achieving class.

To summarise, a comparison of the focus groups confirmed that GBTL was effective in engaging students behaviourally, emotionally, and cognitively, and it worked for students of both classes. The high-achieving class was more emotionally and cognitively engaged than the low-achieving class at the end of the intervention; however, due to the lack of focus group data collected before the intervention as a benchmark, it was impossible to determine whether the changes were greater for one group than the other.

5.4 Data Triangulation

The results of the quantitative survey data indicated that no statistically significant difference was found between the changes in the high-achieving class's engagement level and the changes in the low-achieving class's engagement level, which means statistically, the effects of GBTL could be considered as the same for both classes. Observational checklist data, on the other hand, showed that GBTL was effective in improving students' behavioural engagement in class, and the changes were more evident in the low-achieving class. An analysis of the focus groups' data led to the conclusion that students of both classes regarded

GBTL as helpful in enhancing their engagement level behaviourally, emotionally, and cognitively. Though students' attitudes towards the Mandarin class in the high-achieving class were generally more positive than those of students in the low-achieving class at the end of the intervention, almost all the students from both classes agreed that they had enjoyed playing learning games for similar reasons. Considering the relatively low starting point of the low-achieving class's engagement level, it is reasonable to conclude that there were greater improvements in the low-achieving class's emotional engagement level when compared to the high-achieving class, which is consistent with the teacher–researcher's observation. The fact that no statistically significant difference was found in the survey data, while the other two types of data showed encouraging trends, could be due to a lack of power or the nature of the data itself. That is, the number of student participants might not be enough for a significant between-groups difference to be detected, or the focus groups allowed students to more freely express their opinions about games and engagement. Another noteworthy difference was that students of the high-achieving class were comparatively more cognitively engaged in class in terms of learning Mandarin than the low-achieving class, which is also in accordance with the teacher–researcher's observation.

The different opinions between the teacher–researcher and the mentor teacher regarding the impacts of GBTL on high-achieving and low-achieving classes may be caused by their different focuses when making observations. That is, the teacher–researcher focused on the extent of changes regarding students' behaviours and emotions in class. In this process, she involuntarily diverted her attention to individual students who used to be disruptive in class as these students tended to be more conspicuous. Hence, it is understandable that the teacher–researcher perceived there to be tremendous improvements in the low-achieving class's engagement level when these lowly engaged students were prevented from disrupting the

class by playing learning games. The changes in the classroom dynamics and in the teacher–researcher's teaching experience were more perceptible.

Students of the high-achieving class, on the other hand, demonstrated fewer behavioural issues. They were equipped with better self-discipline skills, and few of them had been involved in off-task initiative behaviours even for those lowly engaged ones. Therefore, barely any students required special attention in the high-achieving class 7A. This is why the teacher–researcher merely recorded them behaving well as usual or being more active and emotionally involved as their engagement level in Mandarin class had already been at a relatively high starting point. In comparison, the engagement level of the group of lowly engaged students in the low-achieving class was visibly enhanced by GBTL. The changes in these students happened to result in improved classroom dynamics of the low-achieving class. In other words, the change in the low-achieving class's engagement level was relatively marked compared to the high-achieving class as it started at a lower level with more substantial upside potential. Based on this, the teacher–researcher came to the conclusion that GBTL affected the low-achieving class more than it did the high-achieving class.

The mentor teacher, however, was mainly concerned with whether there were any differences between the effects of GBTL on students of these two classes during the intervention. She noticed that all the students became addicted to the games, and this contributed to the opportunity for practising their Mandarin. There were no exceptions regarding the effects and learning outcomes of GBTL between the two classes. That is, it was not as if 7A enjoyed the games and learnt a lot from playing while this was not the case for 7C. Thus, from her perspective, there was no significant difference between the impacts of GBTL on the high-achieving class and the low-achieving class. The mentor teacher's opinion pertained mainly to the overall effectiveness of GBTL, and was thus more relevant to

Research Subquestion 1, rather than Research Subquestion 2 (which was concerned with the extent of changes in student engagement).

5.5 Concluding Comments

Following the findings presented in Chapter 4, this chapter further investigated whether the effectiveness of GBTL in enhancing student engagement in Mandarin class differed between classes of different academic achievement levels. Quantitative survey data showed no statistically significant difference between the changes in both high-achieving and low-achieving classes' engagement level, which was consistent with the mentor teacher's perspective on this issue. An analysis of observational checklist and field note data, however, indicated that the changes in the low-achieving class's engagement level were greater than those in the high-achieving class, both behaviourally and emotionally, which means though the difference between the changes in student engagement of the two classes was not statistically significant, it was still of practical significance. After confirming the effectiveness of GBTL in enhancing student engagement in Mandarin class, the following Chapter 6 employs qualitative data to further understand the prerequisites for the effectiveness of GBTL and how its effectiveness was achieved.

Chapter 6. Findings: Effectiveness of Game-Based Teaching and Learning—Requirements and How Effectiveness Was Achieved

6.1 Introduction

This chapter is concerned with Research Subquestion 3: *What are the prerequisites for the effectiveness of GBTL, and if GBTL was effective in enhancing student engagement, how was its effectiveness achieved?* Quantitative survey results confirmed that GBTL was effective in enhancing student engagement in Mandarin class. The qualitative data collected from observational field notes, the teacher–researcher's self-reflection journal, and interviews with the mentor teacher and students were triangulated to identify the prerequisites for the effectiveness of GBTL. Moreover, this chapter enumerates the ways in which the effectiveness of GBTL was achieved.

6.2 Prerequisites for the Effectiveness of GBTL

> Games are always successful, I think; they're always successful. If you build it properly . . . If you've set the tone and given them enough resources and they can do it, it's always successful. (Mentor Teacher, Interview, 18/12/2018)

Chapter 4 findings indicated that GBTL was effective in enhancing students' engagement level in Mandarin class for both the high-achieving and low-achieving classes. But why did it work for the student participants in this study? What were the factors that influenced the effectiveness of GBTL? This section explores the relevant factors behind the effectiveness of GBTL.

6.2.1 Game Elements

When people are asked about factors that may influence the effectiveness of a game-based approach, it seems unavoidable that games are mentioned first as an essential element

of this pedagogy. Indeed, an intriguing game makes a great contribution to engage students and saves all the extra time teachers spend in motivating students and classroom management, whereas inappropriate games may directly lead to the failure of GBTL. In Chapter 2, the researcher illustrated the 12 game elements that make a game engaging. This section focuses on evidence that suggests certain game elements are capable of enhancing student engagement in class through indulging them in playing learning games. That is, the effectiveness of GBTL can be improved through modifying game elements. As the mentor teacher noted,

> When they're playing a game, they have to be a lot more switched on for it to be successful. Especially if you have an incentive, a reward, or if there's a challenge involved, but it's got to be achievable. And they are quite competitive so everyone wants to win. (Mentor Teacher, Interview, 18/12/2018)

In this excerpt, several game elements discussed in Chapter 2 are mentioned, namely, goals, conflict, competition and cooperation, and reward structures. This section elucidates each of these elements.

A goal adds purpose, focus, and measurable outcomes to a game, sustains the game, and keeps players motivated (Kapp, 2012). As mentioned by the mentor teacher, the goal needs to be challenging since once it is accomplished, the game is over. The challenge of a game has a positive effect on enhancing engagement (Hamari et al., 2016). In the meantime, the challenges must be achievable. One way of making a difficult goal achievable is through building the necessary prerequisite skills (Kapp, 2012). Hamari et al. (2016) pointed out that being skilled also increases engagement in the game. On the one hand, the teacher–researcher had prepared worksheets for students to practise on for them to become familiar with the knowledge of Mandarin language they needed to play the learning game. On the other hand,

abundant support was provided during the game if the teacher–researcher noticed it was too challenging for the students:

> After the students finished their worksheets, I started introducing the game rules of Carrot Squat to them. But soon I realised the students were having trouble understanding how to play the game. So I changed my strategy and said, 'Let's play a trial round in English first, then we use Mandarin!' I invited five students and we did a demonstration in English to the whole class. Then, I heard some of the students said, 'Oh, I get it!', and they started explaining the game rules to other students . . . Some students were shy and not confident enough with themselves and they didn't want to participate in the game. I encouraged them and gave them hints when I saw them struggling with the new vocabularies. (Observational Field Notes, 7C, 04/12/2018)

Students like to be challenged by a goal because when they achieve it, they feel a sense of accomplishment. It depends on the teachers to provide the students the right amount of challenge so they will not quit due to its overwhelming difficulty. Appropriate challenge motivates the students in playing learning games and contributes to the effectiveness of GBTL.

Though it is helpful to consider conflict, competition, and cooperation separately, all three elements are frequently seen together in a good game design (Kapp, 2012). The teacher–researcher's intention was to provide the students with an engaging game play environment with games that intertwined the three elements. Take the Chinese Shuttlecock game as an example; students were asked to cooperate with their group members to get the high score and compete against other groups. Rather than going solo, this game required teamwork and a collective sense of honour, since the more they worked together, the more

they were able to achieve. Not surprisingly, everyone was doing their best to contribute to their own team in the competition:

> I was supervising the shuttlecock game with my mentor teacher and we kept telling the students what record was set by their classmates and groups from the other class. I noticed the students just got more motivated in playing the games once they realised they were competing with other groups. When somebody failed to catch the shuttlecock, they were like 'Oh, Charlie! Pick it up, hurry, let's do it again!' 'They got 20. Come on! We can beat them!' They kept practising and tracking their records by asking me, 'Miss, how many did we get? What's the record for the other group?' Nobody seemed to get bored. (Observational Field Notes, 7C, 06/11/2018)

It seems that during the game, the students had a sense of 'us' against 'them' in mind. That is, 'I' should work with other members of my team to achieve the best possible outcome against our opponent, which is the social aspect that most players enjoy (Kapp, 2012). They cared about their scores in the game, practised hard, and were proud of what they had achieved. The students were still talking about the game weeks later during the interview:

> Carla: I liked the shuttlecock game. We were competing against the other group and we won.
>
> Cedric: Yes, it's a bit like soccer, dribbling with the . . .
>
> Carla: We got like 22. You guys got 19. Or even three, if you could get three.
>
> Charlotte: Our group did terrible at the shuttlecock.
>
> Cedric: First go we beat the record. Took you like 20.
>
> Carla: Well, we still beat you. (Focus Group, 7C, 18/12/2018)

The students' fresh memory of the game was due to their enthusiasm for it. They enjoyed working with their peers and striving towards the same goal as well as competing against each other:

Teacher–Researcher: How do you think of the competition? Did you enjoy it?

[Most say yes]

Amelia: Everything's a competition.

Aliya: Yes, especially when you're versing a person and it's like . . . I was versing

Alison where I'd get really competitive.

Teacher–Researcher: What made you guys remember it more?

Adam: I lost every game, so . . .

Teacher–Researcher: But did you still enjoy it?

Adam: Yes, it was different. (Focus Group, 7A, 11/12/2018)

The teacher–researcher assumed that the students would enjoy the competition only when they won. But most unexpectedly, they seemed to take delight in competing against their peers no matter what the result was. Either way, conflict, competition, and cooperation act by reinforcing the effectiveness of GBTL due to the fact that sufficient practice is required if the students are to win in a game either as a group or as an individual. In this case, they were motivated by the competition and willing to immerse themselves in practising the new vocabulary they learnt in Mandarin class by playing games, while practising happened to be the most effective way of reinforcing the newly acquired knowledge.

