

**IMPACTS OF THE PROBLEM-BASED LEARNING ON  
CHINESE MIDDLE SCHOOL STUDENTS' READING  
COMPREHENSION AND PERCEPTIONS**



**A Thesis Submitted in Partial Fulfillment of the Requirements for the  
Degree of Master of Arts in English Language Studies**

**Suranaree University of Technology**

**Academic Year 2019**

ผลกระทบของการเรียนรู้โดยใช้ปัญหาเป็นฐานต่อความเข้าใจการอ่าน  
และการรับรู้ของนักเรียนชาวจีนระดับมัธยมต้น



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต  
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Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for a Master's Degree.

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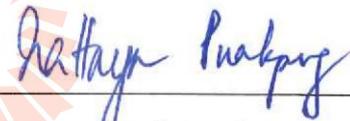
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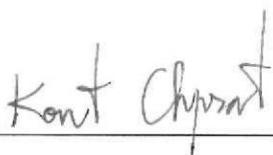
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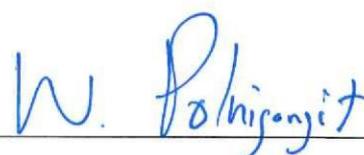
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งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาผลของการเรียนรู้โดยใช้ปัญหาเป็นฐานต่อ  
การปรับปรุงทักษะการอ่านของนักเรียนชาวจีนระดับมัธยมศึกษาตอนต้น รวมทั้งการพัฒนาการตระหนักรู้  
เชิงอภิปัญญาและการรับรู้ต่อบทเรียนที่ใช้ปัญหาเป็นฐาน ผู้เข้าร่วมวิจัยได้แก่นักเรียนระดับ  
มัธยมศึกษาปีที่ 3 จำนวน 57 คน จากโรงเรียนมัธยมศึกษาตอนต้น หมายเลข 21 ซึ่งอยู่ทางตอนใต้ของประเทศ  
จีน โดยสุ่มแบ่งออกเป็นกลุ่มทดลอง (กลุ่มที่ใช้ปัญหาเป็นฐานในการสอน) จำนวน 27 คนและ  
กลุ่มควบคุม (กลุ่มที่ไม่ใช้ปัญหาเป็นฐานในการสอน) จำนวน 30 คน เครื่องมือที่ใช้ได้แก่ บทเรียน  
การเรียนรู้โดยใช้ปัญหาเป็นฐาน แบบทดสอบการอ่านภาษาอังกฤษเพื่อความเข้าใจ ก่อนและหลัง  
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ด้วยวิธีการเปรียบเทียบค่าเฉลี่ยของกลุ่มตัวอย่างอิสระ (independent t-test) และการเปรียบเทียบ  
ค่าเฉลี่ยของกลุ่มตัวอย่างไม่อิสระ (paired sample t-test). ผลการวิจัยพบว่า 1) ทักษะการอ่าน  
เพื่อความเข้าใจก่อนเรียนและหลังเรียนของกลุ่มที่ใช้ปัญหาเป็นฐานในการสอนมีความแตกต่าง  
อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.00; 2) ทักษะการอ่านเพื่อความเข้าใจของกลุ่มที่ใช้ปัญหา  
เป็นฐานในการสอนเพิ่มสูงขึ้นกว่ากลุ่มที่ไม่ใช้โดยมีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ระดับ  
0.02; 3) การตระหนักรู้เชิงอภิปัญญาของกลุ่มที่ใช้ปัญหาเป็นฐานในการสอนเพิ่มสูงขึ้น; 4) ผู้เรียน  
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สาขาวิชาภาษาต่างประเทศ  
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ลายมือชื่อนักศึกษา

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ลายมือชื่ออาจารย์ที่ปรึกษา

WU MEIJING : IMPACTS OF THE PROBLEM-BASED LEARNING ON  
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LEARNING PERCEPTIONS/ METACOGNITION/ PROBLEM-BASED  
LEARNING/ READING COMPREHENSION SKILLS

This study aimed to study the effects of the problem-based learning (PBL) on improving Chinese middle school students' reading comprehension skills including the development of metacognition and students' perceptions towards PBL lessons. The participants were 57 Grade 9 students of No. 21 Middle School in the south of China. Twenty-seven were randomly selected into an experimental group (PBL treatment group) and 30 were randomly chosen for a control group (Non-PBL group). The instruments were a PBL lesson, pre and post reading comprehension exams, questionnaires, a semi-structured interview and observation. The data were analyzed by independent t-test and paired sample t-test. The research findings were as follows: 1) there was a significant difference at .0 level on pre and post reading comprehension skills of the PBL group; 2) there was a significant difference at .02 level on reading comprehension between the PBL and Non-PBL groups; 3) there was an increase in metacognition of the PBL group; 4) the PBL group had a positive perception towards the PBL lessons.

School of Foreign Languages

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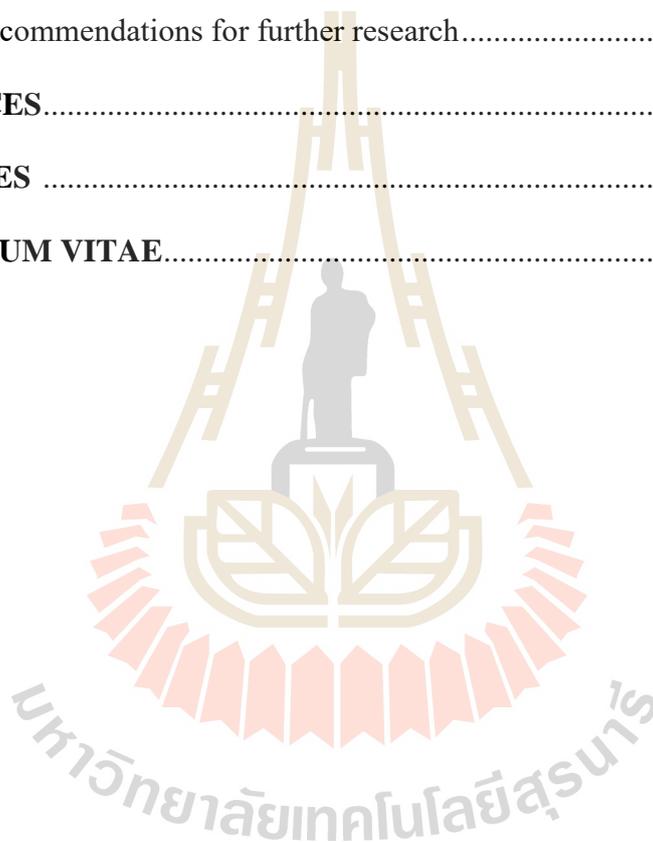
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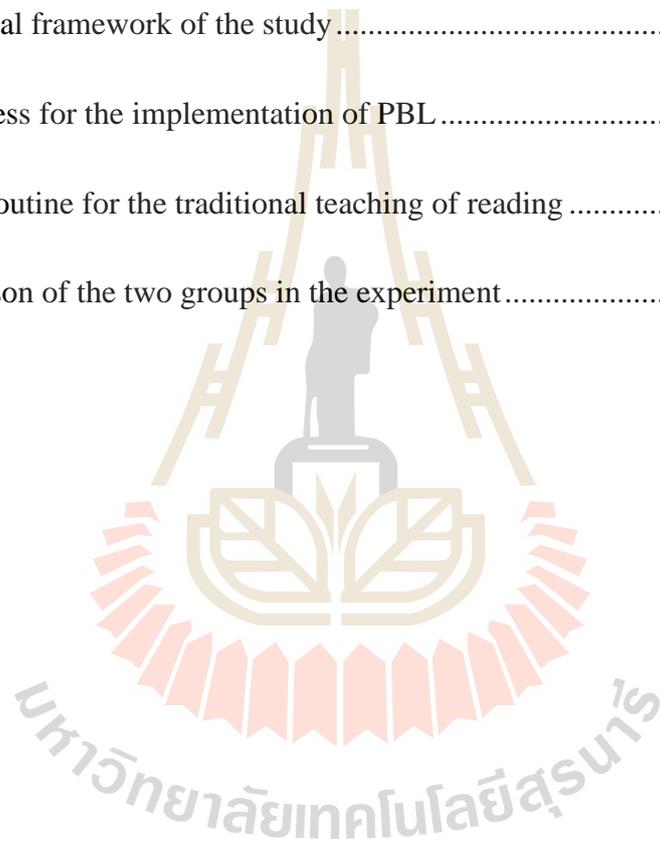
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## LIST OF ABBREVIATIONS

ELT	English Language Teaching
EFL	English as a Foreign Language
ESL	English as a Second Language
GT	Grammar-translation
L2	Second Language
MOE	Ministry of Education
NECS	National English Curriculum Standard
PBL	Problem-based Learning
RCS	Reading Comprehension Skills
RCT	Reading Comprehension Test
SDL	Self-Directed Learning
SPSS	Statistical Package for the Social Sciences

# **CHAPTER 1**

## **INTRODUCTION**

This chapter introduces the study including a description of the research background, the statement of the problem, the research purpose, and the research question, followed by a description of study's significance. Then, key terms are defined. Finally, it ends with a summary for this chapter.

### **1.1 Background of the study**

#### **1.1.1 English language curriculum in the Chinese context**

Teaching English as a foreign language (EFL) in China has undergone significant changes since the first curriculum reform in China (Law, 2014). In 2001, the Chinese Ministry of Education (MOE) published the National English Curriculum Standard (NECS), which presented explicit guidelines for English instruction in elementary schools and set higher objectives for students' comprehensive achievements in middle schools (Hu, 2013). At the middle school level, the goals were to equip students with the ability to understand reading texts (Hu & Baumann, 2014).

The 2001 NECS promoted the idea of developing students' comprehensive language abilities through language applications (MOE, 2001b), which includes the use of the English language to complete tasks and engage in classroom activities (Hu, 2013). Under this curriculum reform, English teaching was to focus on the development of language skills, including listening, speaking, reading, and writing (Hu, 2009). Reading

instruction from the 2001 revised curriculum (MOE, 2001a) focused on common phrases, fluency, vocabulary, grammar, and comprehension based on the nine objectives of the National English Curriculum Standards for Reading (See Appendix A).

As for reading skills, students are expected to achieve four objectives by the end of Grade 9 (MOE, 2001a). Firstly, students should be able to infer the meaning of unknown vocabulary based on context clues and word-formation rules. Secondly, they should be able to understand the logic between the sentences in a paragraph. Thirdly, they should be able to understand the theme and plot of a reading passage as well as to make predictions. Lastly, they should be capable of understanding general reading materials and should cover more than 150,000 words of extracurricular reading.

Additionally, the curriculum reforms attempted to adopt a learner-center learning model and to meet students' developmental needs at different levels (Law, 2014). Thus, the MOE first identified comprehensive subject-specific learning goals and content for the different crucial learning stages of the English subject curriculum standard. Secondly, authentic sources from daily and updated elements were applied to make the curriculum closer to students' daily lives, including understanding and interpreting situations they might encounter (MOE, 2011a).

Furthermore, the curriculum established a constructivist learning model to stimulate students to engage in learning actively and independently (Law, 2014). To be more specific, the MOE (2011a) strongly encouraged learning through exploration rather than through the reception of passive knowledge, memorization without digestion (in Chinese *siji yingbei*), and mechanical drilling. For example, the English curriculum standard encourages students to explore and comprehend ideas in English texts on their own. Students are then allowed to share their thinking with their

classmates. Finally, they achieve the learning outcomes at the end of the class.

In summary, since 2001, the NECS has emphasized *Suzhi Jiaoyu* (quality-oriented education) in English education in China (Law, 2014; Wang, 2007). *Suzhi Jiaoyu* refers to education that leads to qualified individuals, which emphasizes critical thinking and creativity over memorization and test-taking skills (Carson, 2009). It attempts to develop the underlying philosophy and practices of teaching and learning from the traditional teacher-centered, and grammar-based transmissive instruction to more holistic inquiry-oriented learning with the emphasis placed on meaningful and contextualized collaborative and autonomous learning (Yan, 2012). Woolf et al. (2002) pointed out that inquiry-oriented learning focuses on processes to keep students engaged in authentic and active work. It is also characterized by Papáček (2010) as one of the activating methods of problem solving.

### **1.1.2 English reading instruction in China**

Reading is the most important skill in language learning (Gu, 2010), particularly because it builds vocabulary knowledge and leads to lifelong learning and improvement in both first and second language skills (Li & Wilhelm, 2008). In China, reading instruction for comprehension has been a challenge for EFL teachers in language teaching, because most of the middle school textbook focus more on grammatical features. The reading passages in the textbook are also written to demonstrate the characteristics of the targeting grammatical points (Hu & Baumann, 2014). Another issue is the assessment methods. Deng (2005) pointed out that the lack of proper assessment methods did not match the objectives of the 2001 curriculum which aim at the use of English in daily life. The current assessments methods, however, still put an emphasis on vocabulary and grammar. EFL teachers always teach English

reading through translation and grammar rules (Hu & Baumann, 2014). As a result of using ineffective activities and overly focused on language points instead of its functions, English lessons failed to foster students' higher-order thinking skills (Zhang, 2008).

The No. 21 Middle School is a Chinese secondary school that combines a middle school and a high school which is located in south of China. At this school, most EFL teachers apply the grammar-translation approach in English reading instruction. They focus more on teaching language points such as grammar and vocabulary and they teach reading skills using a bottom-up approach, a method that focuses on words, phrases, or sentences. They also emphasize the smallest units, decoding words and sentences rather than comprehending the gist of their reading. The reason for this is that EFL teachers in the No. 21 Middle School believed that the limited vocabulary and poor grammar of the students was causing them difficulties with their reading comprehension.

Generally, English reading instruction in Chinese middle schools has been impacted by the traditional teaching methods that are teacher-centered and focused on grammar-based teaching. Evidence from the No.21 Middle School context shows that the current reading instruction remains a challenge in language teaching, which indicates the need for more effective reading instruction techniques. Thus, it is necessary to explore more effective and efficient approaches to the teaching of reading in the language classroom.

### **1.1.3 PBL in language teaching and learning**

Problem-based learning is a student-centered approach in which students learn about a subject by solving an open-ended problem related to their experience

(Savery, 2006). It is an instructional and curricular learner-centered approach in which students need to conduct research, integrate theory and practice, and apply knowledge and skills to find possible solutions to problems (Coffin, 2013; Azman & Shin, 2012). It also focuses on helping learners develop strategies and construct knowledge (Azman & Shin, 2012).

Recently, problem-based learning has gained popularity as an alternative approach to teaching and learning (Savery, 2006; Seng, 2005; Chung & Chow, 2004). It has been applied successfully for many years as an instructional approach for multiple disciplines (Azman & Shin, 2012; Savery, 2006). In the educational context, PBL has been widely employed to enhance students' ability to apply knowledge from the classroom to the real world (Poikela & Poikela, 2005).

Regarding the learner effect, previous research indicated that students who engaged in PBL programs extended their learning skills after the treatment and enjoyed learning processes more (Lin, 2017a; Torp & Sage, 2002). Compared to non-PBL classes, students have more positive attitudes and higher learning motivation in a problem-based learning environment (Dehkordi & Heydarnejad, 2008). PBL has an impact on fostering students' motivation and engagement in learning (Lin, 2017b; Azman & Shin, 2012; Bosuwon & Woodrow, 2009), increasing their awareness of their own responsibility for learning (Peters, 2010), and using self-directed learning abilities (Lin, 2017; Aliyu, 2017). To be more specific, Lin (2017b) conducted research that revealed how a PBL approach significantly fostered EFL learners' active learning attitudes because it provides a format for the development of learners' attitudes in English learning.

In terms of the existing studies on reading and the PBL approach, Bosuwon

& Woodrow (2009) found that students' attitudes towards the use of PBL enhanced their English reading ability. Also, Lin (2017) indicated that the PBL approach significantly improved participants' reading comprehension ability and the PBL participants' strategies for identifying the subject matter and supportive details were better than that of their counterparts (Non-PBL group). However, research on problem-based learning is still quite scant in language classes, especially for the teaching of reading (Ansarian & Mohammadi, 2018). these researchers concluded that “not many researchers have delved into the effects of PBL on the receptive skills of listening and reading as compared to its effects on the speaking and writing skills” (p.17).

In spite of these challenges in applying PBL in language teaching and learning, some positive effects in the use of the PBL approach for language learning and teaching have been documented (Aliyu, 2017; Othman, Shah, & Ismail, 2013; Phanitphim, 2009; Bosuwon & Woodrow, 2009). For example, Aliyu (2017) found that the PBL approach could be adopted by ESL instructors and teachers to increase students' awareness of metacognitive knowledge, which in turn can enhance their writing proficiency. Also, Othman, Shah, & Ismail (2013) revealed that problem-based learning enhances post-writing tests with students using richer supporting arguments for each point in their essay. Phanitphim (2009) encouraged the use of the problem-based approach for language teaching since results showed that the effectiveness of PBL in a writing course was greater than that for the PBL group which used task-based learning (TBL). Moreover, students had a higher level of achievement when a PBL approach was used over a TBL approach. Also, PBL resulted in positive attitudes among participants. Bosuwon & Woodrow (2009) found that a problem-based business English reading course taken as an ESP (English as Special Purpose) course could enhance

English reading ability among participants in the study. They thought that PBL could provide meaningful activities in which students need to solve problems or address situations that triggered their reading motivation and engagement. Furthermore, Lin (2017) revealed that an English reading course integrated with the problem-based learning approach was able to foster EFL learners' reading comprehension ability, strategy use, and active learning attitudes through by using scaffolding with a small group. Lin implemented a five-stage PBL teaching scheme starting with confronting a problem, then examining the problem, re-examining the problem, and finally reviewing the problem through presenting the solutions. These stages were featured in small-group discussion in and out of class. It was found that the PBL approach dramatically improved the students' reading comprehension ability.

To sum up, PBL has many merits that enhance students' English learning including improving reading ability as well as their use of reading strategies. Thus, it seems that this might well be a feasible and effective approach to language teaching and learning. On the basis of the possible, advantages of PBL in language instruction, it may therefore be worthwhile to conduct a study using a PBL approach to improve the reading skills of middle school students in China.

## **1.2 Statement of the problem**

### **1.2.1 Issues of teaching English reading in Chinese middle schools**

Recently, Chinese middle schools have had problems with English teaching concerning both the direct teaching of language points and an overemphasis on test scores (Luo, 2019). Teachers play a vital role in English language instruction in class, particularly with a teacher-centered model. In addition, teachers consider exam scores

as the best way to evaluate students' abilities, resulting in a lack of attention to students' ability to apply the language. Specifically, teachers overemphasize exam-oriented teaching, particularly in grades six, nine, and twelve. This situation most likely discourages teachers' from using their creativity and their own initiative (Hu, 2013). Moreover, teachers require students to do numerous exercises to prepare for the exams leading to less opportunities for the practice of reading skills. Lau (2016) also mentioned that reading instruction failed to trigger students' intrinsic motivation as well as ignore their cognitive comprehension of language learning.

Several studies have indicated some problems in reading comprehension instruction in China. Some researchers found that teachers fail to promote students' higher-order thinking skills because they use ineffective activities and focus too much on language points rather than understanding meaning (Zhang, 2006; Huang, 2007; Zhang, 2009). Higher-order thinking skills refers to metacognition that includes control over the cognitive processes engaged in learning (Livingston, 2003). These processes of metacognition in nature include planning how to approach a given learning task, monitoring comprehension, and evaluating progress (Zhang, 2009). In a reading class, ineffective activities often involve role-playing, reading a text one paragraph at a time by successive students and a large number of related written exercises. As mentioned earlier, too many language points in teaching reading refer to the analysis of sentence by sentence in reading text with explicit grammar-based instruction, and the explanation of the meaning of words and phrases.

Another problem is that some English teachers are not able to teach effectively because they do not have a high level of language proficiency and they do not use appropriate or effective teaching methods (Zhang, 2009). Thus, it is necessary

to adopt an efficient method for the teaching of English. Although the Ministry of Education in China has strongly advocated self-directed learning, cooperative awareness, and a spirit of inquiry in an educational context, middle school English teachers still employ traditional ways of teaching (Hu & Baumann, 2014). EFL teachers in China commonly teach English reading texts through the translation of single words and sentences as well as through an analysis of grammar. As a result, students are misled into believing that the only approach to improve reading is to enlarge their vocabulary and to understand and master complex grammar. Most of the students from the No. 21 Middle School, for example, work very hard to memorize and recite vocabulary as well as to practice English grammar.

The choice of teaching method should be based on the goal of achieving different teaching aims effectively. According to Luo (2019), there are some key factors for a teaching method that need to be taken into consideration. A teaching method should be adopted according to the teaching content. As for the different requirements of different teaching contents, there should be flexibility and diversity in the selection of teaching methods. Teachers should organize their teaching content thoroughly and systematically before preparing their classes. A proper and effective teaching method should be adopted which takes into account the different teaching conditions and teaching environments. Under the guidance of a specific, the class should also be conducted by making full use of the teaching environment and teaching conditions. Therefore, in order to create a student-centered classroom environment and active learning, teachers should adopt new teaching methods that focus on the students.

As mentioned previously, although the current reformed curriculum in China has advocated self-directed learning, an awareness of the need for cooperation, and a

spirit of inquiry, middle school English teachers still employ conventional methods in their teaching leads to passive learning on the part of the students. Hence, there is a need to break with the traditional teacher-centered concept and guide students to learn more actively on their own. In other words, students should be their own master of learning. An effective English class should involve students in comprehending, manipulating, producing or interacting in the target language, which should be principally focused on meaning rather than form (Nunan, 1999).

To sum up, conventional teaching and learning methods are used in English language classes including grammar-translation method, as well as an emphasis on test taking which leads to passive learning among students. Accordingly, middle school English teachers need to focus more on active learning and the enhancement of self-learning and student-centered learning. In order to achieve this, PBL might be a productive alternative method for language learning.

### **1.2.2 PBL implementation in language education**

PBL was originally applied in the medical field and, then, later it was developed for other fields, including language education. However, Larsson (2001) questioned whether PBL was a possible approach to language education because he considered a language as a tool rather than the actual subject, which was very different from learning anything else. Besides, he thought that understanding was of importance for learning a language so that learning raw facts (e.g., in the form of vocabulary) played a more substantial part than in many other subjects. Additionally, he also stated that, in the domain of languages, there were neither distinct 'real situations' nor journals describing recent developments that could be used when constructing problems. Thus it was necessary to find a plausible context for the problem. Eventually, he concluded

that it was a formidable challenge to apply PBL to language education for whoever might choose to attempt it.

Meanwhile, Lan (2014) conducted research which involved the design of PBL materials for a medical English course for the improvement of the speaking skills of medical students. In this study, she documented the issues and challenges during the process of materials development. She mentioned that the design and development of PBL materials were challenging for application in language classes. Thus, the design and implementation of the PBL approach for reading lessons might be difficult and complicated with regard to teaching materials involving real-world problems.

There has been some research on a PBL approach in language teaching and learning. For example, Aliyu (2017) conducted a study to examine the implementation of PBL in the development of metacognition and writing performance of Nigerian undergraduates. The results showed that the participants increased their progress in content knowledge, organization, vocabulary, language use, and in the mechanics of writing. In addition, Phanitphim (2009) implemented the PBL approach for writing courses for university students in Thailand. The findings showed that PBL was more effective with a PBL group obtaining better results than a TBL group. In other words, the students had a higher achievement using the problem-based learning approach than those students employing the task-based learning approach. Also, PBL received positive feedback from the participants. Furthermore, Bosuwon & Woodrow (2009) found that a problem-based business English reading course taken as an English as Special Purposes course with an effective design could enhance English reading ability among its participants. The students thought that PBL provided meaningful activities when they needed to solve problems or situations since it triggered higher reading

motivation and engagement.

However, the above PBL research was implemented in different ways and took place in a variety of contexts focusing on different language skills which might have had an impact on the effects of the PBL approach in a language class. Therefore, it might be worth while to conduct additional studies on problem-based learning for the improvement of middle school students' reading comprehension and students' attitudes based on previous studies. The results of the current study might provide a deeper understanding of how to apply PBL in the teaching of reading and have pedagogical implications for improving students' L2 reading comprehension.

### **1.3 Purposes of the study**

On the basis of the problems and background mentioned earlier, the present study intends to improve Chinese students' reading comprehension through a problem-based learning approach.

The purposes of the study are as follow:

- 1) To examine the effects of the PBL approach on the reading comprehension skills of Chinese middle school students.
- 2) To investigate the effects of the PBL approach on the development of metacognitive awareness.
- 3) To explore the students' perceptions towards the PBL lessons.

## 1.4 Research questions

In order to achieve the research purposes of this study, three research questions are proposed:

Q1: What are the effects of the PBL approach on promoting the reading comprehension skills of middle-school students in China?

Q2: Do PBL lessons develop the metacognitive awareness of students for reading comprehension skills? If so, to what extent?

Q3: What are the students' perceptions towards the PBL lessons?

## 1.5 Significance of the study

This study is designed to contribute to the research on second language reading, focusing primarily on reading comprehension and the application of PBL in an English reading environment. Therefore, the study should contribute to a deeper understanding of the PBL approach in second language reading. Also, it is expected that the findings will reveal the pedagogical implications for second language instruction, particularly in teaching English reading in a foreign language classroom. Thus, the significance of the current study is specified and described as follows.

The research findings will help Chinese English teachers, especially those of No. 21 Middle School, to develop effective teaching methods and activities to improve the students' reading. Hopefully, the findings will also present a clear picture of how to integrate PBL in an EFL context.

Finally, the current study will suggest a basic process for a PBL approach in language teaching and learning which will develop the research on second language reading. Therefore, researchers and teachers of L2 reading will be able to use the current

study as a model for their further studies to investigate the potential of PBL as an effective teaching method.

## **1.6 Definition of key terms**

### **1.6.1 Problem-based learning (PBL)**

PBL is an active learning instructional approach emphasizing a complex problem that does not have a single correct answer. Students work in a small group and they discuss how to share and negotiate the information so that they can identify what they need to learn in order to solve the problems. The teacher acts as a facilitator for the learning process rather than the transmitter of the knowledge. In addition, PBL is about curriculum development and a delivery system that explore the need for developing problem-solving skills as well as helping students to acquire necessary knowledge and skills (Boud & Feletti, 1991).

In this study, PBL is an educational approach applied to an English reading course, which develops teaching design, tutoring, classroom learning as well as assessment. This approach is designed to ensure a student-centered teaching environment and improve self-directed learning in language teaching and learning.

### **1.6.2 Reading comprehension**

Reading comprehension is the process of understanding a written text through the interaction between the words that are written and how they trigger knowledge or information outside the text (Tompkins, 2011). It involves a variety of skills and strategies when interacting with written text intelligently and critically (Van Kraayenoord, 2010). The readers can gain relevant information from the text through reading comprehension, especially in any English reading test. Reading comprehension

also can also help students improve the accuracy of their answers in the English reading comprehension part of an English language exam.

### **1.6.3 Reading comprehension skills (RCS)**

Reading comprehension skills refer to the ability to understand written text (Harris & Hodges, 1995). In the current study reading comprehension skills include the following: 1) identifying simple facts presented in written text (literal comprehension); 2) making judgments about the written text's content (evaluative comprehension; 3) connecting the text to other written passages and situations (inferential comprehension) (Clark & Rumbold, 2006).

### **1.6.4 Reading comprehension strategies**

Reading comprehension strategies refer to the reading techniques which can improve one's performance in learning consciously with a systematic plan (Harris & Hodges, 1995). In this study, reading comprehension strategies are intentional mental actions during reading that improves comprehension (Afflerbach et al., 2008) which include using prior knowledge and questioning (Parr & Woloshyn, 2013), identification of main ideas, making inference, guessing meaning from context, and scanning for information. Thus the pre-test and post-test reading comprehension were developed based on these strategies.

### **1.6.5 Traditional reading instruction**

Traditional reading instruction refers to a grammar-translation approach in teaching reading which focuses on translation of word meanings and explanation of grammatical features. In the current study, traditional reading instruction is defined as a conventional teaching method implemented in a Chinese middle school context, which emphasizes on reading out loud and understanding grammar and vocabulary.

### **1.6.6 Metacognition**

Metacognition refers to the ability to understand what is behind the reader's knowledge or understanding of the process of knowing and perception, or how readers know and perceive. In this study, metacognition refers to metacognitive awareness and the knowledge of metacognition or metacognitive strategies. Metacognition, therefore, relates to three aspects, which are planning, monitoring, and evaluation (Downing et al., 2019). However, the most importance of these aspects is monitoring which refers to making a decision about which reading strategies will be the most effective in the comprehension of a text.

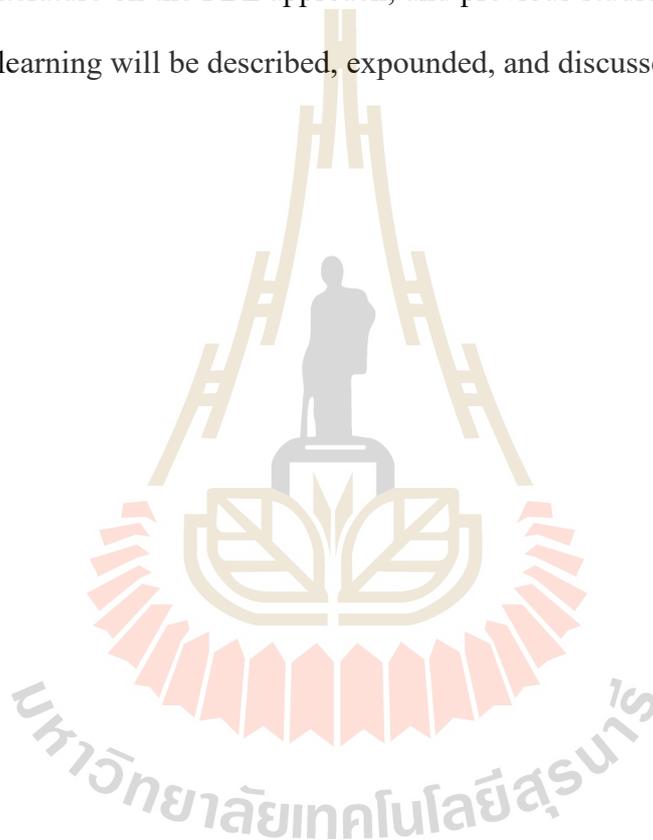
### **1.6.7 Self-directed learning (SDL)**

Self-directed learning or active learning refers to the number and kinds of decisions that are taken by learners themselves (or in cooperation with a trainer/teacher) (Khodabandehlou et al., 2012). In more active forms of learning, for instance, learners plan their use of time; they choose which learning goals and activities they prefer, they test their progress, they take the responsibility of learning and understanding on their own, and they reflect on their errors and successes. Specifically, active learning has to do with the preparation, execution, regulation, control, feedback, and maintenance of learning activities by the learners.

Self-directed learning is one of the procedures in a PBL approach. Take gather information (one of nine steps in PBL process) as an instance, SDL happened when the students gathered relevant information from the reading text to answer the given questions in the study. Students should be able to plan, monitor, and evaluate their reading process on their own to improve their reading comprehension skills.

## 1.7 Summary

This chapter describes the background of the present study, makes a statement of the problems, explains the research purposes and the research questions, and explains the key terms applied in this study, as well as indicates the significance of the study. In the following chapter, the theories related to reading comprehension skills, a review of the relevant literature on the PBL approach, and previous studies on PBL in language teaching and learning will be described, expounded, and discussed



## **CHAPTER 2**

### **LITERATURE REVIEW**

This chapter mainly categories into three parts. The first part incorporates second/foreign language reading and the relationship between metacognition and reading comprehension skills. In the second part, it explains the theoretical framework of the problem-based learning approach and describes the PBL approach in details as well as introduces the process of PBL in a language class. Finally, the last part presents previous research studies on problem-based learning in language teaching and learning.

#### **2.1 Second/Foreign language reading**

##### **2.1.1 English reading comprehension**

Comprehension is the ultimate goal of reading (Lu, 2010; Luo, 2007). It is also the reason and prime motivator when the readers engage in reading (Cunningham & Alington, 2006). Reading comprehension is the process of constructing and comprehending meaning from a piece of text (Zhang et al., 2008). To be more specific, it is the process of constructing meaning through the dynamic interaction among the information from the text, the reader's existing knowledge, and the context of the reading situation (Goodman, 1995). Additionally, Soto et al. (2019) defined reading comprehension as “the set of skills that the subjects invoke to generate a mental representation of the text that is sufficiently coherent and rich enough to adequately understand the material that is being read (p.2)”. Simply speaking, it is understanding

what we read (Carnine et al., 1997). Besides, Zhang et al. (2008) stated that readers who master various strategies are able to achieve the goal of comprehension skills. Therefore, L2 researchers have made efforts on instructing a variety of reading strategies these years which enable students to develop reading comprehension skills.

## **2.1.2 English reading instruction**

### **2.1.2.1 The conventional reading instruction**

Hu & Baumann (2014) described the status of English reading instruction in Chinese context through the descriptions and comments offered by Chinese English teachers. Although the NECS required the *Suzhi Jiaoyu* which encourages the student-centered teaching with equipping students with the ability to understand and learn from English text, the conventional reading instruction mainly emphasizes two aspects in reading class that are vocabulary and grammar.

Vocabulary instruction in reading text is one of the instructional foci at middle school, which includes teaching pronunciation, spelling, and meaning. Repeated reading out loud on words is used to ensure students memorize the pronunciation and spelling as well as foster a sense of reading on targeted reading text. When teaching a verb, the teacher provides a summary of the verb with different tenses. For examples, the verb 'do' as its base form, 'did' as its past tense form, 'does' as its present tense singular pronoun form, 'done' as its past perfect tense form. Verbs are usually considered the most important and confusing part when teaching grammar. Thus, verb taught can increase students' vocabulary, but also helped students build grammar knowledge simultaneously. Then, key sentences from the texts as examples are explained by the teacher. in great detail and students were asked to make sentences following those examples.

Grammar, on the other hand, in traditional reading teaching, became the heart of reading instruction in middle school classrooms which believe that grammar knowledge facilitated reading comprehension and was a key area to be tested. In a middle school, a large amount of the class time was spent on teaching grammar knowledge. Grammatical rules, tenses, and sentence structures explicitly instead of comprehending the reading text. Traditionally, grammar-translation refers to translate texts word-for-word and learn grammar rules, that is, explicit grammar instruction (Hu, 2013).

#### **2.1.2.2 The reading comprehension instruction**

In language class, explicit strategy instruction, called direct strategy instruction, enabled younger students to enhance their comprehension of reading text (Duffy, 2009). Explicit strategy instruction included metacognitive knowledge related to target strategies used (Parr & Woloshyn, 2013). That is, why to use the strategy, when to use the strategy, where to use the strategy, with what materials. In class, a teacher might present strategies applied through think/talk aloud in authentic reading materials after lecturing metacognitive processes in the front of class. The teacher will cue, prompt, and assist students in using relevant strategic processes for new information and tasks through the English text (Almasi, 2003; Woloshyn et al., 2001). Gradually, students have developed to deploy and maneuvering within their strategy repertoires, so they are easy to comprehend any gaps deriving meaning from text through these repertoires (Parr & Woloshyn, 2013). In other words, only when students might master the strategic processes in a subconscious way, they comprehend the text by themselves without the assist of the teacher.

Table 2.1 presents the reading comprehension strategies from Parr & Woloshyn (2013). This table presents cognitive strategies incorporating monitoring for meaning, analyzing text features/structures, questioning, paraphrasing, inferring, summarizing, and synthesizing.

**Table 2.1** Reading comprehension strategies (Adopted from Parr & Woloshyn, 2013)

<b>Reading Comprehension Strategies</b>	
<b>Strategy</b>	<b>Cognitive Process</b>
Monitor for Meaning	Activate relevant prior knowledge (What do I already know?) Check understanding of text while reading (Does this make sense?) Take action if text doesn't make sense (How can I resolve the inconsistency?)
Identify Text Structure	Graphic features and visuals (e.g., font changes, diagrams) Writing patterns (e.g., cause & effect, descriptive lists) Signal words/phrases (e.g., for example, however, contrarily) Writing structures (e.g., opinion essays, research articles) Consider how elements affect text
Questions	Clarify (What does this mean?) Analyze (Why does this matter?) Speculate (What would happen if...?) Contextualize (How does this relate to...?) Use generic stems to generate questions
Paraphrase	Divide complex passages Reorganize sentence parts Question specific phrases Translate difficult wording Analyze connection of ideas Reword and compare with original text Assess whether original passage is represented completely and fairly in paraphrase
Infer	Read, wonder, think Connect ideas in text with prior knowledge Ask "So what?" "If... and..., then..."
Summarize	Identify and paraphrase local and/or global main ideas Combine main ideas into a cohesive description of the original content
Synthesize	Identify categories/themes in or across texts Gather ideas relevant to each category Connect, question, infer to construct meaning in and across texts

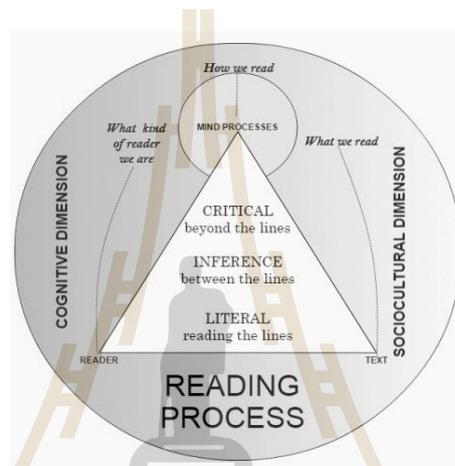
In the current study, the researcher adapted the strategies based on the above table as well as metacognitive strategies mentioned in section 2.2. In order to make sure that students can apply the strategies, each week students were encouraged to integrate strategies discussed last class with the new one. Meanwhile, during the process of reading strategies instruction, questions referred that students ask themselves the related questions before, during, and after reading, which could help them comprehend text deeply. Zhang (2008) integrated clusters of reading strategies in the reading curriculum and conducted the reading instruction systematically in the study. Zhang considered that explicit explanations in classroom instruction could help students develop awareness about English learning. Explicit strategy instruction might have also contributed to facilitate students' improvement in metacognitive awareness of L2 reading strategies (Hudson, 2007). Metacognitive awareness may have a strong influence on learners' choice of language learning strategies (Zhang, 2008).

Therefore, the study attempted to explore the development of the metacognitive awareness among Chinese middle school students on alternative approach for their perceived use of reading strategies through a questionnaire survey.

### **2.1.3 Reading process**

Reading is a cognitive process that consists of a reader, a text, and interaction between the reader and the text (Yoosabai, 2009). This mind process happened through the indirect interaction between text and readers while reading, which means mediation adequately comes from what you read, what kind of reader you are and how you read (D'Vera Rocha, 2017). D'Vera Rocha demonstrated the reading process through the reconceptualization of main aspects related to mental processes in Figure 2.1. Soto et al. (2019) also explained that during the reading, readers evaluate the comprehending

in progress, individually, adjust the implementation to improve the level of coherence of the mental representations, which is metacognitive processes. For instance, successful readers make the determination for their acquirement of sufficient knowledge from a text. They automatically take some additional processing to understand the text, like monitoring and control, which are essential in reading comprehension (Zhang, 2009).



**Figure 2.1** The reading process (adopted from D’Vera Rocha, 2017)

From Figure 2.1, on the left side, it is a cognitive dimension that incorporates perception, strategies, and skills. Zare & Othman (2013) argued that reading is a cognitive activity in which the readers participate in a conversation with the author through the text. Besides, Researchers (Zare, 2012; May, 2001; Walker, 2000) considered that reading strategies are one of the features of cognitive psychology, which are essential for successful comprehension. In the range of cognitive dimension, the bottom of the triangle for ‘what kind of reader we are’ should review perception and cognitive strategies and skills that depend on the physiological and psychological individual conditions of the reader (D’Vera Rocha, 2017). Carrel et al. (1988) thought

it is significant to offer valuable information to select the most useful skills for a reading task: find out specific information, summarizing, interpreting, and so on.

On the other side, it is the socio-cultural dimension as historical/cultural background and situational context. Within the sociocultural dimension, 'what we read' is seen as part of the decision that a student considers according to the nature of text understanding patterns and relations. This group of works comes from linguistics, discourse analysis, or critical discourse analysis (Halliday & Hassan, 2014; Martin, 2009; Van Dijk, 2008).

On the top of the triangle, 'How we read,' namely the mind processes, is centered on different proficiency levels depending on the kind of information that is needed in the reading task. Different levels of interpretation overlapped that emerge depending on the kind of information that is required in the reading task. The levels of reading involve three forms of accomplishing the task, which is literal, inference, critical from the bottom to the top, respectively. That is, reading 'the line,' reading 'between the line,' 'beyond the line,' respectively (Basaraba et al., 2013). Nowadays, the new educational conceptions are claiming for a critical reading at schools where the reader assumes a point of view against sociopolitical forces (D'Vera Rocha, 2017).

To sum up, the study tended to explore how participants read on the top of Figure 2.1 in the study which suppose to associate the mind process with metacognition in reading process. In this sense, the present study mainly discussed metacognition in reading in the following section.

## 2.2 Metacognition in reading

### 2.2.1 Metacognition and metacognitive strategies

Metacognition is seen as an important intellectual skill that plays a critical role in learning (Garrison & Akyol, 2015). The term “metacognition” encompasses similar notions as “metacognitive awareness” (Zhang, 2009). It refers to the capacity of reflecting, controlling, and understanding, in a self-conscious mode, one's own learning and cognition (Schraw and Dennison, 1994). Flavell (1979) defined metacognition as taking one's own cognition as the object of thought, namely “cognition about cognition” in cognitive psychology and in learning theories in the instructional sciences. Also, it was taken as one's understanding of and control over his or her own cognitive processes (Hudson, 2007; Veenman et al., 2006). To be more specific, metacognition involves knowledge about learning and about oneself as a learner, and the skills of monitoring and regulating one's own cognitive process (Li, 2010). Besides, Nelson & Narens (1994) proposed that metacognition comprises of two primary processes, monitoring, and control. White et al. (2009) proposed that the ability to monitor and control learning is crucial both for successful learning and learning how to learn.

Pertaining to metacognitive strategies and skills, Veenman (2011a) reckoned that they refer to the acquired repertoire of procedural knowledge for monitoring and controlling one's learning behavior. A distinction between a strategy and a skill is that strategies require deliberate, conscious effort while the implementation of skills is unconscious and automatized (Afflerbach, Pearson, & Paris, 2008). Veenman (2015) focused if the students want to become proficient readers, they not only have to acquire lower-order skills for fluent reading but need to adopt metacognitive skills as higher-order skills for reading comprehension. Veenman pointed out that the explanation of

how metacognitive skills are acquired and employed by students who follow a theoretical framework of metacognitive self-instruction, which constitutes a well-organized repertoire of strategies and skills at the meta-level that actively controls and regulates cognitive reading activities at the object-level. Metacognitive instruction and training explicitly address the *what*, *when*, *why*, and *how* that constitutes a metacognitive self-instruction.

Phakiti (2003) considered that metacognitive strategies mainly includes two strategies: planning and monitoring. Phakiti explained that planning refers to overview the organization of the test (including reading passages and test tasks); developing directions of what needs to be completed; developing appropriate actions or strategies to handle reading tasks; creating a plan for each reading passage and its tasks to overcome difficulties that may interfere with successful completion of the reading tasks. Whereas monitoring refers to checking, verifying, or correcting reading performance against external standards while or after completing reading tasks. Furthermore, Downing et al. (2019) concluded that metacognitive strategies such as planning, monitoring and evaluating one's own learning evolve more effectively when undergraduates are engaged in problem-based learning.

### **2.2.2 Metacognition and reading comprehension**

Metacognition is one of the important concepts used to promote reading comprehension (Li, 2010; Wichadee, 2011; Soto et al., 2019). According to Alderson (2000), metacognitive strategies can simply be defined as "thinking about thinking." That is, students think scientifically in their mind to decide what to do, how to do what they do not understand. For example, they will evaluate time and reading speed as well

as determine how well they can solve the problem to meet the demand of the reading tasks.

Research on metacognition in reading was carried out since the late 1970s (Li, 2010). In the related studies, researchers have a high compliment of the metacognition as a crucial factor to proficient reading (Zhang, 2009). In the application of metacognition in reading, it evolves readers' "knowledge of strategies for processing texts, the ability to monitor comprehension, and the ability to adjust strategies as needed" (Auerbach & Paxton, 1997, p.240). Metacognition takes into account, not just the product of comprehension (how readers perform on given comprehension tasks), but also the cognitive processes involved during the reading which are ignored through traditional reading tests. In addition, insights from such studies have been useful for readers to become strategic readers.

For instance, Auerbach and Paxton (1997) revealed the findings of the studies to classroom practices, which defined the great success in the problematic readers became high-ability readers after the intervention of reading strategies instruction. Similar findings were reported by Zhang (2008), who conducted strategy-based reading instruction at a tertiary institution in Singapore with young adults from China who were required to take the English-for-academic-purposes (EAP) courses. Furthermore, Wichadee (2011) drew the conclusion that metacognitive teaching strategies might be an effective way to improve students' reading comprehension and unskilled readers can become skilled readers after the instruction of effective strategies.

Therefore, to develop students' reading comprehension skills, the researchers (Zhang 2008; Li, 2010; Wichadee, 2011; Soto et al., 2019) emphasized the need of developing students' awareness of metacognitive knowledge. Students have the aware

of their reading purpose and processes and learn to actively set and regulate their own cognitive goals associated with reading. Zhang (2009) indicated that a need to increase understanding of readers' metacognition of reading strategies was to gain insights into effective strategy instruction. However, most of the studies so far either have been conducted in contexts other than China (Zhang, 2009). Thus, the present study was conducted for the middle school context in China.

### **2.3 Metacognition and problem-based learning**

As for the relationship of metacognition and problem-based learning, some studies have employed the PBL approach in developing students' metacognitive awareness in various fields. For example, Downing et al. (2009) investigated the effect of the PBL approach on metacognitive skills of students in China and found that it is effective in developing the students' metacognition. Similarly, Tosun and Senocak (2013) revealed the effectiveness of the approach in increasing metacognitive awareness of chemistry students. Moreover, Aliyu (2017) proposed that PBL could be used to increase students' awareness of metacognitive knowledge in writing. Furthermore, Bahri & Corebima (2019) considered that PBL approach was potential to empower the development of students' metacognition based on their study findings and its' discussion.

Metacognitive skill is believed to play a key role in various cognitive activities, including comprehension, communication, attention, memory, and problem-solving (Bahri & Corebima, 2019). The development of metacognitive skill helped students become self-directed learners (Bahri & Corebima, 2019). A self-directed learner is responsible for the improvement of his/her learning and, thus, adapt his/her learning strategy to reach the learning objective (Dochy et al., 2005). PBL was capable of

developing skill in knowledge since it can develop high order thinking skill as critical thinking, problem-solving, learning resources finding and implementation, self-directed learning, cooperative skill development, and long-life learning (Azman & Shin, 2012). Therefore, problem-based learning should, to some extent, be aligned to the development of students' metacognition.

In conclusion, based on the relevant existing research, PBL has potential to increase the metacognition which enable students to improve reading comprehension skills. It can be also said that PBL have effects on reading comprehension through metacognition.

## **2.4 Problem-based learning**

This session presents from the definitions of PBL to the basic features of PBL, such as characteristics, goals, advantages, and disadvantages.

### **2.4.1 Definitions of PBL**

According to Shin & Azman (2012), problem-based learning is an innovative, student-centered, self-directed approach for learning in which learners are asked to solve real-life problems to gain knowledge. It is on the principles of using problems as a starting point for the acquisition and integration of the knowledge in the English language classroom in universities (Legg, 2007; Seng, 2005). However, PBL is feasible to all education levels involving secondary as well (Rashid et al., 2016). Moreover, Savery (2006) defined PBL empowers learners to conduct the study, integrate theory and practice, and use knowledge and skills to obtain the possible solutions for the given problems.

Furthermore, Hmelo-Silver (2004) argued that PBL is a instructional approach that learners learn the knowledge by solving a complex problem that have multiple viable answers. For instance, PBL approach was employed on experiential learning organized around investigation and resolution of real-world problems. The teacher uses real-world problems as they guide students' learning through probing, questioning, and challenging learners' thinking. While students in PBL instruction face an ill-structured situation as the "stakeholders" or "owner" of the situation (Torp & Sage, 2002). Torp & Sage reckoned that in the end, students can identify the real problem and determine to learn whatever is necessary to arrive at the viable solutions through investigation.

In addition, PBL is a learner-centered educational method that aims to develop problem-solving skills, self-directed learning as a lifetime habit, and skills for teamwork (Azman & Shin, 2012). It allows students to acquire an integrated body of knowledge from many different subject areas or disciplines. From a social constructivist perspective, students are able to understand processes from a real-world perspective through this approach which have extent across multiple disciplines (Berns & Erickson, 2001).

Different from the conventional approaches, PBL could be generally summarized that it starts with the problems and ends with the solutions that require students to learn from the knowledge on their own during this process. A variety of descriptions highlighted that the main features of PBL for a student-centered learning model and a problem-driving the learning process (Azman & Shin, 2012; Hmelo-Silver, 2004).

### **2.4.2 General objectives of PBL**

The purposes of PBL respond to some aspects of the educational goals, such as develop students' thinking or reasoning skills via the methods of problem-solving, metacognition, critical thinking, which help students become independent and self-directed learner (Barrows, 1996). Barrows and Kelson proposed that the design of PBL with several important goals enable students (as cited in Hmelo-Sliver, 2004) to:

#### **1) Construct an extensive and flexible knowledge base.**

It helps students learn the facts of a domain and most importantly students can integrate the information across multiple domains (Hmelo-Sliver, 2004). It indicated that students use their knowledge in a variety of problem situations to increase the development of flexible knowledge (CTGV, 1997; Kolodner, 1993). In PBL environment, students have a chance to develop flexible knowledge and effective problem-solving skills (Hmelo-Sliver, 2004). When students discuss problems in a group, they are activated to construct relevant prior knowledge and facilitate the processing of new information.

#### **2) Develop effective problem-solving skills.**

Hmelo-Sliver (2004) considered that the development of problem-solving skills involve the ability to apply appropriate metacognitive strategies. As earlier mentioned, metacognitive strategies were concluded for three processes of metacognition like planning, monitoring and evaluating. When students were capable of using this strategies subconsciously, metacognitive strategies become metacognitive skills. Schoenfield (1985) defined metacognitive skills as the executive control processes of planning one's problem solving, monitoring one's progress, and evaluating whether one's goals have been met. For example, students probably know what kind of

problem they need to solve; then, they make the plan; eventually, they manipulate the plan to seek the solutions.

### **3) Develop self-directed and lifelong learning skills.**

Simultaneously, Hmelo-Sliver (2004) also reckoned that metacognitive strategies are essential to develop self-directed and lifelong learning skills. SDL involved that learners must have a metacognitive awareness of what they do and do not understand; they must set learning goals to identify what they need to learn more for the task; they must plan their learning and select appropriate learning strategies; when they implement their plan, learners must monitor and evaluate whether they achieve the goals or not.

### **4) Become an active collaborator.**

The students inevitably need collaboration in THE small group discussions since such discussion is one of the vital features of PBL (Lan, 2014). In the group, group members need to discuss to make an agreement based on establishing common ground, resolving discrepancies, negotiating the actions (Barron, 2002). That is, PBL offers a platform for students to become active collaborators.

### **5) Become motivated intrinsically to learn.**

Hmelo-Sliver (2004) believed that when learners work on a task generated by their interests, challenges, or sense of satisfaction, they become motivated intrinsically to acquire the learning effectively. PBL enables learners to solve the real-world problems, so the learner might be motivated when they value what they are learning and when they join the educational activities indicated in meaningful tasks (Bosuwen & Woodrow, 2009). PBL instruction might be more motivating to reward students for deep understanding, independent thought, and action than many traditional

classrooms using the relative reward performances (Ames, 1992; Ramsden, 1992; Biggs, 1985).

### 2.4.3 Characteristics of PBL

Barrows created a typical model of PBL derived from the original method from McMaster University in the context of medical education. PBL has been developed as a basis for many other contexts such as language classroom (as cited in Boud & Feletti, 1997). Barrows summarized six core characteristics, as follows:

1. Learning is student-centered.
2. Learning occurs in the small groups.
3. A tutor is a facilitator or a guider.
4. Authentic problems are the start points of learning in sequence before any preparation or study has occurred.
5. The problems are tools to achieve the required knowledge and problem-solving skills, and eventually, solve the problems.
6. New information is acquired through self-directed learning.

Some features are the basic elements of the PBL approach also exists in the following previous research. For instance, Dochy et al. (2005) retrieved four typical characteristics of PBL in their study, involving the student-centered learning during the learning process; small student groups; tutors (teachers) work as facilitators; problem tasks; the starting point for learning. Azman & Shin (2012) designed a conceptual framework of PBL in language classroom based on its characteristics involving an ill-structured real-life problem as a trigger. Students formed into the group act as stakeholders owing the problem; teachers act as facilitators; self-directed and collaborative learning environment; outcomes of knowledge and skills.

In conclusion, the main characteristics of PBL in the current study focus on six typical features of PBL from Barrows as they cover the basic aspects of this approach. Firstly, real problems are the starting point as a trigger. Then students engage in the problem for solutions by themselves and share their answers in the small groups while their teacher acts as a facilitator to guide the whole process of problem-solving. Therefore, PBL creates a self-directed and collaborative learning environment that is expected to foster students' problem-solving skills and learn by themselves.

#### **2.4.4 Advantages and disadvantages of PBL**

PBL is an effective instructional method in education, which indicates that it owns the apparent merits in class. However, it also has its challenges.

##### **2.4.4.1 Advantages**

PBL advantages more or less congruent with its ascendant characteristics in language teaching and learning. It is concluded as several aspects: providing a student-centered learning environment; upholding lifelong learning; fostering self-directed learning; enhancing self-motivated attitudes; promoting extensive reading.

#### **1. Providing a student-centered learning environment**

PBL provides the student-centered learning environment through the learning on the foundation of constructivism, sociocultural, and situated conceptions (Jonassen & Land, 2012). According to constructivist theory, students are at the center of the learning process constructed knowledge by deriving meaning from past experiences, experiential learning, and social experiences (Matthews, 2004). In other words, students might activate their prior knowledge and build on existing conceptual knowledge frameworks. Besides, some researchers (Biggs, 2003; Wood,

2003) argued that PBL is student-centered evoking in-deep learning during the learning process by understanding and seeking the information among the students, that is the interaction between the students and learning materials.

## **2. Upholding lifelong learning**

Problem-based learning emphasizes lifelong learning by developing students' potential to determine their own goals, locate appropriate resources for learning, and assume responsibility for what they need to know (Candy, 1991). Students are able to keep long term knowledge retention better in PBL instruction rather than other method (Norman & Schmidt, 1992). They are likely to be autonomous learners who will transfer the skills learned in the classroom to their lives outside the classroom (Lan, 2014).

## **3. Fostering self-directed learning**

PBL enables one to encourage self-directed learning by confronting students with problems and stimulating the development of deep learning (Spencer & Jordan, 1999). Self-directed learning is beneficial to have an awareness of their personal learning needs (Barrow, 1986). To be more accurate, students take the active roles in determining the learning goals, how to reach them, how to study them, how to plan to gain the solutions which have a potential help for them to acquire the knowledge and skills, and how to evaluate what they have learned (Albanese & Mitchell, 1993).

## **4. Enhancing self-motivated attitudes**

Hmelo-Silver (2004) said that enhancing student motivation is a primary advantage of PBL. PBL is fascinating, stimulating, and one of the valuable learning methods so that students can learn with less threatening feelings but more

flexible and fun (Vernon & Blake, 1993). More importantly, If students could gain more self-motivated attitudes from the environment, they possibly pursue learning even after they leave school or college (Vernon, 1995).

## **5. Promoting extensive reading**

PBL provides more opportunities for EFL students to engage in purposeful extensive reading (Bosuwon & Woodrow, 2009). To solve the problem, students need to read a number of reference materials on their own after school. Instead of asking students to read more without any meaningful tasks, students are expected to search the solutions automatically from a wide variety of reading as problem-driving learning, which aims to promote the extensive reading unconsciously.

### **2.4.4.2 Disadvantages**

#### **1. Time-consuming**

Vernon (1995) proposed that instructors for PBL instruction have to invest more time to assess students' learning and prepare course materials, as compared to lecture-based learning instructors. A good problem-based learning design needs plenty of time and work (Wood, 2003). On the one hand, it requires constant monitoring or noting down the students throughout the process, which is a bit time-consuming. On the other hand, it takes a large amount of time to collect materials and information related to real-world problems since most of the questions set with an open-ended format.

#### **2. Roles of a instructor and students**

Ngeow & Kong (2001) pointed out that if teachers and students failed to understand active or meaningful learning in an alternative method, it was difficult to implement PBL in classroom setting. Teachers, on the one hand, work as

facilitators and guiders in PBL instruction (Hmelo-Sliver, 2004). Their task is to question students' knowledge, beliefs, give only hints to correct their mistakes, and guide the students in their research. Besides, they also need to create as many difficult situations as possible during the PBL environment since the whole PBL curriculum is an image of their ideas and how they train the students. It may be obscure to some instructors that they might find it difficult to alter their past habits (Wisestep, 2019).

On the other hand, students are required to engage in active learning strategies and group work to acquire a self-directed learning skills and cooperative learning skills in PBL environment (Ngeow & Kong, 2001). Students may fail in PBL learning when they are unable to work well in groups in which negatively generate resolutions or ideas related to the problem. What is more, students may also fail in terms of critical analysis which is important in PBL practices (Ngeow & Kong, 2001).

In conclusion, compared with the disadvantages of PBL, its advantages are more attractive to further research as an effective instruction. Although PBL is time-consuming for implementing; challenging learning approach to students and teachers, it provides a student-centered learning model that is beneficial to lifelong learning and self-directed learning. In addition, PBL allows students to develop in-depth learning skills through exploring the solutions of real problems in extensive reading, which might enhance self-motivated learning.

## **2.5 Theoretical framework for the study**

### **2.5.1 Constructivism**

Piaget (1976), father of constructivism, hold that learners realize the world based on the construction of their knowledge through interacting with the environment. In other words, learners developed their cognitive structure through the effect of the interaction between the individual and the environment rather than external nor internal factors of cognition. Similarly, Dochy et al. (2005) argued that students actively construct their knowledge and skills through interaction with the environment and through the reorganization of their mental structures instead of performing as passive recipients of the information. However, Weimer (2002) argued that according to the constructivist perspective, knowledge cannot be given to the learners, but learners can construct their own knowledge. Weimer tended to highlight the core role of learners in the knowledge learning that all kinds of knowledge are able to be constructed from existing knowledge by learners.

Congruent with the constructivist conception of learning, the student-centered learning is seen as the core learning model in an educational setting (Dochy et al., 2005). Students have to construct new knowledge by deriving meaning from past experiences, experiential learning, and social experiences during the learning process (Matthews, 2004). They construct knowledge subconsciously rather than the transmission of knowledge through assigning them tasks that enhance the process (Tynjala, 1999).

### **2.5.2 Self-directed learning in PBL**

Self-directed learning refers that students go to search, read, and study the information following the learning goals which they discuss to formulated (Dochy et

al., 2005). In a PBL environment, SDL is required to seek solutions for issues from scenarios in the implementation of the PBL approach for language teaching and learning (Hmelo-Silver, 2004). It allows students to have an awareness of their personal learning needs (Barrow, 1986). In short, students need know what they have learned and how they construct the previous information for the new knowledge.

Researchers (Coffin, 2014; Savin-Baden, 2000) believed that students could become self-directed and self-regulated in the process of this approach, which helps them to gain staff outcomes of learning assessment and student self- and peer assessment. Also, PBL is quite effective in terms of fostering students' motivation and engagement in learning and self-directed learning (English & Kitsantas, 2013; Azman & Shin, 2012). In the self-directed activity, students are supposed to determine their learning goals actively and think about how to reach them, how to study them, how to plan to gain the solutions which might help them acquire the knowledge and skills and how to evaluate what they have learned (Albanese & Mitchell, 1993).

In order to meet the demand for educational goals as fostering self-directed learning, the PBL approach becomes a good choice to develop a self-directed learning model of learning. Before students deal with reading sources, they would get problem scenario from the instructor in the self-directed activities. Since students are in need of some skills in finding the acquired information resources, they become proactive in achieving their goals, adapting their strategies according to situational demands (Seng, 2005).

### **2.5.3 Problems in PBL**

As for the PBL approach, the problems associate with students' real-life are given as a trigger for the students' inquiry (Aliyu, 2017). It generates the students to the

discovery of relevant knowledge in need of solving or understanding the problems. Specifically, students start with complex, real-world problems from the introduction of a problem scenario, which is used as a vehicle for learning (Ng Chin Leong, 2009). The problems are crucial to PBL implementation. For example, Boud (1987) stated that problems in PBL instruction should be the starting point for learning. Unstructured problems are used as the starting points and anchors for the inquiry and learning in an active-learning and learner-centered approach (Seng, 2005). Moreover, Legg (2007) described that PBL is a learning method based on the principles of using real-world problems as the starting points for the acquisition and integration of new knowledge. However, problems should be adapted to the knowledge level of the students so they can triggers students' interests and motivation to search for more knowledge independently, and associated with previous knowledge (Suh, 2004).