As Kapp (2012) stated, children have no less fun in letting others know they are the ones who received the high score than they do when obtaining a high score. Reward structures are a powerful motivator for players to play a game repeatedly since they provide social capital and bragging rights to those who achieve the high scores (Kapp, 2012). Keeping this in mind, the teacher–researcher brought some gifts from China and presented them as prizes to the winners of the games, and this significantly increased students' interest and motivation in game playing. For example, Cecilia and Casey were two girls from 7C who used to be lowly engaged in Mandarin class. One of the teachers had to keep an eye on them

for them to listen and work on the tasks. During the Kahoot! game, however, they behaved very differently:

> Even Cecilia and Casey, they did the game. They were working. Because they wanted. I told them that they would get the reward at the end, so that even motivated them because they knew that at the end of the game there would be something exciting. (Mentor Teacher, Interview, 18/12/2018)

This example shows that prizes and rewards greatly stimulated the students' interest and motivated them in playing learning games, even for those previously lowly engaged students. For some students, the prizes symbolised their winning status in the competition, whereas other students might merely have been attracted by the prizes, so they were working hard to get the small gift or the points on their leaderboard. Either way, reward structures contributed to the effectiveness of GBTL as long as they kept motivating and engaging students in playing the learning games.

6.2.2 Teachers' Practical Knowledge

Teachers, as 'active, thinking decision-makers who make instructional choices by drawing on complex, practically-oriented, personalised, and context-sensitive networks of knowledge, thoughts, and beliefs', play a role of vital importance in the classroom (Brog, 2003, p. 81). Teachers' teaching practice is based on their body of knowledge of teaching and learning (Qiu, 2013). Though a teacher's practical knowledge is implicit and contextually bound, groups of teachers share common parts of knowledge (Chou, 2008; Van Velzen, Volman, & Brekelmans, 2011). Meijer, Verloop, and Beijaard (1999), for example, summarised practical knowledge into six categories: knowledge of subject matter, students, student learning and understanding, educational purposes, curriculum, and instructional techniques. Golombek (1998), on the other hand, divided teachers' personal practical knowledge into four categories, namely, knowledge of the self, subject matter, instruction,

and context. This section focuses on the influence of teachers' practical knowledge on the effectiveness of GBTL. Data were categorised into subcategories identified by previous studies.

6.2.2.1 Knowledge of students. Teachers' knowledge of students includes 'prior understandings that students of given ages and backgrounds bring with them to the study of particular topics', 'developmental differences among students', 'cultural and social characteristics', and 'students' motivations, aspirations, learning modes, cultural and linguistic backgrounds' (Shulman & Sykes, 1986, cited in Tamir, 1988, p. 106). Student participants of the current study were Year 7 students aged 12 to 13 years. Students of this age have particular ways of interacting, and this should be considered fully when designing the game to be used. Otherwise, unwanted types of interactions between students may sabotage the enjoyable atmosphere and result in negative impacts on GBTL's effectiveness.

For instance, the teacher–researcher selected the Matching game to reinforce students' memory of the vocabulary of colours in Mandarin. In this game, students were asked to take turns and match the cards written in Chinese pīnyīn and characters with the corresponding cards written in English. The teacher–researcher planned to divide the students into groups of four or five since she had done it before in a Year 4/5 class in a primary school, and it went well. However, the mentor teacher suggested the teacher–researcher change the plan to pair work. She explained the reasons later in the interview:

> Because I know the class well, because I see them all the time and I've had them
> since February, and also I've been a teacher for 14 years, so I know how kids
> interact . . . As they get older the dynamics change. Their ability to tolerate each
> other changes. Their interactions, they get a lot more lively and their interactions just
> get out of control quicker . . . Pairs is always good, maybe threes at the most, and

that worked really well. Because nobody's left out. (Mentor Teacher, Interview, 18/12/2018)

This narrative shows that teachers' knowledge of students is of crucial importance, gained through spending abundant time with the students in addition to previous teaching experience. Moreover, teachers cannot assume that students of different ages possess the same pattern of interaction. Their social characteristics and dynamics alter as they grow. Therefore, the game rules that work for one age group does not necessarily mean it will work for all age groups. Students also need their own roles in the game if it aims to engage the whole class. Otherwise, those who are not assigned any tasks will not consider the game relevant to them, or they will even feel left out by other group members. In this case, they will try to find something else to do, and normally, they will end up disturbing other students and disrupting the class.

The teacher–researcher followed the mentor teacher's advice, and the outcomes turned out to be quite positive:

> Today's lesson finished with the matching game. I asked the students to play in pairs . . . Everybody was engaged. I walked around the class and the whole class was focusing on the task—checking the vocabularies and memorizing the cards. I could hear the students asking each other 'hóng sè, what's hóng sè?' 'Red!' Some of them could play the game without referring to their worksheets and the clue I showed them on the board. When they finished the first round, they started the second round spontaneously without asking me what to do next. They also remembered their scores. 'I beat her at 7:5 the first time, and then it was a tie'. Based on my observation, students were enjoying themselves when they were playing games. (Observational Field Notes, 7A, 27/11/2018)

From this excerpt, it is evident that knowing the students and the specific social interaction pattern defined by their age ensured the smooth process of the game so that it could engage everyone in the classroom. The lack of a profound understanding of the students may lead to a chaotic classroom, which will consequently undermine the effectiveness of GBTL.

Equally important for teachers before applying GBTL to the classroom is knowing the developmental differences among students. Ideally, students enrolled in schools across the country should be equally distributed among top, upper-middle, lower-middle, and bottom quarters, but the practical situation varies. Regarding the distribution of students at RHS, more than half (53%) of the students were reported to be in the bottom quarter, whereas merely 4% were reported to be in the top quarter. Therefore, generally, there was still room for the improvement of students' learning ability and academic achievement. In terms of the application of GBTL, limited learning ability means certain students may require more time and opportunities for practising the new knowledge before they are confident enough to apply it to a game. As the mentor teacher pointed out,

> Not [playing the games] without reinforcing. Not with our type of students. Some students might be able to cope but with the type of students we have, we need to really build their confidence first and then they play the game. Confidence with a vocab. Because of the nature of the learners. (Mentor Teacher, Interview, 18/12/2018)

The students' nature determined the teaching strategy employed by the teacher–researcher in her class. With regard to this study's students, sufficient support needed to be provided prior to and during the application of the games. Keeping this in mind, the teacher–researcher developed a way of effectively supporting her students in class:

I have also prepared a shorter version of worksheets for the experimental classes, as I need to keep them busy when I was delivering the new knowledge to them, in this case, with writing the words down. I have learnt earlier that if I gave them nothing to do in hand, they would absolutely not sit properly and listen to me. After introducing the new vocabularies, there were several tasks on the worksheet to get them familiar with today's new things. What's more, the students need something to refer to when they're playing the language games. So in addition to the worksheets, I also prepared a slide with all the new vocabularies we have learnt today and had it displayed when the students were playing. I think it really helped since I could see many students looking at the slide and checking vocabs during the game. (Teacher–Researcher's Self-Reflection Journal, 20/11/2018)

Worksheets, small tasks, and a hint left on the board were all strategies that helped students with lower learning ability to become familiar with the new knowledge and build confidence in themselves. These preparations were necessary as the games were supposed to reinforce what was taught in class while boosting students' interest rather than challenging them and preventing them from being successful. Knowing the learners' nature meant the teacher–researcher could provide the support they needed and therefore ensure that the students had a cheerful learning experience by playing games.

Concurrently, it is difficult to ignore the fact that even classes of the same school differ from one another greatly. In Chapter 5, the status of the two experimental classes 7A and 7C prior to the intervention was described in detail. 7A was a high-achieving class composed of capable students with few behavioural issues, whereas 7C was a relatively low-achieving class composed of students with limited learning ability, and some of them were concerning due to their major behavioural issues. Not only should the differences between classes be considered carefully when planning the teaching content, but also the general difficulty of the games to be employed. Games with the most basic rules and an easy mode are a good starting

point for the low-achieving class. However, for the high-achieving class with highly capable students, a more advanced, challenging version ought to be provided. The mentor teacher compared the different difficulty levels chosen for the high-achieving class 7A and the low-achieving class 7C with regard to the Matching game:

> With 7A . . . you wanted them just to match the word, but because I know the class very well I went straight into challenge mode, and there was a group of boys and I said, let's do challenge mode and let's turn them face down, and then I want you to find the Chinese word. So I went straight because I wanted to challenge them . . . for 7C we could just do match first and then we played memory . . . I don't think they like games that are too hard. You know? You saw what happened when we had gone straight to memory. Without support, I don't know if it would have been as successful. (Mentor Teacher, Interview, 18/12/2018)

Based on their knowledge of the students, teachers can select and modify the games to cater to students of different developmental levels by providing them with the right amount of challenge during game play. That is, the games will not be too easy nor too hard for them, which will give them a sense of accomplishment after playing.

Other than students' age and developmental differences, the other thing the teacher–researcher noticed when she first began her school engagement was the homogeneity of students' cultural and linguistic background. In the observational field notes, she compared the students of RHS to the other Sydney public school she volunteered at and wrote,

> Different from the other school, the students of RHS are mainly white local students and native speakers of English. It seemed to me that maybe only one out of ten students were from families of different cultural backgrounds, whereas in the other school about half of the students were from immigrant families. My mentor teacher told me this is indeed a monolingual community. Compared to Sydney city or other

suburbs near city, the cultural and language background of this community is rather simplex. (Observational Field Notes, 30/01/2018)

This is further suggested by the school's information on the My School website. The school is situated in a semirural environment, and reportedly, only 8% of students in this school were from a language background other than English. The monolingual background of the students has led to certain difficulties in the teaching of a second language, not only the Chinese language, but also French. Living in such a community means limited opportunity to interact and communicate with people from different cultural backgrounds. Students had not realised the importance of knowing another language and culture, and thus lacked the motivation to learn another language and the culture embodied in it. Researchers have also discovered a decrease in enthusiasm and motivation towards foreign language learning between the ages of 11 to 13 years (Tragant, 2006). The mentor teacher expressed her concern in the same dilemma she was facing:

> Not many students are from families of different cultural backgrounds. They only speak English at home. They just haven't realised the importance of learning a second language, you know? They even don't like their own language. They don't like their English class. Sometimes you just think, oh, how am I supposed to teach them another language when they're not interested in their own. (Mentor Teacher, Interview, 18/12/2018)

Not surprisingly, some students' general lack of interest in language, even in their first language, was revealed in the focus group:

> Teacher–Researcher: How do you think about our Mandarin lesson?
> Adam: Better than English.
> Teacher–Researcher: Wow, that's . . . What happened in your English class?
> Amelia: English isn't bad.

Adam: No, it's just boring.

Teacher–Researcher: What?

Adam: English is boring. (Focus Group, 7A, 11/12/2018)

From this conversation, it is evident that for some students, 'not boring' or, in another word, 'interesting' is a key evaluation criterion to whether they like a subject or not. The language itself does not make much difference to the majority of students, unless they have already developed particular interest in a language, country, or culture. For example, several students of 7A specifically stated their reason for taking Mandarin as one of their favourite subjects:

[Mandarin is] definitely one of my favourite subjects as I like Asian countries and I'm fascinated learning about their cultures. (Amelia, Focus Group 7A, 11/12/2018)

I enjoyed learning Chinese because I like learning about a country's language and everything, so I enjoyed most of the lessons. (Anne, Focus Group 7A, 11/12/2018)

Otherwise, no matter whether the language is an Asian language such as Mandarin, European language like French, or their first language, English, the students do not resist the learning of any language in particular. They are willing to learn and engage in their language class as long as it is interesting. In a word, for students from a monolingual community without much personal interest and motivation in language learning, keeping the class interesting may be the best way to engage them.