#### **2.5.4 Small discussion group**

Group work, one of the typical features of the PBL environment, provides a platform for the cooperative learning experience, and it has a positive influence on learning (Willis, Jones, & Canaan, 2002). It promoted effective learning through collaboration (Savery, 2006). Moreover, Neville & Britt (2007) argued that a group work leads to “a realistic team-based working environment and foster a community of practice” (p.231). Simultaneously, some empirical evidences have illustrated that a group work triggers cognitive effects and results in the restructuring of knowledge and enhances intrinsic interest in learning (Ngeow & Kong, 2001; Songhori, 2008; Lan, 2014). However, PBL is suggested as the small group discussions rather than the big size among the PBL research (Othman, Shah, & Ismail, 2013; Neville & Britt, 2007; Hmelo-Silver, 2004).

In relation to group work, Chang (2010) indicated that a joyful, supportive classroom climate is able to be created when the groups develop a positive identity among the group members. It requires group members as a whole to share the information and ideas with accessing necessary knowledge rather than any individual group member (Chang, 2010; Salomon & Perkins, 1998). Also, individuals promote knowledge construction sharing through coordinating different points of view that enables to enhance reasoning and improve high order thinking skills (Brown & Eisenhardt, 1995; Goldman & Hasselbring, 1997).

Glaser (1991) argued that in small group work, the learner's exposure to alternative points of view is a real challenge to fundamental understanding. Moreover, a group work highlights the construction of a learning scaffold to facilitate peer collaboration and further assumes that the learners can gain support from teachers and peers in the group (Chang, 2010). Eventually, students evoke their problem-solving methods and conceptual knowledge in PBL activities and, then, to express their ideas and share responsibility in managing problem situations.

### **2.5.5 The roles of teachers and students**

In the PBL environment, researchers (Coffin, 2014; Savin-Baden, 2000) noted that an instructor transfers his/her role as a facilitator to stimulate and guide students to solve the problem instead of knowledge carrier, while students are expected to be self-directed and self-regulated learners in the process of learning and are assumed to gain new ways of learning assessment, resulting in the change from teachers' evaluation to student self- and peer evaluation.

A tutor has two main functions in teaching and learning in PBL instruction (Azman & Shin, 2012). Firstly, the instructor is a stimulator of the learning process

since she/he needs to stimulate students to reflect more deeply on the represented content. Secondly, the instructor is a stimulator of the collaboration process. The instructor must be skilled in managing small-group tutorials because she/he has to monitor and evaluate the group's task and attempts to build up the conditions in which each group member engaged effectively. On the other, students are seen as an owner for their learning. They are expected to read, search, and study the information and knowledge in according to the learning goals they formulated. Also they need to discuss, compare and clarify the relevance of the discovered information about the given problems. As Baeten et al. (2010) said, PBL requires that students adopt an in-depth approach to learn in a student-centered learning environment. Meanwhile, they found that if teachers are involved and oriented towards changing students' conceptions, students are inclined to use an in-depth approach.

In short, PBL students are given a greater responsibility for their own learning process which can foster students' independent study behavior (Boud & Feletti, 1997). Whereas, the instructor should make a flexible adaptation of the instructional support possible in need of the individual differences among learners in cognitive aptitudes as well as effective and motivational characteristics (De Corte, 2000).

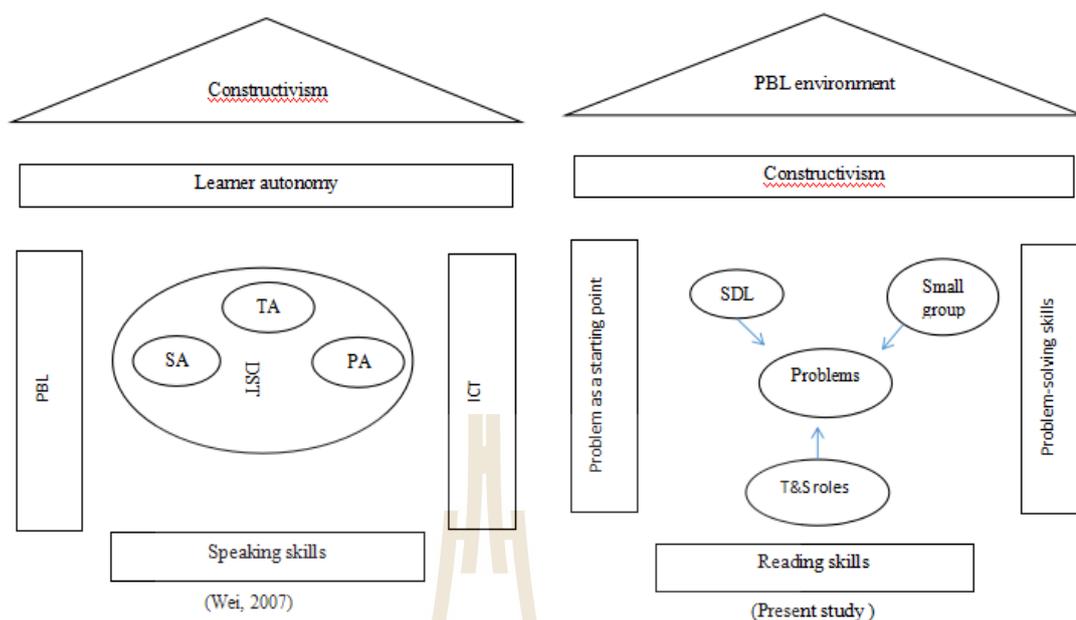
#### **2.5.6 Problem-solving skills**

Problem-solving skills are the ability to transfer learning strategies to new problems (Hmelo-Sliver, 2004). Students who own the problem-solving skills, are capable of identifying what the problem is, especially with ill-structured problems. In PBL instruction on reading comprehension skills, the problem-solving tasks involve collecting information to solve the problem in the best possible manner.

In conclusion, there are six sections mentioned above as the concepts in the

study, like constructivism in the PBL environment, self-directed learning in PBL, problems in PBL, small group discussion, the roles of teachers and students, and problem-solving skills. These concepts are proposed based on the basic elements of PBL, which happen in the process of PBL instruction.

Since the house-shaped conceptual framework of Wei (2017) enable us to make the conceptions in clearly and systematically, the conceptual framework of the study is assumed to shape like the house indicating the functions of each section like a different part of the construction to support a house. Therefore, the study adapted a conceptual framework of Wei (2017) (See Figure 2.2), which helps to construct the conception of study in an explicit construction. In the figure, the PBL environment is described as an umbrella that is acting as a roof of a house, guiding all that happened under the roof in the house. Constructivism is just like a crossbeam. Problems in PBL scenarios setting and problem-solving skills are the front and back pillars, respectively, for supporting the house framework, which is the significant supporter, for implementing the PBL approach in this environment. The learning theory, like self-directed learning, small group discussion, the roles of teachers and students are the critical elements formed in the PBL approach, which have an interaction to exist in the real PBL environment. Reading skills and problem-solving skills are the results and outcomes of teaching and learning in this environment. That is to say, constructivism, problems, self-directed activities, small group discussion, the roles of teachers and students, problem-solving skills are main elements in the PBL environment that constitute the conceptual framework of the current study for reading skills.



**Figure 2.2** Theoretical framework of the study (adapted from Wei, 2017)

## 2.6 The process of PBL

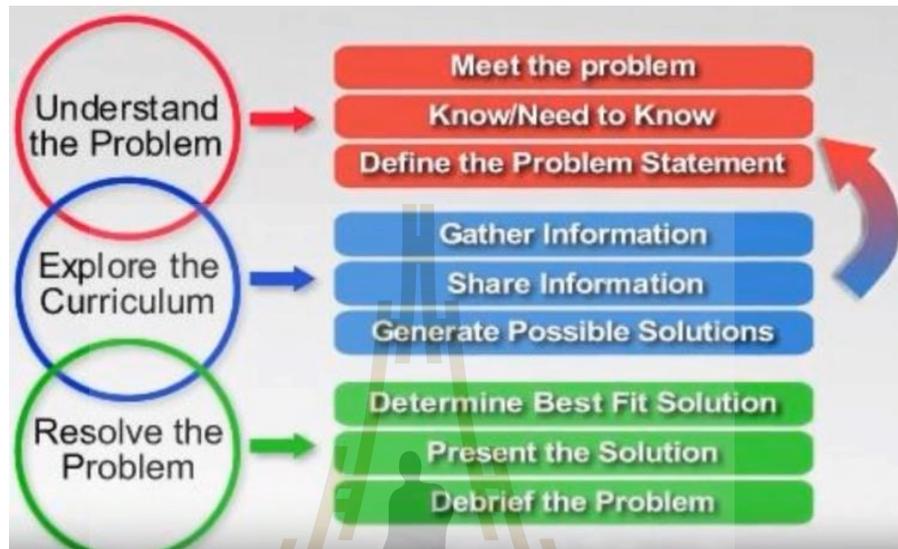
Some researchers (Dochy et al., 2005; Neville & Britt, 2007; Ng Chin Leong, 2009; Azman & Shin, 2012; Liu, 2013; Jaleniauskiene, 2016; Lin, 2017a) have studied how the PBL approach can be applied in real classroom teaching. For example, Lin (2017a) proposed a five-stage PBL teaching scheme in his research, such as confronting the problem, examining the problem, re-examining the problem, and reviewing the problem through the presentation of the solutions. During the PBL instructional model, he took the small groups as the center on the problem-solving cycle. Moreover, Jaleniauskiene (2016) conducted the following steps; first, group learners mixed with different English proficiency and present them with a problem or allow them to select a problem individually within a group; then allot the time for the self-directed learning in various resources; third, organize teamwork, hold discussions in order to share and revise the problem, trigger possible solutions; last, require learners to draw a conclusion

for generalized opinion what they have learned and present solutions. However, the instructors enable to supplement all these steps by various procedures in order to effectively monitor and support FL development.

In the implementation of PBL, it involves the designed questions assignments and projects by the instructors which aims to motivate and interest students through relevant with course materials, and in line with the students' living experience, as well as discussing and sharing session which meet the demand of course requirement that students work with each other (Liu, 2013). Additionally, Seng (2005) ever adopted the following process of the previous study which includes 1) to introduce the PBL in class; 2) to identify the problem; 3) to learn the resources and search for information; 4) to share information and make reflections in group; 5) to represent the solutions as the evaluation.

However, in this study, the researcher is going to adopt another practical process from East Canton Middle school, the school of Ohio state of USA (Murphy, 2016). On the one hand, it shows the detailed procedures step by step clearly in instructional teaching. On the other hand, it covers similar main procedures as others' study, which is mentioned above. In that classroom, the instructor used three main sections along with nine steps for the conduction of the PBL approach in the teaching. These three sections were described as (1) understand the problem including meet the problem; know/ need to know; define the problem statement; (2) explore the curriculum, involving gather information; share information; generate possible solutions; (3) resolve the problem encompassing determine best-fit solution; present the solution; debrief the problem (See Figure 2.3). The researcher will design pertinent the reading

materials and problem scenario on the basis of the above process of the instructional approach. The three parts with these steps are described in the following.



**Figure 2.3** The process for the implementation of PBL (Murphy, 2016)

### 2.6.1 Understand the problems

In this step, the student will be presented with a problem scenario as a class assignment to solve. Because a problem-based scenario is like a vehicle for learning (Ng Chin Leong, 2009). Ng Chin Leong described that the problem should be an open-ended and real-life scenario pertaining to daily or social life. It might be animal protection, environment, health and fitness, discovery and invention, and so on. In a problem-scenario setting, the exact problems designed are quite critical since they like navigation to guide the students to learn the new knowledge and necessary information. In terms of understanding the problem, the first steps that students meet the problems from the scenario setting. And, then, the last two steps in this part, know/need to know and define the problem statement aim to make sure whether students are able to

comprehend the problem from the scenario and express precisely the problem based on their understanding.

Overall, the problems of the scenario should be short and explicit, which calls for a decision to provide solutions (Seng, 2004). In PBL, the teacher does not engage in any direct teaching of content but acts as a cognitive coach or facilitator (Ng Chin Leong, 2009). Jaleniauskiene (2016) argued that the students would gain the problem from the introduction of problem-scenario settings through using videos, texts, and vocabulary. Moreover, students should be asked about the previous personal experience with the problems and can be provided with pre-reading exercises on it.

### **2.6.2 Explore the curriculum**

Jaleniauskiene (2016) considered that “PBL can be used within a conventional curriculum by changing parts of an existing course and thus making it hybrid, or as the basis for an entire curriculum” (p.273). According to Albanese (2000), it indicated that PBL is contextual learning, i.e., receiving knowledge in the context of how it raises responsibility that new knowledge and skills are useful in actual practice. There are three steps in this section as well, such as gather information, share the information, and generate the information (Murphy, 2016). Although Murphy employed a PBL approach to reach the outcomes in Math class, this implemented process of PBL was beneficial to explore the reading instruction in order to meet the demand of language class. During the process of exploring the known and unknown from the reading materials, the students are supposed to understand the problems ahead, then plan to deal with the problem, finally solve the problem through the step of gather information, that is, the design of self-directed learning. However, there is no single answer or solution, and students need to identify the most viable solution and prepare

to explain why they choose within the groups as another step, that is sharing information through the group work. When students generate possible solutions, they need to consider the consequences and choose the possible solutions again and note them down.

### **2.6.3 Resolve the problems**

Last, the students' category so-called optimal solutions and design the way to make a report for presenting their solutions. When they perform the solutions pertaining to the problem scenario, a reflective and evaluative process is conducted. That is contextualization and application of knowledge to the situation (Seng, 2004). Based on the given problems, students within different groups are likely to present various realistic and practical solutions, but, probably, some information or solutions are the same. Students need to think about the ways to show their answers in diverse formats like the graph, data, posters, and so on, for illustrating their solutions. At this point, the PBL environment helps to create some types of that scenario's awareness in the future. The debrief the problem refers to self-report of students' reflection on what they learned; what information is selected; what could have gone better.

In conclusion, within a student-centered learning environment of PBL, students have opportunities to think on their own. They have a chance to learn to analyze and reflect on their thought processes. It assesses learning in a way that demonstrates understanding instead of mere replication or rote memorization.

## **2.7 Research studies on PBL in language teaching and learning**

Numerous studies have been focused on analyzing the PBL approach in the instruction of doctors and nurses, as it is considered as an established and accepted method in the medical field (Hallon, 2011). With the development of the era, PBL

approaches have been widespread moved from medical education into other disciplines (Lan, 2014; Gijbels et al., 2005; Duffy & Savery, 1994).

The research on problem-based learning was quite scant in language classrooms (Othman et al., 2013; Mathews-Aydinli, 2007; Larsson, 2001), participate in reading teaching (Ansarian & Mohammadi, 2018). While, researchers (Larsson, 2001; Abdullah, 1998) argued that PBL could be effectively employed with the productive language skills of speaking and writing. So it is significant to go further research to develop a PBL approach by the implementation of this approach in language classroom to improve students' language proficiency.

The followings are the previous study in terms of the PBL approach in language teaching and learning.

Aliyu (2017) conducted a study to examine PBL instruction in the development of metacognition and writing performance among Nigerian undergraduates. The study aimed to investigate whether PBL could increase Nigerian students' writing ability and to examine how PBL affected participants' metacognition. The participants are 18 second-year students taking an English composition course in a college in North-eastern Nigeria. They took the PBL treatment in two cycles for over a 12-week duration. In each cycle, participants were given an ill-structured problem to work collaboratively and propose viable solutions within three weeks. They were supposed to generate possible solutions, brainstormed and identified available information related to the problem with tutor facilitation. Besides, they gathered the information through self-directed learning and finally proposed viable solutions. While the tutor conducted a debriefing session to discuss writing and PBL-related issues with the participants at the end of each cycle.

The statistical analysis results revealed a significant effect on the improvement of participants' metacognition. The findings also showed that there was an increase in the participants' knowledge on content, organization, vocabulary, language use, and mechanics of writing. The study suggested PBL as an alternative method to be used in writing classrooms.

Additionally, Lan (2014) performed a study on the effect of PBL and materials on speaking English ability of Chinese EFL medical students based on the constructivist theory and a mixed-methods design. She employed the paired sample t-test and descriptive statistics to analyze quantitative data, while content and discourse analyses were used to analyze qualitative data. Forty-eight third-year medical students who took a medical English course at Guizhou Medical University in China engaged in a 36-hour PBL medical English course during an 18-week semester. The research procedures encompassed two phases. First was about the design and development of PBL lessons. Second, the PBL lessons lasted for 10 hours in a medical English course to explore students' speaking changes and their perceptions under the PBL intervention. The instruments contained pre-and post-speaking tests, students' logs, recorded group discussions, and semi-structured interviews. In the end, the results indicated that the PBL approach helped to improve the students' speaking ability in group discussions. In other words, the PBL approach had a positive effect on students' speaking ability.

Moreover, Coffin (2013) described how to employ PBL based on restructuring English as a foreign language(EFL) writing course at a Thai university. The results had significant differences between pre- and post-survey in students' perceptions of the PBL process of their learning experiences. They were benefits for increasing motivation in learning, communication skills, collaborative skills, critical thinking, problem-solving,

and self-directed learning skills. To sum up, PBL has a positive on both teachers' and students' experiences in language teaching and learning. Simultaneously, other researchers like Aliyu (2017) and Phanitphim (2009) also concluded that PBL on writing skills enable students to get positive results for their study.

Furthermore, in a paper discussing the implementation of PBL in language classes, Shin & Azman (2012) aimed to gauge the effects of PBL on language learning in English as the Second Language (ESL) context of Malaysia. Firstly, an ill-structured real-life problem is given to students. Then they acted as stakeholders on the problem in the group under the tutor facilitation. In a self-directed and collaborative learning environment, students plan their own learning to solve the problem. They generated working ideas or possible solutions, identify available information within the group and finally choose the most viable solution before they present it to the class. The study determined learners' cognitive thinking ability before the treatment to ensure that the problems suit the cognitive thinking ability of the students. The results revealed that PBL could have a positive effect on language learners.

In an attempt to develop a PBL course based on needs analysis, Bosuwon & Woodrow (2009) did a study aimed to increase language learners' reading abilities in business English. The findings from the needs analysis were used to determine the course's learning objectives, content, and evaluation. The researcher followed Jordan's (2000) ten-step needs analysis, such as 1) purpose of analysis; 2) delimit student population; 3) decide upon the approach; 4) acknowledge constraints/ limitations; 5) select method of collecting data; 6) collect data; 7) analyze and interpret results; 8) determine objectives; 9) implement decisions; 10) evaluate procedures and results. Consequently, it proposed that the problem-based business English reading course

might be effectively designed as an ESP course to enhance the English reading ability of Thai undergraduate students.

Additionally, Hearn & Hopper (2008) introduced strategies for implementing PBL. They had strong confidence that PBL could be a gate to authentic language learning in accuracy implementation. In their study, they explored how ill-structured problems could be presented to the learners on the implementation of PBL. Eventually, they concluded that the most beneficial component of PBL in language classes was a group discussion, so they came up with a table for enhancing group discussion within PBL groups, while task-based language teaching group had low effective.

Some studies on PBL (i.e., Coffin, 2013; Shin & Azman, 2012) also focused on language teaching in PBL classes. During these studies, it employed both qualitative and quantitative method to research the conduction of PBL in language classes. For instance, observation field notes, video recording, interviews, and survey questionnaires were among the most frequently used instruments for qualitative data collection, whereas quantitative data was mostly collected through tests (usually researcher-made). According to these mentioned studies, it found that scant research had been conducted with regards to reading skills and listening skills compare to speaking and writing skills. The researcher acknowledges that the articles presented in the paper might not represent all studies conducted to problem-based learning on language.

However, Ansarian & Mohammadi (2018) also drew a conclusion that most of the studies on PBL in language classes tended to research productive language skills of speaking and writing, whereas many researchers pay less attention to the effects of PBL on receptive skills of listening and reading. In spite of many such studies have been

conducted in the Western context in other disciplines (Shin & Azman, 2012), the results cannot be generalized to the Asian educational setting, especially in Chinese context because students in China have their own thinking and performing which connect with difference of cultural and EFL backgrounds and may have diverse learning preferences which distinct these students from other countries. Other factors, such as institutional, environmental, and social expectations, could also impact on the findings of problem-based learning studies in China. At this point, the study provided the research, probably having a useful guide for a researcher in the domain and future research.

Furthermore, the previous research presented that the PBL approach has already gradually developed to language teaching and learning and has had a positive impact on the language field. So it indicates that the research on PBL worth developing deeply and diversely for instructional language teaching as well as exploring the theory and practices of PBL for its implementation to be comprehensively successful in an English language classroom. Such empirical research triggers the ideas on the study of PBL to improve reading skills, which probably provide crucial references with methodologies and PBL design.

PBL in reading skills has occurred not much. So far, few studies for PBL in reading are mentioned as the following. Even though, Lin (2017) researched the PBL on reading comprehension through a web-based English course in China and Bosuwon & Woodrow (2009) studies PBL on reading ability on Business English in Thailand, the further research still needs enough study to develop the PBL to extend the PBL research in English education later.

Therefore, the study tends to concern with improving the general reading proficiency in reading class, which is also expected to increase middle students'

confidence for reading resulted from the reading session occupies the crucial roles in all kinds of English tests. Furthermore, with the development of globalization, all walks of life may be required to read English news or information not only for their work but for multiple-culture life with the different necessity of extent.

## 2.8 Summary

PBL approach has developed language teaching and learning with its strengths in teaching. Its advantages are worth applying for triggering students' self-directed learning and enhancing their language skills. In the PBL environment, students enable to use a problem as a focus for the study of language skills, actively integrating the information into a system that can be applied to the problem at hand and subsequent problems. The students need to generate ideas, get information, look for cues, analyze and synthesize the data available, develop a hypothesis, and apply reasoning skills to the problems to solve them. Accordingly, the present study employed PBL in teaching reading for grade 9<sup>th</sup> students in China. The following chapter presented a practical implementation of reading instruction in a PBL environment.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

This chapter introduces the research methodology of the present study. It starts with a description of the research design, the context and the subjects. Then, the variables and research instruments are discussed. After that, the researcher describes the pedagogic procedures. Lastly, there are explanation of the procedures used for data collection and data analysis for the study.

#### **3.1 Research design**

The present study utilized a quasi-experimental design and a mixed method design since the research purposes and research questions determined the method of the research design. Thus, in order to examine the effect of a PBL approach on promoting the reading comprehension skills of middle-school students, the development of metacognition on reading comprehension skills through PBL lessons, and the students' perceptions towards PBL lessons, an experimental design was considered as a good choice for the current study. White & Sabarwal (2014) defined a quasi-experimental design as the use of methods and procedures that took into account the conditions and experiences of the participants without random assignment in a experiment. Additionally, Seliger & Shohamy (1989) proposed that a quasi-experimental design has two facets for its strengths. For example, on the one hand, it can be more representative and convenient to use such a research method in hard-to-change situations. On the other

hand, it is less intrusive and disruptive, so the researcher is likely to gain access to the target population for the purposes of conducting an investigation. Regarding a mixed approach, some researchers (Lin, 2017; Aliyu, 2017; Beltran et al., 2016) employed it in language teaching and learning for PBL interventions. Since the use of both quantitative and qualitative methods are more effective in answering research questions than either a qualitative or a quantitative approach alone, as they combine the advantages of both methods (Tashakkori & Teddlie, 2003). In addition, Creswell et al. (2003) stated that the weakness of one method may be offset by the strengths of the other. Generally, a combination of the two techniques allows researchers to answer questions more substantially and comprehensively (Carey, 1993).

### **3.2 Research context and participants**

The researcher developed a PBL approach for English reading instruction to help Chinese middle-school students improve their reading comprehension skills through PBL lessons. It was expected that the middle-school students would improve their reading comprehension after reading instruction using a PBL approach. The researcher, however, realized that it would not be possible to conduct an intervention in a large-size class for PBL lessons in regular classes in a middle school in China (No. 21 Middle School was used for this research study). On the one hand, there are no particular reading lessons in the English classes of a middle school. To be more specific, English classes not only teach reading, but also teach writing, speaking, and listening. On the other hand, PBL lessons should only involve small discussion groups in an activity, which is one of the main features of PBL mentioned as mentioned in Chapter 2. But No. 21 Middle School has 60 to 70 students per class. Such a large class might have an

influence on the effects of a PBL approach on promoting reading comprehension skills. Therefore two extracurricular reading classes were set up randomly, one for an experimental group and the other for a control group, for the purposes of this study.

### **3.2.1 Research context**

No. 21 Middle School, founded in 1954, is a public middle school including both a middle school and a high school which is located in Guangdong Province in the south of China. There were a total of 4500 students for all the grades in the academic year 2019 of which about 720 students were studying in Grade 9 at that time in 11 classes. The size of each class was about 60 to 70 students. According to the curriculum requirements of No. 21 Middle School, English is one of the compulsory courses for the High School entrance exam in Grade 9, so each English teacher is responsible for two classes, with a total of about 130 students.

### **3.2.2 Research participants**

The two main roles of the participants are discussed in the following sections the instructor and the students of the study.

The English teacher of Classes Seven and Eight was invited to participate in the study. On the one hand, she has been responsible for these two classes from Grade 7 to Grade 9 for three years, so she was very familiar with both classes and she could easily manage the participants in the experiment. On the other hand, she had the authority to encourage her students to join the extracurricular reading class which guaranteed a sufficient number of participants to make the study viable. Since the instructor was not familiar with the PBL approach, she was invited to participate in the related training on the teaching of the PBL approach. First, she was introduced to the definition of a PBL approach and then she was able to observe the teaching of a PBL

approach through watching some youtube videos. Later, she obtained more information about the PBL approach and studied it on her own. Finally, she took one PBL lesson to rehearse her teaching and to obtain a greater understanding of the approach.

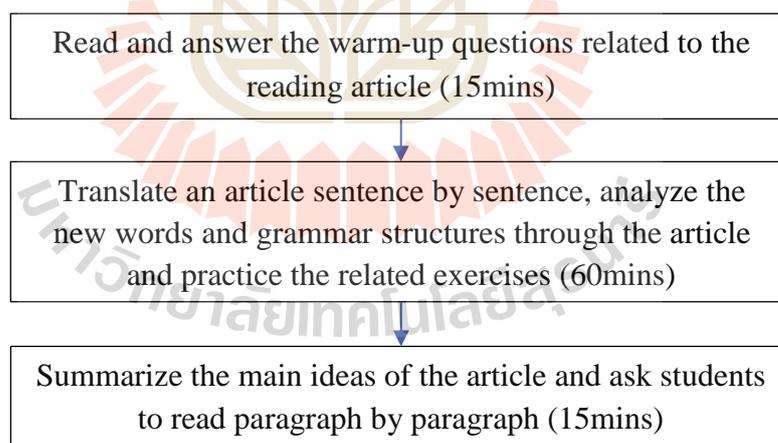
There were a total of fifty-seven students in the experimental and control groups in the study of which 30 students were in Class Seven and 27 students in Class Eight. These students did not know that they were participants in the study, but they were assigned to join these lessons to improve their reading comprehension skills. Class Seven and Class Eight were randomly assigned as the experimental group and the control group, since these two classes had similar levels of English proficiency based on the results of a summative test obtained from the scores of an exam test in their mid-term and final exams. Both the experimental group and the control group included students with a similar range of English test scores such as below 60, 60-80, 80-100, and above 100 (full points = 120), which ensured the students had homogeneous levels of English proficiency.

In order to avoid ethical problems, all of the participants were asked to sign a written consent form (See Appendix B) before the experiment was conducted. The forms were given to the students to make sure that they took part in the extracurricular reading lessons voluntarily. Meanwhile, they were aware of the process and challenges of the experiment.

### **3.2.3 Control group**

Class Seven of Grade 9 was the control group which received reading instruction in the traditional way (See 1.1.2), consisting of frequent and regular reading of English in the class. In order to check their reading proficiency, they took a pre-test and a post-test before and after the extracurricular reading lessons, respectively. They

attended reading course lasting eight weeks which consisted of one 90-minute reading lesson per week through the regular method of teaching reading in English class. There were four topics for the 8 weeks reading course. Each topic was composed of two reading passages which were allocated for two weeks' teaching so each text was covered in one week. Thus, there was a total of 180 minutes available for each topic. Generally, the teacher thought about activities that allowed students to practice speaking fluency, asking questions and repeating the language points to enhance reading skills. They also mentioned that the on-line teaching resources provided by the school helped them to obtain more teaching materials. Thus, the use of the internet became a very useful tool for them to make lesson plans and look for pictures to include in their PowerPoint presentations. The normal routine of the traditional teaching of a reading text each week in No 21 Middle School is shown in Figure 3.1.



**Figure 3.1** Normal routine for the traditional teaching of reading

This routine followed by No. 21 Middle School is representative of the traditional methods of teaching reading in middle schools all over the China according

to the relevant literature (Hu & Baumann, 2014; Hu, 2013; Gu, 2010; Zhang, 2009). Such a routine has led to the poor reading comprehension of reading texts in the middle schools of China (Hu, 2013). Therefore, the PBL approach was employed in an attempt to improve reading comprehension skills in an experimental group of middle-school students in China.

#### **3.2.4 Experimental group**

The experimental group, Class Eight of Grade 9, took the PBL lessons on improving their reading comprehension skills. The participants of this group were not only required to take a pre-test and a post-test, but also to complete two questionnaires for a metacognitive survey of student perceptions towards the PBL lessons. In addition, some of the students were also required to participate in a semi-structured interview at the end of the experiment. The participants followed the PBL lessons with the teacher's guidance in the reading class. They attended one 90-minute PBL training lesson and eight PBL lessons. The arrangements for the PBL treatment with the experimental group are shown in Table 3.1.