6.2.2.2 Knowledge of instruction. Knowledge of instruction refers to a teacher's pedagogical knowledge that they draw upon to teach and to make sense of their teaching (Golombek, 1998). It includes 'knowledge of the role of teachers and students, the role of the classroom and naturalistic settings in language learning, the role of lesson plans, the objectives of tasks, evaluation of students and tasks, interaction with students, and assessment

of students' (Golombek, 1998, pp. 451–452). This section argues that teachers' knowledge of instruction is of vital importance for GBTL's effectiveness.

Lesson plans, as systematic records of a teacher's thoughts about what content will be covered in a lesson, help teachers prepare a lesson in terms of resolving problems and difficulties that they may encounter and providing a structure for a lesson and a record of what has been taught (Farrell, 2008). Regarding the lesson planning for the experimental classes, the teacher–researcher would generally chunk her Mandarin lessons into three parts and proceed in the following order: first, introducing new vocabulary, then practising on the worksheets, and finally, playing learning games. The teacher–researcher considered the possibility of removing the worksheets from the plan or moving the game-playing part forward since occasionally the time left was barely enough for one round of playing. However, the mentor teacher suggested not to discard the worksheets nor to change the structure of the lesson. As she explained,

> We need something where they are practising, yes, practising first, so they were confident . . . You can't play a game without preparing first. So you built the field. You built all the knowledge. You taught them the vocabs and then the game was like reinforcing everything that they've learned . . . It's about where you put the game in the lesson sequence. And it's normally a really good tool at the end to summarise their learning or reinforce or repeat or enhance their learning. But we couldn't have done that at the beginning of the lesson. (Mentor Teacher, Interview, 18/12/2018)

As mentioned in the previous section, due to the specific nature of these learners, teachers should always prepare some tasks for them to practise before applying any game playing to build their confidence and ensure the success of GBTL. The established structure of the Mandarin lesson is consistent with this argument. That is, games can be effective in engaging students and reinforcing new learning content, but only when they are planned in a

sequence that comes after sufficient practice. The lesson sequence determined by a teacher's previous knowledge of instruction contributes to the effectiveness of GBTL.

Though lessons are well planned, teachers normally have to modify the content when delivering the lesson because things do not always proceed as planned in a real classroom: 'You've got to be prepared to modify things. If things aren't working, you just stop it and say, you know what, let's do it this way' (Mentor Teacher, Interview, 18/12/2018).

The same rule applies to GBTL, in which case, games are an essential part of the class. Similar to other types of classroom activities, games need to be modified in terms of rules and levels if the students show confusion, a lack of interest, or being under or overchallenged by the games. The teacher–researcher documented an example of making modifications to a game in class:

> Since the matching/memory game went well with 7A, I planned to stick to the same plan with 7C. After the new vocabs and worksheets, I went straight to the memory game, but things didn't work out as I imagined. Students were not very enthusiastic about the game. Some groups were chatting, and some groups looked confused. That's when my mentor teacher hinted me to change it back to a simple matching game . . . What my mentor teacher said today reminded me of a Chinese saying '随机应变' (suí jī yìng biàn), which means being malleable and resourceful when dealing with unexpected things and making certain changes when necessary. I need to prepare various classroom activities of different types, and always be ready to change the sequence of the lesson I prepared based on the real scenario. (Teacher's Self-Reflection Journal, 20/11/2018)

This example shows that when a game does not work out as planned, a teacher's knowledge of instruction is important in modifying the game so that it can better meet students' needs and work in an effective way. Generally, students of this age do not possess

the capacity to adjust the difficulty level of a game in accordance with their own ability, so they rely heavily on their teacher's instruction. Under this circumstance, teachers should be able to evaluate whether their students are bored because the game is too simple for them, stuck or at the edge of giving up because the game is too challenging, or are immersed in the learning game as everything is just right, making insightful decisions on whether modifications need to be made based on their evaluation to ensure the effectiveness of the game on their students' learning.

To make clear and meaningful instructions, teachers are also supposed to understand the process and the objective of a game in advance:

> Like when we were playing the Carrot Squat. I couldn't understand the game. Remember? You were telling me about the game and I asked you a thousand questions. Then I asked you to do a demonstration before you even delivered it to the class. Because you had to be able to explain. So that's always very important that you've played the game yourself where you know what the outcome is . . . And what's the purpose of the game. For example, the purpose of that matching game is to get them confident with using the Chinese words for colours. (Mentor Teacher, Interview, 18/12/2018)

It is rather challenging for both the teachers and students to play a new game in class. For teachers, clear instructions on how to play a game and what makes one the winner of a game are vital, especially when they are introducing a new game that the students have not played before. Ambiguous instructions often result in confusion and misunderstanding among the students, which may directly lead to the failure of playing a game as a classroom activity. Students, on the other hand, need to learn how to play a new game and apply the newly learnt knowledge to that game, which makes the teacher's instruction and support even more decisive. Moreover, teachers should bear in mind that learning games are introduced to the

classroom not only for fun, but also, more importantly, for enhancing students' learning in certain aspects. Based on this understanding, teachers can provide guidance to students in a way that assists in the accomplishment of the game's objectives. In summary, the quality of a teacher's knowledge of instruction should be regarded as one factor that predetermines how effective GBTL will be.

6.2.3 Students' Social Skills

In addition to the teacher's important role in assuring the smooth process of game playing in class, students as active participants also contribute to the success of GBTL. Playing games inevitably involves interactions among players. That is, students are required to cooperate or compete with their classmates in the process, which tests their social skills. As both the teacher–researcher and mentor teacher noticed,

> Teacher–Researcher: So it's like the dynamics between students and their relationships are . . .
>
> Mentor Teacher: Exposed. Isn't it? It's exposed. It's revealed. Like oh, so you're not that good at talking with your buddy. (Mentor Teacher, Interview, 18/12/2018)

In the spotlight of GBTL, students with excellent social skills tend to enjoy themselves while playing games with their peers as they consider it a great opportunity to make friends and learn from others:

> Amelia: I enjoyed the teamwork where we worked with like a partner or a group.
>
> Anne: It's good to communicate with others because it helps us communicate and make more friends and learn more about each other.
>
> Adam: Sometimes others can teach you some stuff because they may have more experience in something.
>
> Agnes: I think it's easier to work with a partner. (Focus Group, 7A, 11/12/2018)

These students had realised the importance of social interaction and had a rather pleasant experience in socialising with their classmates when playing games. This, in turn, had a positive impact on enhancing their engagement in Mandarin class as they were doing something they enjoyed with people they liked.

However, not every student was equipped with such strong social skills, and this was revealed in the study. For example, the mentor teacher shared with the teacher–researcher her thoughts on her observation in a Mandarin lesson with 7C:

> I'm a bit disappointed in Collin because Cory was doing it all by himself. So him and Collin are supposed to be good friends, but when it comes to games I got to see them in a different light. You know? I was like, oh. Because I gave Collin the opportunity to work with Cory but he's not very good at working with other people, which is why I said to him, you're a soccer player, you should be helping your team. So I made that observation. I'm a little bit disappointed in how they interact. Whereas 7A, they know, they've got their social skills down pat. But in 7C you start to see whose social skills are a bit weaker than others, and game playing, yes, you see the kids in a different light. Because I didn't know that Collin wasn't a team player. (Mentor Teacher, Interview, 18/12/2018)

This observation reveals that some students possessed the ability to work independently but not within teams. In the case of GBTL, students are required to learn not only the new knowledge and how to play a game, but also how to cooperate with others as well. This increases the difficulty of the task invisibly for those who have trouble in working or socialising with other people. Playing games with their classmates might not be an enjoyable activity for them. In the worst case, they may give up trying to work on it, which makes the whole idea of using games to enhance students' learning in Mandarin pointless. It is also interesting to note that students of the high-achieving class generally possessed stronger

social skills than did their peers in the low-achieving class. Evidence from this study suggests a positive correlation between students' learning ability and their social skills; however, this remains to be more carefully investigated in further studies.

Under this circumstance, to ensure the effectiveness of GBTL, teachers ought to pay extra attention to students' social interactions during games and provide moderate support to students with limited social skills when necessary. Moreover, certain issues need to be considered before starting a game, such as 'the grouping. Who you put with who. You were asking them to sit with, you know, who do you want to sit next to in the game' (Mentor Teacher, Interview, 18/12/2018).

Inappropriate grouping may lead to various problems. When a student is not acquainted with other group members, the lack of interaction among the team will result in the stagnation of group activity:

> Once I stood there and I got them organised, it's like they don't talk about who's going to set up the cards. Maybe the friendship's not close enough. Because Clayton came to the school quite late so maybe he doesn't have that rapport that the others had . . . Maybe that group was a bit of an awkward mix, so they weren't as comfortable with each other as other groups. (Mentor Teacher, Interview, 18/12/2018)

In this example, the student was experiencing difficulty in fitting into the already established social circles of a class as a latecomer. Both he and the other students required time to get acquainted with each other, but nobody took the initiative in starting a conversation. Hence, they were just sitting there while other students were practising and learning. In this case, teachers should reach out to help establish communication and start the game. But more importantly, teachers should consider grouping students with weaker social

skills with their friends or with those who possess stronger social skills to avoid the unnecessary barriers that hinder the smooth process of GBTL.

Grouping students who are familiar with each other spares the teacher from concerns about the negative impacts on the effectiveness of GBTL caused by the lack of social interaction, but occasionally, this may deviate the group from working on the task since they have too much in common to talk about. As the teacher–researcher documented,

> I noticed Chloe and Celia had had their cards set on the table, but they were not playing with them. Instead, they were having a pleasant chat about something that was definitely not related to the Mandarin class. Then, Chloe got her phone out. They were looking at her phone together and the conversation went on until I walked towards them. (Observational Field Notes, 7C, 04/12/2018)

To summarise, students' social skills significantly affect the effectiveness of GBTL. Students with stronger social skills tend to enjoy themselves more and learn more through playing games with others. However, for GBTL to be effective for students with weaker social skills, teachers should consider carefully how to group and provide them with more support in terms of socialising during playing games.

6.3 Effectiveness of GBTL: How It Was Achieved

The prerequisites and factors that needed to be considered for the successful implementation of GBTL in Mandarin class were illustrated in Section 6.2. This section takes a step further and discusses how the effectiveness of GBTL was achieved, which includes providing opportunity for interacting with the target language, turning students into active learners, and improved peer and teacher–student relationships.

6.3.1 Opportunity for Interacting With Chinese Language

Researchers have attributed the low retention rate of students who study Chinese as a second language in Australian schools to the limited opportunity for utilising the Chinese language in and outside the classroom (Singh & Han, 2014). GBTL as a meaningful classroom activity, however, addresses this issue by providing the opportunity for students to interact with the language in class:

> They're always using their Chinese. I could see with 7C, they were saying, 'What is 红色 (hóng sè, red)?' 'Oh, 红色 (hóng sè, red) is where you have to look for a . . .' You know? And they were actually using the language. It was really good. That was with 7C. I was very impressed. (Mentor Teacher, Interview, 18/12/2018)

The students were engaged with the Chinese language voluntarily and unconsciously when it was built into the games. That is, by playing games, they were contacting and using the language in a natural way. Moreover, different from other tasks that are endowed with obvious and specific purposes, such as reinforcing students' listening, reading, or speaking ability, games impressed students more as a recreational activity rather than a tedious learning task. Few realised they were required to understand the new knowledge they had learnt and apply it to a game in order to play and win it. Yet they had already been doing this.