**Table 3.1** The arrangements of the PBL treatment with the experimental group

 <p>One 90-minute training lesson</p>
<ol style="list-style-type: none"> <li>1. Students attended an introduction to problem-based learning (PBL).</li> </ol>
<ol style="list-style-type: none"> <li>2. Students took a pre-test of 30 minutes and completed the questionnaires for a metacognitive survey.</li> </ol>
<ol style="list-style-type: none"> <li>3. Students were grouped into small discussion groups of six teams; the names in each were confirmed; students were assigned different roles.</li> </ol>
 <p>Eight PBL lessons (two lessons for one topic of 180 mins)</p>
<p>Section 1 (45mins)</p> <ol style="list-style-type: none"> <li>1. Students engaged in explicit strategies instruction for reading comprehension skills and learned about metacognition for the target strategies used including why they should use the strategy, when to use the strategy, and with what materials. In addition, they learned some new words and phrases for the topic.</li> </ol>
<p>Section 2 (135 mins)</p> <ol style="list-style-type: none"> <li>1. Students engaged in the learning about reading in a PBL environment, including a student-centered learning model, metacognition, self-directed learning, cooperative activity, and problem-solving activities, etc.</li> <li>2. Students presented the outcome of their learning from the process of the PBL lesson.</li> </ol>
 <p>Last Week (week 10)</p>
<ol style="list-style-type: none"> <li>1. Students took a post-test of 30 minutes.</li> <li>2. Students completed the questionnaire for the metacognitive survey and students' perceptions towards the PBL lessons.</li> <li>3. Students participated in the semi-structured interview.</li> </ol>

From Table 3.1, it is clear that the first lesson/week was a training lesson for the introduction of the PBL lessons. In the training lesson, students were introduced to the process of a PBL lesson which was designed to ensure the fluency and accuracy of students' engagement during the PBL instruction. To avoid possible confusion about

the use the term PBL among the students, the instructor implicitly mentioned the problem-based approach in class. That is, students would be told about the organization of the PBL lessons and the requirements during the implementation of PBL.

As for the eight PBL lessons, students learned each lesson through the process of PBL approach. First, they met the real-world problems. After students understood the situation of the problem, they received the relevant reading materials involving the reading articles from the textbook and the topic-related reading resources. During this period, students were reminded to use reading strategies and metacognitive strategies to comprehend the text. Students had to manage their reading to finish the task within a certain time. After that, students needed to cooperate in finding the final solutions, so they had to discuss an agreement based on establishing common ground, resolving discrepancies, and negotiating actions within the small group discussions. Afterwards, the participants made a decision about the possible solutions of the problem among their group members. Finally, the students presented their answers in front of the class as the learning outcomes in which they had learned how to follow the process of the PBL lessons. In the last week (Week 10), the students took a post-test for 30 minutes. After that, they completed the questionnaires on reading strategies and students' perceptions of the PBL lessons. Lastly, some of the students were invited to participate in a one to one semi-structured interview with the researcher.

However, the experimental group were required to follow a different procedure to the control group, which was designed to meet the purposes and answer the research questions of the experiment. Figure 3.2 shows the general differences between the control group and the experimental group in the experiment in more detail.

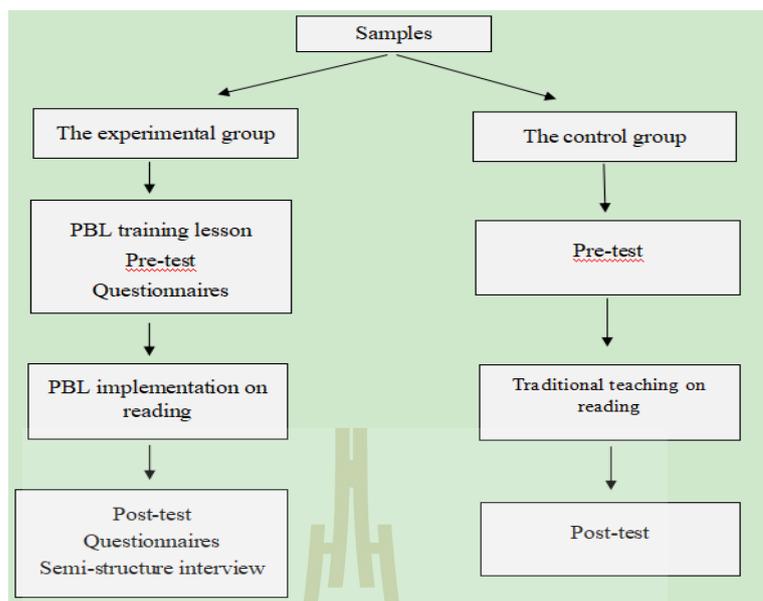


Figure 3.2 Comparison of the two groups in the experiment

### 3.3 Variables

In the present study, the independent and dependent variables are as follows:

**Independent variables** refer to the treatments in this experiment. They are the explicit strategies instruction for reading comprehension skills, introduction of metacognitive awareness of strategies used, and the PBL intervention.

**Dependent variables** are outcomes of the research involving the effects of PBL on improving reading comprehension skills, the development of metacognitive awareness, as well as students' perceptions towards the PBL lessons.

### 3.4 Research instruments

The selection of appropriate instruments is important to obtain high-quality data (Seliger & Shohamy, 1989). According to the research objectives and questions in the current study, the researcher planned to collect the research data by using the following

instruments. These instruments embody a pre-test and a post-test; a PBL reading treatment; two kinds of questionnaires; a semi-structured interview; and an observation field note.

### 3.4.1 Pre-test and post-test

A pre-test and a post-test of reading comprehension were designed based on the reading section of the *Zhongkao* exam. The *Zhongkao* exam is the national English entrance examination for middle schools. It is administered to middle school students in June each year all over China. In the reading section of the *Zhongkao* exam, there are three reading articles with two kinds of reading items including two multiple-choice texts and one information collocation text (See Appendix C). These two multiple-choice texts have two genres. The first text consists of letters, conversation, and information of different things like tickets, journals, etc, while the second text is always a narrative, like story, etc. The multiple-choice reading texts for the pre-test and post-test were carefully selected for the study. The multiple-choice items were not only more easier to ensure the reliability of the evaluation, but were convenient to administer with well-established procedures for analyzing multiple-choice items (Alderson, 2000). Since the *Zhongkao* exam is always set at the end of the second term after Grade 9 (two terms for Grade 9), it would be difficult for the participants who had just started their first term of Grade 9 study. Therefore, the researcher decided to use the reading texts from the mid-term and final exams in the first term of Grade 9. Since these exams in No. 21 Middle School were designed based on the basis of the *Zhongkao* exam administered by the Ministry of Education of Xiashan city, a district city of China, it was expected to ensure the validity of the English reading texts for the pre-test and post-test.

In the study, the pre-test and post-test consist of four reading texts, with 5

multiple-choice items for each text which gives a total of 20-item questions, respectively (See Appendix D). Each item was allocated 2 points because it is a common marking criteria for reading test in Chinese middle school. Thus, full marks for pre-test and post-test total 40 points. It was recommended by the English coordinator who has taught English for 27 years in No. 21 Middle School and has also researched the *Zhongkao* exam for more than 20 years that the 20-item questions should be finished in 20 minutes. However, in order to provide enough time for the students to complete their personal information and check their answers, the time for the exam was set at 30 minutes for both the pre-test and the post-test.

### **3.4.2 PBL reading treatment**

The PBL treatment was the eight-week PBL lessons designed only for the experimental group. The lessons were implemented under the general organizational principles of the PBL approach to enhance the effectiveness of learning when learners are provided with a chance to comprehend the text freely on their own circumstances (Azman & Shin, 2012). Before the PBL treatment, the instructor was introduced to the concept of PBL and she also learned about PBL instruction through references related to the PBL approach and videos of PBL instruction offered by the researcher in order to ensure that the PBL lessons were conducted smoothly and effectively for the study. Students in the experimental group were engaged in the extracurricular reading lessons for 10 weeks. Specifically, they received a 90-minute PBL training lesson in the first week, followed by the PBL lessons for eight weeks from week 2 to week 9, and finally on week 10 they completed the questionnaire and were interviewed by the researcher.

#### **3.4.2.1 PBL training**

In the first week, the PBL training lesson was allotted for 90 minutes.

The lesson included 45 minutes of PBL instruction, 30 minutes for the pre-test, and 15 minutes to group the teams and complete the questionnaires for the metacognitive survey. This lesson aimed to help the students understand the process of the experiment which would ensure that the PBL instruction proceeded smoothly and successfully. In the PBL lessons, the students needed to engage in active learning strategies and acquire a self-directed learning disposition (Ngeow and Kong, 2001). Compared with teacher-centered learning in the traditional approach, students who were in a circumstance of problem-based learning situation needed to conduct self-directed learning without the teacher's directions which might cause them to lose their confidence and motivation in learning reading (Azman & Shin, 2012). Thus, the PBL training lesson helped significantly to improve students' confidence and to demonstrate the procedures used in PBL instruction in a PBL context. In the PBL training lesson, the middle-school students were not introduced directly to the PBL approach because they were too young to understand the terms of PBL but they indirectly engaged in it to learn the process of PBL lessons as well as the necessary class disciplines (See Table 3.2).

**Table 3.2** Lesson plan for the PBL training

<b>Lesson Plan</b>			
Objectives: At the end of the PBL training, students are supposed to know the purposes of the extracurricular reading lesson, the process of the reading instruction, and their group members for the activities. Additionally, they have learnt about what they should and should not do in class.			
<b>Topic</b>	<b>Technique</b>	<b>Teaching Aids</b>	<b>Time mins</b>
Opening & Warm-up	1. Greeting 2. Briefly make an interaction with students. E.g. what do you expect to learn in this class?		5
Introduction to extracurricular reading lesson	3. Introduce the lesson description and its purposes. 4. Explain the class discipline. E.g. they should not be absent or late for lessons; they should discuss the tasks in English, etc.	PPT Internet access	10

**Table 3.2** Lesson plan for the PBL training (Continued)

<b>Lesson Plan</b>			
Presentation of the procedures of the PBL lesson	1. Write down the procedures of the PBL lesson step by step to students and allow them to ask questions at any time. 2. Explain the role of the teacher and the purpose of the groups.	Black board Micro-phone Reading materials	30
<b>Class break (10mins)</b>			
Pre-test	1. Pre-reading test	Test paper	30
Questionnaire	2. Fill out the questionnaires about the use of reading strategies ( metacognition)	questionnaires	10
Create the small groups	Group the students into 6 groups with 5 people per group and select one of them as the coordinator in each group		5

### 3.4.2.2 PBL lessons

#### The implementation of the lessons

In the current study, the PBL lessons lasted for eight weeks with four topics to explore the effects of PBL on promoting reading comprehension skills, the development of metacognition, and students' perceptions towards the PBL lessons. Over a period of eight weeks, one topic was covered in two weeks. Each week had a 90-min PBL lesson so one topic would take 180 minutes for the instruction. The PBL lessons included two sections. The first section was the instruction of reading comprehension strategies, while the second section was the implementation of the PBL approach. However, PBL implementation was the main focus of the PBL lessons.

Specifically, three reading comprehension strategies: making inference, guessing meaning from context, and scanning for detailed information (See Appendix E) were explicitly introduced and practiced at the beginning of the class. To ensure that the students could effectively engaged in problem-based learning, the metacognitive strategies which involved why to use the strategy, when to use the strategy, where to use the strategy, and with what materials were also instructed. In

addition, students also learned some new words or phrases for each topic in this section.

The second section was the PBL implementation. This section was conducted on the principles of the PBL approach which is a learner-centered model with the purpose of developing problem-solving skills, self-directed learning as a lifetime habit, and teamwork skills (Azman & Shin, 2012). For instance, in the PBL implementation, the student-centered learning environment was constituted through the learning conceptions of constructivism, sociocultural factors, and situations (Jonassen & Land, 2012). With regard to constructivism, it was necessary for the students at the center of the learning process who need to construct knowledge by deriving meaning from past experiences, experiential learning, and social experiences (Matthews, 2004). In addition, the PBL implementation was conducted based on the principles of using real-world problems as a starting point for the acquisition and integration of new knowledge (Legg, 2007). Thus, students were able to acquire problem-solving skills by the end of the PBL instruction. Furthermore, students were able to become self-directed learners through the process of the PBL approach (Coffin, 2014). Self-directed learning requires that a learner maintains active control of the learning process (Long, 2002). Also it is an umbrella term for various processes such as metacognition, goal setting, and self-assessment (Loyens et al., 2008). It requires the learners to assess their learning accurately and to manage their learning goals, behaviors, environment, and outcomes (Rivers, 2001) actively. With regard to teamwork skills, they were developed through the small discussion groups required in the PBL lessons, so that students were able to develop cooperative skills during the process of discussion in teams.

To conclude, the above features occurred in the process of the PBL implementation of this study which included nine steps: to meet the problem, know/

need to know, define the problem statement, understanding the problem, explore the curriculum, resolve the problem, determine the best-fit solution, present the solution, and debrief the problem (See section 2.6 in Chapter 2). Table 3.3 below illustrated procedures of a PBL lesson for one topic in 180 minutes.

**Table 3.3** The procedures of a PBL lesson for one topic

<b>First section: instruction in explicit strategies</b>			
Step	Topic	Activities	Time mins
1	New knowledge	a. Warm-up b. To learn new words and phrases related to the topic	20
2	Reading strategies teaching	a. Reading strategies instruction involves main idea identification, reference, detailed information, and guessing words/phrase. b. Practice reading strategies	15
3	Strategies use	a. Introduce targeted strategies using (metacognition)	10
<b>Class break (10mins)</b>			
<b>Second section: PBL implementation (Nine steps)</b>			
1	Meet the problem	The instructor gives a brief introduction to the scenario along with several questions. It aims to generate the problem through the scenario which is taken as a navigation point for the participants' learning process.	10
2	Need/know to know	The teacher will ask questions to find out whether the students know what problems they need to solve.	10
3	Define the problem statement	The teacher confirms whether the students know the problems. One student from each group will act as a representative to define the problem statement in order to guarantee each group has a clear understanding of the problem. The problems drive the learning direction to guide participants to do the following reading.	10
4	Gather information	This section involves self-directed learning where the participants have to understand what they need to do first. Then, they make a plan to deal with the reading materials. Finally, they will find out and decide on the possible information needed. A series of behaviors are assumed to respond to the concept of metacognition.	15

**Table 3.3** The procedures of a PBL lesson for one topic (Continued)

<b>Outside the class</b>			
5	Share information	The students are encouraged to share their findings, solutions and ideas in their group.	15
6	Generate possible solutions	The students generate possible solutions and list the all the information they have collected with the group members.	15
7	Determine the best-fit solutions	This session is a hands-on step. Students need to decide how and what should be shown as the outcomes of learning through any means such as, posters, reports, etc.	15
<b>Class break (10mins)</b>			
8	Present the solutions	Each group has to present their solutions in front of the class.	30
9	Debrief the problems	This section offers the chance to explore deeper idea about the problems and the knowledge they learned.	15

### The reading materials for the lessons

Regarding the reading materials for the PBL lessons in the present study, they were taken from the Grade 9 textbook «*英语 Go for it*» (See Appendix F) of No. 21 Middle School for both the experimental and control groups. This textbook consists of fourteen units/topics, which was published by the People's Education Press, the most influential textbook publishing organization in China. The fourteen units are used for two terms of Grade 9 in that school. However, only four units were selected as the topics for the PBL lessons in the experiment ( See Table 3.4). They are “How can we become good learners? ; Teenagers should be allowed to choose their own clothes; Life is full of the unexpected; and We're trying to save the earth!. These topics were selected because they were familiar and interesting to students with regard to their daily lives.

Table 3.4 shows how the four topics were arranged for both the experimental and the control groups:

**Table 3.4** Four topics for the extracurricular reading lessons

Scenario	Topic	Time
1	How can we become good learners	90mins + 90mins (2 weeks)
2	Teenagers should be allowed to choose their own clothes	90mins + 90mins (2 weeks)
3	Life is full of the unexpected	90mins + 90mins (2weeks)
4	We're trying to save the earth!	90mins + 90mins (2weeks)

The reading lessons on these four topics were implemented to both the experimental and control groups. However, the teaching procedures were different. The control group learned certain grammar and vocabulary related to the reading while the experimental group studied how to apply the reading strategies and the metacognitive strategies in their reading through the nine steps of PBL implementation. Unlike the control group, the experimental group was allowed to use the topic-related/extensive reading resources which were electronic materials provided by the *English Review*, a cooperative organization in the No. 21 Middle School.

### 3.4.3 Questionnaire

With regard to the questionnaires, Cresswell (2012) described a questionnaire as one of the traditional research instruments in quantitative research. It is designed to gather information on phenomena which cannot be easily observed, such as opinions, attitudes, beliefs, and motivations (Oppenheim, 2000). It constitutes a series of questions for collecting information from the respondents which can help the researchers answer the research questions. Therefore, two questionnaires were developed for this study. One was concerned with the students' perceptions towards the PBL lessons and the other with metacognitive strategies. The items of both questionnaires were adopted to ensure that they were congruent with the research objectives. Two questionnaires were translated into Chinese to help the middle-school

students understand them more easily. Some revisions to the two questionnaires in the Chinese version were made to improve the quality of the questionnaires based on the comments and suggestions of three English teachers who have taught English for more than 10 years in No. 21 Middle School.

#### **3.4.3.1 The questionnaire for the metacognitive survey**

The questionnaire in this study consists of two parts: Part One was about the students' background information on gender, age, years of English study, and current English learning levels, while Part Two was a survey of the awareness and use of metacognitive reading strategies before and after the pre-test and post-test which aimed to answer the second research question "What is the development of metacognition for reading comprehension through the PBL lessons? ". This was the means for an exploration of the metacognitive development of the students for their use of strategies by means of a 5-point Likert scale analysis. The 5 points ranged from "never", "not often", "sometimes", "usually", and "always", with the equivalent scores of 1 to 5.

The questionnaire for the metacognitive survey aimed to investigate the development of metacognition as a result of the students' activities in their reading comprehension skills before and after the PBL treatment. According to the questionnaire on pre- and post-metacognitive strategies used of Whichadee (2011), the current study adopted items 2, 4, 7, 11, 12, 13 from the study of Whichadee and developed the rest items to match the research in terms of the metacognitive strategies used involving planning, monitoring and evaluating in the 16-item metacognitive questionnaire (See Appendix G). In this questionnaire, planning includes items 1, 2, and 3; monitoring involves items 4 to 13; and evaluating is items 14, 15, and 16.

Metacognition requires planning questions to measure a reader's knowledge of how to select appropriate reading strategies aimed at achieving reading goals. While monitoring questions measures students' ability to adjust their attention and efforts during the reading task. Furthermore, evaluation questions measure whether students' achieved an appropriate understanding of a text.

#### **3.4.3.2 Questionnaire on students' perceptions towards the PBL lessons**

The questionnaire on students' perceptions towards the PBL lessons were implemented to answer research question 3, "what are the students' perceptions towards the PBL lessons. Like the questionnaire for the metacognitive survey, this questionnaire consisted of two parts. Part one included students' background information. Part two was related to the participants' perceptions towards the PBL lessons. However, unlike the questionnaire for the metacognitive survey, only students in the experimental group were required to complete it after the post-test. In order to ensure the validity of the items in the questionnaire, the researcher adopted all the items from Patria (2015), as shown in Table 3.5. These items can be grouped into 6 dimensions, namely, the effects of a PBL environment (items 1-3); student-centered learning (items 4-6); small groups (items 7-9); problems as stimulus (items 10-12); teacher's role (items 13-15); and self-directed learning (items 16-18). Each dimension contains three items.

**Table 3.5** Six dimensions of PBL (adopted from Patria, 2015)

<b>Dimension</b>	<b>Items</b>
The effects of PBL	1. PBL is helpful in students' learning 2. The PBL approach provides a pleasant atmosphere in class 3. PBL can improve reading comprehension
Student-centered learning	4. Students are responsible for their learning 5. Students are actively involved in the process of learning 6. Students have autonomy in the process of learning
Small groups	7. The group size is appropriate to stimulate group discussion 8. The learning groups have a positive atmosphere (i.e., non-threatening) 9. The group size is necessary to encourage active student participation
Stimulus problems	10. match students' level of knowledge 11. activate students' prior knowledge 12. lead to the discovery of the learning objectives
Teacher's role	13. to summarize what students had learned in their own words 14. to give constructive feedback on group work 15. to evaluate group co-operation regularly
Self-directed learning	16. Students formulate their personal learning goals 17. Students choose appropriate learning strategies 18. Students evaluate the accuracy and value of the resources

The questionnaire consisted of 18 items, and the participants were required to complete the questionnaire within a certain time. Since the term PBL was difficult for middle-school students to understand, these reading lessons were not labeled "PBL" in the questionnaire (See Appendix H). In addition, the items in the Chinese version were adjusted to help the students understand the items better. The participants were required to check their responses on a 5-point Likert scale from 'Strongly Agree' (5), 'Agree'(4), 'Neutral'(3), 'Disagree'(2) to 'Strongly Disagree'(1) as an exploratory investigation to measure students' perceptions towards the PBL approach.

#### **3.4.4 Semi-structured interview**

The researchers (Burgess, 1984; Kvale, 1996; Silverman, 2000) described

interviews as ‘conversation with a purpose’, ‘professional conversation’, and ‘the gold standard of qualitative research’, respectively. They indicated that the design of the interview as a research tool is important for gathering the qualitative data. Also, Robson (1993) argued that face-to-face interviews offer the researcher the possibility of asking people directly about what is going on and thus they are a “shortcut” to seek the answers to research questions. There are three types of interviews; the structured interview; the semi-structured interview and the unstructured interview (Creswell, 2012). For a structured interview, the questions are structured in a set order which are easy to test for reliability, while an unstructured interview is without any structures for the questions which might result in some unexpected answers (Creswell, 2012). However, a semi-structured interview combines the strengths of both of the other two types of interviews (Creswell, 2012, Dornyei, 2007). Thus, it enables an interviewer to have a clear picture of the topics that need to be covered but also allows the conversation to head in unexpected directions which might not be expected by the interviewers.

In this research, a semi-structured interview (See Appendix I) was administered at the end of the entire experiment to investigate the development of metacognition and explore the students’ perceptions towards the PBL lessons. As for metacognition, questions 1 and 2 were adapted from Yoosabai (2009), and questions about the students’ perceptions on the PBL lessons, questions 3 and 4, were adapted from Lan (2014). Since the term PBL lessons would be too difficult for middle-school students to understand, it was simplified to reading lessons. The interviewees were chosen on the basis of the criterion proposed by Alberta Municipal Health and Safety Association (AMHSA) in 2010 for determining a representative interview sample (See Appendix J) which is suitable for any fields of research including social science

(AMHSA, 2010). In the criterion, it proposes the minimum interviewees aligned with different ranges of participants' number. In this study, for example, there were 27 students engaged in PBL intervention. According to the criterion mentioned above, the minimum interviewees should be 15 for the interview as for 27 participant of the study. However, in the real interview, there were only 13 interviewees engaged for the current study. Since the 13 interviewees close to the number of 15 interviewees, it was considered that 13 interviewees might provide sufficient information as the same as 15 interviewees provided to support the results from the questionnaires in the study.

#### **3.4.5 Observation field notes**

During the 10 weeks' of the PBL lessons, the teachers took the notes to observe individuals' learning in class, while the researcher observed the whole atmosphere and the situations of group activities which acted as a teaching assistant to supply the information for the notes. In this study, the observations recorded the real events during the process of PBL instruction on reading. The observation was applied to collect the naturalistic data that record the real situation happened during the experiment (Lodico et al., 2010). The observation notes for this study were adapted from Yang (2016) as shown in Table 3.6.

**Table 3.6** Observation field notes

- |                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Record the time and the number of participants.</li> <li>2. Note the teaching settings.</li> <li>3. Observe the function of the teacher in each PBL procedures as well as any issues that occur.</li> <li>4. Describe the learning performances of students and the problems they encounter.</li> <li>5. Jot down the learning atmosphere.</li> </ol> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

It was clear that the observation field notes include a record of time and the number of participants; a description of setting and instructor's role as well as problems occurred in introduction of PBL lessons; a record of students' action and problems they encounter, and eventually a description of class atmosphere. The observation field notes might help the researcher understand students' reaction to the PBL lessons when the researcher interpret the qualitative data and answer the research questions.

In conclusion, each research instrument has its own advantages and disadvantages for data collection, so the current study undertook a triangulation method involving students' reading comprehension scores on the pre-test and post-test, the questionnaires for the metacognitive survey and the students' perceptions towards the PBL lessons, a face-to-face semi-structured interview in order to assess the effect of PBL on students' reading comprehension, and to collect the data about the development of metacognition from the middle-school students and to explore their perceptions towards the PBL lessons.

### **3.5 Pedagogy procedure**

In this section, the pedagogic procedure for the experimental group is introduced in order to provide a general picture of students' learning processes and classroom tasks during the PBL lessons. Brief lesson plans for four topics of the PBL lessons are provided in Appendix K. This appendix included the eight-week PBL intervention with a brief introduction.

#### **The overall procedure**

##### **Week 1 (the PBL training)**

Before the PBL implementation began, there was a training lesson on PBL

instruction regarding the introduction of the PBL procedures with the experimental group. In the training class, students found out the purposes of the extracurricular reading lessons, the process of reading instruction, and the organisation of the classes. The training lesson was taught according to the PBL lesson plan in Table 3.2. Additionally, students were told about how the PBL lessons would be organized including what they should and should not do. Moreover, they were grouped into six teams to complete the PBL tasks. Each team had one student as a coordinator for coordinating his/her fellow teammates' participation and the implementation of the tasks. To be more specific, the team coordinator needed to make the assignment move smoothly for each step of the PBL intervention in every lesson. Students in both the experimental and control groups took a pre-test. But students in the experimental group also completed a questionnaire for the metacognitive survey, while the control group did not.

### **Week 2 and Week 3( First topic for PBL lessons)**

The first topic of the PBL lesson consisted of two parts: explicit strategy instruction and implementation of the PBL approach, which took a total of 180 minutes (two weeks), with 90 minutes per week.

First, students learned some new words and phrases about the relevant topic and they were taught reading strategies as well as being introduced to the concept of metacognition. This part lasted 45 minutes in total. While, the second session took the rest of the time which was 135 minutes to implement the PBL instruction in three sections (See section 2.6). The first section was on understanding the problem including meeting the problem; know/ need to know; defining the problem statement which aims to offer the problems of the scenario setting; make sure whether students are able to

comprehend the problem from the scenario; and expressing precisely the problem based on their understanding, respectively. It showed two important features (See Section 2.4.3). For instance, authentic problems were the starting points of learning in sequence before any preparation or study had occurred and a tutor is a facilitator or guide. The second section explored the curriculum, which included gathering information; sharing information; and generating possible solutions. This session required students to use self-directed learning, cooperative learning, and problem-solving learning which represented the three main features of the PBL approach (See Section 2.4.3). For example, learning is student-centered; learning occurs in small discussion groups; new information is acquired through self-directed learning. And the last section was resolving the problem of determining the best-fit solution; presenting the solution; debriefing the problem which indicated that the problems are tools to enable students to achieve the required knowledge and problem-solving skills, and eventually, solve the problems. Thus, the students acquired the learning outcomes by the end of the PBL implementation.

**Week 4 and Week 5** (Second topic for PBL lessons)

The same procedures for the PBL implementation were conducted for the second topic

**Week 6 and Week 7** (Third topic for PBL lessons)

The same procedures for the PBL implementation were conducted for the third topic.

**Week 8 and Week 9** (Fourth topic for PBL lessons)

The same procedures for the PBL implementation were conducted for the fourth topic.

**Week 10** (Outcomes of PBL lessons)

In the last week, the students took the post-reading test for 30 minutes. After that, they filled out the questionnaires for a metacognitive survey and students' perceptions

towards the PBL lessons. Lastly, the experiment ended with a semi-structured interview.

### **3.6 Data collection**

Data was obtained from a reading comprehension via the pre- and post-tests, two kinds of questionnaires, and a semi-structured interview.

#### **1) Pre-test for English reading comprehension:**

A reading comprehension pre-test was conducted in the PBL training lesson, which aimed to obtain a baseline of the reading ability of the participants. This provided crucial data as a reference to determine any significant differences that resulted from the PBL intervention. The test consisted of four reading texts with five multiple-choice questions for each, making a total of 20 items. The questions mainly evolved identifying the main ideas, making inference, guessing the meaning from context and scanning for specific information.

#### **2) Post-test for English reading comprehension:**

After the PBL instruction, the participants took a reading comprehension post test. In other words, it was necessary to examine the outcomes of the reading comprehension skills of the participants after the experiment was completed. The post-test data was used to compare the results with those of the pre-test, which provided the empirical data to explain the effects of the PBL approach on reading comprehension. The format of the post-test was the same as the pre-test, except for the content of the reading texts.

#### **3) Questionnaires:**

There were two kinds of questionnaires in the current study, a metacognitive questionnaire and a questionnaire on perceptions. The questionnaire on metacognition

was one of the important tools to answer research question two while the questionnaire on perceptions was to answer research question three. The participants were required to fill out the metacognitive questionnaire only before the PBL instruction. However, they needed to fill out both the metacognitive questionnaire and the questionnaires on perceptions after completing the last PBL lesson. These two questionnaires were different in the number of items. The questionnaire on metacognition consisted of 16 items on the 5-Likert scale while the questionnaire on students' perceptions towards the PBL lessons contained 18 items on the 5-Likert scale.

#### **4) Semi-structured interview:**

With regard to the face-to-face semi-structured interview, four general guiding questions were used to obtain further data. In an attempt to obtain more significant data to satisfy the purpose of this tool, the researcher selected thirteen participants for purposive sampling. These participants were active in speaking who were from different English proficiency levels and they were asked to answer as much as they could to cover all the aspects of the research questions. Each interviewee had around five minutes to answer all the guiding questions. Before the interview, they were allowed to think about all the procedures and context of learning English in the extracurricular reading lessons. Also the researcher informed the interviewees that their responses would be recorded as voice files for the current research.

#### **5) Observation notes:**

During the 10 weeks' experiment, the instructor observed the lessons following the observation field notes for each class. She played a supportive role rather than that of a lecturer throughout the learning process. The instructor walked between the groups during the PBL implementation so she could record some useful information from the

participants. In addition, the researcher also checked and added information to the notes as one of observers. In general, the observation notes provided useful information about what actually occurred during the process of PBL instruction in the reading lessons. Information included the time of the class and the number of students; a descriptions of the teaching settings; a description of the teacher's role in each pedagogical procedure and the problems facing her; a record of the students' performances at each step and the problems they encountered; and a description of the class atmosphere.

### **3.7 Data analysis**

This section describes the methods for the data analysis used in the present research. A statistical analysis collection of the data was conducted using the Statistical Package for Social Sciences (SPSS) software. Also, a qualitative analysis was conducted to categorize and interpret the data in order to answer the research questions.

#### **3.7.1 Quantitative data analysis**

The main purposes of this study were to show the scores for the pre- and post-reading tests after the PBL intervention. The present study analyzed the quantitative data through a paired sample t-test and an independent sample t-test with descriptive statistics to determine the effect of PBL on promoting reading comprehension skills among middle-school students in China.

**A paired-samples t-test** was employed to examine whether there were significant differences between the pre-test and post-test for each group. The study aimed to check the effects of the PBL approach on the improvement of reading comprehension by a paired samples t-test.

**An independent samples t-test** was applied to compare the results of the

two groups and to reveal whether there were statistically significant differences between the control and experimental groups before and after the PBL instruction in relation to the students' reading comprehension skills.