As mentioned before, playing learning games can also be considered a way of applying what students have learnt to a real-life situation:

> Teacher–Researcher: So they [students] are really using the words they've learned?
> Mentor Teacher: They are . . . Sometimes when you're just learning and you're not applying your knowledge, and there's no point, it's very disengaging for them. But when they're playing a game, they're actually using the new information.
> Teacher–Researcher: So playing games is a way of applying their knowledge to the real life.

> Mentor Teacher: Absolutely yes, a way of applying it, definitely, and that's what makes it exciting. And they have to think a lot more. A lot more thinking. (Mentor Teacher, Interview, 18/12/2018)

As students of a school located in a monolingual community, there was limited opportunity and need for the student participants to practise the Mandarin language outside of the classroom and apply it to their everyday life. Also, due to their competence level as beginner learners with no previous experience in learning Mandarin, it was inevitable that the lessons were mainly delivered in English, which further reduced the time they had to interact with the language. The failure to apply what they had learnt in class frustrated the students and led to a decrease in their motivation to learn. Playing learning games, however, provided them with simulation of a real-life situation to which they could apply their knowledge in Mandarin. This in turn engaged the students in class and motivated them to further pursue this subject.

6.3.2 Students as Active Learners

Bonwell and Eison (1991) defined active learning as 'anything that involves students in doing things and thinking about the things they are doing' (p. 19). That is, to become active learners, students need to be involved in more than simply listening; they should also be engaged in classroom activities and higher order thinking (Bonwell & Eison, 1991). Due to the nature of language teaching, the Mandarin class unavoidably involved lots of explaining, repeating, and copying things down, which could easily lead to passive learning. However, the introduction of game playing to the classroom could actually be regarded as a game changer. The mentor teacher noted the changes in students' cognitive engagement, which were revealed by their behaviour during game playing:

> When they [the students] play a game they do seem to be a lot more active, they're not as passive. When you're presenting new information they can become quite laid

back and maybe daydream a little. But when they're playing a game they have to be a lot more switched on for it to be successful. (Mentor Teacher, Interview, 18/12/2018)

Students were more active during playing learning games since it was more of a student-centred classroom activity rather than teacher centred, which means they were required to think and take action instead of passively listening to their teacher. In this process, they were engaged in the class behaviourally, emotionally, and, more importantly, cognitively.

Some of the students were not satisfied with merely being active players in the games; they even took initiative and started modifying the games in accordance with their ideas:

> After playing the shuttlecock game for a few rounds, a group of boys started to create their own game rules. They introduced the rules of other sports to this game and said let's do elimination this time. So the ones who failed to catch the shuttlecock were eliminated and finally it became a one v. one game. The game rules did not matter to me as long as they were practising how to count in Mandarin, so I let them be with pleasure. They liked it a lot and played for a few more rounds before they changed it back. (Observational Field Notes, 7A, 30/10/2018)

It is evident that the students were engaged in active learning since no one was giving instructions for them to modify the game and create new rules. They mastered how to play the original game and then combined it with their previous knowledge to make it more engaging and challenging for themselves. In this case, they were not simply following the teacher's instructions; instead, they were in charge of what they were learning and how they were learning it:

> I suppose they [the students] do initiate a lot of things when you play a game . . . So when one form of the game wasn't working, they said let's try this game. No, let's do

it this way. No, let's stand in a circle. No, let's just make it one. They were initiating

so many different strategies with that game because they were very comfortable with

that game because they've played a lot of sport. And then they were able to bring

that to that Chinese game. And also, the teacher was almost invisible in that sense,

weren't we? We were like just there to make sure that everything was safe and that

was it. Our role. They took total control. Sort of taking ownership over their learning

and over what they can produce. (Mentor Teacher, Interview, 18/12/2018)

Being active learners and taking ownership over their learning has reportedly resulted

in the increase of student performance (Freeman et al., 2014) and students' self-esteem (Laal

& Ghodsi, 2012). Apparently, the students enjoyed taking control of their own learning

during game playing, and this sense of being in charge boosted their confidence and made

them more willing to play and learn. They actively participated in the games, emotionally

enjoyed themselves in the games, and, more importantly, they were cognitively engaged in

learning as they played. In summary, GBTL turned students into active learners, which

further enhanced their engagement in class.

6.3.3 Improved Peer and Teacher–Student Relationships

In Section 6.2.3, it was argued that students' social skills are one of the prerequisites for

the effectiveness of GBTL. However, this study also discovered that GBTL provided a great

opportunity for peer interaction that facilitated students' social skills, teamwork skills, and

bonds:

Before the Kahoot! game started, I noted that some students were establishing their

alliance rather than playing it on their own. They came up with a user name that

contained both their names and joined the competition as a group. They divided the

work in advance—who's reading the questions, who's looking up the vocabulary,

and who's in charge of searching vocabs from that specific topic. They were talking

to and cooperating with each other and trying to make this as their advantage in order to win the game. (Observational Field Notes, 7A, 11/12/2018)

This observation shows that game playing enabled students to interact with each other in a way that other classroom activities cannot achieve. Normally, classroom interaction is between teacher and students unless it involves some sort of group discussion. However, during a group discussion, the interaction does not comprise cooperation, competition, or bonding and therefore, lack of emotional investment. Playing learning games, on the other hand, is completely different:

Definitely the opportunity to interact with each other. They also enjoy games because they get an opportunity to interact with their friends. They love that. But they're interacting in a positive way . . . and learning through interaction . . . They are supporting each other. Or they find comfort. No one's judging them when they're playing a game, and I think they like that. (Mentor Teacher, Interview, 18/12/2018)

The students were experiencing positive peer interaction during playing games. They were being supportive of each other. For them, it would feel like there was a huge challenge in front of them, but they were going to conquer it together, and they would do it better than other groups in the class. So they felt more comfortable, confident, and encouraged when they were cooperating with their partners. This point was further confirmed by the students in the focus group:

Amelia: I enjoyed the teamwork where we worked with like a partner or a group.
Anne: Yeah, it's good to communicate with others because it helps us communicate and make more friends and learn more about each other.
Adam: Sometimes others can teach you some stuff because they may have more experience in something. (Focus Group, 7A, 11/12/2018)

The students expressed quite positive appraisal towards the teamwork embodied in game playing. They considered it a great opportunity to make new friends and to get to know each other. Some of them even regarded it as a chance to learn from others. Therefore, it is evident that the students enjoyed themselves while playing learning games and deemed it a great way to improve their peer relationships. This in turn enhanced students' emotional and behavioural engagement in class.

In the meantime, the benefits brought about by GBTL were mutual, which means it also had positive influences on the teacher–student relationship. Teachers and students normally stand on opposite sides when it comes to small conversations between students in the classroom. That is, teachers generally assume that chatting between students is irrelevant to the teaching content, so they tend to prevent it from disturbing the class. But students never stop trying to bond with their friends, even during a class. This makes the teacher the one that stands between students and their friends, which can lead to the deterioration of the teacher–student relationship. When playing games, however, teachers do not have to stop students from talking to each other as long as their focus is still on the game:

> All I needed to do was to be there and supervise the game in case there was any
> emergency situation, and provide a little help from time to time when they needed
> me . . . I suddenly realised that we were in the same camp during game playing. I
> was cheering for them and proud of what they have achieved in the game instead of
> telling them what they should or should not do. This has made the class much easier
> for me . . . Also, I got more chances to have informal talks with the students. It was a
> great opportunity to get close with the students and get to know their life, thus forge
> a trusted relationship with them. (Teacher's Self-Reflection Journal, 7C, 06/11/2018)

In this case, teachers are finally the ones who provide instruction and support in the classroom rather than the evil figures who prevent students from doing what they would like

to do. Teachers and students no longer stand on opposite sides. This will presumably lead to significant improvement in the teacher–student relationship. An amicable teacher–student relationship further enhances student engagement in class, as students are more willing to listen to their teachers when they like and respect them.

6.4 Concluding Comments

Through examining the qualitative data collected, it is evident that both the mentor teacher and the teacher–researcher agreed on the effectiveness of GBTL as a way of enhancing student engagement in Mandarin class. However, it was identified that the effectiveness of GBTL depends largely on the teacher's choice of the most engaging game, the teacher's practical knowledge, and students' social skills. Under proper conditions, the application of a game-based approach to the classroom could provide the opportunity for students to interact with the target language, turn them into active learners, and improve peer and teacher–student relationships. Student engagement can be enhanced due to these improvements.

Chapter 7. Discussion: Combined Findings to Answer the Main Research Question

7.1 Introduction

Chapters 4 to 6 each focused on one research subquestion and presented findings derived from the quantitative and qualitative data collected. Chapter 4 examined the general effectiveness of GBTL in enhancing student engagement, while Chapter 5 took a step forward and emphasised the extent of its effectiveness on classes of different academic achievement levels. Chapter 6 drew on the qualitative data to identify three prerequisites for GBTL's effectiveness and three ways this effectiveness was achieved. The present chapter provides a summary and discussion of the study's findings, in which the overarching research question is addressed: *Does GBTL impact the engagement of secondary school students studying Mandarin in the Western Sydney region?*

7.2 Summary of Findings

Through analyses of the quantitative and qualitative data collected, the four key findings of this study are summarised as follows:

Key Finding 1: GBTL was effective in enhancing both high-achieving and low-achieving classes' engagement level in Mandarin class.

Key Finding 2: The quantitative data revealed no statistically significant difference between the extent of changes in students' engagement level of the high-achieving class and the low-achieving class. The qualitative data, however, showed that the engagement level of the low-achieving class was more enhanced than that of the high-achieving class.

Key Finding 3: The effectiveness of GBTL was heavily dependent on the teacher's choice of game, the teacher's practical knowledge, and students' social skills.

Key Finding 4: The effectiveness of GBTL was achieved through the opportunity for students to interact with the target language, turning them into active learners, and improving peer and teacher–student relationships.

Each key finding is discussed separately in the following section, and in the final section, these findings are combined to answer the main research question.

7.3 Discussion of Findings

7.3.1 Generally Enhanced Student Engagement

Research Subquestion 1 was concerned with whether GBTL affected student engagement in the two experimental classes. The study found a statistically significant difference in students' engagement level between those who were taught with a game-based approach and those who were taught with a traditional approach, which indicates GBTL was effective in enhancing student engagement in both high-achieving and low-achieving classes. This finding resonates with the findings of existing studies examining the effectiveness of GBTL in improving student engagement in various subjects. For example, consistency was found between the results of this study and the results of Little's (2015) study on the effectiveness of games in increasing student engagement in a secondary biology class. The results of the present study were also consistent with those of Annetta, Minogue, Holmes, and Cheng (2009) in their work with 66 high school students using video games to learn about genetics. Huizenga, Admiraal, Akkerman, and ten Dam (2009) found similar results in their analysis of the effectiveness of mobile games in enhancing secondary school students' engagement in history class.

However, one study (Schaaf, 2012) demonstrated that learning strategies other than GBTL produce more student engagement in class and time-on-task behaviours, which indicates that GBTL is not always the best pedagogy. Differences in study findings can be

attributed to differences in the respective studies, such as educational setting, age of participants, target subject, and demographics.

7.3.2 Practical Difference Between the Impacts of GBTL on Classes of Different Academic Achievement Levels

Research Subquestion 2 further examined whether the effectiveness of GBTL on enhancing students' engagement level differed between the high-achieving class and the low-achieving class. Results showed no statistically significant difference between the gain scores of students' engagement level of these two classes. Unfortunately, scarcely any research has checked the effectiveness of GBTL on student engagement using group differences as an independent variable, which means there is no existing research with which to compare the findings. The most analogous is Guan's (2015) study investigating the effectiveness of online game-based learning among students with different levels of Chinese language proficiency, in which the author identified no significant difference. Further research on the impacts of GBTL on student engagement among different groups is required to validate the findings of this study and broaden knowledge of GBTL in language education.

Under this circumstance, to ensure the validity and reliability of the results, this study triangulated data collected from multiple sources with various instruments. The one-on-one interview with the mentor teacher indicated that the effectiveness of GBTL was the same in both classes, which was consistent with the survey results. Quantitative observational checklist data, however, indicated that both classes demonstrated improvements in their behavioural engagement during the treatment. In particular, the low-achieving class showed greater progress than the high-achieving class. The teacher–researcher's observational field notes also documented the improvements in both classes' behavioural, emotional, and cognitive engagement in Mandarin class. Based on the notes of the two classes, the same conclusion was drawn: GBTL was more effective in enhancing the low-achieving class's

student engagement level. Focus group data alone could not indicate which changes were greater for which group. But combined with other types of data, it is evident that the low-achieving class's emotional engagement was improved considerably more than that of the high-achieving class.

In summary, though no statistically significant difference was found between the gain scores of each of the classes' engagement level, qualitative data confirmed there was a difference between the effectiveness of GBTL on groups of different academic achievement levels in practice. Specifically, GBTL enhanced the low-achieving class's student engagement level more so than that of the high-achieving class.

7.3.3 Prerequisites for GBTL's Effectiveness in Enhancing Student Engagement

To answer Research Subquestion 3, this study employed qualitative data to further investigate the requirements underlying the effectiveness of GBTL in enhancing student engagement in Mandarin class. The required conditions for GBTL's effectiveness consisted of three parts, namely game elements, teacher's practical knowledge, and students' social skills. First, the teacher's choice of game was a determinate for the effectiveness of GBTL. This study discovered that games containing challenging goals, conflict, competition and cooperation, and reward structures tend to engage students more in class. Similarly, Fredricks, Blumenfeld, Friedel, and Paris (2002) found that students' perceptions of task challenge were closely associated with their engagement. Newmann (1991) claimed tasks that provide opportunities for fun, collaboration, and assume ownership of conception, execution, and evaluation enhanced student engagement in learning, which is also consistent with the findings of this study.

The second element that had significant impact on the effectiveness of GBTL was the teacher's practical knowledge, which can be divided into knowledge of students and knowledge of instruction. With regard to knowledge of students, teachers need to consider

students' age, developmental differences, and linguistic and cultural backgrounds when designing or choosing a game. Equally important is the teacher's knowledge of instruction including lesson planning, modification of lesson plans in class, and the ability to give clear instructions. Inadequate teacher knowledge may lead to confusion and chaos in the classroom and thereby undermine the effectiveness of GBTL. Battistich, Solomon, Watson, and Schaps (1997) proposed a correlation between teacher support and behavioural engagement, which included higher participation and on-task behaviour. Marks (2000) also discovered higher engagement among students who received proper teacher support in the classroom.

Last, the teacher did not play the only crucial role in the classroom; students as players of learning games also contributed greatly. This study revealed students' social skills are another influential factor that should be considered to ensure the effectiveness of GBTL. That is, students with stronger social skills tend to be more engaged in playing learning games than those with weaker social skills, as they enjoy the social interaction with their classmates more.

7.3.4 Ways GBTL Achieved Effectiveness

Research Subquestion 3 further investigated the ways GBTL enhanced student engagement in Mandarin class. First, GBTL offered opportunities for students to interact with the Chinese language and apply what they had learnt to a real-life situation. This provided them with meaning and motivation for learning a foreign language, which resulted in enhanced student engagement. This finding is consistent with Newmann's (1991) study that pointed out authentic tasks are more effective in enhancing student engagement.

Second, GBTL effectively prevented passive learning and turned students into active learners. Students were able to take ownership over their learning, which consequently led to improved behavioural, emotional, and cognitive engagement. Ryan and Connell (1989) addressed individuals' need for autonomy. Studies show that when individuals' need for

autonomy is met by being able to make choices and decisions, and possessing relative freedom from external controls, they are likely to be more engaged (Connell & Wellborn, 1991), which is consistent with the findings of the current study.

Finally, this study found students' relationships with their peers strengthened, as game playing requires strong social and teamwork skills and provides an opportunity for students to bond with each other. Meanwhile, teacher–student relationships also improved considerably since teachers could finally be the ones to provide guidance and support rather than the one preventing students from doing what they want. Enhanced peer and teacher–student relationships, in turn, enhance students' behavioural and emotional engagement. Fredricks et al.'s (2004) study supports this finding, in which they argued a caring and supportive environment created by teachers and peers satisfies students' for relatedness, which in turn improves their engagement. Other studies have also confirmed that the teacher–student and peer relationship is positively associated with students' behavioural and emotional engagement (Furrer & Skinner, 2003; Valeski & Stipek, 2001).

7.4 Combined Findings: Answer to Main Research Question

The overarching research question of this study asked, *Does GBTL impact the engagement of secondary school students studying Mandarin in the Western Sydney region?* To answer this question, three contributory research subquestions were identified, and the findings were discussed in Section 7.3. This section brings everything together to conclude with a response to the main research question.

The findings of Research Subquestion 1 confirmed the general effectiveness of GBTL in enhancing student engagement in Mandarin class, regardless of the academic achievement level of the students. Next, an investigation into Research Subquestion 2 revealed that there was a practical difference between the effectiveness of GBTL on the high-achieving class and the low-achieving class. Specifically, GBTL affected the low-achieving class more than it did

the high-achieving class. Finally, the prerequisites for the effectiveness of GBTL in enhancing student engagement and the ways this effectiveness was achieved were identified. To summarise, in answer to the main research question, GBTL is effective in enhancing secondary school students' engagement in Mandarin class when the games chosen are appropriate, teachers' practical knowledge is rich, and students' social skills are strong. Its effectiveness was achieved through providing opportunities for students to interact with the Chinese language and apply what they had learnt to a real-life situation, turning students into active learners and improving teacher–student and peer relationships. There was also a group difference observed in terms of the effectiveness of GBTL; that is, the impacts of GBTL on enhancing student engagement were more prominent in the low-achieving class than in the high-achieving class.

7.5 Concluding Comments

This chapter considered the amalgamation of the three research subquestions and how they were addressed by the findings of the study. In the final chapter, I pinpoint the salient issues arising from this study and provides recommendations for future studies in GBTL and student engagement.

Chapter 8. Conclusion and Recommendations

8.1 Introduction

This mixed methods action research investigated the effectiveness of GBTL in enhancing secondary school students' engagement in Mandarin class. Data were collected from Year 7 students, the school mentor teacher, and the teacher–researcher herself in an authentic Mandarin classroom through various data collection instruments. Chapter 8 provides a restatement of the problem and a review of the methodology used in the study. Then, I present the implications of this study, both theoretical and practical. Finally, limitations and recommendations for future research are discussed.

8.2 Restatement of Problem

With 21st-century power shifts and the increasingly vital international status of China, the Australian government and people have realised that relying on bilingual Chinese Australians is insufficient to satisfy the country's needs (Orton, 2016b). Consequently, the Australian government has put out a series of policy publications such as the *Australia in the Asian Century White Paper* (Australian Government, 2012) and the *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 2018) that emphasise the importance of engaging with Asian countries, especially with China, by becoming Asia literate. Under these policies, the number of students learning Chinese in Australia has risen, yet the number of classroom learners continuing through to Year 12 has remained disappointingly low (Orton, 2016a). Reportedly, there were merely 4,500 candidates in Year 12 Chinese nationally in 2015, and among them, only approximately 400 were from a non-Chinese background (Orton, 2016a).

Orton (2016a) partially attributed the low retention rate of students learning Chinese in Australian schools to underdeveloped pedagogy and resources for making learning Chinese

an interesting and engaging educational experience. Also contributing to this issue is the shortage of meaningful activities in class (Orton & Cui, 2016; Scrimgeour, 2014). Research conducted on this topic has suggested that GBTL could be an effective way to address these problems (e.g., H. Chen & Lin, 2016; Dwiana & Singh, 2011; Dwiaryanti, 2014; Fortney, 2016; Reinders, 2012).

This mixed methods quasi-experimental action research sought first to determine the general effects of GBTL on secondary school students' engagement in Mandarin class as measured by student surveys designed for the study. Second, it examined whether the effectiveness differed between groups at different academic achievement levels. The final part of the study investigated both the requirements for GBTL's effectiveness in enhancing student engagement and how this effectiveness was achieved.

8.3 Review of Methodology

This study was a mixed methods action research that adopted a quasi-experimental pre-test/post-test control group design. As the student participants were part of pre-existing classes, randomisation of the sample was not feasible. The research site was a high school located in the Western Sydney region. Of the four Year 7 classes (overall students $N = 74$) participating in this research, one high-achieving class and one low-achieving class were randomly assigned to treatment groups, leaving the other two classes (also one high-achieving and one low-achieving class) as control groups. Each group received equivalent instructional time covering the equivalent Chinese language teaching content. The experimental groups were taught using a game-based approach, while the control groups received traditional instruction, such as worksheets.

The same student survey was administered prior to the treatment and at the conclusion of the treatment to determine students' engagement level in class. The experimental classes were also observed by the teacher–researcher and the mentor teacher using observational

field notes and observational checklists, respectively. Moreover, focus groups were conducted with students from both experimental classes at the end of the treatment, as well as a one-on-one interview with the mentor teacher. The teacher–researcher's self-reflection journal was also included. Data were analysed in accordance with their type and the research questions they provided answers to, reported in Chapters 4 to 7.

8.4 Contributions and Implications

8.4.1 Empirical Contributions

Student engagement and GBTL have been studied extensively but separately. This study combined both domains to examine the effectiveness of GBTL in enhancing student engagement specifically in Chinese language education. The empirical contributions this study makes are threefold.

First, this study employed a mixed methods design rather than a quantitative research design adopted by many previous studies (e.g., Rachels, 2016). Quantitative data provided an average-based overview of the effectiveness of GBTL on student engagement, while qualitative data added in-depth insights from the teachers and student participants. That is, the mixed methods design not only confirmed the effectiveness of GBTL through statistics, but also investigated the prerequisites for its effectiveness and how this effectiveness was achieved.

Second, this study examined the group differences of the effectiveness of GBTL on student engagement. Existing studies in this field have mainly focused on the overall effects of GBTL in the entire targeted populations. This study, however, is the first to determine whether there are differences between the effects of GBTL on students of different academic achievement levels. Though no statistically significant difference was found, qualitative data indicated that in practice, differences exist between different groups.

Third, this study focused exclusively on Chinese language education in the Australian context. Despite a large portion of previous studies on the effects of GBTL in foreign language education, few pertain to the learning of Chinese as a second/foreign language. The current study contributes to this field by confirming the effectiveness of GBTL in enhancing student engagement in a secondary high school Chinese classroom in Australia.

8.4.2 Practical Implications

The current study has several implications for classroom practice and teacher education in the field of foreign language education. First, the results of this study indicate that GBTL was effective in enhancing high school students' engagement level in Mandarin class, and the effects were more remarkable for students of the low-achieving class. Hence, teachers who are encountering difficulties in promoting student engagement in their class are highly recommended to consider the use of GBTL as an alternative pedagogy to complement or replace traditional teaching methods, particularly for those teachers whose students are of lower academic achievement levels and typically exhibit more behavioural issues. The effects are not limited to the Chinese language; teachers of other foreign languages and other subjects may consider employing such game-based teaching methods in their own classrooms.