The main descriptive statistics obtained from the paired-sample t-test and the independent-sample t-test provided a summary of the statistics for quantitative analysis to answer research question one by means of the p-value, deviation, and significant differences. The, the researcher was able to use Excel for the input of the participant scores. Furthermore, SPSS was also used to obtain the results of the descriptive statistics for the metacognitive and perceptions' questionnaires from the experimental group.

### **3.7.2 Qualitative data analysis**

The qualitative data analysis concerned the nature of the things investigated and consisted mainly of words and audio recordings rather than numbers. In this study, the qualitative data was collected from the semi-structured interviews and observations. The researcher expected that the data from the semi-structured interviews would provide an overview and in-depth information about the students' opinions and reflections on the present study. Subsequently, the researcher was able to explore the relationships across categories and to identify themes. Finally, the categories and themes were summarized and interpreted.

**Content analysis** was used when the qualitative data had been collected, in this case through the instrument of the semi-structured interviews. This procedure resulted in the categorization of verbal or behavioral data, for purposes of classification, summarization, and tabulation (Taylor et al., 2015). It also involved coding and classifying data and is referred to as categorizing and indexing. Moreover, the purpose

of content analysis is to make sense of the data collected in order to highlight the important information, features, and findings.

Table 3.7 illustrates the relationships between the research questions, research instruments, and the data analysis of this study.

**Table 3.7** A summary of the data collection and analysis

Research Questions	Instruments	Data Analysis
1. What are effects of the PBL approach on promoting the reading comprehension skills of middle-school students in China?	Pre-test and Post-test PBL treatment	Paired samples t-test Independent samples t-test Descriptive statistics
2. Do PBL lessons develop metacognitive awareness of students for reading comprehension skills? If so, to what extent?	Questionnaire Observation field notes	Descriptive statistics Content analysis
3. What are the students' perceptions towards the PBL lessons?	Questionnaire Semi-structured interview Observation field notes	Descriptive statistics Content analysis

### 3.8 Pilot Study

A pilot study was implemented to check the feasibility and practicality of the PBL instruction on reading comprehension skills. It was conducted using reading lessons for the PBL approach with an experimental group for four weeks with 30 students from No. 21 Middle School in Zhanjiang City of Guangdong Province. The students had finished their Grade 8 studies and were continuing to Grade 9 students. The instructor was the same teacher as for the main study who has already engaged in training for the PBL instruction in terms of theoretical knowledge of PBL and practical teaching of PBL with the help of the researcher and relevant PBL teaching videos, respectively. The researcher explained the purpose of the experiment and explained the pedagogical

procedures to the instructor in detail. Also, the researcher provided the teacher with the materials for two topics (‘ How can we become good learners ?’ and ‘ How we’re trying to save the earth’).

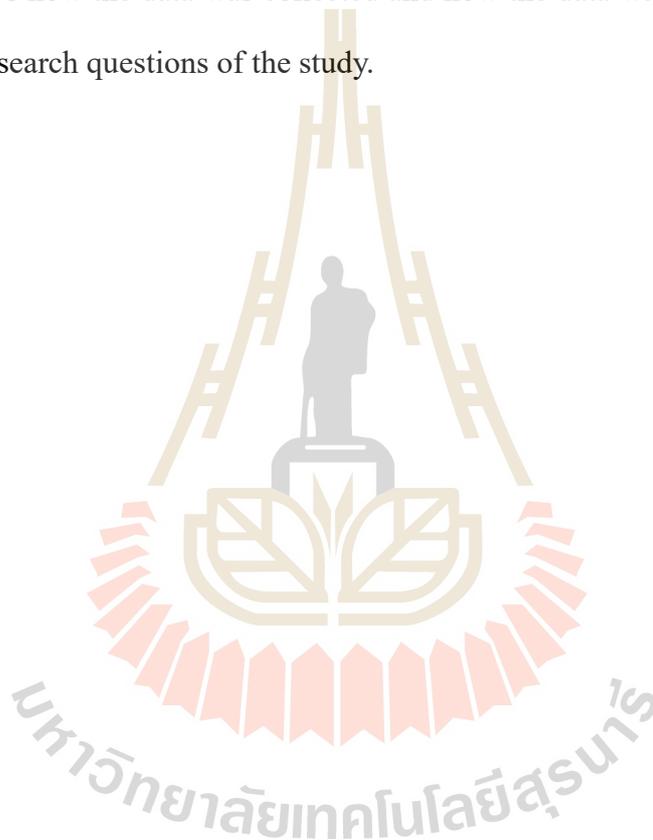
The procedures for the PBL instruction followed the steps based on the design of the main study. The purposes were to adjust the experimental design to match with duration of the lesson, to ensure the reliability and validity of the instruments used, to determine the feasibility of the study among the students, and to ensure that the experimental procedures for the main study would proceed smoothly and effectively.

As a result of the pilot study, the researcher made some adjustments to the design of the PBL treatment involving the pre- and post- RCT, questionnaires, and semi-structured interview. Specifically, the total time and the number of items on the reading comprehension test were changed from 20 minutes to 30 minutes and the previous 15 items were increased to 20 items, respectively. Moreover, the statements of the questionnaires were revised to meet the aims of the metacognitive survey for research question two. Furthermore, the guiding questions for the semi-structured interview were modified to be easy to understand.

To sum up, the pilot study was not only a good chance for adjusting the content and procedure of experimental intervention, but a useful opportunity for the instructor to practice PBL instruction ahead for the main study. Last but not least, to some extent, it guaranteed the reliability and validity of the study which probably gain the valuable and useful data for the further study.

### 3.9 Summary

This chapter presents the research methodology for the present study. The research design includes the research method and its procedures. The main instruments for the current study were the pre- and post-test, research materials, the PBL treatment, questionnaires, a semi-structured interview, and observation. The data collection and analysis shows how the data was collected and how the data was analyzed in order to answer the research questions of the study.



## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

This chapter illustrates the findings of the current study in response to the three research questions proposed in Chapter 1. There are three main sections in this chapter. The first section illustrates the quantitative analysis of the participants' performances on the pre-test and post-test by using statistical methods, namely SPSS 13.0. The second section presents the qualitative data elicited through the questionnaires, the semi-structured interviews as well as field observations. The last section discusses the impact of the PBL intervention on the English reading skills of a selected group of Chinese Middle School EFL students.

#### **4.1 Results of the pre-test and post-test**

##### **4.1.1 Pre-test results**

The pre-test was carried out at the beginning of the experiment to assess the reading comprehension ability of the participants in both the experimental and control groups. There were two main reasons to obtain the results of the pre-test. Firstly, they were used to set the baseline for a comparison between two groups and, then, to help interpret the findings, in particular, if there were any improvements or differences which had occurred by the end of the experiment. The reading comprehension pre- and post-test included four articles with a total of 20 items and each question was allocated two points, which means that there was a maximum score of forty points for the RCT. Both descriptive and inferential statistics were used to analyze the data from the pre-

test. Descriptive analysis of the data was employed to get an overview of the participants' performances on the pre-test. Dey (2003) argued that descriptive statistics gave a fresh view of the data and served as the basis for analysis.

Table 4.1 shows the pre-test results of reading proficiency for both groups. An average score of 30 students in Group 1 (control group) was 16.93 (16.933), whereas 27 students in group 2 (experimental group) had an average score of 16.59 (16.592). The standard deviation of the control group was 5.00 (5.002), whereas it was 5.20 (5.198) for the experimental group. Table 4.2 illustrates the average scores for the control group (M=16.93, SD=5.00) and the experimental group (M=16.59, SD=5.20) on the pre-test.

**Table 4.1** Descriptive statistics of control and experimental groups on the pre-test

Group Statistics					
	group	N	Mean	Std. Deviation	Std. Error Mean
score	1	30	16.9333	5.00299	.91342
	2	27	16.5926	5.19807	1.00037

Table 4.2 illustrates the results of an independent sample t-test to compare the reading proficiency of the control and experimental groups. This table reveals that there was no significant difference in the scores for the control group (M=16.93, SD=5.00) and the experimental group (M=16.59, SD=5.19);  $t(55) = 0.252$ ,  $p = 0.802$  on the pre-test. These results indicated there was more or less the same reading comprehension score before the PBL intervention between both the control and experimental groups which was essential to provide consistency of results for the treatment in the same situation.

**Table 4.2** An independent sample t-test between the control and experimental groups on the pre-test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-Test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
score									Lower	Upper
	Equal variances assumed	.000	.985	.252	55	.802	.34074	1.35187	-2.36848	3.04996
	Equal variances not assumed			.252	53.861	.802	.34074	1.35465	-2.37532	3.05681

To be more specific, this table illustrates the percentage of students in the control and experimental groups for the different score ranges on the pre-test. The score ranges for the pre-test in the experimental and control groups were divided into four categories as can be seen in Table 4.3. This table presents the three main parts for the proportions of the various score ranges on the pre-test. In the first part, the score has four ranges with 0 to 10 (defined as very low proficiency in this study), 11 to 20 (low), 21 to 30 (medium), and 31 to 40 (high). In the second part, the students' number and their different score ranges are presented for the control group. The last part is similar but for the experimental group.

**Table 4.3** Proportion of various score ranges for the control and experimental groups on the pre-test

Score range (points)	Control group (N=30)		Experimental group (N=27)	
	Student Number	Rates (%)	Student Number	Rates (%)
0-10 (very low)	2	6.7 (6.66)	4	14.8 (14.81)
11-20 (low)	21	70	19	70.4 (70.37)
21-30 (medium)	7	23.3 (23.33)	4	14.8 (14.81)
31-40 (high)	0	0	0	0

It is clear from Table 4.3 that the scores range between 11 and 20 points for both the control and experimental groups which accounts for the highest proportion of the figures, with about 70% and 70.4%, respectively, which indicates that the majority

of the students in both groups were low in English reading proficiency before the experiment. Then, the range of scores from 21 to 30 points ranked second for both groups, with 23.3% and 14.8%, respectively, which indicated medium proficiency for English reading. At the same time, the score ranges from 21 to 30 points for a number of the participants with the same proportion (14.8%) as that of 0 to 10 points for the experimental group. However, the score range of 0 to 10 points for the control group constituted only 6.6% of the figure for the participants. Interestingly, there were 0% for the score range of 30 to 40 points which represented high English reading proficiency which means that none of participants were able to obtain high scores for either the experimental or control group.

In conclusion, Table 4.2 reveals that the control and experimental groups of the study were indeed matched as to initial reading proficiency, because there was no statistically significant difference between the control and experimental groups ( $t(55)=0.252$ ,  $p=0.802>0.05$ ). Additionally, Table 4.3 illustrates that most students performed at a reading level between 11 to 20 points which was below 20 points, the average of full marks (40) of the RCT. This indicates that the students of both the control and experimental groups had a low level of reading skills. In particular, none of the participants was able to obtain 30 to 40 points which represents high marks for the reading skills.

#### **4.1.2 Post-test results**

The post-test served to measure the effects of the pedagogical intervention on students' reading comprehension skills. It was administered to students after the PBL and non-PBL intervention had been conducted. The analysis of procedures for assessment was the same as those utilized for the pre-test. Additionally, scoring of the

assessments on post-test also conformed to the same criteria as for the pre-test. Also, both descriptive and inferential statistics were used including a paired samples t-test and an independent samples t-test to analyze and compare the data from the post-test. The results of the experimental and control groups on the post-test are shown as follows:

#### 4.1.2.1 Experimental group

Table 4.4 presents the average means of reading proficiency of the experimental group before and after the PBL intervention. For the experimental group, the average score on the pre-test was 16.59 (16.592), while on the post-test it was 21.85 (21.851). The standard deviation for the pre-test was 5.20 (5.198), whereas for the post-test it was 5.79 (5.789). Table 4.4 presents the average scores for the pre-test (M=16.59, SD=5.20) and the post-test (M=21.85, SD=5.79) in the experimental group.

**Table 4.4** Descriptive statistics of pre-test and post-test in experimental group

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	16.5926	27	5.19807	1.00037
	posttest	21.8519	27	5.78927	1.11415

Whereas, Table 4.5 for a paired-sample t-test was used to perform the comparison of the pre-test and post-test in experimental group, in order to verify the effects of the PBL intervention on reading comprehension skills. This Table discovered that there was a significant difference in the scores for pretest (M=16.59, SD=5.20) and post-test (M=21.85, SD=5.79);  $t(26) = -5.925$ ,  $p=0.000$  within the experimental group. These results indicated that PBL intervention had positive effectiveness on the reading comprehension score, in answer to the first research question.

**Table 4.5** A paired-sample t-test on pre-test and post-test of the experimental group

Paired Samples Test								
	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 pretest - posttest	-5.25926	4.61263	.88770	-7.08395	-3.43456	-5.925	26	.000

Specifically, the following Table 4.6 illustrates the percentages of students on the pre-test and post-test for different score ranges in the experimental group. There are four categories which divide the score ranges for the pre-test and post-test in the experimental group, while the scores of each participant for the pre-test and post-test of the experimental group are shown in Appendix L.

**Table 4.6** Proportion of score ranges for pre-test and post-test in the experimental group

Score range (points)	Experimental group (N=27)			
	Pre-test		Post-test	
	Numbers of Students	Rates (%)	Numbers of Students	Rates (%)
0-10 (very low)	4	14.8 (14.81)	1	3.7 (3.70)
11-20 (low)	19	70.4 (70.37)	12	44.4 (44.44)
21-30 (medium)	4	14.8 (14.81)	12	44.4 (44.44)
31-40 (high)	0	0	2	7.4 (7.40)

Table 4.6 indicates the tendency of participants with very low or low reading proficiency to medium or high reading proficiency after the PBL intervention. For instance, the rates of students in the score range between 0 and 10 points and 11 and 20 points declined from 14.8% to 3.7% and from 70.4% to 44.4%, respectively, while the score range between 21 and 30 points and 31 and 40 points increased from 14.8% to 44.4% and from 0% to 7.4%.

In brief, Table 4.5 indicates that the PBL approach had substantial effects on students' reading comprehension skills, because there was a statistically

significant difference between the pre-test and post-test within the experimental group ( $t(26) = -5.925, p = 0.000 < 0.05$ ). Most importantly, Table 4.6 shows that students with a reading proficiency of a very low or low reading level improved to medium and high reading levels. Clearly, the score of 0 percent for high reading proficiency in the pre-test increased to 7.4 percentage in the post-test in the experimental group. Both Tables 4.5 and 4.6 represent the effects of the PBL approach on reading comprehension skills.

#### 4.1.2.2 Control group

Table 4.7 shows the mean averages for the reading comprehension in the control group before and after the non-PBL intervention. In the control group, the average score on the pre-test was 16.93 (16.933), while on the post-test it was 18.60 (18.600). The standard deviation for the pretest was 5.00 (5.002), whereas it was 4.43 (4.430) for the post-test. Table 4.7 presents the average scores for the pre-test ( $M = 16.93, SD = 5.00$ ) and the post-test ( $M = 18.60, SD = 4.43$ ) in control group.

**Table 4.7** Descriptive statistics of pretest and posttest in control group

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	16.9333	30	5.00299	.91342
	posttest	18.6000	30	4.43030	.80886

Whereas, Table 4.8 for a paired-sample t-test was used to perform the comparison of the pre-test and post-test in control group, in order to check whether students' reading proficiency improve significantly after non-PBL lesson. This Table detected that there was no significant difference in the scores for pre-test ( $M = 16.93,$

SD=5.00) and post-test (M=18.6, SD=4.43);  $t(29)=-1.907$ ,  $p=0.066$  within the control group. These results revealed that the students' reading proficiency did not improve dramatically after the traditional reading instruction.

**Table 4.8** A paired-sample t-test for the pre-test and post-test in the control group

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	pretest - posttest	-1.66667	4.78744	.87406	-3.45432	.12099	-1.907	29	.066

Further Table 4.9 below gives the percentage of the students on the pre-test and post-test for the different score ranges in the control group. Again, there were four categories for the score ranges on the English test for the pre-test and post-test within control group, while the score of each participant for pre-test and post-test which are shown in Appendix K.

**Table 4.9** Percentages of score ranges for pre-test and post-test in the control group

Score range (points)	Control group (N=27)			
	Pre-test		Post-test	
	Numbers of Students	Rates (%)	Numbers of Students	Rates (%)
0-10 (very low)	2	6.7 (6.66)	2	6.7 (6.66)
11-20 (low)	21	70	20	66.7 (66.66)
21-30 (medium)	7	23.3 (23.33)	8	26.7(26.66)
31-40 (high)	0	0	0	0

From the above table, it is clear that none of the students in the control group were able to reach a high proficiency before or after the traditional lessons which indicates that these lessons failed to improve students' reading comprehension skills meaningfully. Although there was a slight change in the numbers between low and

medium reading proficiency, the majority of students still remained at a low level of reading proficiency. The number of students at a very low level also remained the same before and after the non-PBL lessons.

Overall, Table 4.8 reveals that the traditional lessons did not significantly improve students' reading comprehension, because there was no statistically significant difference between the pre-test and the post-test in the control group ( $t(29) = -1.907, p = 0.066 > 0.05$ ). Additionally, Table 4.9 also shows that most students have low reading proficiency levels, although they participated in the lessons. Even so it is clear that there is still 0 percentage of high reading proficiency skills on the pre-test and post-test in the control group. Both Tables 4.8 and 4.9 demonstrate that the traditional lessons failed to enhance students' reading comprehension skills.

#### 4.1.2.3 Experimental group and control group

Table 4.10 shows the post-test results for reading comprehension on both groups. An average mean of the control group was 18.60 (18.600), whereas the experimental group had average mean of 21.85 (21.851). The standard deviation of the control group was 4.43 (4.430), whereas it was 5.79 (5.789) for the experimental group. Table 4.10 gives the average scores for the control group ( $M=18.60, SD=4.43$ ) and the experimental group ( $M=21.85, SD=5.79$ ) on the post-test.

**Table 4.10** Descriptive statistics of the post-test

Group Statistics					
	group	N	Mean	Std. Deviation	Std. Error Mean
score	1	30	18.6000	4.43030	.80886
	2	27	21.8519	5.78927	1.11415

Further, Table 4.11 shows the results of an independent sample t-test which was conducted to compare the reading proficiency of the control and experimental groups. This table reveals that there is significant difference in the scores between the control group (M=18.60, SD=4.43) and the experimental group (M=21.85, SD=5.78);  $t(55) = -2.395$ ,  $p = 0.02$  on the post-test. However, the students' reading proficiency improved much more significantly after the PBL intervention in the experimental group compared to the non-PBL lessons in the control group. This indicates that the PBL lessons had a more positive effects than the non-PBL lessons.

**Table 4.11** An independent samples t-test between the control and experimental group on the pre-test

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
score	Equal variances assumed	2.256	.139	-2.395	55	.020	-3.25185	1.35765	-5.97263	-.53107	
	Equal variances not assumed			-2.362	48.541	.022	-3.25185	1.37680	-6.01929	-.48441	

The following Table 4.12 illustrates the percentage of students in the control and experimental groups with different score ranges on the post-test. The score ranges were divided into four categories for the pre-test on the experimental and control groups. Table 4.12 below illustrates three important aspects which include the range of scores for both the control and experimental groups.

**Table 4.12** Percentages of the various score ranges for the control and experimental groups on the post-test

Score range (points)	Control group		Experimental group	
	Number of Students	Rates (%)	Number of Students	Rates (%)
0-10 (very low)	2	6.7 (6.66)	1	3.7 (3.70)
11-20 (low)	20	66.7 (66.66)	12	44.4 (44.44)
21-30 (medium)	8	26.7(26.66)	12	44.4 (44.44)
31-40 (high)	0	0	2	7.4 (7.40)

From the above table, it is clear that the score ranges between 31 and 40 points at a high proficiency level occurred in the experimental groups at 7.4 percent while it remained at 0 percent in the control group, which means none of students in the control group were able to reach a high level of reading proficiency. The number of students in the experimental group was higher than that in the control group, with rates of 44.4% and 26.7%, respectively in the range of 21 to 30 points (medium level). Moreover, the number of students with low and very low reading proficiency in the experimental group was lower than that in the control group in the range of 11 to 20 points (44.4% and 66.7%, respectively) and 0 to 10 points (3.7% and 6.7%, respectively).

In conclusion, Table 4.11 reveals that the students' reading proficiency after the PBL intervention was dramatically higher than that after the non-PBL lesson because there was a statistically significant difference between the control and experimental groups ( $t(55) = -2.395$ ,  $p = 0.02 < 0.05$ ). Additionally, Table 4.12 illustrates that the students in the experimental group were able to reach a high proficiency while those in the control group could not. Thus, generally, the PBL intervention enabled students in the experimental group to improve their reading proficiency dramatically while those in the non-PBL (control group) failed to do that.

## **4.2 Results of questionnaires, semi-structured interviews and observations**

This section was incorporated into this research study to answer the second and the third research questions regarding the development of metacognitive strategies on reading performance through PBL instruction and students' perceptions towards the PBL lessons. Questionnaires were employed for both research questions but only administered to the 27 participants in the experimental group. However, the questionnaires on the metacognitive survey were conducted before and after the PBL intervention while the questionnaire on students' perceptions was only administered after the PBL intervention. The PBL participants had to submit the questionnaires within a given time in the class. Meanwhile, the instructor needed to check each of the submitted questionnaires carefully to check that no blank or incomplete sheets had been submitted. As for the semi-structured interview, only thirteen participants were interviewed after the PBL treatment. Furthermore, there was a brief interpretation based on the observation in class. In short, all the data obtained from the questionnaires was analyzed both quantitatively and qualitatively. The interviews and observation, by contrast, were only analyzed qualitatively.

### **4.2.1 Results of questionnaires**

#### **4.2.1.1 The questionnaire on the development of metacognitive strategies**

To answer the second research question (“What is the development of metacognition through the PBL lessons”), the questionnaire on the metacognitive survey was designed with 16 related items for statistical analysis. All questionnaires were then analyzed quantitatively by using a 5-point Likert scale based on the responses of students to 16 statements by ticking the choices from “Never”, “Seldom”,

“Sometimes”, “Usually”, “Always” which represent the points “1”, “2”, “3”, “4”, “5”, respectively. Specifically, the highest score was “Always” on each item while the lowest score was “Never”. Oxford (1990) proposed that the levels of a 5-point scale range were high level (3.5-5.0), medium level (2.5-3.4), and low level (1.0-2.4), which were employed to explain the data in the present study. All the results from the pre-questionnaires and post-questionnaires were analyzed and compared to see the differences in the frequency of use of metacognitive reading strategies. The following descriptive statistics present the results based on the three main metacognitive strategies, namely, planning, monitoring, and evaluating as shown in Table 4.13 below.

**Table 4.13** Results of the metacognitive strategies used in the PBL lessons

Metacognitive strategies	Pre-text		Post-test	
	X	SD	X	SD
Planning (1,2,3)	2.29	.040	3.66	.202
Monitoring (4,5,6,7,8,9,10,11,12,13)	2.40	.286	3.64	.099
Evaluating (14,15,16)	2.18	.242	3.52	.090

Table 4.13 presents the findings for the three main metacognitive strategies before and after receiving PBL instruction in the experimental reading class. The results of the pre-metacognitive awareness showed that the students had a low frequency of metacognitive use, such as planning, monitoring, and evaluating (2.29, 2.40, 2.22) because it showed the total mean scores below a mean score were 2.4 which is defined as low frequency by Oxford (1990) as mentioned earlier. Whereas the students' metacognitive awareness after the PBL instruction was significantly higher than that before the PBL instruction, with 3.66, 3.64, 3.52 for the planning, the

monitoring, and the evaluating, respectively, which stood at a the high level in the frequency range.

**Table 4.14** Results of the metacognitive reading strategies students employed before and after the PBL treatment

<b>Metacognitive Strategy Survey</b>		<b>Pre</b>		<b>Post</b>	
<b>No</b>	<b>Statements</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>
1	I planned how to read the text in the test.	2.33	.87	3.62	.92
2	I was aware of which strategy to use and how or when to use it.	2.25	.85	3.88	1.08
3	I predicted what would happen next while I was reading	2.29	.99	3.48	1.12
4	I used pictures (if any) to predict the content of the text.	2.66	1.17	3.59	.88
5	I tried to find the information for reading comprehension by scanning.	2.44	1.01	3.55	.93
6	I guessed the meaning of the important new words from the context by reading on or looking back.	2.59	1.27	3.62	1.21
7	I selected relevant information to help me understand the reading texts and answer the test questions.	2.48	1.01	3.66	1.00
8	I used multiple reading strategies to help jme understand the reading text. (e.g. Main idea, inference, word meaning, detailed information, summary).	2.33	1.03	3.85	1.09
9	I tried to find the topic and main ideas by skimming.	2.07	.82	3.59	.93
10	I re-read the relevant information if I do not understand the passage.	1.88	.69	3.59	.97
11	I adjusted my reading rate according to the difficulty.	2.29	.77	3.70	.99
12	I kept track of my own progress to finish the text on time.	2.44	.89	3.55	.84
13	I corrected mistakes immediately when found.	2.88	1.21	3.77	1.01
14	I made sure I understood what had to be done.	2.22	1.05	3.44	1.12
15	I checked my own performance and progress while completing the test.	1.92	.67	3.51	.93
16	I checked my accuracy as I progressed through the test.	2.40	.97	3.62	1.00
<b>Total</b>		2.34	.25	3.62	.12

It is clear from Table 4.14 that the total average mean of the sixteen items for the metacognitive survey were 2.34 before the PBL treatment, which was within the range of the low frequency (0-2.4) defined by Oxford (1990). Although three items 4, 6, and 13, had the highest mean scores among these 16 items, with 2.66, 2.59,

and 2.88 above 2.4, which were within the range of the medium frequency (2.4-3.4), these general results on pre-metacognition indicate that the students probably had a lower metacognitive awareness before they carried out their English reading during the PBL intervention.

In contrast, the overall mean score of metacognitive use after the PBL treatment improved from 2.34 to 3.62 which reached a high level in the frequency (3.4-5). Specifically, the average mean of most items for metacognition employed after the PBL teaching was above 3.5, except for items 3 and 14 which were “I predicted what would happen next while I was reading” and “I made sure I understood what had to be done.”, with scores of 3.48 and 3.44, respectively. The top three strategies with the highest mean scores after the PBL treatment included “I was aware of which strategy to use and how or when to use it”; “I used multiple reading strategies to help me understand the reading text.” (e.g. Main idea, inference, word meaning, detailed information, and summary); “I corrected mistakes immediately when found while and after the reading” received scores of 3.88, 3.85, 3.77, respectively, while the least employed metacognitive strategy was item 14 “I made sure I understood what had to be done.” (3.44).

In summary, Table 4.14 shows a positive development in the use of metacognitive strategies on reading comprehension skills through the PBL lessons in general, because the total mean of the post-survey scores for the metacognitive strategies items was higher than the mean scores for the pre-survey. In other words, the students with low frequency use of used metacognitive reading strategies before the instruction made a considerable progress to reach a high level in the frequency after the

PBL intervention. Thus, these students achieved greater metacognitive awareness than before they did the reading.

#### 4.2.1.2 The questionnaire on students' perceptions

To investigate the perceptions of students towards the implementation of the problem-based learning approach, the researcher collected the data by using a 5-point Likert scale questionnaire including “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree” which are represented by the scores of “1”, “2”, “3”, “4”, “5”, respectively. The analysis of the results follows the scale ranges proposed by Oxford (1990) which are high level (3.5-5.0), medium level (2.5-3.4), and low level (1.0-2.4). The findings of the analysis are shown in Tables 4.15 and 4.16 below.

With regard to Table 4.15, the researcher analyzed the students' perceptions in six dimensions. These concerned the students' perceptions towards the PBL lessons in 18 items with items 1-3 about the effects of the PBL environment; items 4-6 regarding student-centered learning; items 7-9 for small groups; items 10-12 about problems as stimulus; items 13-15 for the teacher's role; and items 16-18 concerning self-directed learning.

**Table 4.15** Results of students' perceptions towards PBL lessons in six dimensions

Six Aspects	X	SD
The effects of PBL	4.43	.23
Student-centered learning	4.14	.16
Small groups	4.14	.48
Problem as stimulus	3.84	.27
Teacher's role	4.08	.17
Self-directed learning	3.77	.24
Total	4.07	.24

It is clear from Table 4.15 that the students had positive perceptions towards the PBL lessons (4.07) which were at a high level according to Oxford's categories (1990). Specifically, the majority of students agreed on the beneficial effects of the PBL lessons with a score of 4.43. As for student-centered learning and the small groups of the PBL approach, both of them obtained at the same figure at 4.14. Regarding the teacher's role in the PBL lessons, the score was just over the average mean of the total score 4.07 with a score of 4.08. However, problem as stimulus and self-directed learning were less than 4, with 3.84 and 3.77, respectively. Generally, the results revealed that the students had very positive perceptions towards the PBL lessons since the data for all six aspects attained between 3.5 and 5 which can be defined as at a high level.

Based on the individual items of the questionnaire, the analysis of the results of the average mean scores of each items are provided in detail in Table 4.16.

**Table 4.16** Results of students' perceptions towards the PBL lessons

No.	Statement of students' perceptions	X	SD
1	This reading lesson is helpful to my learning.	4.41	.75
2	This reading lesson provides a good atmosphere in class.	4.67	.55
3	This reading lesson can improve my reading comprehension.	4.22	.64
4	I obtain the information and learn by myself.	3.96	.59
5	I am actively involved in the process of learning.	4.25	.76
6	I seek the solutions of the problem actively.	4.22	.93
7	The small groups is appropriate for me to join in the group discussion.	4.63	.49
8	I feel relaxed in the group discussion.	3.67	.88
9	I can be involved in the discussion.	4.11	.51
10	I can understand the materials.	3.74	.90
11	I can use what I know to understand the information.	4.14	.60
12	I learn the new vocabulary, phrases, and sentences from the reading materials.	3.63	.74
13	The teacher makes a conclusion of what we present in class.	4.26	.45
14	The teacher gives clear feedback on my group work.	4.04	.52
15	The teacher evaluates group co-operation regularly.	3.93	.27
16	I know what I need to do for my learning.	3.63	.69
17	I use some learning strategies to gain information quickly.	4.04	.59
18	I evaluate the accuracy and value of the information.	3.63	.84
Total		4.07	.32

Table 4.16 shows that item 2 “PBL lessons provide a good atmosphere in class” was the highest figure of 4.67 followed by 4.63 of item 7 “The small group is appropriate for me to join the group discussion” in second place. The average mean of items 1,3,5,6,9,11,13,14, and 17 were all above 4 points which means the students “agree” on these features of the PBL lessons, while the remaining items 4,8,10,12,15,16, and 18 had a low average mean below 4 points. Among these low average scoring items, items 12,16,18 had the lowest average value of 3.63. However, generally, the total average mean of 18 items was 4.07 points which means these questionnaire items about the PBL lessons were agreed on by most of the students.