Second, teachers play an important role in ensuring the effectiveness of GBTL. This study demonstrates that a teacher's practical knowledge of students and instruction and their choice of game determine whether or not the intervention is successful. Therefore, teachers are encouraged to refer to this study's findings in terms of choosing or designing learning games for their classes and to take precautions against the problems they may encounter when introducing GBTL to their classrooms.

8.5 Limitations

While this study has a number of implications, it also has its limitations. The first limitation is the lack of randomisation, which means student participants of this study were not selected and assigned randomly. A nonrandomised control group design is more sensitive to internal validity problems (Dimitrov & Rumrill, 2003). Though a pre-test was adopted to minimise the internal threats to validity, including selection, participant history, maturation, and regression, these potential threats persist.

The short duration of the intervention is another limitation of this study. The experimental classes only experienced four intervention sessions (classes), each lasting 50 minutes. If the duration of the study could be extended, then the teacher–researcher would be able to assess both short-term and long-term learning outcomes. Moreover, the post-survey was conducted exactly at the end of the intervention; however, if the post-survey could be postponed to a time after the intervention, this study might be able to find out whether the effect of GBTL is sustainable or if there is any effect that requires some time to reveal itself (Cohen et al., 2011).

The unavoidability of subjectivity when analysing qualitative data is a third limitation of this study. The teacher–researcher still saw data through an interpretive lens and brought subjectivity and ideological frameworks and values to the analysis, though she was as highly reflective as possible (Cohen et al., 2011). This subjectivity may cause threats to the validity and reliability of the results.

This study is also limited by its nongeneralisability. As action research aims only to advance teachers' practice and improve their students' learning, the results may not be applicable and replicable in other settings with different historical, social, economic, and cultural contexts (Efron & Ravid, 2013).

8.6 Recommendations for Future Research

The following recommendations are made to further enhance the quality of the empirical data on this topic and the broader topic of GBTL in foreign language education. First, this study focused on student engagement in the learning of Chinese language in a secondary high school classroom. It is recommended that this study be reproduced at other educational settings including primary and other high school levels. Additional research with different timeframes, such as a daily program or interventions of a longer duration, would also strengthen the research body. Various types of learning games, digital games in particular, are worth further investigation. Meanwhile, the field of research would benefit from individual studies focusing on the learning of different languages.

Moreover, this study involved only 74 student participants. Further studies with larger sample sizes are preferred to increase the statistical strength and reliability of the quantitative part of this research. The internal validity of the results would also benefit from a true experimental design; thus, research employing a truly random sample is worth conducting.

Importantly, future research is recommended to investigate group differences as the independent variable to verify the findings of the current study. Group differences are not limited to students' academic achievement levels, which this study investigated. For example, the researcher found different impacts of GBTL on students who were already highly engaged and those who were lowly engaged; such differences may be worth following up on in future research.

8.7 Conclusion

As the retention rate of students studying Mandarin as a second language in schools remains disappointing regardless of the Australian government's great attention, this study was timely in terms of investigating the possibility of increasing this number by improving

student engagement in class. It aimed to use action research to examine the effectiveness of an alternative pedagogy – GBTL, in enhancing secondary school beginner learners' engagement in Mandarin class. Surveys, observations, and interviews conducted with the participants and the teacher–researcher's self-reflection journal revealed a positive relationship between the implementation of GBTL and student engagement in class.

The findings suggest that GBTL was effective in enhancing student engagement in Mandarin class. More specifically, the effectiveness was more evidently shown in the low-achieving class than in the high-achieving class. Therefore, GBTL can be regarded as an efficient way in engaging students of lower achievement levels. Additionally, qualitative evidence indicated that in order to achieve this effectiveness, it required teacher's use of appropriate learning games, teacher's rich practical knowledge, and students' strong social skills. The effectiveness was achieved through providing opportunities for students to interact with the Chinese language and apply what they had learnt to a real-life situation, turning students into active learners and improving teacher–student and peer relationships.

In conclusion, evidence showed that student engagement in Mandarin class can be improved by the implementation of GBTL, and this could possibly be one of the solutions to the low student retention rate. I hope this thesis has offered alternatives to Mandarin language teaching in Australian schools and added new knowledge to the educational field.

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Appendices

Welcome to this short language survey!

Page1

In this survey, I would like to find out how you feel about our Mandarin classes, and about learning the Mandarin language.

Your participation in this survey is entirely voluntary. If you do not want to complete the survey, you do not have to. If you are willing to participate in the survey, please click below.

Page 2

Thank you very much for taking this survey. You are a great help!

In this survey, you will be asked some questions about your experience learning Mandarin. Please answer them as honestly as you can. I'll ask you to give your name, but do not worry - your answers will not be shared with others. The goal of the survey is to get an idea of how students feel about the Mandarin class so far.

When you are ready to begin, please click below.

Page 3

Q1: Your name is:

Q2: Which class are you in?
7P
7J
7C
7W

Page 4

Let's do an example together!

Indicate how much you agree with the following statements by filling in the bar:

I enjoy playing sports.

I enjoy listening to music.

Page 5

Indicate how much you agree with the following statements by filling in the bar:

1. I'm excited about learning Mandarin. [E]
2. I look forward to having Mandarin lessons every fortnight. [E]
3. I like learning new things in Mandarin classes. [E]
4. I'm interested in the work I get to do in Mandarin classes. [E]
5. I make an effort to behave well in Mandarin class. [B]
6. I pay attention to the teacher in Mandarin classes. [B]
7. I participate actively in classroom activities; for example, I sometimes raise my hand to ask questions or to answer questions. [B]
8. I find it easy to concentrate on what I am doing in class. [B]
9. I feel like I am making progress in Mandarin. [C]
10. There is just the right amount of challenge for me in Mandarin classes. [C]
11. I try to make comparisons between Mandarin Chinese and other languages I know in class. [C]
12. I get to know about China and Chinese culture, and try to compare it to my own. [C]
13. If I had the opportunity to practice Mandarin after class, I would. [BIGE]
14. I have talked about my Mandarin class after the class is over, for example, with friends on the playground, or with my family. [BIGE]
15. I believe learning Mandarin will be useful to me. [BIGE]
16. If I had the opportunity to learn Mandarin in the future, I would continue. [BIGE]

Information:

Small 'e' engagement:

E stands for emotional engagement;

B stands for behavioural engagement;

C stands for cognitive engagement;

BIGE stands for big 'E' Engagement.

Appendix B. Observation

Observational fieldnotes

Topic:

Setting:

Observer:

Role of observer:

Time:

Length of observation:

Description of behaviors   Reflective notes (insights, themes)

Appendix B. Observation

Observational fieldnotes

Topic:

Setting:

Observer:

Role of observer:

Time:

Length of observation:

Description of behaviors   Reflective notes (insights, themes)

Appendix C. Observational Checklists

<u>**Observational checklists**</u>

Topic: Setting:
Observer: Observant:
Time: Length of observation:

<u>**Checklists:**</u>

- Student raised hand, and volunteered to be a   1   2   3   4   5   6
  part of the game.

- Student asked a task-related question.   1   2   3   4   5   6

- Student answered a question.   1   2   3   4   5   6

- Student participated actively in an activity.   1   2   3   4   5   6

- Student listened attentively when the   1   2   3   4   5   6
  teacher or a classmate spoke.

- Student followed the game rules.   1   2   3   4   5   6

- Student appeared to enjoy the game.   1   2   3   4   5   6

- Student disrupted a classmate or interrupted   1   2   3   4   5   6
  the teacher with a nonacademic issue.

- Student started doing something that was   1   2   3   4   5   6
  not related to the class (e.g., chatting to
  neighbor).

- Student engaged in passive Daydreaming or   1   2   3   4   5   6
  listening to a classmate's off-task
  contribution.

Appendix D. One-on-One Interview With Mentor Teacher

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<div style="border:1px solid black; padding:10px;">

<u>Interview protocol</u>

Project:

Date: Time of interview: Place:

Interviewer: Interviewee:

Questions:

1. How do you think of today's class?

2. Which class do you think goes better, the one played games or the one worked on worksheets? Why do you think so?

3. Do you think the game helps engage the students? How can you tell this?

4. Do you think GBTL works differently with high-achieving class and low-achieving class? How can you tell this? Why do you think it works differently?

5. Any suggestions for our future lessons?

</div>

Appendix E. Focus Group Interview Protocol

Interview protocol

Project:

Date: Time of interview: Place:

Interviewer: Interviewee:

Questions:

1. What kind of task do you like to do in class?

2. How do you feel about our Mandarin class after I introduced games to our class?

3. Do you find it easier to concentrate on what was being taught/the class?

4. Which form do you think is more helpful for you to remember and practice new words, playing games or worksheets? Why do you think so?

5. Why do you like games better than other activities?

6. How do you think of the game we played in class in terms of your study of Mandarin?

7. Which game(s) do you think works best?

Appendix F. Teacher's Self-Reflection Journal

Self-reflection journal

Topic:

Class:

Date:

Time:

Entry 1

Appendix G. Western Sydney University Ethics Approval

WESTERN SYDNEY
UNIVERSITY

REDI Reference: H12935
Risk Rating: Low 2 - HREC

HUMAN RESEARCH ETHICS COMMITTEE

23 October 2018
Associate Professor Tonia Gray
School of Education

Dear Tonia,

I wish to formally advise you that the Human Research Ethics Committee (HREC) has approved your research proposal H12935 "Investigating the impact of game-based teaching and learning on the engagement of secondary school students studying Mandarin in Western Sydney region.", until 23 October 2019 with the provision of a progress report annually if over 12 months and a final report on completion.

In providing this approval the HREC determined that the proposal meets the requirements of the National Statement on Ethical Conduct in Human Research.

This protocol covers the following researchers:
Tonia Gray, Lyn Tieu, Qing Sheng

Conditions of Approval

1. A progress report will be due annually on the anniversary of the approval date.

2. A final report will be due at the expiration of the approval period.

3. Any amendments to the project must be approved by the Human Research Ethics Committee prior to being implemented. Amendments must be requested using the HREC Amendment Request Form

4. Any serious or unexpected adverse events on participants must be reported to the Human Research Ethics Committee via the Human Ethics Officer as a matter of priority.

5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the Committee as a matter of priority

6. Consent forms are to be retained within the archives of the School or Research Institute and made available to the Committee upon request.

7. Project specific conditions:
There are no specific conditions applicable.

Please quote the registration number and title as indicated above in the subject line on all future correspondence related to this project. All correspondence should be sent to humanethics@westernsydney.edu.au as this email address is closely monitored.

Yours sincerely

Professor Elizabeth Deane
Presiding Member,
Western Sydney University Human Research Ethics Committee

University of Western Sydney
ABN 53 014 069 881 CRICOS Provider No: 00917K
Locked Bag 1797 Penrith NSW 2751 Australia
westernsydney.edu.au

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Appendix H. SERAP Approval

NSW | **Education**
Public Schools

Miss Qing Sheng
Unit 9, 12-14 Betts Street
PARRAMATTA NSW 2150

DOC18/1323248
SERAP 2018830

Dear Miss Sheng

I refer to your application to conduct a research project in NSW government schools entitled *Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region*. I am pleased to inform you that your application has been approved.

You may contact principals of the nominated schools to seek their participation. **You should include a copy of this letter with the documents you send to principals.**

This approval will remain valid until 23 October 2019.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Researcher name	WWCC	WWCC expires
Qing SHENG	WWC1460568V	29-Aug-2022

I draw your attention to the following requirements for all researchers in NSW government schools:
- The privacy of participants is to be protected as per the NSW Privacy and Personal Information Protection Act 1998.
- School principals have the right to withdraw the school from the study at any time. The approval of the principal for the specific method of gathering information must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the research approvals officer before publication proceeds.
- All conditions attached to the approval must be complied with.

When your study is completed please email your report to: serap@det.nsw.edu.au. You may also be asked to present on the findings of your research.

I wish you every success with your research.

Yours sincerely

Sandi Simpkins
Director, School Policy and Information Management
19 November 2018

School Policy and Information Management
NSW Department of Education
Level 1, 1 Oxford Street, Darlinghurst NSW 2010 – Locked Bag 53, Darlinghurst NSW 1300
Telephone: 02 9244 5060 – Email: serap@det.nsw.edu.au

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Appendix I. Participant Information Sheet for School Principal

WESTERN SYDNEY
UNIVERSITY

W

Participant Information Sheet – Principal

Project Title:

Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

Project Summary:

Your school is invited to participate in a research study being conducted by researchers affiliated with Western Sydney University's ROSETE (Research Oriented School Engaged Teacher Education) Program. The research seeks to address the problem of low retention rates of Australian school students studying Chinese as a foreign language, by investigating suitable teaching pedagogy, methods and strategies. The aim of the current research is to contribute to the development of an improved teaching pedagogy for enhancing student engagement in Mandarin class, in part by examining the effectiveness of game-based teaching and learning through action research for teaching Chinese to Australian school students.

How is the study being paid for?

This study is non-funded.

What will the participants in my school be asked to do?

Your school children will be observed in the classroom during their regular Mandarin classes, as they take part in regular classroom activities (e.g., playing games, listening to the teacher, participating in discussions and other activities).

Your school children may also be asked to participate in two small focus groups of about 6 students during which they will be asked to answer questions about their experience in their Mandarin class. Each focus group session will last approximately 15-25 minutes in school hours. With their parents' permission, the focus group interviews will be audiorecorded for later analysis. Focus group participants will be able to review and edit the transcription of their interviews to their satisfaction. As this part of data is co-generated with children participants, this will allow the researcher to cross-check with participants and thus validate the data collected.

Your school children will also be asked to complete short computer-based surveys containing questions about their experience in their Mandarin class.

Your school teacher will be asked to provide feedback on the student volunteers that he/she is supervising as part of the ROSETE program. The teacher will also be asked to observe the school students' engagement during the Mandarin classes, while the student volunteer is teaching. The teacher's feedback and reactions will form part of the dataset informing the student researcher's investigation. The teacher will also be asked a set of questions about what you have observed in the classroom, e.g., "Do you think today's class activity successfully engaged students?" These interviews will be audiorecorded for later analysis by the student researcher.

How much time will the participants need to give?

As these activities will form part of school children's regular Mandarin Chinese curriculum, they will not have to devote any additional time beyond his or her usual Mandarin Chinese class activities.

For the school teachers, generally, they will not need to devote any extra time to providing feedback beyond their normal role in the ROSETE program. The student researcher may interview them once

or twice a term to obtain more information about their teaching and the students' engagement, which should take no longer than 15-20 minutes at a time.

What benefits will my school, and/or the broader community, receive for participating?

There are no direct benefits to your school, although the activities the students will undertake in their Mandarin classes are generally designed to be age-appropriate, engaging, and beneficial to their learning of Chinese. However, the current research will contribute to our understanding of effective teaching methods for Chinese language education that may benefit future students of Mandarin Chinese in Australian schools.

Will the study involve any risk or discomfort for the participants? If so, what will be done to rectify it?

There are no anticipated risks or discomforts for the participants.

How do you intend to publish or disseminate the results?

It is anticipated that the results of this research project will be published and/or presented in a variety of academic forums. In any publication and/or presentation, information will be provided in such a way that the participant cannot be identified. Reported data will either correspond to group data, or will refer to individuals by a pseudonym or anonymous participant code.

Will the data and information that the participants provide be disposed of?

Please be assured that only the researchers will have access to the raw data the participants provide. However, data may be used in other related projects for an extended period of time. For example, observations of school children's reactions to the classroom activities may be shared with future volunteer teacher participants of the ROSETE program for illustrative or training purposes.

What if I require further information?

Please contact Associate Professor Tonia Gray (T.Gray@westernsydney.edu.au) and Miss Qing Sheng (19105967@student.westernsydney.edu.au) in the School of Education should you wish to discuss the research further before deciding whether or not to participate.

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree for your school to participate in this study, you will be asked to sign the Consent Form. The information sheet is for you to keep and the consent form is retained by the researcher/s.

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is *H12935*.

Appendix J. Letter of Invitation to School Principal

LETTER OF INVITATION TO SCHOOL PRINCIPAL

Dear ▇▇▇▇▇

My name is Qing SHENG, and I am a Master of Philosophy (Education) student at Western Sydney University (WSU). I am conducting a research on the exploration of effective pedagogies in enhancing student engagement in Mandarin class under the supervision of Associate Professor Tonia Gray and Dr. Lyn Tieu. The WSU Human Research Ethics Committee (HREC) has given approval to approach school for my research. A copy of their approval is contained with this letter. I invite you to consider taking part in this research. This study will meet the requirements of the HREC of WSU.

Title of the Research

Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

Aims of the Research

The research aims to:

• Gain a better understanding of Australian secondary school students' engagement level in Chinese language class;

• Assess the effectiveness of GBTL on enhancing student's engagement in Chinese language classes;

• Examine if GBTL works differently for students from different academic and engagement levels.

Significance of the Research Project

According to the *Melbourne Declaration on Education Goals for Young Australians*, "India, China and other Asian nations are growing and their influence on the world is increasing. Australians need to become 'Asia literate', engaging and building strong relationships with Asia" (p. 4). The current research focuses on teaching Mandarin Chinese and Chinese culture to secondary school students and improving their learning outcomes.

Benefits of the Research to School

The activities that the student participants will undertake in their Mandarin classes are generally designed to be age-appropriate, engaging, and beneficial to their learning of Chinese. The findings of the research project will allow the researcher to address known issues surrounding student engagement in Mandarin

classes, and to provide a possible solution - an effective teaching method to enhance student engagement, which may benefit future students of Mandarin Chinese in the participating school and other Australian schools.

Research Plan and Method

This research is an action research and the methods that will be used to collect data include observation, survey, and focus group.

Surveys: Participants will be asked to complete two short computer-based surveys containing the same questions about their experience in their Mandarin class. The surveys will be conducted at the beginning (pre-survey) and the end of (post-survey) of the data collection process (which will last for one school term in the plan). The teacher-researcher will book the school lab where students have access to computers and they will be asked to complete the surveys as a part of the class. The surveys will provide data about the students' engagement in their Mandarin class, which will be used to assess the impact of game-based learning on student engagement.

Observation: Participants will be observed in the classroom during their regular Mandarin classes, as they take part in regular classroom activities (e.g., playing games, listening to the teacher, participating in discussions and working on worksheets). A total of 6 observations will be completed for the two classes that will use game-based teaching and learning, with 3 for each class. Each observation will last approximately 45 minutes. The observational data will provide another measure of the students' engagement in their Mandarin class.

Focus groups: Participants will be asked to participate in two small focus groups of 6 students during which they will be asked to answer questions about their experience in their Mandarin class. The focus group interviews will be conducted during lunch break in student's language classroom in the last two weeks of the data collection process (school term) (due to the fact that the teacher-researcher only goes to school one day in a week). Each focus group session will last approximately 15-25 minutes and will be audiorecorded for later analysis. The parental consent form will include a box for parents to check off to give their consent for audiorecording to take place. The focus groups will provide another measure of the students' engagement in their Mandarin class.

Permission will be sought from the students and their parents prior to their participation in the research. Only those who consent and whose parents consent will participate. All information collected will be treated in strictest confidence and neither the school nor individual students will be identifiable in any reports that are written. Participants may withdraw from the study at any time without penalty. The role

of the school is voluntary and the School Principal may decide to withdraw the school's participation at any time without penalty.

School Involvement

Once I have received your consent to approach learners to participate in the study, I will

- arrange for informed consent to be obtained from participants' parents;
- arrange a time with your school for data collection to take place;
- obtain informed consent from participants.

Further information

Attached for your information are copies of the Participant Information Sheet and Consent Form for Parents and also the Participant Information Sheet for student participants.

Invitation to Participate

If you would like your school to participate in this research, please complete and return the attached consent form.

Thank you for taking the time to read this information.

Yours sincerely,

Qing SHENG   Associate Professor Tonia Gray

Researcher   Principle Supervisor

WSU   WSU

Appendix K. Consent Form: Principal

WESTERN SYDNEY
UNIVERSITY

W

Consent Form – Principal

Project Title: Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

I …………………….….. as the principal of ………………………………… (school's name) hereby give my consent for my school to participate in the above named research project.

I acknowledge that:

•   I have read the participant information sheet (or where appropriate, have had it read to me) and have been given the opportunity to discuss the information and my involvement in the project with the researcher/s

•   The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I consent to the participation of my school in this project, which includes (please tick the boxes as appropriate):

☐ Students from 4 Year 7 classes being observed as they take part in Mandarin class;

☐ 12 selected Year 7 students participate in an interview, where they will be asked questions about their experience in their Mandarin class;

☐ Have students' responses to the interview questions audiorecorded;

☐ Students from 4 Year 7 classes complete online surveys about their experience learning Mandarin Chinese.

☐ The use of the mentor teacher's regular, ongoing feedback about the ROSETE teacher mentee for research purposes;

I consent for the research data described above to be used in this project and other related projects for an extended period of time as long as the data is non-identified.

I understand that the involvement of the participating children and teacher is confidential and that the information gained during the study may be published and stored for other research use but no information about me will be used in any way that reveals their identity.

I understand that I, the mentoring teacher or the children/their guardians can withdraw from the study at any time without affecting my relationship with the researcher/s, and any organisations involved, now or in the future.

Signed:

Name:

Date:

This study has been approved by the Human Research Ethics Committee at Western Sydney University. The ethics reference number is: H12935

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI)   on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix L. Participant Information Sheet: Teacher

WESTERN SYDNEY
UNIVERSITY

W

Participant Information Sheet – Teacher

Project Title: Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

Project Summary:

You are invited to participate in a research study being conducted by researchers affiliated with Western Sydney University's ROSETE (Research Oriented School Engaged Teacher Education) Program. The research seeks to address the problem of low retention rates of Australian school students studying Chinese as a foreign language, by investigating suitable teaching pedagogy, methods and strategies. The aim of the current research is to contribute to the development of an improved teaching pedagogy for Chinese language education, in part by developing effective teaching methods through action research for teaching Chinese to Australian school students.

How is the study being paid for?

This study is non-funded.

What will I be asked to do?

You will be asked to provide feedback on the student volunteers that you are supervising as part of the ROSETE program. You will also be asked to observe the school students' engagement during the Mandarin classes, while the student volunteer is teaching. Your feedback and reactions will form part of the dataset informing the student researcher's investigation. You will also be asked a set of questions about what you have observed in the classroom, e.g., "Do you think today's class activity successfully engaged students?" These interviews will be audiorecorded for later analysis by the student researcher. You will be able to review and edit the transcription of your interviews to your satisfaction.

How much of my time will I need to give?

Generally, you will not need to devote any extra time to providing feedback beyond your normal role in the ROSETE program. A student researcher may interview you once or twice a term to obtain more information about their teaching and the students' engagement, which should take no longer than 15-20 minutes at a time.

What benefits will I, and/or the broader community, receive for participating?