#### **4.2.2 Results of the semi-structured interview**

The purpose of the findings from the semi-structured interviews supposed to support or go further explain the results of the statistical analysis. They contributed to the investigation on the development of metacognitive strategies and exploration students’ perceptions towards the PBL lessons. There were two topics within four guiding questions. In the first topic, the findings of items 1 and 2 were concerned, the development of metacognition through the PBL lessons, while in the second topic, the results of the remaining items were demonstrated students’ perceptions, opinions or feelings about reading instruction methods, that is, to probe their perception, opinions or feelings about the PBL lessons. Additionally, the data of the interview were collected from eight students with a medium to high reading proficiency levels whose reading post-test scores were above 20 points (21-40), and five students with very low to low reading proficiency level whose scores below 20 points (0-20), making a total of 13 students for an interview. These results are shown in Table 4.17.

**Table 4.17** The **selected** interviewees with different reading proficiency levels on the post-test

Range of Scores	Score ranges	Reading proficiency	Number of Interviewees
Below 20 points	0-10	very low	1
	11-20	low	4
Above 20 points	21-30	medium	6
	31-40	high	2

#### 4.2.2.1 Development of metacognition through the PBL lessons

Data from the thirteen participants in a semi-structured interview elicited from the two guiding questions, 1) “How do you do your reading? Are there any differences compared to before?”; 2) “How do you use reading strategies?” were analyzed and interpreted to examine their metacognition development. The transcriptions of all the interviews can be seen in Appendix M.

Some transcriptions of the responses to these guiding questions were selected as follows. Students 1 to 5 (ST1-5) were low and very low in reading proficiency that is on the post-test while students 6 to 13 (ST6-13) were the medium and high in reading proficiency.

**Table 4.18** The five themes of excerpt components from interviewees

No.	Themes	Excerpt
1	Planning	ST6: ....I know how to read and what to read if I plan.. ST10: I realize to do plan.....think about reading techniques after the lessons.....I check my answer after I finish the reading
2	monitoring	ST1: I use reading technique when I read. ST3: Now I try to use the reading techniques when I do reading. ST8: Before, I seldom think too much for my reading strategy. But now, I followed what I learned in these lessons.....
3	evaluating	ST9: Now, I do reading following what the teacher teach in these classes, predicting the picture, guessing the words, understand the questions, etc. ST12: .....And I start to think how I do my reading.....

**Table 4.18** The five themes of excerpt components from interviewees (Continued)

No.	Themes	Excerpt
4	predicting the pictures	ST2:.....predict the pictures. ST8: I , now, I skip some new words or predict them to go on my reading progress. ST2: ...predicting the picture, guessing the words, understand the questions, etc; the teacher teaches us guessing words in this class from prefix, suffix, context
5	guessing the words' meaning	ST2: Guess the words..... ST9: ...predicting the picture, guessing the words, understand the questions, etc; the teacher teaches us guessing words in this class from prefix, suffix, context ST6: I finally know how to guess the words more accuracy ST10: ... guess the new vocabulary...

These themes were concluded to illustrate that the students were more or less aware of the use of metacognition during their reading performance in regard to the first question. In addition, they are further verify how they monitor their reading performance in detail, that is, what reading techniques they use. In general, the students who had medium and high proficiency or low and very low proficiency started to plan and monitor their reading which indicated the development of metacognition through the PBL lessons. As a result, they know how to use reading strategies to get the answer quickly and accurately.

#### 4.2.2.2 Students' perceptions towards the PBL lessons

To obtain the results of students' perception towards the PBL lessons with regard to the third research question, the data from items 3 and 4 of the semi-structured interview are used in Appendix L. The guiding questions of the interview were 3) "What do you think about the extracurricular reading lessons?" and 4) "What comments do you have after these 8-week reading lessons?" Thus, the researcher

categories three themes to explain that some students had positive perceptions to PBL lessons which seen as Table 4.19.

**Table 4.19** The three themes of the excerpt component from interviewees.

No.	Themes	Excerpt
1	Useful	ST10: Very fun. It is very helpful for my reading. ST12: I think my reading skills improve after the lessons ST9: very useful, I feel relaxed to talk with my team mates;
2	Good atmosphere	ST2: It is okay. The atmosphere is good. ST13: The atmosphere of class is higher than regular class.
3	Opportunity to speak English	ST2: The team members can communicate in English. ST6: We have chance to practice our speaking and comprehend the text. ST8: we can speak English in class and...

However, some students pointed out that they preferred much language knowledge taught by the teacher in PBL lessons. For instance,

Excerpt 1

*"I prefer the teacher to teach enough knowledge in class. I have not know much words in the text."* (Student 5)

Excerpt 2

*"I prefer to listen to what the teacher teach in class..."* (Student 9)

Excerpt 3

*"If teacher can teach more, I think it will be better"* (Student 11)

Generally, the students mentioned that the class was fun and the atmosphere was active for learning reading skills. Also, they thought that the extracurricular reading lessons were useful to improve their reading comprehension skills. However, some students suggested that the teacher should give the students more help with the activities since they found it difficult to do the reading on their own.

#### 4.2.3 Information gained from observation

The current study utilized the naturalistic observations in the real-world teaching context to capture data that could not be obtained by other data collection

instruments. The instructor provided her notes for the PBL instruction and the researcher added some information and interpretation to the notes, as can be seen in Appendix N. Field notes were employed to record both descriptive and reflective accounts of the situation being observed. To make the observations rigorous and systematic, the researcher adapted the observation notes of Yang (2016).

Based on the instructor's and researcher's observations, the learning atmosphere could be described as positive and optimistic in the PBL classroom. The students were given the opportunity to be responsible for their own learning. They were allowed to negotiate and construct meaning by themselves which made learning an enjoyable and rewarding experience, with self-motivation, great enthusiasm and positive engagement. Moreover, it was observed that the students were willing to be checked by their teacher or the researcher on their reading performances. They enjoyed practicing their reading skills with their group members.

### **4.3 Discussion**

There were two main points of discussion concerning the study. The first discussion was about the effects of the PBL approach on reading comprehension skills and the second was the increase in metacognitive awareness for reading performance.

#### **4.3.1 The effects of PBL on reading comprehension skills**

The main research question aimed to examine the effects of the PBL approach on the development of the students' reading comprehension skills. The results of the research question showed that the PBL approach had positive effects on the students' reading comprehension after the PBL intervention

The following views cover the major findings on the positive effects of the

PBL lessons on students' reading comprehension.

Quantitatively, the results and analysis of the pre-test and post-test revealed that the participants in the experimental group significantly improved their reading comprehension skills after the PBL intervention as exemplified by the increase in high scores which resulted from an analysis using a paired-sample t-test. Generally, the results of this study are consistent with the previous research (Lin, 2017) on English reading comprehension indicating that the PBL approach significantly improved the EFL learners' reading comprehension skills. As is consistent with the related existing research (Lan, 2014; Phanitphim, 2009; Poikela & Poikela, 2005), the present study also offered evidence that the PBL approach had positive learning outcomes. The significant results of the RC post-test can be attributed to sufficient exposure to the environment of teaching and learning English reading in the PBL treatment.

In line with the findings of this study and the literature review, some possible reasons emerge to explain the improvements in reading comprehension after the PBL intervention in this study which can be summarized as follows.

First, the PBL approach created a student-centered learning model with authentic and real-life problems for the learning environment. In the process of PBL approach, the students learned a variety of knowledge on their own using authentic examples of reading materials. Therefore, students were provided with the opportunity to have an in-depth study which helped to formulate their ideas and develop their internal cognition by themselves which probably lead to their success in learning. Moon (2000) states that PBL allows students to work at their own paces and to be successful at what they do since they become more involved in the learning process.

Second, the PBL is a constructivist approach to learning (Dochy et al., 2005).

The 'powerful learning environments' based on the constructivist view which have led to the development and implementation of learning (De Corte, 1990). 'Powerful learning environments' refer to students' learning the core issues and instruction defined as learning-enhancing (Dochy et al., 2005). Prawat (1996) proposed that learning is a process of active construction which results in understanding. Furthermore, Tynjala (1999) describes knowledge as a building process of constructed knowledge through individuals or social communities. In the study, the PBL treatments allowed students to actively construct their knowledge and skills through interaction with the environment and through the reorganization of their own mental structures in self-directed learning. Thus, the PBL instruction was designed to create a powerful learning tool to improve students' reading comprehension.

Third, in the PBL environment, students are geared to reach a great degree of self-directed learning because they have to plan and manage every step of learning very carefully on their own. Self-directed learning required students to have an awareness of their personal learning needs (Barrow, 1986) Thus, SDL requires students to adapt their learning strategies to attain the learning objectives which develop the disciplines of responsibility. These disciplines resulted in the successful learning of the students (Phanitphim, 2009).

Fourth, the PBL lessons provided cooperative learning in group discussion. Lin (2017a) suggested that both proficient and less-proficient learners can participate in a group. Lin thought that proficient learners may model successful learning outcomes for less-proficient students during the completion of problem-solving tasks. A small group provides mutual support in a PBL classroom which may be beneficial for the development of active learning attitudes of the students (Lin 2017). In addition,

Phanitphim (2009) argued that a problem-based approach could develop students' language proficiency since mixed-ability students in PBL lessons achieved a better performance and when learning in a group. Thus, the mixed proficiency students might input their knowledge to obtain a better understanding of the reading text during cooperative activities which can help them to develop their language proficiency.

Fifth, according to Bahri & Corebima (2019), PBL has the potential to strengthen metacognition, which is based on a cognitive function rather than a memorizing concept. Problem-based learning requires that students have to successfully monitor and guide their problem solving process, as well as to recall memories from concepts and previous learning processes to overcome the given problems which ideally would be aligned to the development of the students' level of metacognition (Bahri & Corebima, 2019). The reading activity carried out by the students in the PBL lessons showed that their metacognition levels were effective enough to improve the students' outcomes during their learning activities.

Furthermore, some researchers (Soto et al., 2019; Wichadee, 2011; Zhang, 2009) argued that metacognitive awareness is an effective way to improve students' reading comprehension. Since PBL has positive effects on the development of metacognition, and metacognition can improve their reading comprehension skills, it can be said that PBL lessons might help students improve reading comprehension skills through metacognition. Most importantly, the findings from the PBL lessons show a significant improvement in the participants' scores in the present study which is probably because they were able to fully practice the strategies which helped them develop their thinking processes metacognitively in these lessons.

Finally, it was found in the study that students had positive perceptions

towards the PBL approach through the statistically analysis of the questionnaires and the qualitative data from the semi-structured interviews. Shiel (1994) argued that when the students' perceptions were changed positively in a learning environment, they might have greater responsibility for their learning which will bring about greater success in learning. Also, a positive perception enables students to learn with readiness and willingness (Phanitphim, 2009).

While the responses of the semi-structured interviews revealed two kinds of perceptions, positive and neutral towards the PBL lessons. In item 3 of guiding questions "What do you think about the extracurricular reading lessons?", all 13 interviewees gave positive comments and feelings about the PBL lessons, no matter what their proficiency level were on the post-test. However, when they asked item 4 "Do you have any comments after these 8-week reading lessons?" , the students who obtained less than 20 points on the post-test mentioned that they wanted more help from the teacher in the class. This is consistent with the two main reasons proposed by Phanitphim (2009) who also said students required more assistance from the teacher. First, the students were not confident about the knowledge they had acquired even though all of them showed similar aspects of knowledge. Another factor was that the students did not trust themselves or their friends, but they trusted their teacher. Therefore, they felt that they needed the teacher's help. However, apart from the above reasons, the researcher also found another two factors in the context of this study which showed that it was the low proficiency students who asked for more helps from their teachers. Firstly, they were not accustomed to a new alternative approach to the teaching and learning of reading as they normally received reading instruction by means of sentence by sentence translation or a grammar analysis of the text. This can be

explained in terms of their being used to a teacher-centered learning model in their regular class rather than the student-centered learning approach in the PBL lessons. Secondly, the students at a low level of English proficiency were not able to obtain both language and content information and comprehend them well enough to share their ideas with other group members. Thus, the researcher needed to take these reasons into consideration in order to make the PBL instruction effective for the students.

Moreover, in the study, some constraints had existed in terms of the PBL implementation of the extracurricular lessons. So the researcher must consider many factors, such as the research setting, participants, reading materials, and time allocation for each step, and so on. The extracurricular lessons required the teaching and learning of reading out of the regular class time and place. Thus, the researcher needed to find a suitable place for the research setting which would allow for the limited number of students and the availability of the necessary tools for teaching and learning. This meant that the instructor was faced with a problem since PBL instruction would require a change from the conventional teaching method for which most lectures used a classroom to student-centered teaching. In the Chinese education system at the schools, classroom teaching is required to follow strict teaching schedules by the school (Lan, 2014). However, the extracurricular reading lessons were required to follow the design of the PBL implementation to achieve an effective approach. Furthermore, the students needed to be monitored to ensure that they attended the extracurricular lessons at special time which different from their regular classes time. As a result, the researcher and the instructor had to spend some time and take measures to confirm the same learning times were available for both the PBL and the non-PBL groups. With regard to the reading materials, the researcher found that it was difficult to make sure that there were

sufficient reading passages for each problem, because the students spent different amount of times on reading the various texts. Thus, the researcher had to adjust the times and the length of time available to the students for them to be able to read the passages which was quite time-consuming. As for time allocation, the PBL treatment required complicated procedures so the researcher needed to allocate reasonable amounts of time which was important for the PBL approach to be conducted successfully. For example, the PBL procedures consisted of nine main steps, so instructor needed to adjust the time of each step based on the actual time the students would take to complete their reading, although the time allocation had been previously fixed according to the lesson plan.

In conclusion, the effects of the PBL approach on the students' reading comprehension skills in this study mainly concerned the following topics, namely a student-centered learning model, the constructivist concept of the PBL approach, self-directed learning, cooperative work in groups, metacognition, as well as students' positive perceptions towards the PBL lessons. At the same time there were constraints which have also been discussed at the end of this discussion of the study which pointed out that the researcher had to be careful in organising extracurricular reading for the teaching and learning of PBL. Finally, and most importantly, quantitative statistics showed positive improvements of the students in the post-reading test after the PBL intervention.

#### **4.3.2 The development of metacognition on the PBL lessons**

The second research question investigated the development of metacognition through the PBL lessons. The results of the descriptive analysis of the questionnaire on metacognitive strategies showed that the participants' awareness of metacognition

increased after the PBL intervention as seen as in Table 4.14, when compared to the mean score of metacognitive survey before the PBL intervention. The findings were similar to those of Downing et al. (2009) that found PBL lessons offer fertile environment for the development of metacognition. In recent years, some researchers have explored the positive impact of the PBL approach on students' metacognition (Aliyu, 2017, Bahri & Corebima, 2019).

The discussion of the reading comprehension strategies followed a similar format to that in Table 2.1 (See 2.1.2) as adopted by Parr & Woloshyn (2013). While introducing questioning, the instructor contextualized questioning as a function of human curiosity and presented various types of questions that could be used to achieve different purpose like to clarify, analyze, speculate, and contextualize (Parr & Woloshyn, 2013). Students were encouraged to ask questions before, during, and after reading which could help them comprehend the text more deeply. In addition, instruction of the explicit strategies in the study discussed and explained methods for finding answers to questions, such as searching in and across texts, making inferences and discussing, and seeking additional information. In the PBL approach, there are not definitive answers to some questions. The process of making questions encouraged students to formulate and share new ideas and take into account other students' perspectives. In addition, students were also encouraged to integrate the use of questions with prior strategies introduced in the class, such as, a method of comprehension monitoring, and subsequent strategies, such as questioning as part of summarizing and synthesizing.

While the qualitative analysis of the semi-structured interviews showed that 12 out of 13 students more or less increased their awareness of metacognition on their reading performance after the PBL treatment. The improvement of the students'

metacognitive skills taught by the PBL approach is closely related to the PBL procedures. During the PBL procedures, students were confronted with real problems which are ill-structured, that is, there were problems without fixed answers. In this case, students will do anything to make the problems clearer and well-structured. In order to solve the problems, one should meticulously read relevant materials first to understand the main idea. After that, based on the main idea, one is able to provide questions, and of course, is able to find solutions eventually. From their learning activities, the students can make self-assessment to make sure of what they knew before the reading activity. Students might also make several possible hypotheses and solutions to problems based on information from their written resources. Students' activities during the implementation of the PBL procedures obviously activated their metacognition skills. The activities related to the PBL procedures are used as the basic measurement to establish that there are metacognition activities in the PBL approach. Similarly, according to the report of Bahri & Corebima (2019). PBL has the potential to activate metacognitive skills as well as to improve metacognitive self-regulation and also to foster thinking and learning processes. In other words, PBL strengthened the development of metacognition.

In general, the results of previous research (Downing et al., 2009; Aliyu, 2017; Bahri & Corebima, 2019), are consistent with those of the present study which also offers evidences from the quantitative and qualitative findings of the questionnaire and interview demonstrating that the PBL approach has a positive influence on the development of metacognition through the findings of quantitative and qualitative like questionnaire and interview.

#### 4.4 Summary

This chapter describes the results of the current study and discusses some of the most important findings with regard to the research questions. For the first research question, the results of the statistical analysis revealed that participants in both the experimental group and control group improved in reading comprehension skills over the course of the study. Consequently, the experimental group surpassed the control group significantly through the intervention of PBL. For the second research question, the PBL lessons empowered the development of metacognition which is supported with quantitative and qualitative evidence in the current study. For the last research question, the quantitative and qualitative methods illustrated that the students generally had a positive perception towards the pedagogical intervention. It should also be mentioned that the students in the experimental group had positive feelings about the PBL lessons because the teaching and learning model was relaxed and effective. In the final chapter, chapter 5, a summary of the study will be presented and the implications of the results will be examined. Some suggestions will also be made for the direction of further research.

## **CHAPTER 5**

# **CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS**

This chapter draws a conclusion to the thesis. It is organized into four sections. Section One summarizes the current study, including the major findings and procedures. Section Two considers the implications of the study for EFL reading and its possible applications for instruction. Section Three describes the limitations of the study. Finally, Section Four proposes recommendations for further research in EFL reading.

### **5.1 Summary of the study**

The current study conducted the problem-based approach to enhance reading comprehension skills of Chinese Middle School students, to increase the their use of metacognitive strategies to improve their reading performance as well as to find the students' opinions and perceptions on the PBL lessons. In the study, a quasi-experimental design was used to analyze the causes and effects in the experimental research (Wiersma & Jurs, 2005). The pedagogical intervention was expected to be conducted based on a teaching environment which was typical of a PBL involving student-centered learning; small discussion groups; tutor as the facilitator; and authentic problems as the starting point for a problem-solving approach. The PBL activity is student-centered in which the learning happened as a direct result of the students' efforts by searching for related information to solve the problem (Liu et al., 2002). Its

environment encourages students to question and allows them to make the decision on their own learning to become the foundation for future professional behaviors (Samford University (n.d.)). The PBL process provides many opportunities to develop and practice metacognition, for example when come to a new idea or problem, students engaging in metacognition propose a plan, monitor it during implementation, and, when completed, determine how it went (Weissinger, 2004). In PBL intervention, the instruments used were the reading comprehension tests which consisted of a pre-test and post-test, as well as students' written questionnaires, face-to-face semi-structured interviews as well as observation. The 57 participants of the study came from two classes which had been taught by the same English teacher for two years, and they were encouraged by their English teacher to enrol in the extracurricular reading class.

The answers obtained to the three research questions were as follows:

With regard to Research Question one, the results of an analysis of the quantitative data obtained from the pre- and post-test scores using SPSS software for calculating the descriptive statistics. To ensure similar backgrounds between the PBL and non-PBL groups, an independent *t*-test of the pre-test confirmed that there was no significant difference between the two groups, which indicated that the two treatment conditions had similar backgrounds in this study. After the implementation of the PBL and non-PBL instruction, the learning outcomes of the two groups were shown through an independent sample *t*-test which compared the effects of the experimental and control treatment conditions. There was a significant difference in the scores of the post-test between the two groups. Additionally, the results showed that the PBL group understood the reading comprehension articles better than the non-PBL group.

To find the effects of the two different instructional treatments between the groups on the participants' reading comprehension, a paired *t*-test was implemented to examine the differences between the test scores. The mean score of the PBL group's post-test was higher than that of its pre-test. There was a significant difference between the PBL group's pre- and post-tests. That is, the participants in the PBL group made significant progress in their reading comprehension ability after the PBL treatment. While, for the non-PBL group, the mean score of the post-test was higher than its pre-test mean score. However, the mean scores did not differ significantly. The results of the paired *t*-test further confirmed that the participants in the non-PBL group did not show significant improvement in their reading comprehension after participating in the traditional teaching techniques for teaching reading.

Concerning Research Question Two, the researcher used the information from the two instruments of a metacognitive questionnaire and a semi-structured interview. In the design of the questionnaire, metacognitive strategy usage was assessed on a scale of five (1- never; 2- seldom; 3- sometimes; 4- usually; and 5- always), while the two guiding questions for the interview were about metacognition.

The overall mean score of strategy usage among these students before the instruction was 2.34 but it improved to 3.62 after the PBL instruction for reading comprehension skills, which demonstrates that PBL significantly increased metacognitive awareness in this study. The 16 items about metacognition in the questionnaire included planning, monitoring, and evaluating. The three processes of metacognition with the highest mean scores after the instruction included planning how to read; being aware of which strategy to use and how or when to use it; and correcting mistakes immediately, while the lowest mean score was for determining what the test

tasks/questions required me to do. In short, the findings from the questionnaires revealed that there was a statistically significant difference between the pre- and post-scores indicating that students had increased their metacognitive awareness.

In order to obtain evidence to answer Research Question Two, a semi-structured interview was implemented with about half of the participants at the end of the PBL treatment. In particular, two aspects of the responses in the interviews can be identified. Firstly, the semi-structured interview found that most of the students started to become aware of metacognition in the reading activities during the PBL process. Secondly, the interview attempted to find out in detail the exact reading strategies used through students' reflections.

Lastly, the finding from Research Question Three showed that the students had positive perceptions on the PBL lessons through the data analysis of the questionnaires and interpretation of the interviews. On the one hand, this questionnaire had various degrees of statements such as, "Strongly disagree", "Disagree", "Neutral", "Agree", "Strongly agree" which were represented by the points "1", "2", "3", "4", "5", respectively. Based on the categories of the levels formulated by Oxford (1990), the high level should be between (3.5 to 5.0); medium level between 2.5 to 3.4 and low level between 1.0 to 2.4. The results showed that the total mean score of students' perceptions was 4.07 which indicated that the perception of students was at the high level of agreement. In other words, most students were satisfied with learning reading in the PBL environment. In the semi-structured interviews, on the other hand, the students agreed that the PBL treatment was helpful to their learning and improved their reading comprehension skills in a good class atmosphere. They agreed that they engaged in the activities actively within the small group discussions. The students were

also aware that the teacher worked as a facilitator rather than a lecturer. However, some of them would have preferred their teacher to teach more during the PBL intervention. They appreciated being members of a small group which motivated them in their learning. Furthermore, they agreed that the alternative assessment activities were bettered for enhancing their reading comprehension skills.

## **5.2 Pedagogical implications**

There are some significant implications in this study for EFL reading instruction in Chinese middle schools or other educational settings that share similar characteristics. These implications are conducted with improving reading comprehension skills as well as the application of PBL in an English reading environment possibly, as follows:

Firstly, the learning outcomes of the research might boost confidence among Chinese English teachers who would like to try a alternative methods of instruction like the PBL approach, especially those teachers in No. 21 Middle School, since PBL has been developed as an effective teaching method with activities to improve the students' reading. The teachers will have the opportunity to adapt their existing teaching experiences to meet the demand for more interesting and effective methods of instruction in this context. Another point is that the experience of implementing a PBL instruction in this context will demonstrate to other teacher a clear picture of how to integrate PBL in an EFL context. Similarly, they will be able to refer to the PBL procedures of instruction which they can adapt to their teaching of other classes.

Secondly, the current study will help the instructors understand the PBL procedures better for use in language teaching and learning. Those teachers who would like to conduct PBL should also ensure that their students have sufficient knowledge of the

process of problem-based learning before they are taught an alternative method. Hence, the instructors should provide the learners with appropriate training to make sure they can easily follow the procedures of instruction. It is important that this should start before the PBL lessons so that the students can learn and practice how to use this approach to learning effectively. It is hoped that other instructors on L2 reading will be able to use the current study as a model to develop their teaching methods to see whether they will achieve similar results.

Additionally, this study has shown that the teachers were provided with the necessary training on the problem-based learning approach before the instruction so that they were able to manage and organize their teaching easily and successfully. Also they should be aware of their role as a facilitator to trigger students' learning skills rather than to tell them what to do directly. If other schools are able to offer a platform to support teachers with the introduction of innovative teaching methods, it will encourage the development of alternative approaches, like PBL or others.

Furthermore, in the PBL intervention, the participants not only improved their reading comprehension, but also increased their use of metacognitive strategies, because they received sufficient training on how to use the strategies in their instruction and then they engaged in the PBL instruction which required them to acquire knowledge through self-directed and cooperative learning. In other words, students had the opportunity to read more and practice more in the PBL process after the metacognitive and reading strategies instruction. Thus, the participants had developed metacognitive awareness and they become better readers which enabled them to reach their goals. Therefore, the PBL instruction empowered the development of students' metacognition (Bahri & Corebima, 2019).

In short, this study contributes to the field of English reading instruction by providing empirical evidence supporting the effects of the PBL approach on improving reading comprehension skills, developing students' awareness of metacognition, and describing the positive perceptions of the students on their PBL lessons. Language instructors and teachers can adopt this approach in their reading classrooms to develop students' reading comprehension skills and metacognition within the positive results from PBL teaching.

### **5.3 Limitations of the study**

The research findings were verified by means of triangulation, which demonstrated the effects of PBL implementation on students' reading comprehension skills. However, several limitations should be addressed.

First, there were not sufficient reading materials available for all the students carry out their reading requirements. That is, the students had limited choice of reading texts from the instructor which might have demotivated them in searching for information and obtaining possible solutions to the problem.

Second, the sample size of 27 participants for the PBL instruction may have been rather small which made it more difficult to determine the effects is probably low compared to the large scale in size. Thus, the non-significant effects of the PBL instruction clearly when compared to an experiment on a larger scale. Thus, the non-significant effects should be treated with caution. Also, all participants were from one middle school, which might limit the generalizability of the results. For instance, the students at from a variety of middle schools would cover a wider range of characteristics, such as different background knowledge, relative English language

ability and other personal factors, that may be different from the students in No. 21 Middle Schools China.

Another limitation was the length of the study. The present study had to be conducted more than three weeks before the mid-term exam of the middle school, since the students needed sufficient time to focus on other subjects in their final exam. As a result, it was only possible to arrange an eight-week PBL intervention for the teaching of reading skills in the current study which might not have been sufficient to obtain enough data.

Last, only verbal data was available from the semi-structured interviews which was not sufficient to answer the research question because it was only possible to obtain a limited amount of information from such young participants. The Middle School students only provided a little information to answer the research questions even though guiding questions were provided. These students needed the researcher to assist them in expressing themselves which may have affected the reliability of the data. Students of No. 21 Middle School were less capable of expressing their thinking independently, especially in a Chinese context. Most students in China usually follow what their parents and teachers ask them to do which seldom requires them to express their feelings or ideas, particularly before they enter the university. Thus, a semi-instructed interview probably may not be the most effective means of gathering data from Middle School students in China.

In conclusion, although there are clear limitations to this study, sufficient data was obtained to answer the research questions and it provides a clearer picture on how to integrate PBL with EFL content which can serve as a useful model for further studies of L2 reading, or, to see if there similar findings were found.

## 5.4 Recommendations for further research

The limitations discussed above clearly show the need to conduct further research on the effects of a PBL implementation on reading comprehension skills in English language classes.

First, students should be allowed to search for possible solutions to the given questions through the internet. In this way, they might be able to find interesting topic-related reading texts which will match their reading proficiency. Thus, they will be able to comprehend some texts in their search to find possible solutions for the given problems. By this means, they will be able to improve their reading comprehension skills through extensive reading.

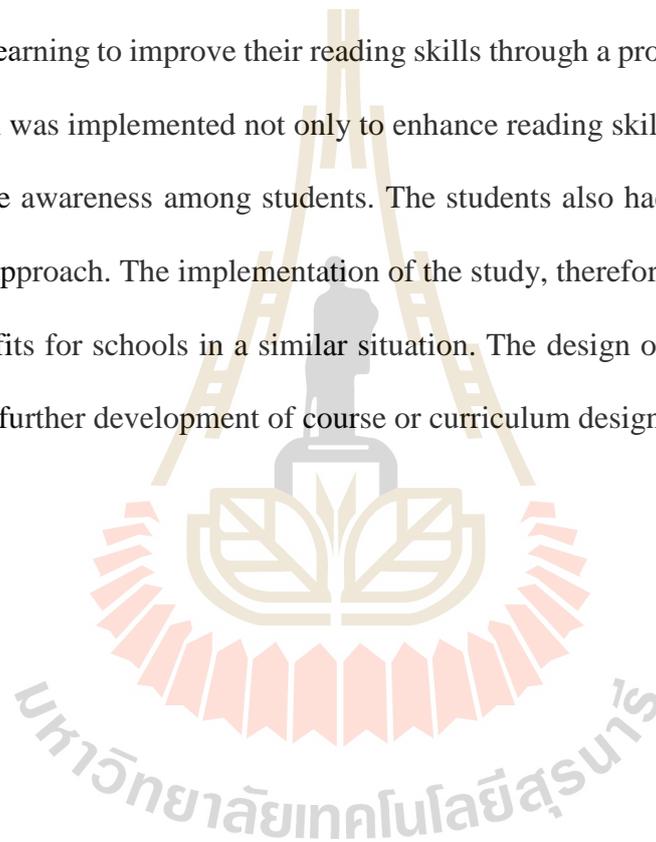
Second, the participants in the present study were encouraged to register for the extracurricular reading lessons. In the Chinese context, a larger population in regular classes would be more appropriate. Thus, ideally an intact class with a larger number of students should be used for further study to add more substance and reliability to the research. Due to different research contexts, this might reveal similar or different characteristics. Therefore, it would be more meaningful to have two or two more different research contexts to improve the generalizability of the results.

With regard to the length of the research, the research should be conducted for the length of a school semester as the research period. One semester in the Chinese context usually last around five months. Thus, compared to the eight-week reading course of the present study, a longer intervention would have been more advantageous to explore and examine the effects of the PBL treatment.