There are no expected direct benefits to you as a participant. However, the current research will contribute to our understanding of effective teaching methods for Chinese language education that may benefit future students of Mandarin Chinese in Australian schools.

Will the study involve any risk or discomfort for me? If so, what will be done to rectify it?

There are no anticipated risks or discomforts for you as a participant.

How do you intend to publish or disseminate the results?

It is anticipated that the results of this research project will be published and/or presented in a variety of academic forums. In any publication and/or presentation, information will be provided in such a way that the participant cannot be identified. The feedback you provide to the volunteer teacher(s) will help to inform their own self-reflections, but your identity will not be revealed neither in their MPhil theses nor in any future publications that arise from this study.

Will the data and information that I have provided be disposed of?

Please be assured that only the researchers will have access to the raw data you provide. However, your data may be used in other related projects for an extended period of time. For example, the self-reflections that are based on your feedback may be shared with future student participants of the ROSETE program for illustrative or training purposes.

Can I withdraw from the study?

Participation is entirely voluntary and you are not obliged to be involved. If you do participate you can withdraw at any time without giving reason.

If you do choose to withdraw, any information that you have supplied will be deleted.

Should you wish to withdraw from the research study, please contact the Coordinating Principle Investigator, Associate Professor Tonia Gray, at T.Gray@westernsydney.edu.au and the Chief Investigator, Miss Qing Sheng, at 19105967@student.westernsydney.edu.au

What if I require further information?

Please contact Associate Professor Tonia Gray (T.Gray@westernsydney.edu.au) and Miss Qing Sheng (19105967@student.westernsydney.edu.au) in the School of Education should you wish to discuss the research further before deciding whether or not to participate.

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree to participate in this study, you will be asked to sign the Participant Consent Form. The information sheet is for you to keep and the consent form is retained by the researcher/s.

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is *H12935.*

Appendix M. Consent Form: Teacher

Consent Form – Teacher

WESTERN SYDNEY
UNIVERSITY

W

Consent Form – Teacher

Project Title: Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

I hereby consent to participate in the above named research project.

I acknowledge that:

• I have read the participant information sheet (or where appropriate, have had it read to me) and have been given the opportunity to discuss the information and my involvement in the project with the researcher/s

• The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I consent to:

☐ Provide feedback on the ROSETE volunteer teacher's teaching;

☐ Observe the Mandarin classes and share my observations with the ROSETE volunteer teacher;

☐ Answer questions (orally) about the volunteer teacher's teaching;

☐ Have my responses to the interview questions audiorecorded.

I consent for my data and information provided to be used in this project and other related projects for an extended period of time.

I understand that my involvement is confidential and that the information gained during the study may be published and stored for other research use but no information about me will be used in any way that reveals my identity.

I understand that I can withdraw from the study at any time without affecting my relationship with the researcher/s, and any organisations involved, now or in the future.

Signed:

Name:

Date:

This study has been approved by the Human Research Ethics Committee at Western Sydney University. The ethics reference number is: H12935

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix N. Participant Information Sheet: Parent/Carer

WESTERN SYDNEY
UNIVERSITY

W

Participant Information Sheet – Parent/Carer

Project Title:

Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

Project Summary:

Your child is invited to participate in a research study being conducted by researchers affiliated with Western Sydney University's ROSETE (Research Oriented School Engaged Teacher Education) Program. The research seeks to address the problem of low retention rates of Australian school students studying Chinese as a foreign language, by investigating suitable teaching pedagogy, methods and strategies. The aim of the current research is to contribute to the development of an improved teaching pedagogy for enhancing student engagement in Mandarin class, in part by examining the effectiveness of game-based teaching and learning through action research for teaching Chinese to Australian school students.

How is the study being paid for?

This study is non-funded.

What will my child be asked to do?

Your child will be observed in the classroom during their regular Mandarin classes, as they take part in regular classroom activities (e.g., playing games, listening to the teacher, participating in discussions and other activities).

Your child may also be asked to participate in small focus groups of about 6 students during which they will be asked to answer questions about their experience in their Mandarin class. Each focus group session will last approximately 15-25 minutes in school hours. With your permission, the focus group interviews will be audiorecorded for later analysis. Focus group participants will be able to review and edit the transcription of their interviews to their satisfaction. As this part of data is co-generated with children participants, this will allow the researcher to cross-check with participants and thus validate the data collected.

Your child will also be asked to complete short computer-based surveys containing questions about their experience in their Mandarin class.

How much of my child's time will he/she need to give?

As these activities will form part of your child's regular Mandarin Chinese curriculum, your child will not have to devote any additional time beyond his or her usual Mandarin Chinese class activities.

What benefits will my child, and/or the broader community, receive for participating?

There are no direct benefits to your child, although the activities they will undertake in their Mandarin classes are generally designed to be age-appropriate, engaging, and beneficial to their learning of Chinese. However, the current research will contribute to our understanding of effective teaching methods for Chinese language education that may benefit future students of Mandarin Chinese in Australian schools.

Will the study involve any risk or discomfort for my child? If so, what will be done to rectify it?

There are no anticipated risks or discomforts for you as a participant.

How do you intend to publish or disseminate the results?

It is anticipated that the results of this research project will be published and/or presented in a variety of academic forums. In any publication and/or presentation, information will be provided in such a way that the participant cannot be identified. Reported data will either correspond to group data, or will refer to individuals by a pseudonym or anonymous participant code.

Will the data and information that my child provides be disposed of?

Please be assured that only the researchers will have access to the raw data you provide. However, your child's data may be used in other related projects for an extended period of time. For example, observations of your child's reactions to the classroom activities may be shared with future volunteer teacher participants of the ROSETE program for illustrative or training purposes.

Can I withdraw my child from the study? Can my child withdraw from the study?

Your child's participation in the study is entirely voluntary and they are not obliged to be involved.

Your child can withdraw at any time, or you can withdraw them, without giving a reason.

If your child does withdraw, any information that has been supplied will be deleted.

Should you wish to withdraw from the research study, please contact the Coordinating Principle Investigator, Associate Professor Tonia Gray, at T.Gray@westernsydney.edu.au and the Chief Investigator, Miss Qing Sheng, at 19105967@student.westernsydney.edu.au.

What if I require further information?

Please contact Associate Professor Tonia Gray (T.Gray@westernsydney.edu.au) and Miss Qing Sheng (19105967@student.westernsydney.edu.au) in the School of Education should you wish to discuss the research further before deciding whether or not to participate.

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree for your child to participate in this study, you will be asked to sign the Consent Form. The information sheet is for you to keep and the consent form is retained by the researcher/s.

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is *H12935*.

Appendix O. Consent Form: Parent/Carer

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Non-Consent Form – Parent/Carer

Project Title: Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

I, _____, hereby do not consent for my child_____, to participate in the above named research project.

I have discussed participation in the project with my child and we do not agree to their participation in the project.

I acknowledge that:

• I have read the participant information sheet (or where appropriate, have had it read to me) and have been given the opportunity to discuss the information and my child's involvement in the project with the researcher/s

• The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I do not consent for my child to:

☐ Be observed as they take part in Mandarin class;

☐ Participate in an interview, where they will be asked questions about their experience in their Mandarin class;

☐ Have their responses to the interview questions audiorecorded;

☐ Complete online surveys about their experience learning Mandarin Chinese.

I do not consent for my child's data and information provided to be used in this project and, as long as the data is non-identified, in other related projects for an extended period of time.

I understand that my child's involvement is confidential and that the information gained during the study may be published and stored for other research use but no information about them will be used in any way that reveals their identity.

I understand that I can withdraw my child, or my child can withdraw, from the study at any time without affecting their relationship with the researcher/s, and any organisations involved, now or in the future.

Signed:

Name:

Date:

This study has been approved by the Human Research Ethics Committee at Western Sydney University. The ethics reference number is: H12935

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

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PARTICIPANT INFORMATION SHEET
FOR YOUNG PEOPLE

Project title:
Investigating the impact of game-based teaching and learning (GBTL) on the engagement of secondary school students studying Mandarin in Western Sydney region.

Part 1 – to give you first thoughts about the project

1. **Invitation paragraph**
   We would like you to help us with our research study. Please read this information carefully and talk to your mum, dad or carer about the study. Ask us if there is anything that is not clear or if you want to know more. Take time to decide if you want to take part. It is up to you if you want to do this. If you don't then that's fine, you'll be taught in our Mandarin classes just the same.

2. **Why are we doing this research?**
   We want to try and find out ways that help you focus on our Mandarin class and learn knowledges about Mandarin language.

3. **Why have I been asked to take part?**
   You have been chosen because you take part in our Mandarin class and you are a beginner learner of Mandarin Chinese.
   You would be one of 89 students from 4 Year 7 classes.

4. **Do I have to take part?**
   No! It is your choice whether you want to take part and you can always change your mind.

5. **What will happen to me if I take part?**
   You will attend our regular Mandarin class and you will be observed by Ms. Badiu and your Mandarin teacher.
   We will ask questions about how you feel about our Mandarin class using online survey. One will happen at the beginning of a term, and the other at the end of a term. The survey will take place in our regular Mandarin class, so it will not take your personal time.

You may also be invited to take part in small focus groups of about 6 students, and your Mandarin teacher will ask some questions about your experience in Mandarin class. It will not take more than 20 minutes! The interviews will be audiorecorded.

6. **What will I be asked to do?**
You will not be asked to do anything extra as a result of the study, just attend our regular Mandarin class and answer the questions as openly and honestly as you can. If you are invited to the focus groups, you will have the chance to review and edit what you say during our conversation until you think it's okay.

7. **Is there anything else to be worried about if I take part?**
There is nothing else required of you. Focus group interview will happen during lunch break, but it will take place only once. No extra time or work is needed.

8. **Will the study help me?**
You will learn Mandarin and take part in interesting classroom activities, and the information we get might help make Mandarin class more interesting for future students.

9. **What happens when the research study stops?**
The result of the study will be written up so that people can read about it but they won't know that you were in the study.

10. **Contact for further information**
If you would like any further information about this study you could contact the Coordinating Principle Investigator, Associate Professor Tonia Gray, at T.Gray@westernsydney.edu.au and the Chief Investigator, Miss Qing Sheng, at 19105967@student.westernsydney.edu.au

Thank you for reading so far – if you are still interested, please go to Part 2:

Part 2 - more detail — information you need to know if you still want to take part.

11. What do I do if I don't want to take part in the research anymore?
    Just tell your parents and your Mandarin teacher that you don't want to take part anymore. You don't have to give any reason. It is your choice.

12. What if there is a problem or something goes wrong?
    Tell us if there is a problem and we will try and sort it out straight away. You and your mum, dad or carer can either contact the Coordinating Principle Investigator, Associate Professor Tonia Gray, at T.Gray@westernsydney.edu.au and the Chief Investigator, Miss Qing Sheng, at 19105967@student.westernsydney.edu.au

13. Will anyone else know I'm doing this?
    The teachers involved in this research will know you are taking part. Your classmates will also know.
    But all information that is collected about you during the research will be kept strictly confidential. You will be given a number which will be used instead.

14. What will happen to the results of the research study?
    When the study has finished we will write up a thesis that presents our findings to other researchers and educators, and we may put the results in magazines and websites that educators read.

15. Who is organising and funding the research?
    Researchers at Western Sydney University are organising this study. They will not get any extra money for doing this research. This study is non-funded.

16. Who has checked the study?
    Before any research goes ahead it has to be checked by a Research Ethics Committee. This is a group of people who make sure that the research is OK to do. This study has been looked at by the Western Sydney University Human Research Ethics Committee. The Approval number is *H12935*.

Thanks for taking your time reading this!