Last, the researcher should be very careful in the design of the research instruments to collect the relevant data if their subjects are Middle School students in China. A

semi-structured interview should be selected with care as a research instrument for obtaining qualitative data particularly among such young participants. If a semi-structured interview is conducted, the participants should be asked to write notes at the end of each question so that the researcher will be able to obtain more information about the teaching process than is possible through a verbal interview alone.

In conclusion, the present study has found there were a number of positive aspects to students' learning to improve their reading skills through a problem-based approach. This research was implemented not only to enhance reading skills, but also to develop metacognitive awareness among students. The students also had positive perceptions towards the approach. The implementation of the study, therefore, will have many and various benefits for schools in a similar situation. The design of this research will be available for further development of course or curriculum design in the future.



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**APPENDIX A**  
**NATIONAL ENGLISH CURRICULUM STANDARDS**  
**FOR READING (MOE, 2001a, pp.10-18)**

Level (Grades Covered)	Reading Objectives
Level 1 (to be achieved by the end of Grade 4)	• identify words based on pictures
	• identify objects and read words and phrases
	• read simple stories with the help of illustrations
Level 2 (to be achieved by the end of Grade 6)	• identify words
	• read words based on phonics rules
	• read and understand simple directions in textbooks
	• understand simple messages on greeting cards
	• understand simple stories and short passages with the help of illustrations, and form a habit of reading based on semantic groups
	• accurately read aloud stories and short passages from the textbooks
Level 3 (to be achieved by the end of Grade 7)	• read aloud texts with accuracy
	• understand and follow simple written directions
	• understand simple stories and short passages and grasp the main ideas
	• know how to use simple reference books
	• the amount of extracurricular reading (i.e., beyond textbook reading) should cover more than 40,000 words by the end of the school year
Level 4 (to be achieved by the end of Grade 8)	• read aloud texts fluently and accurately
	• read and understand informational texts
	• look for information from a passage and understand its meaning
	• infer the meanings of words based on context clues
	• understand and explain information based on graphs and charts
	• understand sequence and character motives in short passages
	• understand simple personal letters
	• use an English-Chinese dictionary or other reference books to promote reading comprehension
	• the amount of extracurricular reading (i.e., beyond textbook reading) should cover more than 100,000 words by the end of the school year
Level 5 (to be achieved by the end of Grade 9)	• infer the meaning of unknown vocabulary based on context clues and word-formation rules
	• understand the logic among sentences in a paragraph
	• understand the theme and plot of a reading passage and predict the possible endings
	• understand general reading materials
	• use different reading strategies to get information from texts based on different purposes of reading
	• use reference books such as dictionary to study

Level (Grades Covered)	Reading Objectives
	<ul style="list-style-type: none"> <li>• the amount of extracurricular reading (i.e., beyond textbook reading) should cover more than 150,000 words by the end of the school year</li> </ul>
Level 6 (to be achieved by the end of Grade 10)	<ul style="list-style-type: none"> <li>• obtain important information and opinions from reading texts</li> </ul>
	<ul style="list-style-type: none"> <li>• infer the meaning of unknown vocabulary based on context clues and sentence structures</li> </ul>
	<ul style="list-style-type: none"> <li>• make prediction about the story based on context clues</li> </ul>
	<ul style="list-style-type: none"> <li>• use different reading strategies for different reading purposes</li> </ul>
	<ul style="list-style-type: none"> <li>• obtain necessary information through different media</li> </ul>
	<ul style="list-style-type: none"> <li>• the amount of extracurricular reading (i.e., beyond textbook reading) should cover more than 200,000 words by the end of the school year</li> </ul>
Level 7 (to be achieved by the end of Grade 11)	<ul style="list-style-type: none"> <li>• obtain important information and extract key points from the reading understand the theme of the reading and the purposes of the author</li> </ul>
	<ul style="list-style-type: none"> <li>• extract, select, and paraphrase information from the reading</li> </ul>
	<ul style="list-style-type: none"> <li>• use context clues to facilitate comprehension</li> </ul>
	<ul style="list-style-type: none"> <li>• understand and appreciate simple English poems</li> </ul>
	<ul style="list-style-type: none"> <li>• the amount of extracurricular reading (i.e., beyond textbook reading) should cover more than 300,000 words by the end of the school year</li> </ul>
Level 8 (to be achieved by the end of Grade 12)	<ul style="list-style-type: none"> <li>• understand opinions and attitudes expressed by the author</li> </ul>
	<ul style="list-style-type: none"> <li>• recognize the characteristics of different genres</li> </ul>
	<ul style="list-style-type: none"> <li>• understand long and difficult sentences through sentence-structure analysis</li> </ul>
	<ul style="list-style-type: none"> <li>• understand and appreciate simple English classics</li> </ul>
	<ul style="list-style-type: none"> <li>• obtain information from electronic books and the Internet and put it into application</li> </ul>
	<ul style="list-style-type: none"> <li>• the amount of extracurricular reading (i.e., beyond textbook reading) should cover more than 360,000 words by the end of the school year</li> </ul>
Level 9 (to be achieved by students in English-emphasized vocational schools)	<ul style="list-style-type: none"> <li>• be able to read English newspapers and magazines and obtain important information</li> </ul>
	<ul style="list-style-type: none"> <li>• read English classics and understand their plots and characters</li> </ul>
	<ul style="list-style-type: none"> <li>• read and understand manuals and general reading materials</li> </ul>
	<ul style="list-style-type: none"> <li>• comprehend reading materials through the use of context clues</li> </ul>
	<ul style="list-style-type: none"> <li>• use different materials and reference books to understand difficult language</li> </ul>
	<ul style="list-style-type: none"> <li>• develop an interest in extensive reading and form a good reading habit</li> </ul>
	<ul style="list-style-type: none"> <li>• use media such as the Internet to obtain and process information</li> </ul>

## **APPENDIX B**

### **CONSENT FORM FOR PARTICIPATING THE EXPERIMENT**

#### **Introduction**

You are being asked to be in a research study of English reading instruction. You were selected as a possible participant through purposive sampling. We ask that you read this form and ask any questions that you may have before agreeing to be in the study.

#### **Description of the Study Procedures**

If you agree to be in this study, you will be asked to do the following things: attend a extracurricular reading class lasting 10 weeks.

#### **Risk/Discomforts of Being in this Study**

The study has the following risks. First, the way you learn for English reading during the experiment may be different from normal classes. Second, you need to spend some time to complete the reading task outside the class which might affect your spare time for other hobby.

#### **Benefits of Being in this Study**

The benefits of participation are: becoming the readers with comprehension skills; fostering your problem-solving skills and lifelong learning; having awareness of reading strategies applied; and increasing your reading ability.

#### **Confidentiality**

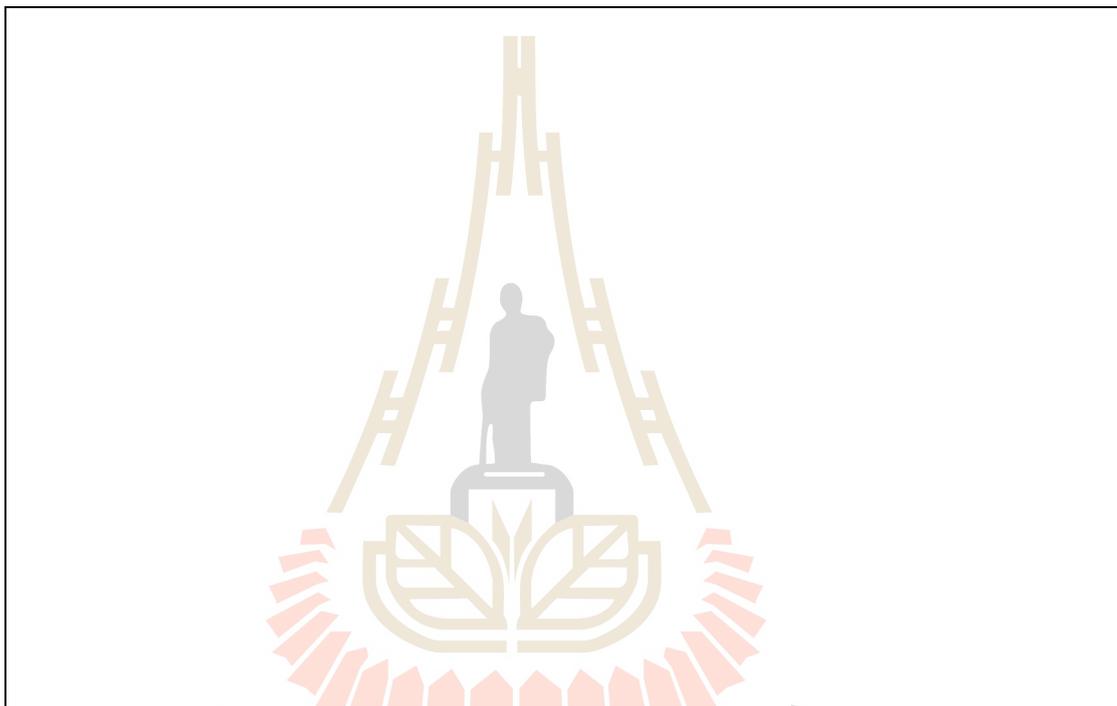
This study is anonymous. We will not be collecting or retaining any information about your identity.

#### **Right to Refuse or Withdraw**

The decision to participate in this study is entirely up to you. You may refuse to take part in the study. Your decision will not result in any loss or benefits.

**Consent**

Your signature below indicates that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study researcher.

**Subjects' Signature:**

มหาวิทยาลัยเทคโนโลยีสุรนารี

**APPENDIX C**

**READING COMPREHENSION PART**

**IN 2019 NATIONAL ENTRANCE ENGLISH TEST**

A

BIPC would like to invite beekeepers to the

**World Bee Day Activities**

**9:00 am - 4:00 pm, Sunday, May 20th 2018**

**Landhill Hall, Cornwall**



Bees are now in danger and its number is going down every year largely because of human activity, while a third of the world's food production depends on this yellow and black insect(昆虫) and other pollinators(传授花粉者).

May 20th this year is the first World Bee Day. It was created last year by the UN, after Slovenia put forward the idea, to draw people's attention to the important role of bees and other pollinators in keeping the planet healthy.

A day for all those who are interested in learning to improve the quality(质量) of their bees! A day also for those who want to know more about bee keeping!

Bring your family with you and have fun! Let's celebrate everything connected with bees and the coming of spring!

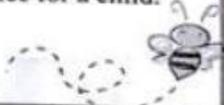
**Activities for the whole family:**  
talks on bees/bee products for sale/wax(蜡) & candle-making lessons

**Bee Communication:**  
Dr Gavin Ramsay will explain the dances of bees, telling you about what smart behaviors bees have.

**Cleaning beeswax & candle-making:** Classes will be given by Kate Black.

**Café:** Lunch and tea/coffee/cakes are available at the café.

These activities are held by BIPC, the Bee Improvement Program for Cornwall.  
Tickets are \$8 for members of BIPC and \$10 for non-members. Half price for a child.  
All the money will go to the City Bee Protection Project.  
Book your place by emailing [bengreen@hotmail.com](mailto:bengreen@hotmail.com).



56. The danger that bees are facing is caused by \_\_\_\_\_.
- A. beekeepers      B. food production      C. human activity      D. other pollinators
57. The World Bee Day was created \_\_\_\_\_.
- A. to advise people to keep healthy      B. to help beekeepers sell more bee products  
C. to celebrate the coming of spring      D. to make people know the importance of bees
58. During the activities, you can learn all the following **EXCEPT** \_\_\_\_\_.
- A. to make a candle      B. to improve the quality of bees  
C. to make tea and coffee      D. to understand the dances of bees

59. Bill, a member of BIPC, and his 5-year-old son will pay \_\_\_\_\_ for tickets to the activities.
- A. 10 dollars      B. 12 dollars      C. 16 dollars      D. 18 dollars
60. The money from the sales of tickets \_\_\_\_\_.
- A. will be used to protect bees      B. will make BIPC very rich  
C. will be given to beekeepers      D. will be spent on the celebrations

61. You miss the object underwater when you want to touch it because \_\_\_\_\_.
- A. your eyesight is quite poor      B. you are not quick enough  
C. it is not as close as it seems      D. it disappears very quickly
62. The example of the wet suit is used to explain the change of \_\_\_\_\_ of an object underwater.
- A. the size      B. the color      C. the position      D. the weight
63. The underlined word "**descend**" probably means \_\_\_\_\_ in Chinese in this passage.
- A. 上升      B. 漂浮      C. 屏息      D. 下潜
64. Which of the following is true?
- A. A four-meter-long fish looks three meters long underwater.  
B. The wavelengths of red light are longer than those of blue light.  
C. Much water will be taken in by the swimmer deep in the water.  
D. You will see a ghost if you go as deep as 6 to 9 meters into the sea.
65. The best title of this passage is \_\_\_\_\_.
- A. The Standard of Color Underwater      B. The Direction of Light Underwater  
C. The Brightness of Color Underwater      D. The Behavior of Light Underwater

**B**

There's much to see under the sea, but you need to remember that light behaves differently in water than in air. The objects appear closer to you than they exactly are. You might find yourself reaching out to touch something and completely missing it.

Objects under water will appear larger than they would on the surface, too. Be careful not to tell any stories about the big fish that got away. That fish might not be so big after all! It's just because sometimes things can seem to be as much as about 33 percent bigger in water!

What's more, in deeper water, colors just don't seem as bright. In fact, it looks as if some colors are missing. Remember the color of an object results from the wavelengths(波长) of light that are reflected(反射) from its surface. And light is taken in as it moves down through the water.

Swimmers wear wet suits to keep warm underwater. Let's take a bright red, yellow, and blue wet suit as an example. These colors are hard to miss on the surface of water. Watch carefully the changes in color as you descend in the water. The red part now looks almost black because the red light wavelengths, the longest among these three colors, are missing. As you go down deeper, the same thing will happen to the yellow part and in the end to the blue part. Even at a place of about 6 to 9 meters underwater, you will look terrible, like a ghost(鬼怪)! And you have to wait for your return to the surface to enjoy the bright colors again!

## C

配对阅读。左栏是五位学生打算成立俱乐部时所遇到的问题，右栏是相应的建议。请为左栏的每位学生选择一个合适的建议，并将答题卡上对应题目所选的选项涂黑。

66. Jack plans to create a cooking club at school. He wants to know how much it will cost.	A. Setting up an English club is one of the things we are going to do this term. So do it right now. Let's see how many people will join and then decide where and when to meet.
67. Sam cares about the environment very much. But he doesn't know how to start an Environmental club in school.	B. You must know that pools are expensive to build, and they usually take several years to complete. So think it's a good idea to get the swimmers to a nearby pool.
68. Creating a swimming club is Mike's dream. However, he isn't sure whether his school can help to build a pool.	C. Reading poems can be very fun. You can first ask your classmates to join, and then they will invite their own friends to join it.
69. Sue is thinking of starting an English club. But she worries about theme and the place they can meet.	D. Your plan sounds like a good one. As for the cost, you can ask your mother for some advice. She must know a lot about cooking.
70. Lucy expects to start a club about poetry because she knows that lots of kids love poetry. But she is wondering how to get people to join.	E. First you should think about your interest. If you like playing games, a gaming club will be a good idea. If you are a swimming fan, it is great to start a swimming club.
	F. I think it is a good idea to set up a club like that! You can first give speeches about protecting the environment at school.
	G. A club can influence people a lot even if it has only a few members. I wouldn't worry too much about it being small.

## APPENDIX D

### PRE/ POST-TEST

#### Reading Comprehension Pre-Test (30 minutes)

姓名: \_\_\_\_\_ 组名: \_\_\_\_\_

一. 阅读理解 (本大题有 20 题, 每小题 2 分, 共 40 分)

#### A

Dear Lisa,

Whenever my teacher calls on me in class, my heart beats quickly. I'm afraid I'll give the wrong answer and everyone will laugh. So I say "I don't know".

Candy

Dear Candy,

You are not the only kid who feels this way. Talk to a parent or your teacher for ideas. You can also set small goals (目标). Try your best to answer questions and put up your hand in class once a day. Remember, it is really OK to be wrong sometimes.

Dear Lisa,

My friend is starting to hang out with a girl who used to bully (欺负) her! And my friend doesn't seem to want to be around me at all anymore.

Wendy

Dear Wendy,

It's normal for friendships to change, and it's possible that the girl has become kinder over time. Try not to worry about that, and pay attention to how your own friendship is changing. Hanging out, just the two of you, might help to mend your friendship.

Dear Lisa,

My mom and I often argue. Sometimes she starts it. Sometimes I do. Either way, I feel sad and alone after arguing. A way to stop?

Carl



## B

I used to have a friend called Matilda. We were together at secondary school. When we were 16, she moved because of her father's job, but we kept in touch. We used to write long letters to each other. I went to stay with her a couple of times too. We lost contact (联系) after university. I'd love to see her again because we used to be really good friends.

I used to hate a couple of teachers at school, but I think the one I hated the most was my French teacher. He was really terrible. I don't think he liked children or even teaching. He used to be impatient with us and he didn't explain things well. I failed French — it was the only subject I ever failed at school.

I used to play a lot of squash (壁球), but I recently started playing tennis and now I like it better. The problem with squash is that it's pretty hard and maybe I'm just not strong enough to play it. Also the friend I used to play with always beat me. The great thing about tennis is that it's outdoors so I can enjoy the fresh air. It's less competitive and more fun. The only problem is that you can't play when it rains.

根据材料内容选择最佳答案。

- ( ) 6. What does the underlined phrase “kept in touch” mean in Chinese?  
 A. 失去联系      B. 保持联系      C. 总是争吵      D. 从不争吵
- ( ) 7. When did the writer and her friend Matilda lose contact?  
 A. At secondary school.      B. During high school.  
 C. During college.      D. After university.
- ( ) 8. The writer's French teacher was \_\_\_\_\_.  
 A. very strict with his students      B. good at playing tennis  
 C. bad at teaching      D. very humorous
- ( ) 9. In the writer's opinion, squash is \_\_\_\_\_.  
 A. relaxing      B. interesting  
 C. easy to learn      D. hard to play well

- ( ) 10. According to the passage, the writer \_\_\_\_\_.
- A. hated learning French
  - B. has more friends than before
  - C. thinks tennis is more fun than squash
  - D. has never lost a game in playing tennis



## C

Christine and Ryan are good friends. They both live on a farm on an island near Ireland.

One morning, Ryan came to Christine's house. "Christine, let's go to the beach."

They went to the beach to look for shells (贝壳) and other beautiful things. Suddenly Christine shouted, "Look! There's something in that net (网) over there."

They ran over and found a small bird in the net. The bird was black and white, and it had orange legs.

"What kind of bird is that?" Ryan asked.

"I don't know," Christine answered.

They ran back to Christine's house and showed the beautiful bird to Christine's dad.

"It's a young puffin (海鹦)," he told them. "Puffins catch fish in the water. They can fly and they are very good at swimming. There were lots of puffins on the island, but now there aren't many."

"Why not?" Christine asked.

"There aren't many fish anymore," said her dad. The children put the small puffin in a box. Christine's mom gave the children some fish and they fed the puffin.

Ryan came over to Christine's house every day to feed the puffin. It got bigger and bigger. One morning there was no puffin in the box.

"Where is it?" Christine asked her mom.

"I'm sure the puffin is with its friends out in the sea."

It was a year later. Christine was looking for shells on the beach again. Suddenly, she heard Ryan shouting, "Come quickly, Christine!"

Christine ran along the beach and then she saw them. There were three puffins on a stone near the farm. Christine was sure that one of them was their puffin. She was very happy.

根据材料内容选择最佳答案。

- ( ) 11. Where did Christine and Ryan first find the puffin?  
 A. In a net    B. In a garden    C. On a farm    D. On a stone
- ( ) 12. Which of the following is **TRUE** about the puffin?  
 A. It had black and white legs.    B. It was old but beautiful.  
 C. It was a poor swimmer.    D. It lived on fish.
- ( ) 13. Who seemed to know a lot about puffins?  
 A. Christine's father.    B. Christine's mother.  
 C. Christine.    D. Ryan.
- ( ) 14. What happened to the puffin while it was in Christine's house?  
 A. It got hurt.    B. It died.    C. It got ill.    D. It flew away.
- ( ) 15. What does the underlined word "them" refer to?  
 A. Shells.    B. Puffins.    C. Fish.    D. Children.

## D

Fifth-grader Kayla Martel loves basketball. But her school doesn't have a girls' team. So for the past four years, Kayla has played on the boys' team at St. John the Apostle School in Clark, New Jersey. That hadn't been a problem until earlier this year. The team was told that it either had to ask Kayla and another girl to leave the team or end its season early.

The team, called the Chargers, plays in a league (联赛) that didn't allow mixed teams after fourth grade. When the league leader found out that there were girls in the team, he gave the coaches (教练) bad news. The team could keep playing but only without the girls.

Keisha Martel, Kayla's mom, is one of the Chargers' coaches. She asked the team to take a vote (投票), knowing it would be difficult for the kids to choose.

“They all said, ‘It doesn't matter. We're a team and we're sticking together (团结一致),’” said Keisha.

The Chargers wasn't allowed to play for a few weeks, but then the league reversed its decision. The team, girls included, played the rest of the season. They even made it to the championship (锦标赛) game — and won!

Kayla has some advice for other teams. “Make sure you are family — you have each other's back,” she says.

根据材料内容选择最佳答案。

( ) 16. How many girls played for the Chargers?

- A. Two.      B. Three.      C. Four.      D. Five.

( ) 17. What was the bad news the Chargers' coaches got?

- A. Some of them had to leave their jobs.  
B. The team had to keep playing without the girls.

- C. The team couldn't play in the league
- D. There would be no basketball anymore. team at the school.
- ( ) 18. What does Kayla's mom do?
- A. She is the league leader.
- B. She is a basketball coach.
- C. She is a teacher at Kayla's school.
- D. She is the headmaster of Kayla's school.
- ( ) 19. The underlined word "reversed" is closest in meaning to "\_\_\_\_\_".
- A. forgot      B. supported      C. changed      D. made
- ( ) 20. What's Kayla's advice for other teams?
- A. They should practice more.
- B. Team members should support each other.
- C. They should not be afraid of making mistakes.
- D. Team members and coaches should trust each other.

### Reading Comprehension Post-Test

(30 minutes)

姓名: \_\_\_\_\_ 组名: \_\_\_\_\_

一. 阅读理解 (本大题有 20 题, 每小题 2 分, 共 40 分)

#### A

#### The Outdoor Center

#### Opening times

Water sports: 10:00 a.m. — 6:00 p.m.

**Play Park:** 10:00 a.m. — 5:30 p.m.

**Parking fees** (停车费)

**Low season:** Weekdays £2.00 per day

Weekends £3.00 per day

**High season:** 23 July — 11 September

Weekdays and weekends £3.00 per day

The center is not a private club: it provides outdoor sports for all members of the public. All staff are fully trained and qualified to teach the activities in the center.

#### **One-day windsurfing** (帆板运动) **course**

Beginner windsurfing courses are offered on Saturdays and Sundays when the weather is good enough. Learning to windsurf is a lot of fun.

Course fee: £32.50

#### **One-day adventure** (冒险) **course**

Come and try sailing, climbing and surfing. This course introduces outdoor activities to adults in a fun way. You do not need to be strong or to have had any experience of the activities. All you need is to be interested.

Course fee: £22.50

#### **Play Park**

The Play Park is suitable for children from two to ten years of age. It is one of the best of its kind in the country. It has sand and water play, large ball pool, play

castle and much, much more. Next year the center will open a new Play Palace and Play Ship.

**Summer adventure holidays (for 8-14 years of age)**

**Sailing Climbing Windsurfing Fun Games**

Safety is the most important at the Outdoor Center. We also make certain that all children only take part in activities that are suitable for their age and physical abilities. For this program children must be able to swim.

根据材料内容选择最佳答案。

- ( ) 1. Mike plans to drive to visit the Outdoor Center and stay there for two days in August. How much is the parking fee?
- A. £4.00.      B. £5.00.      C. £6.00.      D. £7.00.
- ( ) 2. How many kinds of sports can one try in the one-day adventure course?
- A. One.      B. Two.      C. Three.      D. Four.
- ( ) 3. Summer adventure holidays are open to children \_\_\_\_\_.
- A. who are in good physical health
- B. who are interested in outdoor sports
- C. from two to ten years of age who can swim
- D. between eight and fourteen years of age who can swim
- ( ) 4. Which of the following is **TRUE**?
- A. The Play Park is open for eight hours a day.
- B. The new Play Palace has been opened to the public.
- C. The adventure course costs less than the windsurfing course.
- D. The Outdoor Center encourages children to try dangerous sports.

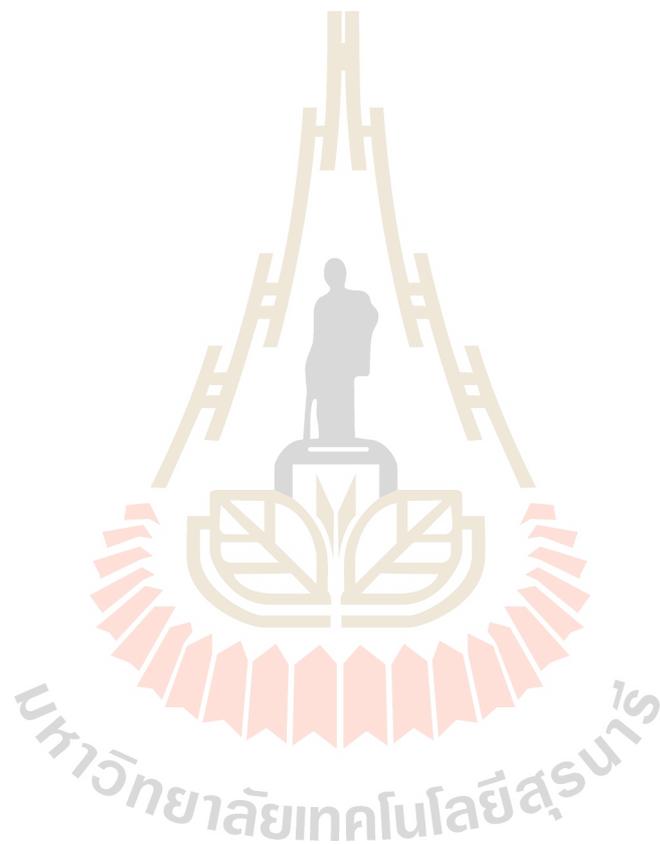
( ) 5. Where can we read this material?

A. From a textbook.

B. From a guidebook.

C. From a news report.

D. From a science fiction book.



## B

Kwanzaa is a celebration of African American history and culture. It begins on December 26th and continues until New Year's Day, January 1st.

During the festival, a family member, usually the youngest child, lights candles in a special candleholder. Each night a candle is lit. Traditionally there are three green candles, three red candles and a central black candle. They represent the seven Kwanzaa principles (原则). The principles are believed to play a big role in building strong, successful families, neighborhoods, etc. In the evenings, adults share stories and explain how to follow the seven principles in daily life. On the sixth day, which falls on New Year's Eve, family and friends get together to enjoy a large meal.

Kyle, a third grader, wrote this about Kwanzaa, “When we celebrate Kwanzaa, we have many people at home, light the candles, and have a nice dinner. We learn the meaning of Kwanzaa and remember family members. We say something good about them. Last year, we remembered my grandmother.”

In 1966, Dr. Karenga created Kwanzaa. He was studying the history of Africa at that time. Dr. Karenga wanted to create a holiday to bring African Americans together and celebrate their history and culture. He called the holiday “Kwanzaa”. In fact, the name comes from an African language, and it means “first fruits of the harvest (收获季节)”.

根据材料内容选择最佳答案。

- ( ) 6. How long does the festival of Kwanzaa last every year?
- A. Two days.    B. Three days.    C. Five days.    D. Seven days.
- ( ) 7. What color are the candles?
- A. Green, black and red.    B. Green, white and red.  
C. Green, black and white.    D. Black, white and red.
- ( ) 8. What does the underlined word “represent” in Paragraph 2 mean in Chinese?
- A. 决定    B. 展示    C. 维护    D. 代表

( ) 9. Who did Kyle remember during Kwanzaa last year?

A. His aunt. B. His father. C. His grandmother. D. His grandfather.

( ) 10. Which of the following is **TRUE** about Kwanzaa?

A. It has a history of about 100 years.

B. Its name comes from an African language.

C. It is to celebrate the good harvest of the year.

D. During the festival, there's a big family dinner each night.



## C

It was an early spring morning. I was driving home down a quiet country road. Suddenly, I saw a rock up ahead in the middle of the road. As I slowed to go around it, I noticed that it had a head and was looking up at me. It was a turtle (龟). It was sitting in the sun to warm up.

I stopped to the side of the road and picked it up. I knew if I moved the turtle off to the side of the road, it would just move back to the warmer place as soon as I left. What if it was hit by a car? Not knowing what else to do, I carried it to my car.

When I finally got home, I picked it up again and went to the forest behind my house. After looking around a bit I saw a clear place. The sun was shining down on a rock. I slowly put the turtle down on it and took a few steps back. A few minutes later the head slowly came out and started enjoying the \_\_\_\_\_ once more. I smiled and went back to my house. My simple act of kindness didn't seem like much in the eyes of the world, but it made a difference in the life of one turtle and in the heart of one man.

Most of us go through our lives and want to make some big differences in this world. However, any kind act makes a difference. Remember this the next time you see a person or a turtle needs a helping hand.

根据材料内容选择最佳答案。

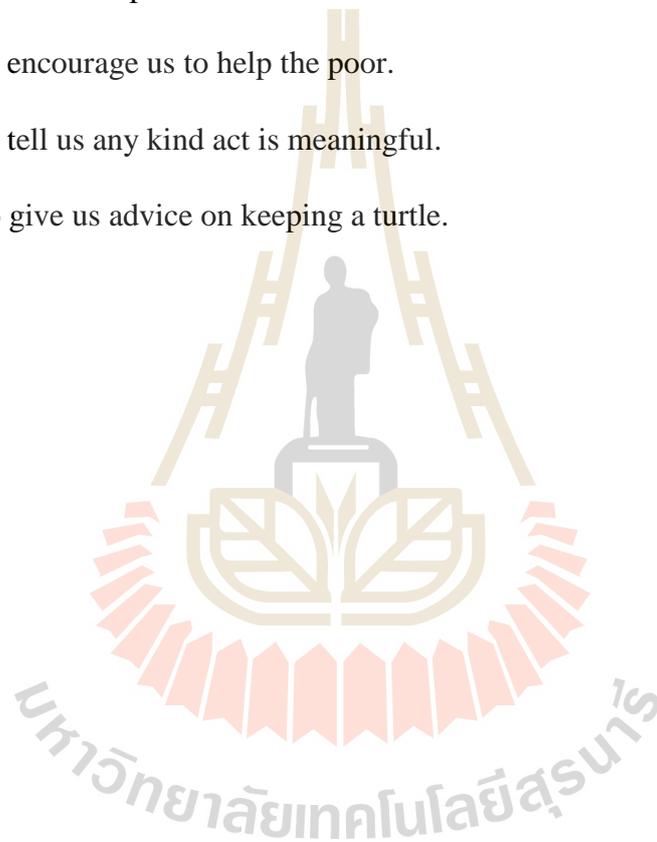
( ) 11. At the beginning, the writer thought the turtle was \_\_\_\_\_.

- A. sick            B. lovely            C. a rock            D. a wheel

( ) 12. Why did the writer carry the turtle to his car?

- A. Because he wanted to keep it as his pet.  
B. Because he thought others would take it home.  
C. Because he wanted to send it to a warmer place.  
D. Because he thought the road was dangerous for it.

- ( ) 13. Where did the writer put the turtle at last?
- A. In a zoo.    B. In a forest.    C. In his house.    D. In a river.
- ( ) 14. Which word can be put into the blank in Paragraph 3?
- A. Sun.    B. Water.    C. Food.    D. Wind.
- ( ) 15. Why does the writer write this passage?
- A. To ask us to protect turtles.
- B. To encourage us to help the poor.
- C. To tell us any kind act is meaningful.
- D. To give us advice on keeping a turtle.



## D

There once was a very honest shopkeeper. He would open his shop at 8:00 a.m. after having his breakfast and at 1:00 p.m. he would go for lunch. In the evening at 8:30 p.m. he closed his shop.

However, to get time for lunch was really difficult because he didn't have anybody to help him at that time. So any customer who was shopping at 1:00 p.m. would be asked to watch the shop until the shopkeeper returned from lunch.

One day, four thieves (小偷) planned to steal from his shop while he was gone for lunch. One of the thieves went at 1:00 p.m. He hoped to be asked to watch the shop.

The thief, pretending (假装) to be a customer, went in at 1:00 p.m. and started buying several things. As planned, the shopkeeper asked the thief to sit on his chair for thirty minutes until he returned. The thief agreed and sat on the chair.

Then, the other three thieves quickly came and told the pretended customer to help. But something had changed in his mind. He knew that if he was given responsibility, he should not perform any dishonest acts during that time. His friends did not agree and began stealing things. The now honest man tried to stop them. Then a fight started. And at the same time the shopkeeper returned and asked why they were fighting. The now honest man explained the whole thing.

The shopkeeper had been searching for an honest man to watch the shop. The shopkeeper realized that he had found the right man.

根据材料内容选择最佳答案。

( ) 16. What was the shopkeeper's problem?

- A. Nobody bought things in his shop.
- B. He was too busy to have lunch every day.
- C. Nobody could prepare lunch for him every day.
- D. He had nobody to watch the shop when he went for lunch.

- ( ) 17. The thief went to the shop at 1:00 p.m. because \_\_\_\_\_.
- A. he thought he would be asked to watch the shop
  - B. he thought he could buy cheap things then
  - C. the shopkeeper invited him to lunch then
  - D. the shop was closed at that time
- ( ) 18. What does the underlined word “responsibility” mean in Chinese?
- A. 警告
  - B. 提醒
  - C. 责任
  - D. 奖励
- ( ) 19. When the shopkeeper returned from lunch, he found \_\_\_\_\_.
- A. there was a fight in his shop
  - B. things in his shop were stolen
  - C. there was a new owner of the shop
  - D. the thief was selling things in his shop
- ( ) 20. From the passage, we can know that \_\_\_\_\_.
- A. a thief is always a thief
  - B. an honest man is always brave
  - C. you can't help dishonest people
  - D. trust can change a thief into an honest man

## APPENDIX E

### SAMPLES OF WORDS GUESSING FOR EXPLICIT

#### STRATEGIES INSTRUCTION

信息词: **un-, im-, in-, dis-, il-, anti-**等前缀与**-less**等后缀可构成反义词;  
 后缀**-ful, -ly, -ism, -ness**等可改换词性。  
 合成词要在正确理解两词的基础上, 结合上下文把握两词之间的关系  
 猜测词义。

即时练习: We must safeguard the world peace.

问题: What is the meaning of "safeguard"?

A protect B care C prevent

◆ 通过定义或释义说明来推测词义;

Cauliflower, like many other kinds of vegetables, can be grown in this part of the country.

问题: The close meaning of the underlined word "cauliflower" is \_\_\_ in English .

A. vegetable B. fruit C. game

信号词: **is, means, that is (to say), or, or rather, in other words, namely**

即时练习:

The herdsman, who looks after sheep, earns about 650 yuan a year.

问题: The underlined (划线的) word "herdsman" mean?

A. 商人 B. 工人 C. 牧人

◆ 通过因果关系猜测词义;

(2012 长沙) "No one in New York is going to let their child go to school without a cellphone". What about the cellphone owners the students? Most of the students said since the cellphones were essential and the cellphone was like all (额外的) hand or foot for them.

问题: What does the underlined word "essential" mean in Chinese?

A. 时髦的。 B. 必要的。 C. 昂贵的。

信号词: **because, since, as, for, due to, so, therefore, that, such, that, thus**

即时练习:

She loves reading all kinds of books, She did not hear what you said because she was completely engrossed in her reading.

问题: The word "engross" refers to?

A. 专注 B. 放弃 C. 厌恶

## APPENDIX F

### TEXTBOOK *GO FOR IT*

#### 1. Cover of Textbook



#### 2. Sample Reading Texts and Extensive Reading of Topic 1 from *Go for it*

##### - Text I How can we become good learners?

**How I Learned to Learn English**

Last year, I did not like my English class. Every class was like a bad dream. The teacher spoke so quickly that I did not understand her most of the time. I was afraid to ask questions because of my poor pronunciation. I just hid behind my textbook and never said anything.

Then one day I watched an English movie called *Toy Story*. I fell in love with this exciting and funny movie! So I began to watch other English movies, too. Although I could not understand everything the characters said, their body language and the expressions on their faces helped me to get the meaning. I also realized I could get the meaning by listening for just the key words. My pronunciation improved as well by listening to the conversations in English movies. I discovered that listening to something interesting is the secret to language learning. I also learned useful sentences like "It's a piece of cake" or "It serves you right". I did not understand these sentences at first. But because I wanted to understand the story, I looked them up in a dictionary.

Now I really enjoy my English class. I want to learn new words and more grammar so that I can have a better understanding of English movies.



**2b** Read the passage quickly and check if any of the habits you listed in 2a are mentioned. Which four habits of successful learners can you find from the passage?

**USING DICTIONARIES**  
This can help you find the definition that matches the context of the word in the text.

### How Can You Become a Successful Learner?

Everyone is born with the ability to learn. But whether or not you can do this well depends on your learning habits. Research shows that successful learners have some good habits in common.

**Creating an interest in what they learn**  
Studies show that if you are interested in something, your brain is more active and it is also easier for you to pay attention to it for a long time. Good learners often connect what they need to learn with something interesting. For example, if they need to learn English and they like music or sports, they can listen to English songs or watch sports programs in English. This way they will not get bored.

**Practicing and learning from mistakes**  
Good learners think about what they are good at and what they need to practice more. Remember, "Use it or lose it." Even if you learn something well, you will forget it unless you use it. "Practice makes perfect." Good learners will keep practicing what they have learned, and they are not afraid of making mistakes. Alexander Graham Bell did not invent the telephone overnight. He succeeded by trying many times and learning from his mistakes.

**Developing their study skills**  
It is not enough to just study hard. Good learners know the best way they can study. For example, they may take notes by writing down key words or by drawing mind maps. They also look for ways to review what they have learned. They may do this by reading their notes every day or by explaining the information to another student.



**Asking questions**  
Good learners often ask questions during or after class. They even ask each other and try to find out the answers. Knowledge comes from questioning.

Learning is a lifelong journey because every day brings something new. Everything that you learn becomes a part of you and changes you, so learn wisely and learn well.

## - Text 2 How Can You Become a Successful Learner? for topic 1

### Extensive Reading

As we all know, English is one of the most important languages in the world. It's necessary for us to learn it well. How do you study? Everyone learns English in different ways. I think the best way to improve your English is to improve your English skills—listening, speaking, reading, and writing.

Firstly, we should practice them every day. We should remember more words and grammar. Reading more English story books or novels. Watching more English cartoon TVs or movies. Listening English tapes and repeating after the speaker.

Secondly, you are not afraid to make any mistakes you speak English as much as possible.

Finally, you ask the teachers when you don't understand any knowledge. It's very good for you if you are interested in English.

You will find studying English is interesting and helpful. One more thing remembers “Practice makes perfect”! I hope everyone makes progress. Thanks!

### Sample2

.....

.....

### 3. Excerpts from the Syllabus for Grade 9 English Course

#### Program Description

English of grade 9 will cover the 14 units of the textbook *Go for it* in two semester. This course is going to select four units for the 8-week reading instruction as extracurricular English training on PBL approach.

#### Objectives

This course selects the four courses designed to contribute to the development of reading skills as well as other basic and comprehensive language skills.

*Go for it* intends to provide students with opportunities to gain expertise in the four language skills, especially reading skills in accuracy, fluency, and grammar. Each unit provides six sections, such as topics, functions, structures, target language, vocabulary, recycling. Students are expected to develop oral and written skills, expand vocabulary, read and understand authentic English articles of some difficulty, write different types of text, and expand their knowledge of the culture of English speaking countries.

*Go for it* is designed based on the following features.

1. It not only help to learn English language skills, but benefit for developing the ability of English application which let students enable to interact their idea in target language;
2. It combines the daily life with the necessity of learning which aims to motivate the learning from the authentic context;

3. It also highlights language strategies and skills as the foundation of English learning;
4. It designs a lot of meaningful activities and tasks, aiming to promote the engagement which requires the cooperation with classmates and the guide of instructor;
5. It increases the awareness of cultures from English countries and non-English countries.

### **Selected Contents**

Topic 1 (Unit 1) How can we become good learners?

Topic 2 (Unit 7) Teenagers should be allowed to choose their own clothes

Topic 3 (Unit 12) Life is full of the unexpected.

Topic 4 (Unit 13) We're trying to save the earth!

### **Methodology**

The English extracurricular course aims to improve reading comprehension skills on PBL approach. It includes the reading strategies instruction and individual and group activities for reading tasks according to the guide of PBL approach. The course emphasizes the following features, like student-centered, self-directed learning, small group, the teacher as a facilitator, and real-life problem, which fully embodies the implementation of PBL approach in reading instruction.

### **Evaluation**

Evaluation will take into account the accomplishment of the goals outlined for the course, and will encompass the assessment of the reading comprehension skills. Regular attendance is required.

## APPENDIX G

### Questionnaire of the development of Metacognition on Reading Comprehension Skills Before and After PBL lessons

(English Vision)

Directions: This questionnaire includes two parts. Part I is designed to gather information on your background. Part II is metacognition survey before and after PBL treatment. Please kindly spare a few minutes to fill out this questionnaire. Your personal information and response to this questionnaire will be kept confidential.

Suggestions for answering the questionnaire

1. Please tick (✓) one of the answers which best indicates your reality.
2. Please do all the items. If any of the items is undone, the analysis of the data will be in trouble.
3. The final scores only for data analysis, not for the scores of the reading test.

#### Part I: Questions about students' status or background information

1. Your gender: Male  Female
2. Your age (years-old):  
12  13  14  15  16

Others; please specify: \_\_\_\_\_

3. How many years have you learned English?

4  5  6  7  8

Others; please specify: \_\_\_\_\_

1. How do you rate your reading ability in English?

Very good  Good  Fair  Poor  Very Poor

## Part II Metacognitive survey

Explanation: 1 (Never); 2 (Seldom); 3(Sometimes); 4(Usually); and 5(Always).

No	Statement	1	2	3	4	5
1	I planned how to read the text in the test.					
2	I was aware of which strategy to use and how or when to use it.					
3	I predicted what would happen next while I was reading					
4	I used pictures (if any) to predict the content of the text.					
5	I tried to find topic and main ideas by skimming.					
6	I guessed the meaning of the important new words from the context by reading on or looking back.					
7	I tried to find the information for reading comprehension by scanning.					
8	I used multiple reading strategies to help understand the reading text. (e.g. Main idea, inference, word meaning, details information, summary).					
9	I selected relevant information to help me understand the reading texts and answer the test questions.					
10	I re-read the relevant information if I do not understand the passage.					
11	I adjusted my reading rate according to the difficulty.					
12	I kept track of my own progress to finish the text on time.					
13	I corrected mistakes immediately when I checked the questions.					
14	I made sure I understood what had to be done.					
15	I checked my own performance and progress while completing the test.					
16	I checked my accuracy as I progressed through the test.					

(Adapted from Whichadee, 2011)

## Questionnaire of the development of Metacognition on Reading Comprehension Skills Before and After PBL lessons

(Chinese Vision)

说明：该问卷调查由两部分组成。第一部分旨在调查你的个人信息。第二部分在实验前和实验后对元认知策略的调查。请认真填写。我们将严格保密你的个人信息和你的回答。

### 问卷调查指南

- 1.请在你认为符合你的实际情况的答案前打√。
- 2.请回答全部问题。如果问题回答不全，将会影响我们的数据分析。
- 3.选择得分, 没有分高低，只做数据分析。

### 第一部分：关于个人信息的调查

1. 性别： 男  女

2. 年龄(岁):

11  12  13  14  15

其它; 请注明: \_\_\_\_\_

3. 你学了多少年英语?

4  5  6  7  8

其它; 请注明: \_\_\_\_\_

4. 你如何定位你的阅读能力?

很好 好 一般  差 很差

## 第二部分：元认知的调查

注：1（从不）；2（不经常）；3（有时）；4（经常）；5（常常）

## 你阅读前做了什么？

题号	阅读前	1	2	3	4	5
1	我计划如何做阅读题。					
2	我有意识去思考该用哪个阅读技巧，什么时候用，如何用。					
3	阅读时，我会提前预测下一步要干什么。					
4	我打算根据图片推测文中的大概内容。					
5	我通过快速阅览的方式寻找主题。					
6	我通过上下文或者回顾来猜测新单词的意思。					
7	我通过确定关键词或关键句来寻找细节题。					
8	我用过很多不同技巧理解阅读题。例如：寻找主题词，推断，猜词意，细节题，总结。					
9	我选择相关的信息帮助我理解文章并且作答。					
10	但我理解不了文章，我会反复去理解相关信息。					
11	我根据文章的困难程度，来调整我阅读速度。					
12	我保持自己的阅读进程去按时完成考试。					
13	做阅读时，当发现有错误，我立即改正。					
14	我确定英语阅读问题的要求。					
15	考试结束后，我回顾自己的阅读能力和进步进程。					
16	我通过考试答题地准确率来确认我的阅读进步与否。					

谢谢你的合作！

## APPENDIX H

### Questionnaire of students' perceptions towards PBL lessons (English Vision)

Dear students,

This questionnaire is to investigate your perceptions of the PBL approach in reading teaching and learning. There is no right or wrong answer. Please feel free to respond to the statements below using the following scale by ticking the number that best suit your feeling. Tick only one answer; do not tick between numbers or indicate a fraction or a range. Your response to the questionnaire will be kept confidential.

Thank you for your cooperation.

#### Part I Personal Information

Gender Male \_\_\_\_\_ Female \_\_\_\_\_

Age \_\_\_\_\_

Years of English study \_\_\_\_\_

มหาวิทยาลัยเทคโนโลยีสุรนารี

## Part II Questions

<u>Strongly Disagree</u>	<u>Disagree</u>	<u>Neutral</u>	<u>Agree</u>	<u>Strongly Agree</u>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>

No.	The statement of students' perception	1	2	3	4	5
1	This reading lesson is helpful to my learning.					
2	This reading lesson provides a good atmosphere in class.					
3	This reading lesson can improve my reading comprehension.					
4	I obtain the information and learn the knowledge by myself.					
5	I am actively involved in the process of learning.					
6	I seek the solutions of the problem actively.					
7	The small group is appropriate for me to join the group discussion.					
8	I feel relaxed in the group discussion.					
9	I can be involved in the discussion.					
10	I can understand the materials.					
11	I can use what I know to understand the information.					
12	I learn the new vocabularies, phrases, and sentences from the reading materials.					
13	Teacher makes a conclusion of what we present in class.					
14	Teacher makes clear feedback to my group work.					
15	Teacher evaluates group co-operation regularly.					
16	I know what I need to do for my learning.					
17	I use some learning strategies to gain information quickly.					
18	I evaluate the accuracy and value of the information.					

(Adopted from Patria, 2015)

## Questionnaire of students' perceptions towards PBL lessons

### (Chinese Vision)

亲爱的同学们

这个问卷主要调查是关于你对本次阅读课的相关信息。根据具体情况，在五个空格中选出一项并用打勾方式标记。该问卷不影响你最终阅读的成绩。

谢谢配合！

#### 第一部分个人信息

性别 男 \_\_\_\_\_ 女 \_\_\_\_\_

年龄 \_\_\_\_\_

学多少年英语 \_\_\_\_\_

#### 第二部分问题

强烈反对

反对

中立

赞同

很赞同

1

2

3

4

5

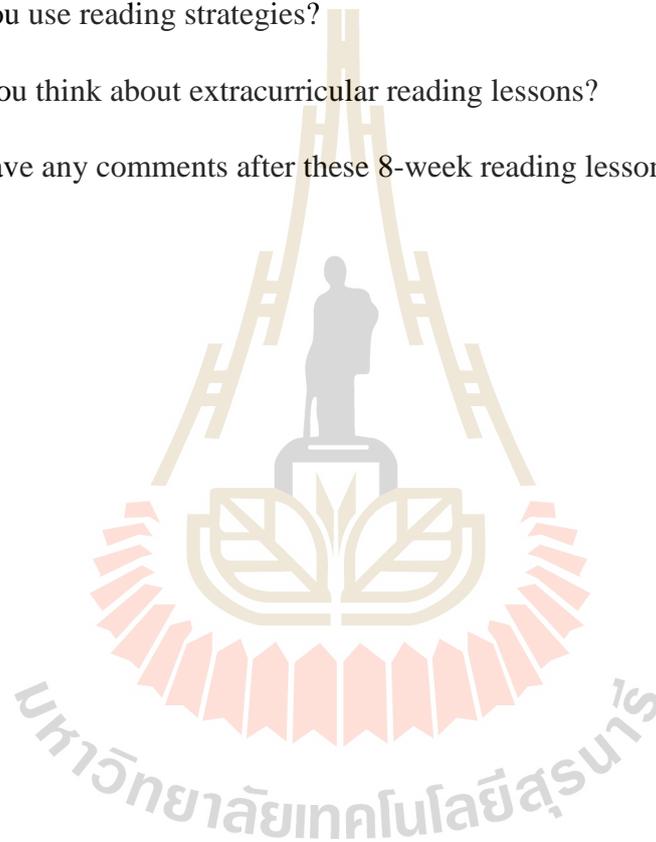
序号	学生的陈述	1	2	3	4	5
1	这次阅读课对我的学校帮助很大。					
2	这次阅读课课堂气氛很好。					
3	这次阅读课提高了我的阅读理解能力。					
4	我自己搜索信息和学习知识。					
5	我主动参与了学习过程。					
6	我主动找问题的答案。					
7	我能加入小规模的小组讨论中。					
8	我感觉小组学习的氛围轻松。					
9	我参与主题讨论。					
10	我能理解材料。					
11	我通过已有知识去理解信息。					
12	我学习阅读材料中的新单词，词组，句子。					
13	老师在课堂总结我们演示的信息。					
14	老师对我小组任务给予回馈。					
15	老师照常评估小组合作情况。					
16	我知道我需要学什么。					
17	我会用一些学习技巧快速获得信息。					
18	我会估算信息的准确性和价值。					

## APPENDIX I

### The Guiding Questions for Semi-interview Guide: (English Version)

#### Guiding questions for the metacognitive development and students' perceptions:

1. How do you do your reading? Is there any differences compared to before?
2. How do you use reading strategies?
3. What do you think about extracurricular reading lessons?
4. Did you have any comments after these 8-week reading lessons?



**The Guiding Questions for Semi-interview Guide:  
(Chinese Version)**

关于元认知和学生对本阅读课的态度引导问题

1. 你是如何做阅读的？跟以前做阅读的方式一样吗？
2. 你如何用阅读技巧的？
3. 你认为课外阅读课如何？
4. 你如何评价这八周的阅读课？



## APPENDIX J

### Criterion for Determining a Representative Interview Sample

participants	Minimum Interviews	participants	Minimum Interviews	participants	Minimum Interviews
0-9	ALL	86-99	22	339-369	53
10-12	9	100-149	24	370-475	58
13-17	11	150-199	26	476-550	65
18-24	13	200-220	30	551-600	70
25-30	15	221-240	35	601-700	80
31-44	17	241-299	37	701-800	86
45-64	19	300-320	42	801-900	90
65-85	21	321-338	47	901-1,000	100

(Source: <http://www.amhsa.net>, 2010)



## APPENDIX K

### A Brief of Lesson Plans for Four Topics on PBL lessons

<p><b>Topic 1:</b> How can we become good learners? (180 minutes)</p>
<p><b>Part 1 Explicit instruction: new words; phrases; and strategies</b></p> <p>1. Teaching new words and phrases related to the topic, as following:  “aloud; pronunciation; discover; repeat; note; pronounce; increase; speed; partner; create; active; connect; review; knowledge; wisely born; work with friends; ask the teacher for help; read aloud; look up; practice; pronunciation; connect...with...; pay attention to.”</p> <p>2. Instructing the reading strategies and metacognition</p> <p><b>Part 2: PBL intervention (within nine steps)</b></p> <p>Problem scenario: My neighbor, Wang dama, know I am a English teacher. Yesterday, she came to me and asked whether I can help her son to improve his English proficiency. Her son was a grade 9 students as you, but his English was poor. Could you help her son to find some ways to learn English well?</p>
<p><b>Topic 2:</b> Teenagers should be allowed to choose their own clothes (180 minutes)</p>
<p><b>Part 1 Explicit instruction: new words; phrases; and strategies</b></p> <p>1. Teaching new words and phrases related to the topic, as following:  Vocabulary: “smoke, pierce, license, safety, earring, cry, field, hug, lift, awful, teen, regret, poem, bedroom , community, chance, manage, society, unit, educate, professional, enter, support, talk about, keep away from, make one’s own decision, get in the way of. ”</p> <p>2. Instructing the reading strategies and metacognition</p> <p><b>Part 2: PBL intervention (within nine steps)</b></p> <p>Problem scenario: Last week, one of my students come to me and complain why the students need to wear the school uniforms every day and why not to wear</p>

their own clothes? Why they can not do many things in school? Like piercing the earhole, dry the hair and drive the car, etc. Could you help me to answer her complaint? Why should students need to wear the school uniforms everyday, why not to wear their own clothes?

**Topic 3: Life is full of the unexpected (180 minutes)**

**Part 1 Explicit instruction: new words; phrases; and strategies**

1. Teaching new words and phrases related to the topic, as following:

“unexpected, block, in line with, worker, stare, disbelief, above, burn, burning, alive, airport, till, west, ring, give ...a lift, by the time I got outside. ”

2. Instructing the reading strategies and metacognition

**Part 2: PBL intervention (within nine steps)**

Problem scenario: My colleague and I prepare the lesson plan for next term. When it comes to one of topics, life is full of the unexpected, we reflected the day 9.11 Event happened in 2001, America. However, at that time, we were still young so we got little news for this event. Could you find out some information and share some details about 9.11 with me?

**Topic 4: We're trying to save the earth! (180 minutes)**

**Part 1 Explicit instruction: new words; phrases; and strategies**

1. Teaching new words and phrases related to the topic, as following:

“litter, advantage, bottom, fisherman, coal, ugly, cost, wooden, plastic, takeaway, bin, shark, fin, method, cruel. Harmful, chain, ecosystem, industry, law, scientific, afford, reusable, transportation, recycle, napkin, upside, gate, bottle, president, inspiration, iron, work, metal, creativity, be harmful to, at the top (of sth.), take part in, turn off, take action, throw away, put sth. to good use, pull... down, bring back.”

2. Instructing the reading strategies and metacognition

**Part 2: PBL intervention (within nine steps)**

Problem scenario: As we know, our earth is badly polluted. In order to protect the

earth, our school calls upon the teenagers to take actions for saving the earth. Students should not only be friendly to the earth but also propaganda more people to have aware of taking care of our environment. What should we do to save the earth? Now, we start to propaganda for protecting the endanger animal, shark! Please learn the relevant information of sharks through the following questions like What do you know about sharks? Could you think sharks can be endanger? Why? What do you think might cause a fall in the number of the sharks? Please make a poster and think of what we can do?



## APPENDIX L

### The results of pre/posttest on control and experimental group

Experimental group		
No.	Pretest	Posttest
1	28	32
2	20	20
3	16	26
4	16	20
5	8	16
6	22	26
7	18	28
8	18	22
9	14	18
10	12	20
11	12	14
12	20	26
13	18	18
14	16	12
15	16	24
16	14	22
17	24	28
18	18	20
19	16	20
20	16	32
21	10	22
22	24	26
23	20	30
24	20	24
25	18	14
26	10	20
27	4	10

Control group		
No.	Pretest	Posttest
1	26	24
2	16	20
3	12	18
4	14	20
5	24	16
6	18	22
7	18	12
8	20	22
9	22	24
10	18	20
11	6	14
12	14	18
13	16	20
14	22	24
15	26	20
16	12	20
17	14	18
18	16	12
19	16	20
20	14	18
21	6	10
22	22	14
23	16	18
24	24	28
25	16	8
26	14	22
27	12	16
28	18	18
29	16	20
30	20	22

## APPENDIX M

### TRANSCRIPTION OF THE INTERVIEW

**Student no. 1:** I use reading technique when I read; I understand the questions first and then go to the reading text and guess the new vocabulary; I learn some reading strategies to improve reading proficiency; I think that I do not have enough words to express my thinking. So I regret that I did not study hard before.

**Student no. 2:** Now, I do reading following what the teacher teach in these classes, predicting the picture, guessing the words, understand the questions, etc; the teacher teaches us guessing words in this class from prefix, suffix, context (the researcher generated they says out); very useful, I feel relaxed to talk with my team mates; I prefer to listen to what the teacher teach in class. I feel worried if I need to do something on my own in class.

**Student no. 3:** Now I try to use the reading techniques when I do reading; Guess the words, identify the main idea.....find the detailed information; it lets me comprehend the text on my own. I need to plan what to do and how to do the reading because the teacher only give the questions; nope

**Student no. 4:** I do not understand a lot of words, so I do not have time to think reading techniques and check my answer; I do not know; it is good; nope.

**Student no. 5:** Sometimes I plan to do my reading sometimes not; I understand the questions first then go to the text to find the answers; Hmmm. Sometimes, I want to cry because I think the words I should be learned before but I always fail to use during my group discussion; I prefer the teacher to teach enough knowledge in class. I have not know much words in the text.

**Student no. 6:** I do not scare about how to start English reading any more. I know how to read and what to read if I plan, I check reading answer after I finish the reading; I finally know how to guess the words more accuracy. We have chance to practice our speaking and comprehend the text. Also we get more ideas from team members; nope.

**Student no. 7:** The teacher ask me to do plan and use techniques when we do reading. And I can read the text more fast and more accuracy than before; I understand the

questions first then go to the text to find the answers; The topic is interesting and easy to understand. Indeed, I know the teacher wants to use the example from our daily life. And I like it; nope

**Student no. 8:** Before, I seldom think too much for my reading strategy. But now, I followed what I learned in these lessons. So I could find the answers quickly and easily; I, now, I skip some new words or predict them to go on my reading progress; we can speak English in class and discuss the questions with team members; I think it is good.

**Student no. 9:** I start to use any ways to improve my reading like predict the text and plan my time and speed in reading; Guess the words.....predict the pictures; it is okay. The atmosphere is good. The team members can communicate in English. I like this new method to learn the reading skills; I think it is good.

**Student no. 10:** I realize to do plan.....think about reading techniques after the lessons.....I check my answer after I finish the reading; I know the strategy guessing words meaning, I know how to guess.....from prefix, suffix, context; Very fun. It is very helpful for my reading. When I read the text, I decided what the reading strategies should I use. Because the teacher do not tell me; I think it is good.

**Student no. 11:** I am happy I learn some reading techniques ...emm how to find the topic, how to predict the new words; guess the words, go to the questions; I hope the teachers use the same way to teach in regular English class; If teacher can teach more, I think it will be better.

**Student no. 12:** Planning make me know how to start my reading. And I start to think how I do my reading.....If I have some problems, I think I know how to deal with; I predict the text through the given picture of the text; I think my reading skills improve after the lessons; nope.

**Student no. 13:** I learned some reading strategies in this class. And I use them while I do reading part of test; I now know that I need to seek the possible related sentence according to the key words and try to and try to understand them; The atmosphere of class is higher than regular class. We can talk in class. I am more confident when I speak English in a group; nope

## APPENDIX N

### SAMPLES OF OBSERVATION FIELD

**August 2, 2019**

<b>Time: 8:30-11:30 Students: 27</b>		
In a classroom, there is a blackboard and a computer. The desks and chairs are movable.		
<b>Teaching procedures</b>	<b>Teacher</b>	<b>Student</b>
Step 1: New knowledge Step 2: Reading strategies teaching Step 3: Strategies use	Act as a lecturer and a instructor	Act as a listener Input the knowledge
<b>PBL procedures</b>		
Step 1: Meet the problem Step 2: Need/know to know Step 3: Define the problem statement Step 4: Gather information	Act as a facilitator or a guide. The teacher addressed the real problems that the neighbor Wang Dama ask the learning method to improve her son English. The teacher goes to the groups to observe and provides some helps for the necessity. The teacher stops for a while to notice the common problems students met in the reading, like how to pronounce the pronunciation, how to write the possible solutions, and how to collect the solutions, etc.	Act as a performer The students laugh and make a joke. The reason might be 1) they are interesting in hearing the common problems in the real; 2) most of them also want to find the way to improve English. Some students raise the hands to ask some meaning of words and phrases. Students discuss within the groups. Some of them talk in Chinese when the instructor walks away. Some students have a small talk until the instructor go to them.
Most of student engage and follow the PBL procedures. They perform actively and have great enthusiasm to the alternative approach in learning.		

## **CURRICULUM VITAE**

Meijing Wu was born in April 1991, Guangdong Province, China. She graduated from Guangdong University of Petrochemical Technology in 2016 with a Bachelor of Arts degree in Business English. After that, she pursued her M.A. in English language studies in the School of Foreign Languages, Institute of Social Technology, Suranaree University of Technology, Thailand. Her research interests mainly include English as a foreign language teaching and learning, metacognition, problem-based approach, and lifelong learning, etc.

